the Future *Urban Legacy* Lab

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a report 2017-2021

HOW TO: read this book

TONE OF VOICE

Hello! This is the RED BOX, the voice that will guide you through all this publication. There will be different red boxes visibile all around the book as a guide to the topics. They are the narrative voice accompaining the reading.

The voice can function as an introduction, or describe quantities and facts of a given subject.

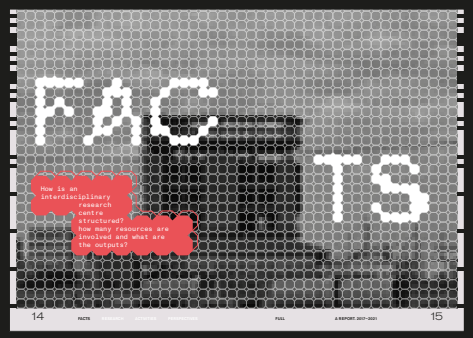
As the red box suggests, there will be a guidance in all the book based on hints, little stories and numeric informations. This first part in black background is an introduction to all the different elements you will find in the book.

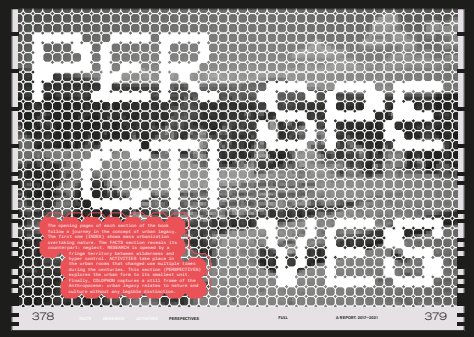
HOW TO: read this book

BOOK STRUCTURE

The book is divided in 4 main chapters which are:
FACTS, RESEARCH, ACTIVITIES, PERSPECTIVES.

Every chapter is guided through it's specific color and contains various formats of text, subchapters, deepening on the topics and explanations of specific projects.





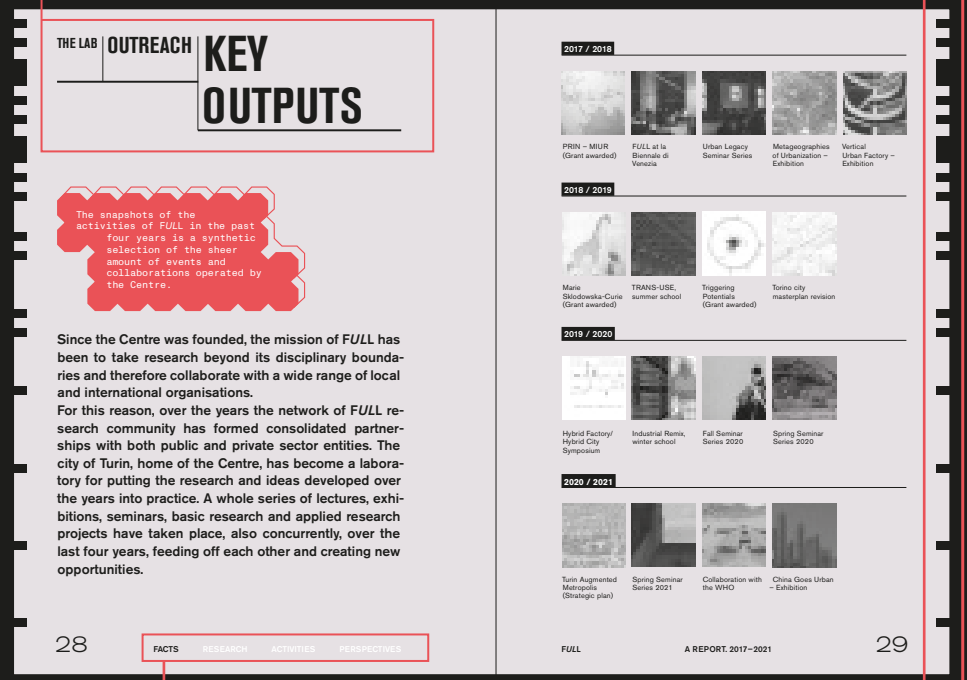
HOW TO: read this book

PAGES STRUCTURE

Every page has guidance tools to help the navigation of the book:

The chapters and sub chapters are guided also through little crumb threads.

The lateral color, which draws on the fore edge of the book a pattern representing *FULL*'s logo, can help in the navigation through the chapters (colors refer to different chapters).



Here you can find the position of the chapters and in which chapter you are.

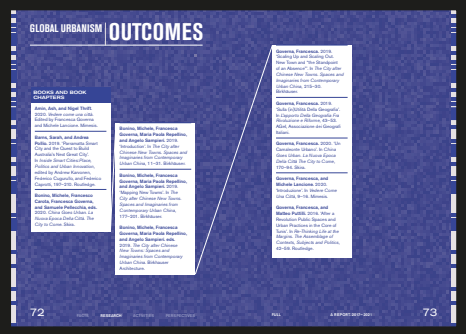
HOW TO: read this book

CHAPTERS CONTENTS | some advices referred to the Research chapter

Please, pay attention to the higher complexity of structure of the RESEARCH ISSUES: you will find eight sub-parts refering to eight ISSUES.

Please also note that every issue will have a specific code to follow that you can check on page 40.

Every issue contains a certain number of researches explained. Each research has a shorter or longer description, depending on the author's preference.



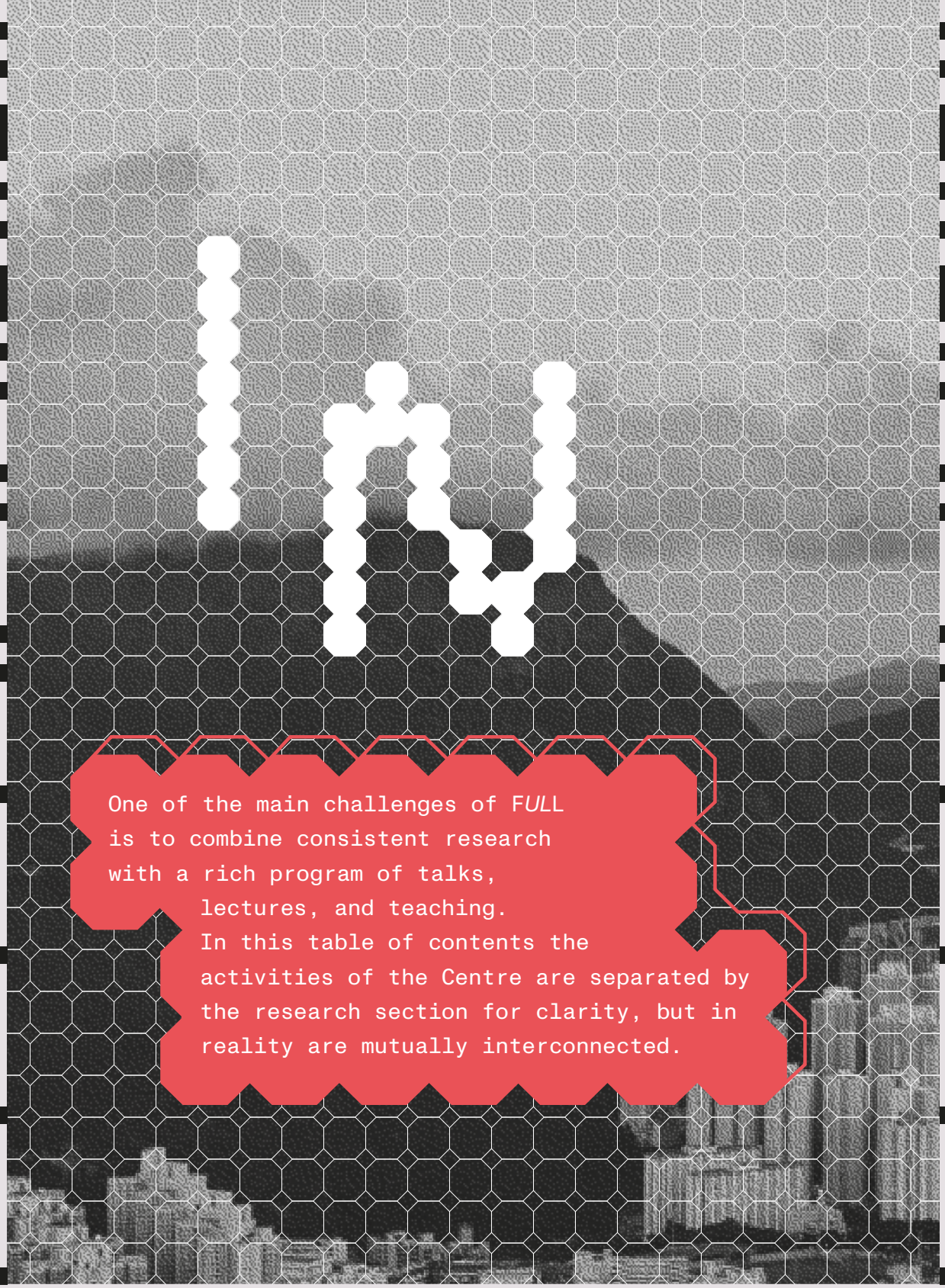
Every issue has an ending annex page called OUTCOMES. The subchapter has diverse typologies of bibliographic content.

In addition to the chapters, positioned at the end of every ISSUE of the RESEARCH chapter there will be green background pages containing a glossary.

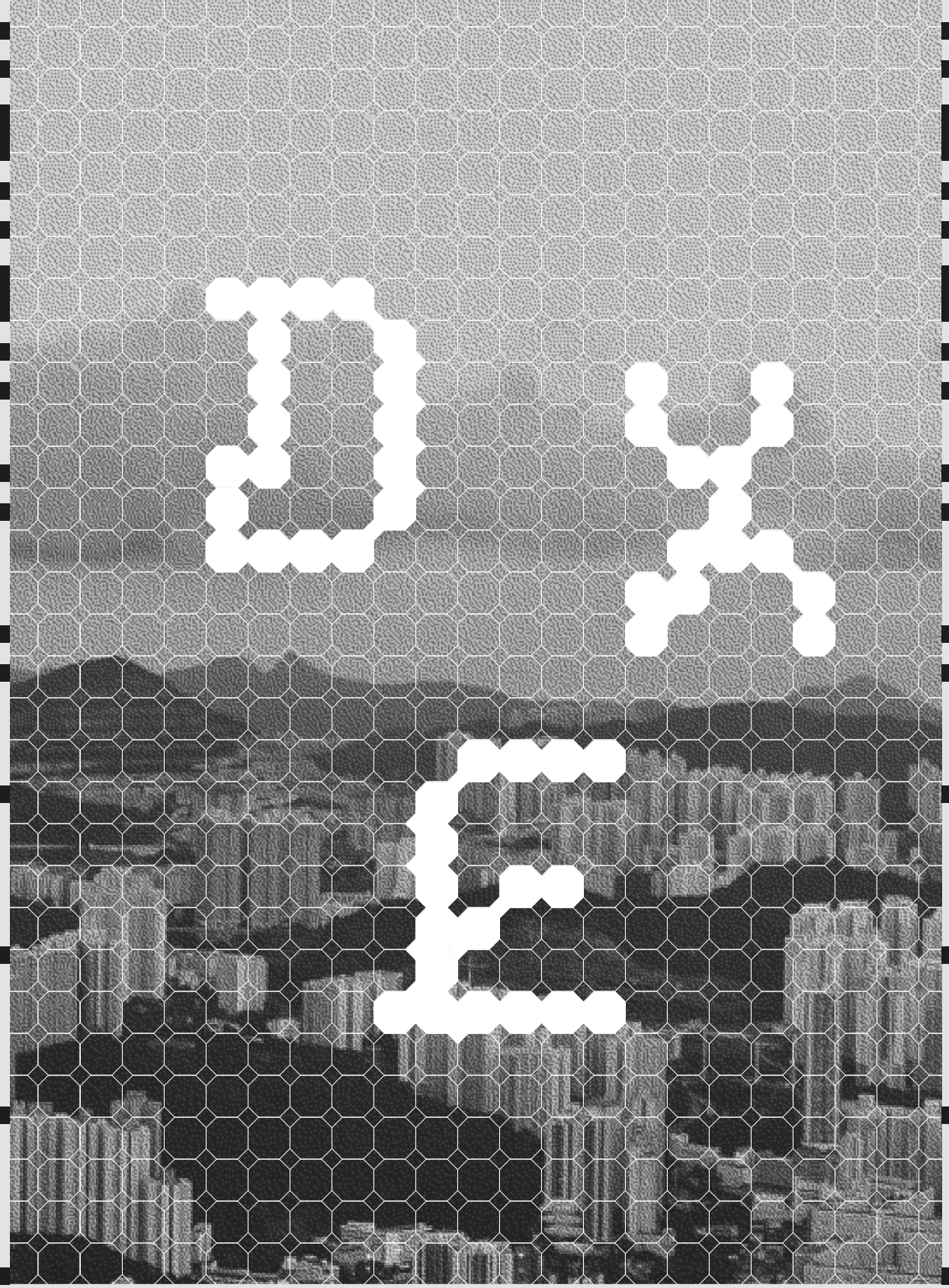
You will see KEYWORDS appearing as taken from quotes during lectures and seminars hosted by *FULL*. They are linked to the issues but they can be considered as an interlinked glossary.

The keywords are the following:

INTERDISCIPLINARITY, REPRESENTATION, SQUATTING, HERITAGE, EFFICACY, CULTURE, TRADITION, TOOLS, TECHNOLOGY, LEGACY, MORPHOLOGY, HYBRID, SPECIFICITY, PRODUCTIVITY, ARTIFICIAL INTELLIGENCE, PLATFORM ECONOMY, RENOVATION, RIGHTS, INNOVATION, REAL ESTATE, CULTURAL HERITAGE, PLANETARISM, CARTOGRAPHY, UNESCO, NOSTALGIA.



One of the main challenges of *FULL* is to combine consistent research with a rich program of talks, lectures, and teaching. In this table of contents the activities of the Centre are separated by the research section for clarity, but in reality are mutually interconnected.



FACTS 14

Here we present our organization. With an overview of all the relevant information about the research centre.

RESEARCH 38

A detailed account of our research production, made of research projects, applied researches and PhD researches.

ACTIVITIES 316

During the past four years *FULL* hosted numerous events and talks. We invited guests from the most diverse disciplinary fields. These kind of activities unfolded in different media and can be found on our Vimeo channel and our Podcast channel.

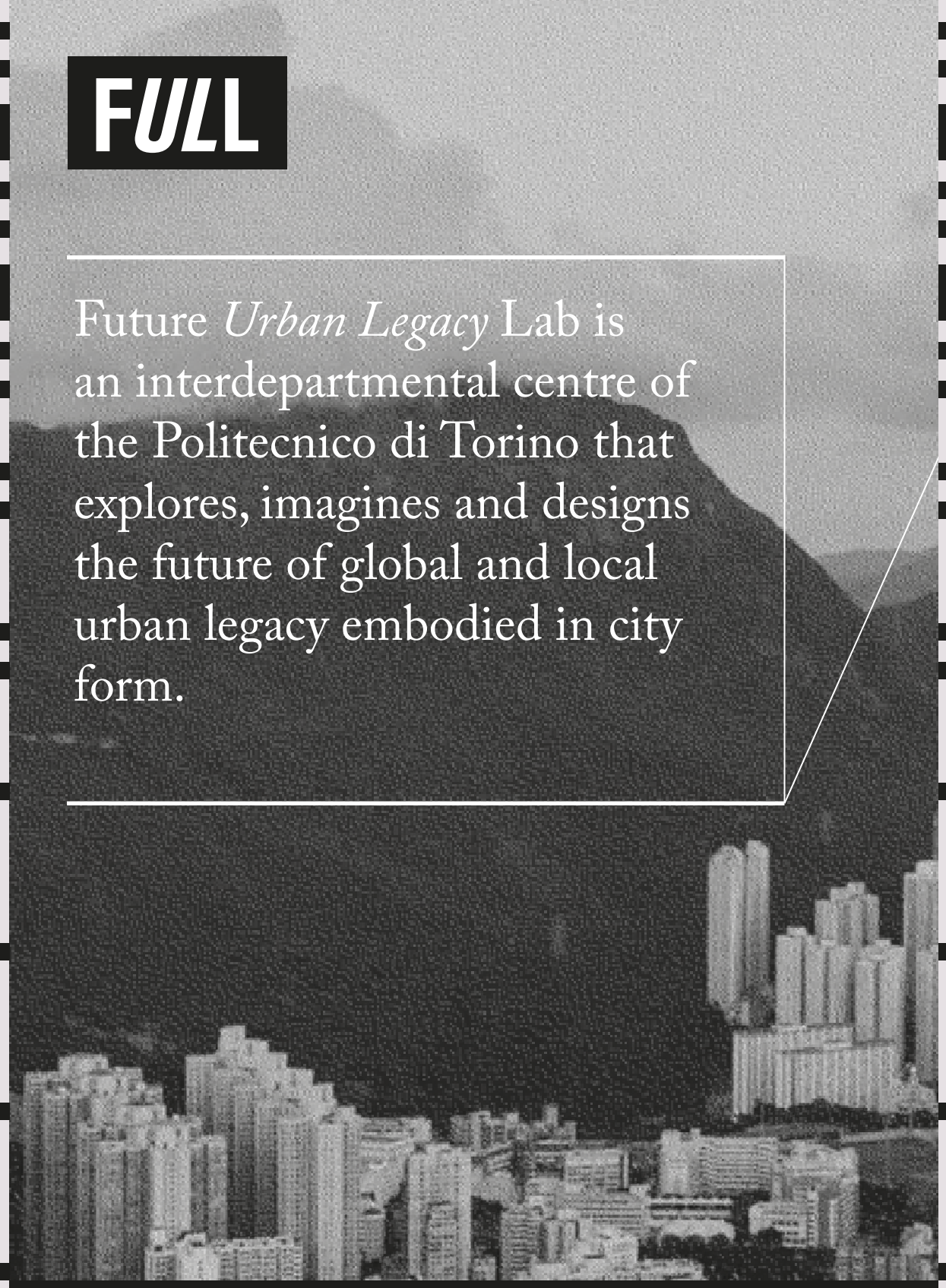
PERSPECTIVES 378

Here we discuss the trajectory described by *FULL* during the years and some possibilities for the future.

COLOPHON 400

FULL

Future *Urban Legacy* Lab is an interdepartmental centre of the Politecnico di Torino that explores, imagines and designs the future of global and local urban legacy embodied in city form.



FUTURE

/’fju:tʃər/ ▪ noun

A period of time following the moment of speaking or writing; a time regarded as still to come.

URBAN

/ ‘ə:b(ə)n / ▪ adjective

In, relating to, or characteristic of a town or city; e.g. ‘the urban population.’

LEGACY

/ /’leg.ə.si/ ▪ noun

A situation that exists now because of events, actions, etc., that took place in the past.

LAB

/lə’b/ ▪ noun

A room or building equipped for scientific experiments, research, or teaching, or for the manufacture of drugs or chemicals.

FAQ

How is an interdisciplinary research centre structured? how many resources are involved and what are the outputs?

FOREWORD

Stefano Paolo Corgnati
Interdepartmental Centres
Committee Coordinator
Vice Rector for Internal Policies

The creation of the Interdepartmental Centres has without doubt been one of the most influential strategic decisions of the last ten years at Politecnico di Torino. A highly innovative decision yet also an intrinsic source of potential tension, as is inevitable when a new "research" body joins a consolidated model.

I have had a really unique opportunity to follow their entire evolution, first as a member of the board where I first brought up the idea of setting up these new "research spaces", then as Vice Rector for Research with the mandate of launching the (essential) dialogue between department directors and the coordinators of the interdepartmental centres, and now today, albeit with new responsibilities as Vice Rector, as Coordinator of the Interdepartmental Centres Committee.

Over the years I have answered lots of questions about the "Centres". The most frequent question is "why"? The answer lies in the increasing complexity of the problems we are asked to consider and possibly solve, a complexity that we address by taking strong expertise in different disciplines and bringing it together to create a single inter-disciplinary voice.

The other thing is "what"? In other words, "what are they"? The vision that I have evoked on several occasions is that of a "research playground": free and open spaces where you can practice a sport (i.e. the theme of the centre), therefore a place that attracts players from different areas (the departments) who, interested in the match (the issue being discussed), join the team with everyone on the pitch playing the role in which they specialise (their disciplinary area). The Interdepartmental Centres are this: physical and thematic places that welcome specialists of different extraction and get them to operate in an interdisciplinary setting where they can address complex problems from all angles.

F*UL*L operates in this challenging University context where it has combined the transversal themes of the new paradigms of urban and territorial regeneration, as well as modern interpretations of living, with expertise in various domains ranging from economics to the environment, mobility to connectivity and energy to social themes. A crucial interdisciplinary approach for addressing the current trajectories defined by the national and European development plans for a "post-carbon" society.

THE LAB

Laura Martini
Executive manager

Between 2017 and 2021, in its first four years of work, the F*UL*L Interdepartmental Centre has developed research and activities across a broad range of interdisciplinary projects merging together humanities with sociotechnical understanding. The research team has looked at the main challenges faced in a rapidly urbanising world, as well as the pandemic and post-pandemic contexts, using its research work to focus on the future of global and local urban legacy embodied in city form.

The research centre was born out of cooperation between seven Politecnico di Torino (PoliTo) departments: Design, Urban Studies, Environment and Land, Energy, Management and Production, Electronics and Telecommunications, and Computer Engineering (1), growing into a wider research community reaching a peak of seventy faculty members across PoliTo, the University of Turin, visiting professors from abroad, scholars and PhD students.

Over the past four years, F*UL*L has built a unique approach to urban studies, moving from the traditional perspectives of similar Italian centres to adopt an internationally acknowledged ground-breaking approach. F*UL*L has shared its research with a broad network of research centres worldwide, reaching the goal to enhance the scientific impact of city-related studies at PoliTo.

F*UL*L's research team on urban regeneration and industrial reuse has set up a vast research network working with the Department of Urban Studies and Planning at MIT, the Vertical Urban Factory network, the Urban Land Institute Pittsburgh, Technion - Israel Institute of Technology, Tsinghua University Beijing, and Baumeister - BM in Brussels. Within this network, between 2018 and 2020, F*UL*L organised two international schools, one exhibition at the Lingotto factory and the International Symposium Hybrid Factory/Hybrid City.

F*UL*L has also begun to strengthen its partnership across PoliTo, most notably with China Room, in particular, the research team on Global Urbanism has been awarded and financed by the Italian Ministry of Education, University and Research (MIUR) for its research *Rescaling the Belt and Road Initiative: urbanisation processes, innovation patterns and global investments in urban China* as a Project of National Interest (PRIN 2017). This and the Marie Curie post-doctoral scholarship in partnership with the PoliTo Interuniversity Department of Regional and Urban Studies and Planning and African Centre for Cities (ACC) - Cape Town, boosted and widened the field of work of F*UL*L, as well as its international impact and relevance.

In the field of media and society, F*UL*L cooperated with the PoliTo research centre NEXA Center for Internet and Society, contributing to the organisation of the 2018 Nexa Conference, Urban Digital Commons and the Future of Cities, also cooperating with the Institute for Advanced Architecture of Catalonia (IaaC) in Barcelona and the Barcelona Supercomputing Center.

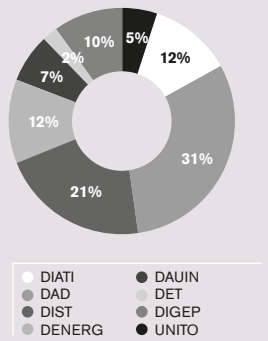
During the COVID-19 outbreak in 2020 and the post-pandemic period in 2021, we have embarked on collaborations with international agencies such as the World Health Organization (WHO) for the validation of Covid hospitals in Burkina Faso and private foundations, such as Fondazione Agnelli, to tackle the pandemic emergency in schools in Italy. In the latter case, we quickly became a benchmark research centre on this topic. Moreover, we have supported public agencies in policy-making, among others: in 2020, we supported the Metropolitan city of Turin in shaping their three-year strategic plan. (Turin Augmented Metropolis).

From the very start, the research centre has been increasingly active in the scientific debate on diverse urban issues, producing over 120 publications, among books and book chapters, scientific papers, conference proceedings, and scientific reports. (2)

Engagement with scholars and experts during the over 50 events, seminar series, lectures and exhibitions, produced by the research centre, and the participation of F*UL*L representatives at scientific events around the world, enhanced the production of a vast international research network and reinforced the dialogue with other research institutions.

F*UL*L is coordinated by a Project Manager and an Executive Manager who report to the Scientific Board in bi-monthly meetings. The Scientific Board comprises a faculty member from each of the seven departments participating in F*UL*L, plus the Project Manager and the Deputy Project Manager.

1. Staff distribution by department (42 members)

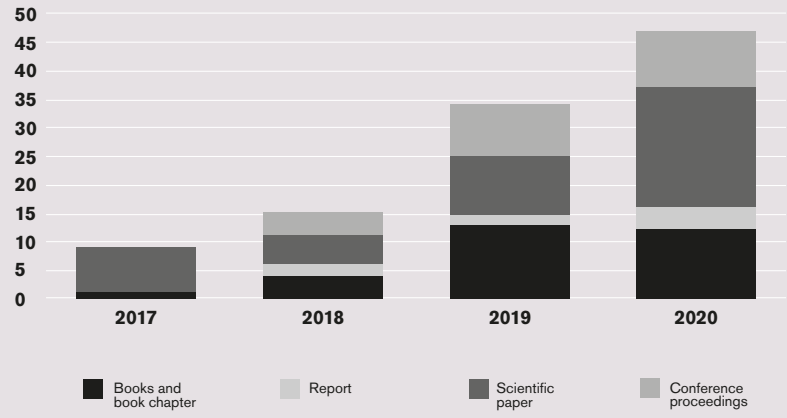


Due to the vast and diverse number of research projects, F*UL*L has modelled a research management and verification system, which is structured through a coded decision-making process and a research project validation and approval process. Each research team is required to fill in, update and share a research project sheet with the Scientific Board during its meetings to describe the impact and the budget, both financed and spent, for the research project.

In its first four years of work, the research centre has been housed in a two-hundred square meters laboratory consisting of a meeting room, a library and an open space where scholars from several different research fields could come together to share their knowledge and understanding and build a common ground for a brand-new approach to urban studies.

We would like to take this opportunity to thank all the research and administrative staff at the Politecnico di Torino who have supported us in these four years of intense work.

2. Main publications



THE LAB | PEOPLE

Departments

7 departments,
59 people,
33 disciplinary
expertise
fields.

DAD

Urban and architectural design, landscape design, construction technology, urban history, heritage preservation and restoration, geomatics.

DIST

Urban planning, urban geography, urban economics, project evaluation.

DET

Digital networks in urban settings, device-to-device communications.

DIGEP

Innovation economics and innovation management.

DIATI

Environmental assessment, urban environmental quality indicators, remediation techniques for urban post-industrial sites.

DAUIN

Big data, information technologies, public data management and policies in cities.

DENERG

Urban energy networks and grids, renewable energies in urban settings.

Team *FULL*

Project manager

Matteo Robiglio

Executive manager

Laura Martini

Deputy project manager

Francesca Governa

Scientific board

Luigi Buzzacchi
Claudio E. Casetti
Juan Carlos De Martin
Enrico Fabrizio
Francesca Frassoldati
Paolo Giaccone
Marco Carlo Masoero
Antonio Santangelo
Giuseppe Scellato
Tiziana Tosco
Antonio Vetrò
Giulio Zotteri

Faculty

Edoardo Piccoli
Elisabetta Raguseo
Nina Rappaport
Nicola Russi
Luigi Sambuelli
Nannina Spanò
Elena Vigliocco

Research Fellows

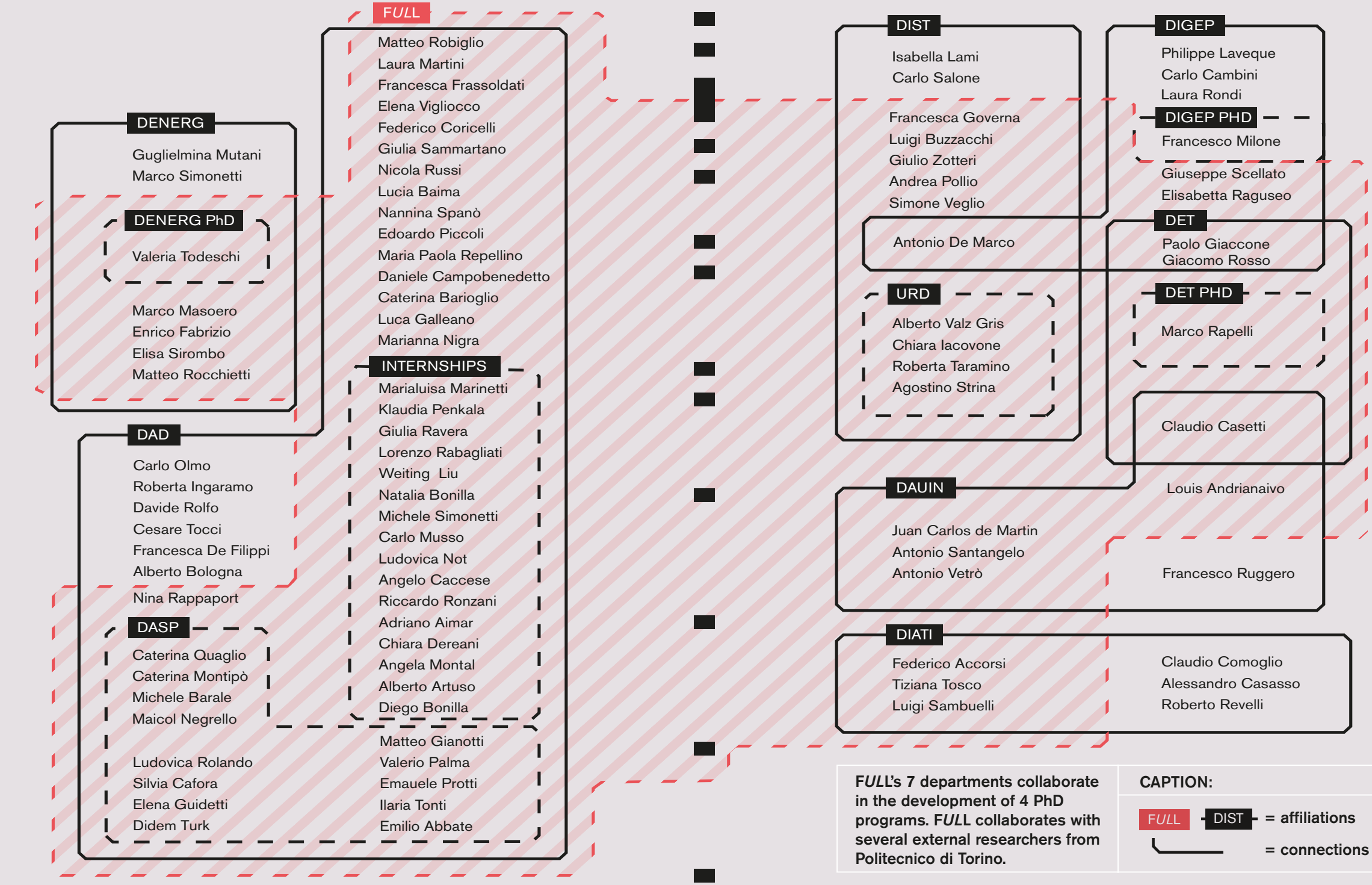
Adriano Aimar
Lucia Baima
Caterina Barioglio
Angelo Caccese
Daniele Campobenedetto
Marco Cappellazzo
Federico Coricelli
Antonio De Marco
Luca Galleano
Marianna Nigra
Andrea Pollio
Caterina Quaglio
Maria Paola Repellino
Giulia Sammartano

PhD candidate

Silvia Cafora
Matteo Gianotti
Elena Guidetti
Chiara Iacovone
Francesco Milone
Valerio Palma
Marco Rapelli
Ludovica Rolando
Agostino Strina
Roberta Taramino
Valeria Todeschi
Ilaria Tonti
Didem Turk
Alberto Valz Gris

Past fellow

Emilio Abbate
Federico Accorsi
Louis Andrianaivo
Michele Barale
Natalia Bonilla
Caterina Montipò
Maicol Negrello
Emanuele Protti
Elisa Sirombo



FULL's 7 departments collaborate in the development of 4 PhD programs. FULL collaborates with several external researchers from Politecnico di Torino.

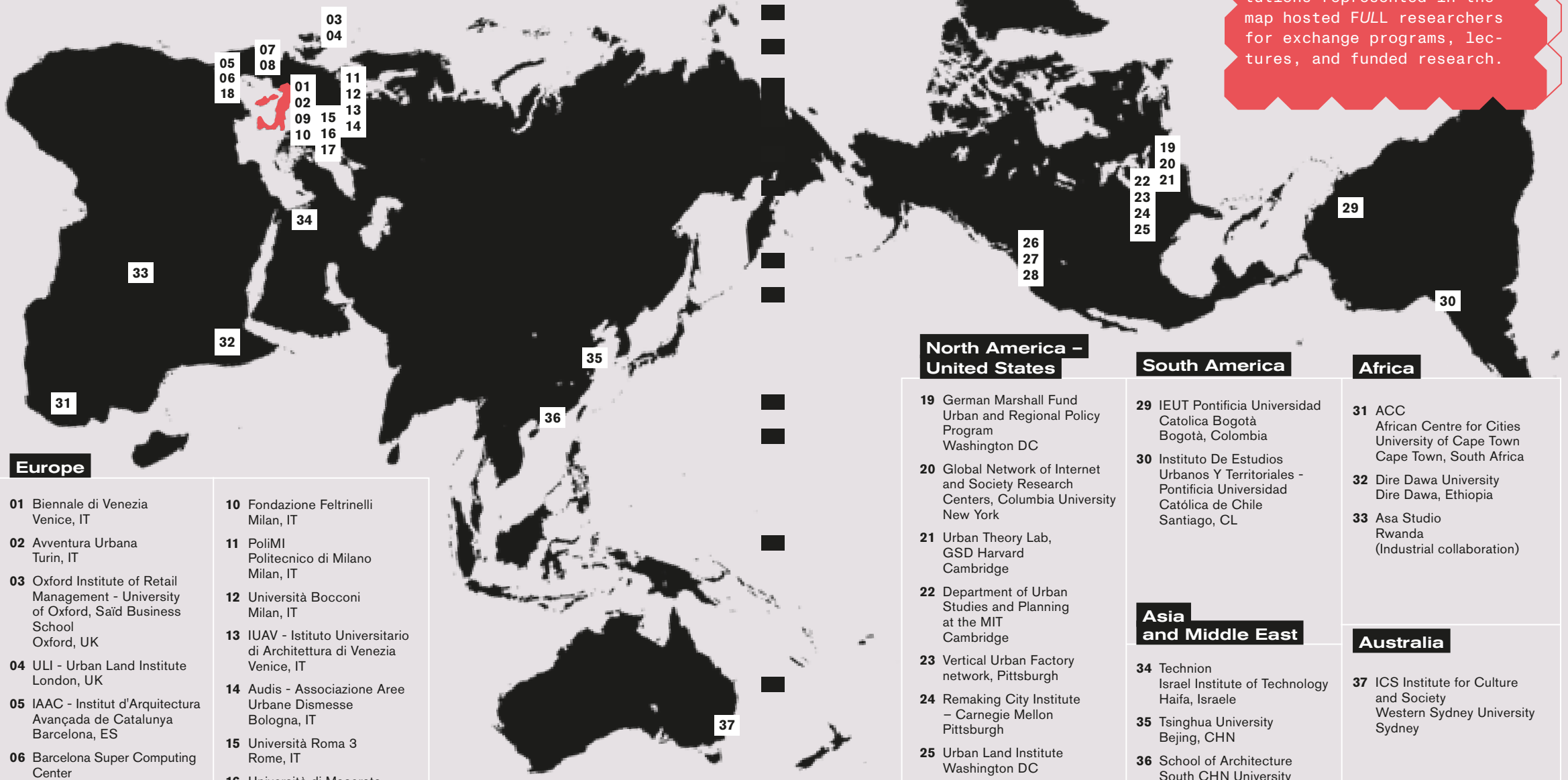
CAPTION:

FULL — DIST = affiliations

= connections

THE LAB | OUTREACH

The map shows the institutions that collaborated with *FULL* in the past years. The institutions represented in the map hosted *FULL* researchers for exchange programs, lectures, and funded research.



Europe

01 Biennale di Venezia
Venice, IT

02 Avventura Urbana
Turin, IT

03 Oxford Institute of Retail Management - University of Oxford, Saïd Business School
Oxford, UK

04 ULI - Urban Land Institute
London, UK

05 IAAC - Institut d'Arquitectura Avançada de Catalunya
Barcelona, ES

06 Barcelona Super Computing Center
Barcelona, ES

07 Baumeister - BMa
Bruxelles, BE

08 Paul Andreu Architecte
FR (Industrial collaboration)

09 Links Foundation
Turin, IT

10 Fondazione Feltrinelli
Milan, IT

11 PoliMI
Politecnico di Milano
Milan, IT

12 Università Bocconi
Milan, IT

13 IUAV - Istituto Universitario di Architettura di Venezia
Venice, IT

14 Audis - Associazione Aree Urbane Dismesse
Bologna, IT

15 Università Roma 3
Rome, IT

16 Università di Macerata
Macerata, IT

17 UniSalento
Lecce, IT

18 Urban Next / ACTAR
home based in New York, USA; office in Barcelona, ES

North America – United States

19 German Marshall Fund Urban and Regional Policy Program
Washington DC

20 Global Network of Internet and Society Research Centers, Columbia University
New York

21 Urban Theory Lab, GSD Harvard
Cambridge

22 Department of Urban Studies and Planning at the MIT
Cambridge

23 Vertical Urban Factory network, Pittsburgh

24 Remaking City Institute – Carnegie Mellon
Pittsburgh

25 Urban Land Institute
Washington DC

26 Global Metropolitan Studies Center University of California
Berkeley, California

27 UCLA - University of California, Los Angeles

28 UC Davis Art University of California
Davis

South America

29 IEUT Pontificia Universidad Catolica Bogotà
Bogotà, Colombia

30 Instituto De Estudios Urbanos Y Territoriales - Pontificia Universidad Católica de Chile
Santiago, CL

Asia and Middle East

34 Technion
Israel Institute of Technology
Haifa, Israele

35 Tsinghua University
Bejing, CHN

36 School of Architecture South CHN University of Technology, Guangzhou, Guangdong Province, CHN

Africa

31 ACC
African Centre for Cities
University of Cape Town
Cape Town, South Africa

32 Dire Dawa University
Dire Dawa, Ethiopia

33 Asa Studio
Rwanda
(Industrial collaboration)

Australia

37 ICS Institute for Culture and Society
Western Sydney University
Sydney

KEY OUTPUTS

The snapshots of the activities of F*UL*L in the past four years is a synthetic selection of the sheer amount of events and collaborations operated by the Centre.

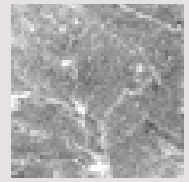
Since the Centre was founded, the mission of F*UL*L has been to take research beyond its disciplinary boundaries and therefore collaborate with a wide range of local and international organisations.
For this reason, over the years the network of F*UL*L research community has formed consolidated partnerships with both public and private sector entities. The city of Turin, home of the Centre, has become a laboratory for putting the research and ideas developed over the years into practice. A whole series of lectures, exhibitions, seminars, basic research and applied research projects have taken place, also concurrently, over the last four years, feeding off each other and creating new opportunities.

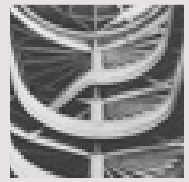
2017 / 2018


PRIN – MIUR (Grant awarded)


F*UL*L at la Biennale di Venezia

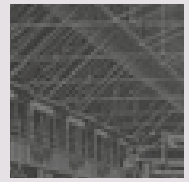

Urban Legacy Seminar Series

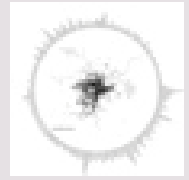

Metageographies of Urbanization – Exhibition


Vertical Urban Factory – Exhibition

2018 / 2019


Marie Sklodowska-Curie (Grant awarded)

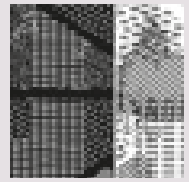

TRANS-USE, summer school


Triggering Potentials (Grant awarded)


Torino city masterplan revision

2019 / 2020

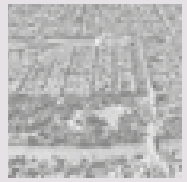

Hybrid Factory/ Hybrid City Symposium


Industrial Remix, winter school


Fall Seminar Series 2020


Spring Seminar Series 2020

2020 / 2021


Turin Augmented Metropolis (Strategic plan)


Spring Seminar Series 2021


Collaboration with the WHO


China Goes Urban – Exhibition

SELECTED PRESS

The research activities of *FULL* have been covered by international and local news outlets

LA REPUBBLICA — 03.08.20
Scuola, Fondazione Agnelli: ecco come usare mense e corridoi per la didattica in emergenza

URBANNEXT — 06.11.18
Industrial Clusterization Strategies in the Pearl River Delta Area: Reorganizing the Production of the PRP in Zengcheng NTDZ

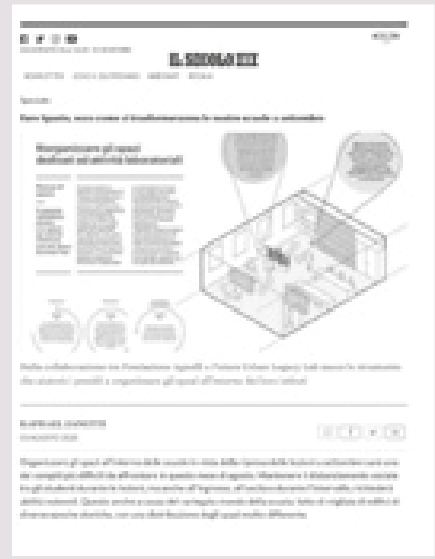
BLOOMBERG — 09.07.19
Portugal Passes 'Right to Housing' Law As Prices Surge


Portugal Passes 'Right to Housing' Law As Prices Surge

URBANNEXT — 06.11.18
Exploring Chinese New Towns

IL SOLE 24ORE — 14.11.19
Guida assistita, a Torino i test «on the road» di sei applicazioni

IL SECOLO XIX — 03.08.20
Fare Spazio, ecco come si trasformeranno le nostre scuole a settembre



CORRIERE DELLA SERA — 18.02.21

Anna Silenzi e Marianna Nigra, le giovani progettiste italiane che realizzano ospedali Covid

CORRIERE DELLA SERA — 21.01.21

Torino su Instagram, il georitratto negli scatti social (quasi solo centro e zona Sud)

LA STAMPA – 08.11.19

Inquadra e clicca, ora i monumenti di Torino li racconta lo smartphone

LA REPUBBLICA — 01.03.21

“Grande Torino”, sei ricette antideclino

LA REPUBBLICA — 11.04.21

Ora alla "Grande Torino" serve una squadra di cuochi per poter decollare

URBANNEXT — 12.09.18

Production Strikes Back: Rethinking Urban Manufacturing Spaces

CORRIERE.IT — 05.04.19

Appendino: «La nuova Ztl aiuterà contro lo smog». Ma per i tecnici «cambia poco, livelli uguali»

YAHOO! FINANZA — 15.04.21

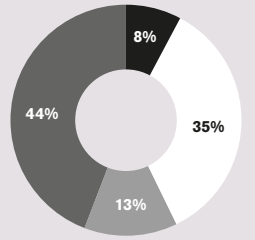
Skygate, primo Digital Twin a Torino per test Urban Air Mobility

THE LAB | FINANCIAL REPORT

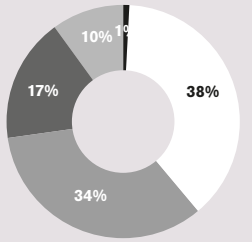
According to the objectives of its Strategic Plan, in 2017 the Politecnico di Torino established and funded its first eleven Interdepartmental Research Centres, with the aim of enhancing systematic interdisciplinary collaboration between different technological and scientific fields in order to tackle the complexity of scientific problems. F*UL*L was one of these eleven centres; launched in November 2017, it received funding for three million euros over a three-year period.

In its first four years of existence, F*UL*L has spent less than two thirds of the allocated budget, as costs were partly covered with the growth of new revenue streams from externally-funded research. Due to its intrinsic structure and research focus, most of the research centre's costs have been dedicated to human resources: 35% of the budget has been allocated to fund new research positions, in particular 15 PhD scholarships, 12 research assistants, 3 assistant professor grants and 1 executive manager. The centre has invested 8% of its budget in technological equipment, high-quality photographic and filming equipment, laser scanners, a drone with thermal imaging cameras, portable equipment for 3D surveys and a hydrogen generator. To foster research, the centre has purchased numerous databases, including the European Airbnb database (2019/2021), the STR Share 2019 hotel database and the European Patent Office database. (1). Of the new revenue streams, 38% come from private third-parties (mostly commercial contracts for applied research), 34% from research funded by public agencies (the Italian Ministry of Education, University and Research), 17% from the European Union. (2) Since F*UL*L, as an Interdepartmental Centre, is not an autonomous spending unit, these new funds have been allocated to the seven F*UL*L departments, mostly to the Architecture and Design Department (DAD) and the Interuniversity Department of Regional and Urban Studies and Planning (DIST). (3) In December 2020, F*UL*L submitted its updated business plan to the Interdepartmental Centre Review Committee appointed by Politecnico di Torino Board of Directors. F*UL*L was found to be in good financial health, so that the centre is now ready to enter a new stage of growth and consolidation.

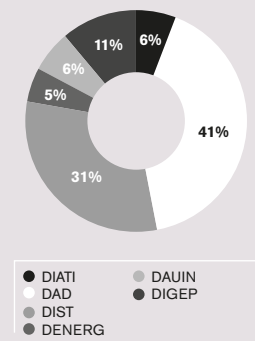
1. Budget expenditure (over the 3 mln euros allocated)



2. New revenue streams (1,1 mln euros total)



3. New revenue streams by department



Data form 2020 Business Plan Review, the new revenue streams updated at october 2021.

THE LAB | PARTNERS

A selection of the main institutions and private partners that supported *FULL*'s research over the years.

PRIVATE

5T
Assoimmobiliare
Banca d'Italia
CCIAA Torino
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Enel
Equiter SpA
FCA
Fondazione Agnelli
Fondazione CRT
Iren
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Thyssenkrupp
TIM

INSTITUTIONS

Anci Lombardia
Città metropolitana di Torino
Comune di Torino
CSI Piemonte
European Commission - Marie Sklodowska-Curie Actions
MIBACT - Soprintendenza Torino e Alessandria
MIUR - Ministero dell'Istruzione, dell'Università e della Ricerca
Regione Lombardia
Regione Piemonte
Regione Autonoma Trentino Alto Adige
Unione Industriali Torino
UrbanLab Torino
World Health Organisation

RESEARCH

The dissemination of *FULL*'s research, due to its interdisciplinary composition, is operated on various research products spanning from books and books chapters to scientific papers and research reports.

RESEARCH ISSUES

We grouped our vast research production in eight main issues. Each issue aims to provide answers to global research issues related to the environment, territories and the city.

GU = acronym of the research issue

GU GLOBAL URBANISM

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KEYWORDS
LEGACY
REAL ESTATE
CARTOGRAPHY
NOSTALGIA

- SURGE. Chinese Financialisation and Urban Change in East Africa (Marie Skłodowska-Curie Action)
- Rescaling the Belt and Road Initiative: urbanisation processes, innovation patterns and global investments in urban China
- Hinterlands of the green transition. Atacama, lithium and the extended geographies of the zero-emission city
- Infrastructure scripts. History and futures of urbanisation along the Ethio-Djibouti Railway

NPL NON-PERFORMING LEGACIES

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CULTURAL HERITAGE
HERITAGE
UNESCO
TRADITION

- Adaptive reuse scenarios
- The buildings inside the Cittadella of Alessandria
- Geophysical surveys and preventive archaeology. Ground-penetrating radar survey of pre-existing structures in the Bergoglio district (AL) under the Piazza D'Armi (Parade Ground)
- Reactivation of non-performing cultural heritage
- Manufacturing Technology and Compentence Center Turin
- Adative Remediation
- Loft Working
- The Potential of form. Assessing the transformative potential of existing buildings in post-functional Europe
- The Workspace [R]evolution. The comeback of Incubator and its role in the New Urban Economies

EOU ECONOMIC ORGANIZATION AND URBAN SPACE

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Italy is the Air(bnb). The The uneven diffusion of short-term rental markets between urban locations and selective tourism destinations

Seizing local entrepreneurial opportunities in the platform-based era. Airbnb, gig entrepreneurs and middlemen

Impact of Covid-19 on the strategic choices and performance of hosts. An empirical investigation on peer-to-peer accomodation platforms

Urban retail

Agglomeration and the Italian North-South divide

Shifting the triangle

University research funding, patenting and technological impact, European Patent Office (Academic Research Programme)

Airbnb in the real estate financial chain. Housing and policies in Southern Europe post-crisis territories

Retail, Agglomeration and urban Morphology

KEYWORDS
PLATFORM ECONOMY
HYBRID

TUL TRANSFORMATIVE URBAN DESIGN AND LANDSCAPE

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Re-coding. Rethinking the rules of cities

Turin Augmented Metropolis

A new regional regeneration model in Lombardy

Reconstructions. Design tools after emergencies. Seismic transitions, from temporariness to permanence

Servitude of form. Comparative urban property and building rules

KEYWORDS
MORPHOLOGY
SPECIFICITY
PRODUCTIVITY
RIGHTS

NHI NEW HOUSING ISSUES

200

Contemporary rentscapes

New Domestic Rentscape. A Critical Insight into Middle-class Housing

Community-led housing development. A key ingredient for a new housing architecture and policy

Tailor—made housing. How to improve housing affordability and adequacy through innovation of the cohousing model

KEYWORDS
CULTURE
SQUATTING

DT

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Digital Open Urban Twin / 3D city model

Augmented reality heritage

Triggering Potentials. The enhancement of urban cultural heritage as a strategy to reactivate city regeneration processes.

5G USE CASE. Smart Tourism. The potential of the 5G infrastructure to enable micro-localized content for tourism

5GAA demo

City Twin. Digital urban models between description and abstraction

Mobility applications for a smart city environment

KEYWORDS

TECHNOLOGY
TOOLS
ARTIFICIAL INTELLIGENCE
INNOVATION

UC

URBAN CLIMATE ACTIONS

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Design Management Dynamic Tool (DMDT)

Urban Agriculture

Holistic approach for large PV plants design and operation

Architecture for urban agriculture

Smart Energy Solutions for Sustainable Cities and Policies

KEYWORDS

INTERDISCIPLINARITY
RENOVATION

PPC

POST-PANDEMIC CITY

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Severe Acute Respiratory Infections Treatment Centre

Re-school. Rethinking the school, starting with spaces

Real Estate Innovation Manifesto

Next Generation Urban River Park

KEYWORDS

REPRESENTATION
PLANETARISM

ISSUES | INTER-DISCIPLINARY MAP

GLOBAL URBANISM	SM AD UDP BME EPG
NON-PERFORMING LEGACIES	CRA HA RA AD UDP BME EPG AG
ECONOMIC ORGANIZATION AND URBAN SPACE	SM AD UDP BME EPG
TRANSFORMATIVE URBANISM AND LANDSCAPE	SM AD AT UDP EPG BPS SEE
NEW HOUSING ISSUES	CRA AD BME
DIGITAL TECHNOLOGY AND DATA SCIENCE FOR CITIES	SM AD AT UDP BME EPG NA IPS TC
URBAN CLIMATE ACTIONS	SM AD AT UDP BME BPS
POST-PANDEMIC CITY	SM AD AT EPG

DEPARTMENT OF ARCHITECTURE AND DESIGN

- CRA Conservation and restoration of architecture
- HA History of architecture
- RA Representation of architecture
- SM Surveying and mapping
- AD Architectural design
- AT Architectural technology
- UDP Urban design planning

DEPARTMENT OF CONTROL AND COMPUTER ENGINEERING

- NA Numerical analysis
- IPS Information processing systems
- TC Telecommunications

INTERUNIVERSITY DEPARTMENT OF REGIONAL AND URBAN STUDIES AND PLANNING

- UDP Urban design planning
- BME Business and management engineering
- EPG Economic and political geography

DEPARTMENT OF ENVIRONMENT, LAND AND INFRASTRUCTURE ENGINEERING

- AG Applied geophysics
- SEE Sanitary and environmental engineering

Every research issue requires a variety of disciplinary expertises borrowed from each of the seven departments.

DEPARTMENT OF ENERGY "GALILEO FERRARIS"

- TIS Thermal engineering and industrial energy systems
- BPS Building physics and building energy systems

DEPARTMENT OF MANAGEMENT AND PRODUCTION ENGINEERING

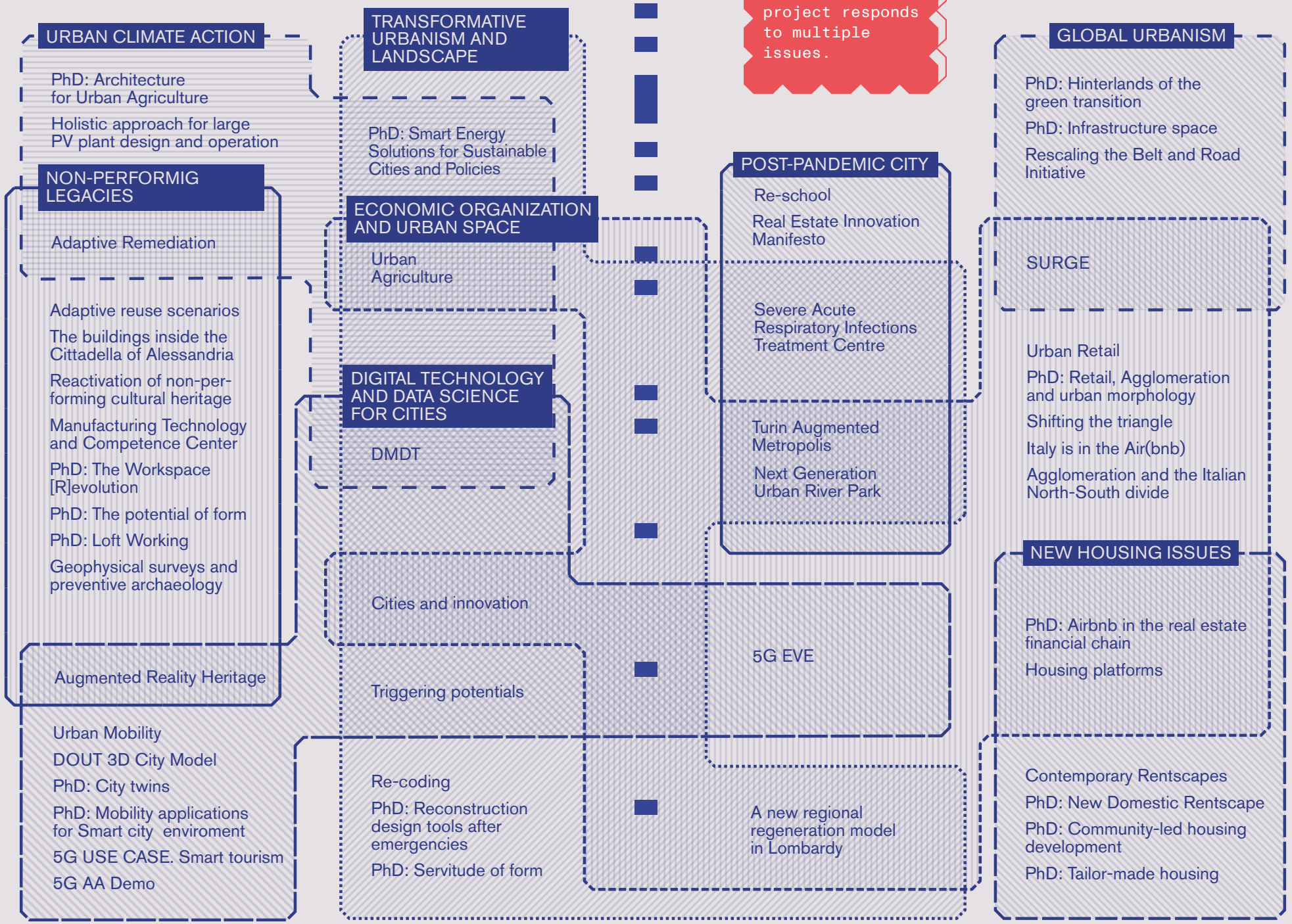
- BME Business and management engineering

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATIONS

- IPS Information processing systems
- TC Telecommunications

ISSUES MAP

The following map shows the connections and intersections of *FULL*'s research. In most of the cases a single project responds to multiple issues.



GLOBAL URBANISM

GU

What is the impact of global finance and extractive capitalism operated by superpowers?

Field notes, Atacama desert, december 2018. Author: Alberto Valz Gris

The high-altitude territories of the Puna de Atacama in the Argentinian province of Jujuy are a growing global hotspot for lithium-related exploration,extraction and popular contestation.

The focus of F*ULL*'s research extends beyond the urban scale, since planetary and regional phenomena redefine the economic and territorial structure in the globalised world.

The growing Chinese presence in Africa promoting large-scale infrastructural developments is one of the manifestations of these current trends. The research on *Chinese Financialisation and Urban Change in East Africa* focuses on Addis Ababa and Nairobi as case studies of the transformations produced by foreign lines of investment.

In the same vein, the PhD research *Infrastructure Scripts* interprets the railway as a linear system to observe urban change, from the colonial period to neo-colonial tendencies. *Hinterlands of the Green Transition* explores the commodity chain of lithium batteries, starting from their extraction sites in the Atacama Desert and following the complex journey of a pervasive commodity of the present era. As these dynamics unfold across corners of the globe, the deployment of the Belt and Road Initiative as an urbanization strategy beyond China demands new vantage points and analytical lenses.

INDEX

SURGE

Chinese Financialisation and Urban Change in East Africa (Marie Skłodowska-Curie Action)

TYPE
Research project

YEAR
2020 - 2023

TEAM

Chief investigator:
Dr Andrea Pollio

Supervisors:
Prof. Francesca Governa (*FULL*- PoliTo), Dr. Liza Rosa Cirolia (African Centre for Cities - UCT)

Advisory board:
Prof. Fran Tonkinss (LSE), Prof. Brett Neilson (WSU), Prof. Sue Parnell (Bristol University).

This project was awarded with a Marie Curie Fellowship in 2020.

SURGE is a Marie Sklodowska-Curie project addressing urban transformation driven by private Chinese capitals in Africa. Current research on Afro-Chinese relations focuses on major government-driven investments, such as the Belt and Road Initiative, which is the most recent example of China's increasing presence in Africa. Scholarly attention is thus directed toward the state and the continental scale, overlooking private and provincial Chinese investments in Africa and their consequences on cities. Very little is known about the non-state-driven financial operations of Chinese entrepreneurs, or about the responses of African cities to the influx of Chinese capital. SURGE addresses these knowledge gaps with an urban ethnography of the Chinese financialisation of two African cities that offer two different models of China's involvement in Africa: Addis Ababa, for manufacturing and Nairobi, for high-value services. The research will explore the key urban sites of these financial operations: special economic zones, new towns, technology hubs and master-planned estates, charting the spatial and economic consequences of private Chinese capital in the making of 21st-century African urban worlds.

Relations between China (as the PRC) and Africa date back to the post-World War II period, when Maoist foreign policy involved support for anti-colonial liberation movements. The alliance between the PRC and African countries was sealed by several economic and political partnerships that were predicated on the principles of non-interference, non-conditionality, equality and mutual benefit, in explicit contrast with European and American aid policies. Following Deng's market reforms in

the '80s, however, Chinese engagement in Africa took a stronger economic turn, especially as China's Go Out policy of the late '90s brought with it a need for natural resources which African countries could readily supply. Since then, in spite of proclaimed political equality and mutual-benefit principles, China's economic presence has become more and more assertive. This relationship was recently confirmed by the current Beijing Action Plan, which officially launched Africa's section of the Belt and Road Initiative (BRI). In the context of this plan, East African cities and ports will become crucial hubs connecting Western China to Europe, through the 'blue' corridor of the Maritime Silk Road.

These accelerated economic and political partnerships have aroused much interest in development and international relations scholarships. A wealth of literature has addressed the differences and continuities between Chinese developmental FDI and Euro-American forms of economic engagement, the perils of predatory investment and debt and the resource-driven paths of Chinese capital. It remains to be understood how smaller private Chinese capital operations work in relation to major, state-driven investments and corporations in the field of infrastructure and resource extraction and how these operations are spatialised in the African cities that lie on the 21st century Maritime Silk Road. As a qualitative ethnography of private Chinese finance operations, SURGE thus addresses the following questions, using Addis Ababa (Ethiopia) and Nairobi (Kenya) as case-study cities:

In this research project Chinese foreign policy is measured at the local urban scale.

In this case, infrastructure plays a trans-scalar role in the urban making.

1. WHAT are the characteristics of Chinese financial operations not included within the framework of major state-driven investments within the BRI, AIIB (Asia Infrastructure Investment Bank), or FOCAC (Forum on China-Africa Cooperation)? How do these ancillary financial operations relate to main BRI and AIIB investments?

2. HOW are these financial operations spatialised in Addis Ababa and Nairobi (for example, through special economic zones in the first and through technology hubs in the latter)? What is their impact on the urban fabric and politics of these cities?

3. HOW do these financial operations relate to previous forms of international economic development and earlier Chinese engagement in the making of African cities?

4. HOW are Addis Ababa and Nairobi responding to the influx of private Chinese capital, especially with regard to their commitment to the urban justice principles of Goal 11 of the UN Sustainable Development Goals (SDGs)? In what ways are these cities responding to attract and harness these financial operations?

To answer these empirical questions, the research will focus on three typologies of Chinese investment: manufacturing zones (especially in Addis Ababa), seed and venture capital (especially in Nairobi's fintech ecosystem) and speculative investment in real estate, especially in the form of master-planned estates (in both cities).

Rescaling the Belt and Road Initiative:

urbanisation processes, innovation patterns and global investments in urban China

TYPE
Research Project

YEAR
2019 – ongoing

Principal investigator:
Francesca Governa

Scientific coordinators:
Michele Bonino, Mauro Berta, Francesca Frassoldati, Marco Santangelo, Angelo Sampieri, Giorgio Trentin

Research team:
Francesco Carota, Astrid Safina, Leonardo Raimondetti, Selusi Ambrogio

Framework:
Project funded by the Italian Ministry of University and Research in the framework of the Progetti di Rilevante Interesse Nazionale (PRIN) program.

A necessary integration between different disciplines is required for the study of the Chinese urban processes, and in particular the study of the spatial transformations connected to the Belt and Road Initiative (BRI), the role that infrastructures acquires in the Chinese urban development, the assumptions and economic effects of investments and the relationship between urbanisation and development dynamics. The project, adopting a clear interdisciplinary approach aligned with the European research framework (EU, EUR 27370 EN, 2015), integrates urban exploration in the spatial dimension of the BRI with specific analysis of economic and geo-political angles. Focusing on urban China, the research will investigate the spatial dimension of the BRI, questioning how, and how much, such an imposing global investment is changing the places that are crossed and affected by it. The "spatialisation" of the BRI can be observed as a sort of 'last step' in the process of Chinese urbanisation, defining increasingly polycentric and complex geographies of urbanisation within which a heterogeneity of socio-economic dynamics more and more physically redefine the urban/rural divide.

This project was funded by the PRIN excellency program of the Italian Ministry of Education.

Within this framework, the research observes the urbanisation processes connected to the BRI, a strategy that is global in its forms and objectives but materialised in some specific spaces thus transforming their socio-spatial organisation (whether these spaces are crossed by railways tracks, defined as maritime and territorial hubs, or at the margins of this strategy). What characteristics do this "new" spatial organisation has? Is it possible to find any recurrences or generalisations, for example in terms of underlying rationalities principles and settlement orders? What is the relationship among large commercial and infrastructural investments, urban dynamics and innovation centres? How do urban transformations induced by the BRI generate international investment opportunities? What role can another country, Italy in specific, assume within this investment scenario?

Geopolitical and geo-economic issues

At the end of 2013, Chinese President Xi Jinping launched the Silk Road Economic Belt and a 21st Century Maritime Silk Road, commonly referred to as One Belt, One Road (OBOR) or the Belt and Road Initiative (BRI). On land, the Silk Road Economic Belt aims to connect central and western provinces of China to Europe through Central Asia; at sea, the 21st Century Maritime Silk Road aims to connect the fast-growing Southeast Asian region to China's southern provinces through ports and railways (Summers, 2016).

With the establishment of multiple development corridors along the two routes, Chinese government envisions future international cooperation based on five aspects: enhancing development policy coordination, forging an infrastructure network, expanding investment and trade cooperation, improving financial integration, deepening people-to-people bonds (Fei, 2017).

According to Minghao (2015), the BRI is driven by a variety of domestic and foreign policy challenges facing China in the coming years. First, it can help in keeping China's economic boom alive. Second, it could add an international policy pillar for the "Go West" policies, which were previously regarded as a domestic policy to address the socio-economical gap between the coastal and the western regions (Spigarelli and Rosenthal, 2015). Third, the BRI is crucial in consolidating China's status as the largest developing country and promoting South-South cooperation. Fourth, China and other emerging powers as well as Western countries are united in their concern about the instability of Eurasian inner land and maritime transportation routes, especially the surge of terrorism and extremism, transnational organised crime and other unconventional security threats. Finally, through the BRI, Beijing is developing a coherent set of policies to realise the "Chinese Dream", in which national and personal aspirations to "reclaim national pride and enhance personal well-being" combine together, as in the words of President Xi.

Transcalarity and rescaling

The interpretations of Chinese intentions behind the BRI fall into two broad categories: as a geopolitical strategy, the BRI highlights the effort to extend China's political power and influence; as a geoeconomical strategy it reflects economic and commercial drivers, such as creating new markets for Chinese companies or addressing challenges facing the Chinese economy such as industrial overcapacity (i.e. steel and cement) or excessive holdings of US dollars (Summers, 2016). Geopolitical and geoeconomical issues refer also to different scales. While the geopolitical dimension is mainly related to China's global role, the geoeconomical dimension refers to various dimensions and scales (global, national, local) (Cai, 2017).

In 2014, the BRI was officially inserted into Chinese economic policies, both at national and local levels. According to Yeh and Wharton (2016), the BRI is the new form taken by the Going Out and Going West strategies of the 1990s and «arguably brings the two strategies together as a successor to both» (p. 288).

In political and economic terms, the BRI coherently embodies a twofold strategy. On the one hand, it is re-designing, reorganising as well as optimising the regional trade and investment patterns. On the other hand, the BRI is enhancing the network of regional infrastructure, including transportation infrastructure (mainly railways and roads), energy infrastructure and communication infrastructure (IT infrastructure) whose local and trans-local implications go beyond national allocation strategies. Indeed, the BRI has a sub-national regional dimension. The chapter VI of the Vision and actions on jointly building Silk Road Economic Belt and Twenty-first Century Maritime Silk Road (http://en.ndrc.gov.cn/newsrelease/201503/t20150330_669367.html), titled "China's Regions in Pursuing Opening-Up", highlights that «in advancing the BRI, Chi-

na will fully leverage the comparative advantages of its various regions, adopt a proactive strategy of further opening-up, strengthen interaction and cooperation among the eastern, western and central regions, and comprehensively improves the openness of the Chinese economy». However, the document overcomes the traditional regionalisation structure which has been the dominant demarcation in regional policies since the early 2000s suggesting a strong link between the BRI and the evolution of "Going up" and "Going west" policies (Summers, 2016; Yeh and Wharton, 2016).

Therefore, the geography of the BRI is flexible and in many ways vague; it cannot be reduced to the location of infrastructures, but refers to a plurality of scales and socio-spatial organisations. Indeed, according to Summers (2016), the BRI can be considered as an ideoscape, that is one of the dimensions suggested by Appadurai (1996) to describe global cultural flows: «ideoscapes have to do with the ideologies of states and the counter ideologies of movements explicitly oriented to capturing state power or a piece of it» (p. 36).

Infrastructures and urbanisation:
the spatial dimension of the BRI

In the next five to twenty years, the BRI should boost Chinese urbanisation even further. The form with which inner China will be transformed to accommodate the BRI infrastructural networks is a crucial step not only in the relationship between national development policies and decentralised actions. National policies from 1949 to the Ninth Five-Year Plan (1996-2000) show an unsolvable contradiction between attempts to level control of regional disparities. Tang et al, (2000) identified a continuous tension between the attempt of smoothing regional differences through centralised industrialisation and infrastructure processes mainly directed towards the "third front" regions. Such attempts characterised the five-year plans of the 1960s and early 1970s (see also Li, 2000), as well as the mechanisms of identifying local pilot cases as reference models to reinforce "linkages between localities". Thus centralised control and decentralisation are mutually exclusive, but coexisting processes in the "institutional configurations of a place" (Tang et al., 2000: 17).

Political intention intersects and catalyses the flow of investments redefining the ways in which centralised state power is appropriated and captured by local and situated agglomerations of interests. According to Summers (2016), «Two-thirds of Chinese provinces have cited the BRI as a development priority, included it in their annual work plans and identified particular investment projects to support this. There is a competitive dynamic at play here, with provinces aiming to justify Silk-Road-related projects, or to attract more investment to their areas» (p. 1634) (cfr. also Cai, 2017; Fei, 2017).

The correlation between the long maturation process of the "Go West" policies, of which the BRI is the latest and most ambitious evolution, and the new urbanisation in the internal areas of the country is reflected in the report of the China Centre for Urban Development (CCUD) (http://www.ccud.org.cn/2013-09-26/113349759.html). In 2013, the CCUD analysed planning documents of 156 prefecture-level cities in 12 provinces (Liaoning, Inner Mongolia, Hebei, Jiangsu, Henan, Anhui, Hubei, Hunan, Jiangxi, Guangdong, Guizhou and Shaanxi; see also: Yang et al., 2015) covering, more or less, the areas invested by the BRI, the Jing-Jing-Ji global city region, the Guangdong Province (concerned by the 21st Century Maritime Silk Road) and the Hunan Province, whose capital, Changsha, inaugurated a railway connection with Europe, based on the active branch of the Eurasian Bridge of the BRI (cfr. https://eng.yidaiyilu.gov.cn/home/rolling/16695.htm).
Even if local transformations cannot be reduced to the direct manifestation of the central government intentionality (a-spatial as they might be), therefore the local dimension of urbanisation can be traced back to national macro-objectives. After all, physical infrastructures, particularly roads, railways and dams,

are key characteristic of China's development strategy «since the mid-1990, as a necessity for both supporting rapid economic growth and reducing regional inequality» (Yeh and Warthon, 2016, p. 297). The endless increase of settlements and the nonstop infrastructure and housing boom cover the landscape and make China "the largest construction site in the world today" (Zhu, 2013, p. 169). This astonishing transformation not only involves first level cities, but also other big and small cities, villages, and rural areas, meandering and spreading everywhere (Lin, 2013).

According to Harvey (2001), «capitalism has to fix in space (in immoveable structures of transport and communication nets, as well as in built environments of factories, roads, houses, water supplies, and other physical infrastructures) in order to overcome space (achieve a liberty of movement through low transport and communication costs)» (p. 25). Summers (2016) suggests that the BRI «are more of a 'spatial fix' than a geopolitical manoeuvre, although, whatever the intentions driving the Chinese vision, it will have geopolitical implications as a result of China's ongoing rise and its growing economic influence across the rest of the world» (p. 1629).

Aims and phases

The aims of the research can be summarised as follow:

i. contributing to the scientific debate regarding the BRI, by interweaving the study of economic and geopolitical development strategies at global scale with urbanisation processes dynamics (role of the infrastructure in the Chinese urban development, assumptions and economic-spatial effects of investments, relationship between urbanisation, economic development and innovation patterns of cities);

ii. questioning through Chinese urban development, forms and ways of spatial transformation that go beyond "China itself", thus helping us to understand wider global transformation dynamics.

iii. fostering Italy-China relations within the new era of Chinese New Normal growth model and international exposure, by exploring the role of cities within the BRI as focal areas to optimise economic and scientific exchanges with Italy.

To achieve these goals, the research will be articulated in different phases and activities. An initial phase (1 year) will have as the main goal the consolidation of a common knowledge base among the research team, regarding the political and socio-economic framework. Besides the literature review, a survey on the different policies linked to the BRI will be conducted. The second phase will be devoted to fieldwork (1 year and 6 months). Urban processes and dynamics (an in-depth study of spatial processes related to BRI in three selected cities, Chongqing, Zhengzhou and Lanzhou) as well as innovation and economic development patterns will be analysed, with a specific focus on the integration of the BRI objectives and innovation patterns in Chongqing. The third phase (final 6 months) will be related to the systematisation of the outcomes in order to identify some specific areas able to foster Italy/China cooperation in terms of economic and urban development in the BRI framework.

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Yeh, E. T., & Wharton, E. (2016). *Going West and Going Out: discourses, migrants, and models in Chinese development.* Eurasian Geography and Economics, 57(3), 286-315

Zhu, J. (2013). *Architecture of modern China: a historical critique.* London & New York: Routledge

Hinterlands of the green transition

Atacama, lithium and the extended geographies of the zero-emission city

TYPE
PhD research

YEAR
2021

AUTHOR
Alberto Valz Gris

This PhD dissertation traces the journey of lithium from the mines in South America to the pockets of billions of people.

The Atacama plateau is a biogeographic region shared across the countries of Bolivia, Chile and Argentina. In the last decade, it has been also known as the 'Lithium Triangle,' an expression pointing to the vast mineral reserves contained in the region. The global demand for lithium has drastically increased through the growing adoption of electric vehicles and renewable energy storage systems as fundamental components of the so-called 'green transition' occurring in many urban cores across the globe. This thesis investigates the urbanisation of the hinterland through the geographies of extraction that emerge together with the progressive decarbonisation of cities. In considering the metabolic interactions that exist between cities and the geographies of extraction that sustain them, it seeks to advance knowledge around the question of extended urbanisation as the planetary geography of hinterlands, operational landscapes and extractive peripheries.

In doing so, this thesis draws upon recent efforts in the field of urban studies directed at both exceeding the physical and conceptual boundaries of the city in researching urban questions and at more accurately comprehending the metabolic interactions embedded in the process of planetary urbanisation. Mobilising existing studies on extended urbanisation and urban metabolism, extractivism and commodity chains, this thesis foregrounds two original propositions: exploring such metabolic exchanges through the study of commodity chains; and centring extraction squarely on the study of global patterns of

urbanisation. This thesis thus unpacks the metabolic interactions underpinning the green transition of cities by following part of the commodity chain of lithium.

Researching the urban beyond the city, though, demands novel methodological approaches. This work responds to this question by both challenging the telescoping of planetary urbanisation and not settling on the impractical visions of embeddedness offered by postcolonial, queer and feminist critics. Instead, it attempts to build new ground by constructing a practice of mobile, relational and thin ethnography across a portion of the li-ion commodity chain in the Atacama, capable of holding together thin slices of local dynamics and global patterns, thus more aptly responding to the transcalar imperative embedded in the ideas of urban metabolism and commodity chains.

This moving ethnographic sequence is articulated across three case studies along the 'lithium route' that links the mineral deposits in the Andean cordillera to the port infrastructures on the Pacific coast. These case studies explore different conceptual issues and multiple dimensions that characterise the making of extractive processes across the operational landscape of the Atacama, while expanding the notion of extraction beyond the often-restricted definition of natural resource extraction. Firstly, the establishment of a lithium mine in the Olaroz basin (Argentina) reveals how the process of strategic coupling, when observed from the ground, is largely different from the balanced mechanism described in the literature and instead is built on multiple levels of socioeconomic unevenness. Secondly, the construction of South America's largest solar farm in the Cauchari basin (Argentina) reveals the entanglement between the dynamics of large investment funds and the making of renewable energy landscapes, highlighting how the large financial investments that actually build such mega infrastructures are forced to translate into microfinancial arrangements affecting everyday life in the hinterland. Thirdly, the daily geographies of Antofagasta, one of Chile's main port cities, unveil the endurance of logistical infrastructures as axes of continuing dispossession, taking cue from recent hype around the arrival of the China-centric Belt and Road Initiative in the region to show how, despite the different source of funding, the extractivist principle of logistical infrastructure in the area remains unchanged.

The different dimensions of socio-spatial transformation in the regions of extended urbanisation unpacked by this thesis point to the urgency of a critical, decentred perspective on the urban. In a broader sense, these findings speak to emerging debates, both popular and academic, around alternatives to capitalist development in general and to the urgency of decoupling urbanisation from resource extraction by imagining post-extractivist urban agendas.

GLOBAL URBANISM

GU

Infrastructural scripts

Histories and futures of urbanisation along the Ethio-Djibouti Railway

TYPE
PhD research

YEAR
2021

AUTHOR
Matteo Gianotti

This PhD research starts from a field work in Ethiopia and an intense observation of African infrastructures.

A constant stream of trucks and people move every day between Addis Ababa and Djibouti, where most of the goods moving to and from Ethiopia transit, making this route a strategic economic corridor for both countries. The importance of this route can be traced back to the colonial past when, at the beginning of the 20th century, the French built the Chemin de Fer Djibouto-Éthiopien. Based on this colonial infrastructure, a new railway was inaugurated in 2018 as a key component of an ambitious effort to transform the country to middle-income status by 2025. It is a political strategy that plans to spur industrialisation, urbanisation and economic growth through the construction of new infrastructure.

This research looks at the spatial features of the urban development that is taking place along the Addis Ababa-Djibouti infrastructure corridor. The overlapping between infrastructure, industrialisation and development informs this research in an attempt to draft a compendium of the urban. The dualistic nature of space – real/imaginative – has oriented the research, offering the possibility of relocating the urban in an expanded dimension, where narratives of the built space are combined with the analysis of official documents, political discourses and visual materials, in an attempt to never move too far away from the architectural object and at the same time to capture, as suggested by De Boeck 'the material articulations of imagination, ideology and social life' associated with the development of infrastructure networks.

GLOBAL URBANISM | OUTCOMES

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LEGACY

QUOTE

As an architect, I can think about legacy in two ways: first of all a material one, and the other term is social economy.
I think that these two aspects are really forming a framework.

LECTURE REFERENCE

Jianxiang He in 24.05.18 *FULL* at La Biennale di Venezia, 17 Tesa 105 - Arsenale Nord - Venice

REAL ESTATE

QUOTE

The socio-economic phase we are currently experiencing is characterised by a systemic cycle of accumulation which is redesigning the world economy: cities and buildings are at the centre of this new scenario. The real estate, which is lagging behind more than others, is facing the challenge of a profound technological, organisational and productivity metamorphosis.

LECTURE REFERENCE

Lorenzo Bellicini in 14.01.2018, *La metamorfosi delle costruzioni e una nuova utopia urbana*, Urban Legacy Seminar Series, Sala dello Zodiaco, Castello del Valentino, Turin

GLOBAL URBANISM

CARTOGRAPHY

QUOTE

The map takes on new relevance in a historical era characterised by the great quantity and availability of geo-referenced data, producing the illusion that the city can be represented in its totality and entirety.

LECTURE REFERENCE

Nikos Katsikis in 05.10.18 *Metageographies of Urbanization*, Knowing the urban beyond cartographic representation, F*UL*L, Toolbox, Via Agostino da Montefeltro 2, Turin

GLOBAL URBANISM

NOSTALGIA

QUOTE

How can minarets and tulips be part of building nostalgia? Traces of empires are often evident over large swathes of land long after the eclipse of imperial power, whether serving as a substrate of later developments, lingering as an indelible scar, or re-emerging as atavisms over time.

LECTURE REFERENCE

Ryan Centner, in 23.10.2020, *Building nostalgia, reinventing imperial legacies: Divergent engagements with Ottoman heritage in Istanbul & Beirut,* Fall Seminar Series 2020, F*UL*L, Toolbox, Via Agostino da Montefeltro 2, Turin

NON–PERFORMING LEGACIES

NPL

How to deal with heritage in a sustainable financial way that excludes museification?

The Italian peninsula is punctuated by large-scale heritage and post-industrial complexes with no economic plan or vision for their regeneration. The following researches tackles the issue from an interdisciplinary perspective.

What do we mean by the expression Non-Performing Legacies? The term derives from finance: Non-Performing Loans. Accordingly, non-performing cultural legacies can be understood as the assets of cultural interest that cannot produce a sufficient value to cover the initial investment for their maintenance and renovation. At the same time, the non-performing legacy has no potential to undergo a process of museification. The abandoned medieval fortress of Alessandria is a typical example of a non-performing legacy, nor can it become a museum of such a scale nor remain as a void in the city.

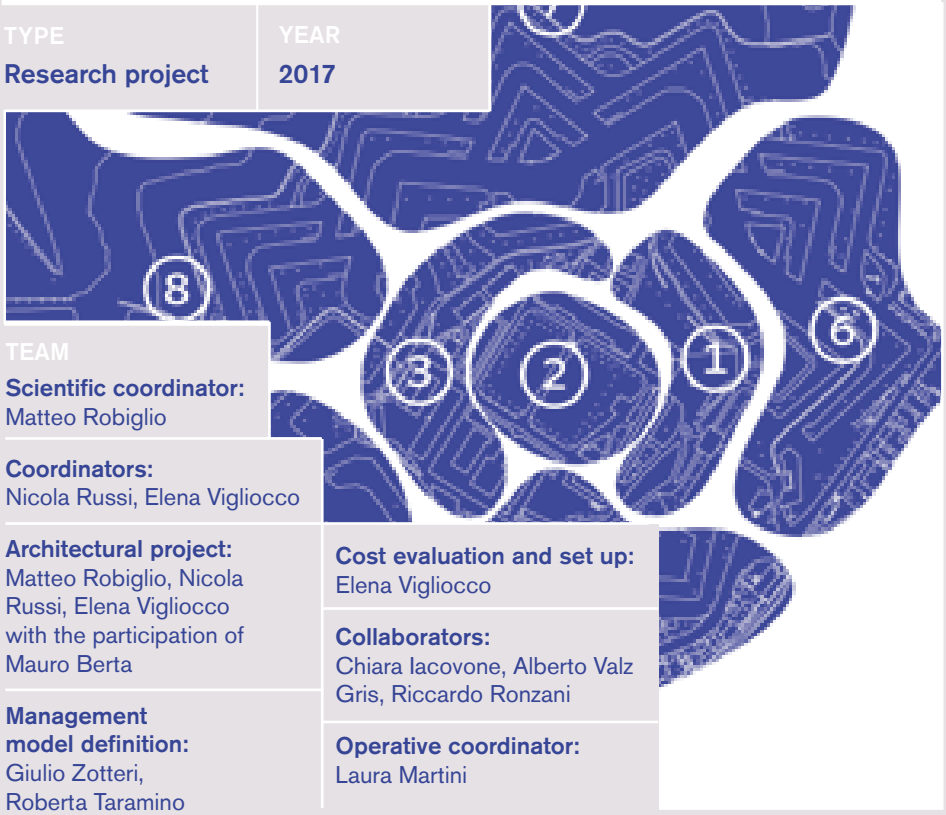
These complex socio-technical problems require an interdisciplinary approach to tackle the different issues they raise. Non-performing legacies are not limited to the domains of historical heritage. The post-industrial city leaves behind empty boxes with undefined futures. The PhD researches the *Potential of Form*, the American spaces of production, and the *Workspace [R]Evolution* try to understand how to combine innovative preservation with new modes of production.
Finally, *Adaptive Remediation* investigates all the unseen layers below and above the remains of time.

INDEX

Adaptive reuse scenarios

TYPE
Research project

YEAR
2017



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Collaborators:
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Operative coordinator:
Laura Martini

The incremental recovery strategy, outlined in the research project *La Cittadella di Alessandria. Scenari di riuso adattivo* (Adaptive Reuse Scenarios for the Cittadella of Alessandria), developed in 2017 by the Department of Architecture and Design of the Politecnico di Torino on assignment for Compagnia di San Paolo, begins to redefine the boundaries and possibilities of

The uncertain destiny of an object as the Cittadella di Alessandria is shared by a multitude of abandoned heritage sites in Italy.

reuse of this architecture that is resistant to change, deeply isolated, disused and oversized. The identification of three Cittadella landscapes and eight environments helps to establish an initial hierarchy of the 26 buildings inside and unveil the latent potentialities of a unitary but internally complex and heterogeneous building. The resulting image revealed an unclear spatial complexity, potentially able to house extremely different activities. The research identified an initial chart of flexible infrastructure devices that form the heart of a strategy aimed at minimal, almost light, intervention on historical artefacts that is still able to immediately reactivate the Cittadella, making it safe and usable.

Adaptive reuse strategy for oversized legacies

Matteo Robiglio, Nicola Russi, Elena Vigliocco

The Cittadella of Alessandria is a Savoy fortress that has survived undamaged. Until 2007, the Cittadella was a military garrison, but today it is owned by the Italian Ministry of Cultural Heritage and Activities and Tourism (MIBACT) - Superintendency Fine Arts and Landscape of the provinces of Alessandria, Asti, Biella, Cuneo, Novara, V.C.O. and Vercelli, which is interested in its cultural preservation and enhancement.
In the early '90s, before it was decommissioned, the Italian Government, the Piedmont Region, the Province of Alessandria and the City of Alessandria launched a series of administrative and research initiatives aimed at enhancing the Cittadella on account of its important cultural value. Despite the efforts,

the outcomes were not successful and the Cittadella, emptied of all its original activities, seemed destined toward unstoppable decline. The era of investment in flagship assets, such as the Palace of Venaria, was over. The main cause of the failure of these attempts was the interpretation of the Cittadella as a unitary, inviolable system. All the hypotheses of new uses and economic interventions crashed into the oversized dimension of the site. At the same time, the Cittadella has become a place where spontaneous re-appropriation practices and temporary organised events take place. In 2012, it became a FAI 'Place of the Heart' and today some cultural activities and events have found a place here, giving new life to these abandoned spaces. In 2016, MIBACT took over ownership of the area and the process of renovation reached a turning point: the new aim was no longer to identify a new use for the Cittadella, but to preserve it through focused and efficient interventions to safeguard and restore it.
Thanks to the active participation of MIBACT, the research represents the first step in a complex sequence of safeguarding interventions for this oversized cultural heritage.

The research aims were:

1. through an inclusive approach, integrate diverse opinions – social, cultural, political – into a cohesive vision;
2. translate that vision into a coherent plan of interventions and uses with a temporal progression developed according to opportunities of urgency and financing;
3. ensure the sustainable implementation of the plan.

Turning a shared vision into a reality – into a truly great place – means finding the patience to take small steps, to truly listen and to see what works best in this particular context. For these reasons, the research included two opportunities for discussion with stakeholders.
Two workshops took place at the Cittadella at two different times during the research project with the aim of (1) collecting requests and allowing stakeholders to discuss them and (2) returning at the intermediate phase of the work in order to collect feedback.

The Cittadella case study is a recurring theme in the protection of vast heritage buildings with low heritage density. This is a huge military site in a peripheral context that cannot be capitalised by simply conserving it nor used as an undifferentiated container or transformed through the selection of some elements to preserve and others to be altered. Given its huge size, the research identified an innovative approach that combines conservation needs, possible reuse and economic and management sustainability.

Previous iconographic and historical research studies represented the 'state of the art' and formed the base on which the project layout was developed. The aim of the research focused on the strategic aspects of the adaptive reuse process, taking on board previous historical research as scientific support, but neglecting to deepen the material degradation of the buildings, which could be explored in a successive knowledge phase.

The design research analysis has been developed both through a new interpretation of the architectural and landscape features of the Cittadella of Alessandria and through a careful recognition of its contemporary uses. The spatial aspects investigated have been useful in identifying existing values, latent potentialities and criticalities and have formed the starting point for drafting a strategic proposal strictly connected with the economic resources available and the development over time. Starting by observing people's spontaneous repossession process, as described above, the placemaking developed capitalises the local community's assets, inspiration and potential, with the intention of creating a renewed public space at the Cittadella that could promote people's wellbeing.

The large dimensions of the Cittadella are as follows:

Citadella extension:	**444.000**	**m²**
Permeable area:	**408.000**	**m²**
Covered area:	**36.000**	**m²**
Built surfaces:	**115.000**	**m²**
Used surfaces:	**7.000**	**m²**
Wall bastion surface:	**90.000**	**m²**

To these numbers, the research adds its interpretation that the historical complex consists of three landscapes and eight main environments, with 26 buildings that help to establish an initial hierarchy of spaces. These numbers have unveiled the latent potentialities of this unitary but also articulated and heterogeneous complex: this new interpretation of the Cittadella enriches the traditional image of a unitary architecture that, through its decomposition, reveals its specific, latent and non-visible potentialities. The resulting image of the Cittadella shows its less evident spatial complexity, extremely rich and potentially able to accommodate activities and uses that are extremely different in consistency, function and size and that may be established at different times.

Since the preservation of the historical complex is the aim of the strategy designed, the project of adaptive reuse has identified: (1) an initial chart of infrastructure devices combining the most urgent structural operations of consolidation; (2) the main infrastructural backbones; and (3) the new architectural mechanisms that might reactivate the Cittadella, making it safe, usable and open.

The research has (1) identified the interventions on the buildings and military infrastructures and (2) designed a series of flexible and (possible) reversible devices that were the main instrument of the action strategy aimed at intervening as little as possible on the material consistency of this historical complex. Combined with the temporal sequence of introduction of these devices, the approach to the Cittadella evolved the architectural restoration project of the Cittadella from a 'static' horizon, durable but also rigid and expensive, into a 'dynamic' process, renewable in time; the setting for multiple kinds of scenarios.

The strategy of intervention designed an incremental process whereby the Cittadella becomes a design laboratory. The structural sequence of interventions brings together the ordinary restoration project of some buildings – that starts and ends in a limited time period and has government grants and a defined use layout – and a series of interventions developed over time but brought together by a unitary design intention. In short, the research identified a new 'active safeguarding strategy'.

The gap between funds needed and funds available is enormous:

Restoration estimated cost:	**€200**	**millions**
Economic Governmental available resources:	**€34**	**millions**
Difference:	**€166**	**millions**

The safeguarding strategy was designed starting with an analysis of the last projects to renovate the Cittadella. The analysis underlined that, more than the big top-down projects – almost all stopped because of the disproportion between funds available and funds required –, small bottom-up initiatives have made people aware of the Cittadella and made it loved and protected by its users. By confirming existing uses, the core of the first step of the strategy was to enhance the initiatives that made the Cittadella a lively public place.Based on this assumption, the research study proposed a light and agile management model. Through a minimal set of interventions, ranging from the simple preservation to the insertion of the devices necessary for the safe use of spaces, the sequence of incremental interventions

formed the core of this 'active safeguarding strategy'. The first tranche of funding (2017-2023) represents the trigger – with immediate effect – of the entire programme of adaptive reuse that, governed by a sustainable management model, will be able to attract public and private operators. This first step consists of defining a timely series of interventions aimed at halting the deterioration of the buildings and fortifications and enabling a peaceful reconquest of the Cittadella.

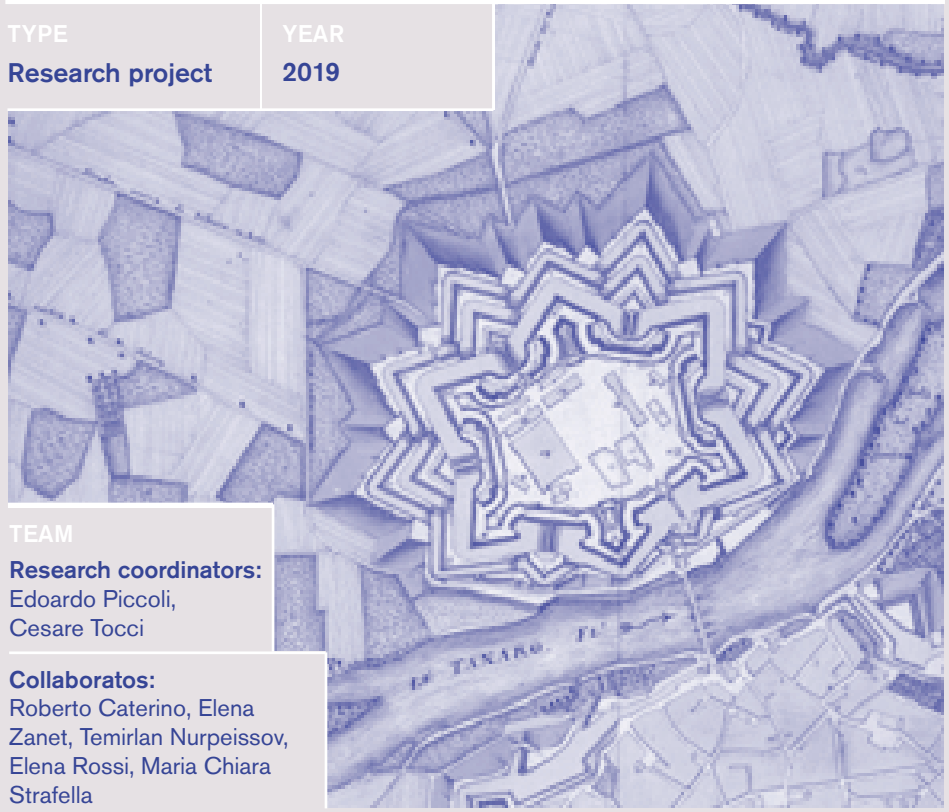
The strategy described concluded as follows: (1) the subjective selection of architectural elements and their consequent sacrifice, was not functional to the hypothesis of 'updating' of the Cittadella – structures and buildings with poor value were more interesting for an adaptive reuse project because they can absorb humble uses, such as stores or services; (2) it was necessary to introduce technological, material and infrastructural systems necessary to reactivate this historical heritage; (3) the 'new' elements added by necessity must have a character of autonomy and clear legibility; (4) the adaptive reuse strategy must absorb local potentialities because of its aim of enhancing place identity through the capitalisation of current resources.
To preserve this cultural heritage, the project did not 'subtract' but 'add'. These were the interpretative keys of the entire proposal and the challenges of the project.

NPL

The buildings inside the Cittadella of Alessandria

TYPE
Research project

YEAR
2019



TEAM

Research coordinators:
Edoardo Piccoli,
Cesare Tocci

Collaboratos:
Roberto Caterino, Elena Zanet, Temirlan Nurpeissov, Elena Rossi, Maria Chiara Strafella

The research examines the construction history of the buildings inside the Cittadella of Alessandria. While these buildings are unquestionably part of Italian national heritage, they have never been considered, up to this day, in their complex materiality. The research aims to cross-reference archival information on the Cittadella's early history with close observation of the buildings,

in order to construct a plausible interpretation of the planning and construction process and of their actual physical configuration. The research questions, at the time this report goes to print, include the following: what construction techniques and materials were employed in the Cittadella? Who were the main actors involved and how do they relate to the state-of-the-art knowledge of their time? How did the buildings perform in their time? Were any crises and failures recorded and if so, did they lead to improvements or alterations? How does the materiality of the buildings relate to the reuse/preservation/consolidation issues that arise today?

The buildings inside the Citadella of Alessandria: architectural and Construction History.

Edoardo Piccoli, Cesare Tocci

Outline

The choice to focus on the 18th and early 19th c. large-scale buildings of the Cittadella in Alessandria, rather than on the better-known infrastructural and defensive works, has allowed us to venture into the somewhat uncharted territory of the planning of the buildings and the detailed choices leading to their construction.

The information gathered will allow a more competent examination of structural and planning issues in future interventions and also provides a guideline for research/reuse/preservation issues, both in Alessandria and in similar sites elsewhere.

In the first phase, we followed two main lines of investigation:
a) An in-depth archival reconnaissance within the Buildings' and Fortification Agency funds (1730s-1800) in the State Archives in Turin, with secondary investigations in Rome, Paris and in other Turin archives. The more than 400 contracts retrieved, along with countless other items, from Royal Decrees, to expense charts, to copy-letters, instructions, drawings and judicial funds, allowed us to track and summarise in detail the 18th century evolution of the construction site, drawing a map of those involved, as well as of the materials and technologies (a similar in-depth exploration of the 'French period', i.e. 1800-1815, remains a more open question, due to the loss of most archival funds).

The Cittadella of Alessandria is the first kind of 'urban legacy' investigated by the research center. Three projects were dedicated to the study of this challenging subject.

b) A thorough inspection of the accessible parts of the site, through several site visits, leading to first-hand knowledge of its layout and construction characteristics. The inspection was followed by a closer observation, with partial surveys – surprisingly, no general survey of the site is yet available, at the time of writing – of three of the 18th-century buildings: the S. Tommaso and S. Carlo barracks and the military hospital.
Following this first phase, which led on the one hand to a quite massive collection of digitalised and transcribed archival documents and, on the other, to a collection of documentary evidence on the buildings (photographs, drawings, partial measurements), the group worked together to examine a select number of issues, which we felt were particularly pressing, historically relevant and useful for the Cittadella's future conservation. This part of the research is still ongoing and we can summarise it in the following points.

1. Masonry construction

The buildings within the Cittadella are a remarkable example of brick masonry construction. Almost all of the structures are made of brick masonry (tens of millions of bricks, produced on or near the site; different kinds of mortar; limited use of wood; iron ties; almost no natural stone), with very small but significant variations in arrangement and bonding types, as well as peculiar construction details over the first century of construction of the military complex.

The Cittadella's buildings are clearly comparable with classical masonry work, but their enormous dimensions introduce significant variations that are worth specifically examining: the role of mortar can no longer be overlooked, compared to ordinary buildings; the connection between mutual elements, which the wall thickness makes far more effective than usual, are also relevant; the layout, finally, is not so strictly related to horizontal slenderness of perimeter walls, as in normal constructions.

While these buildings look simple, almost every choice or detail is the result of careful planning, given the quantities of materials and workmanship involved. Even understanding a few basic facts about their constitution therefore required accurate research and cross-referencing. After establishing a consistent timeline of construction and recovering a few key documents (general and specific instructions for building, drawings, etc.), we were able to debunk a few 'myths', such as one regarding the piecemeal reuse of materials from the demolition of the city buildings (which proved false, as the reuse of old materials was in itself a carefully planned operation). We could then move on to more detailed analyses (Points 2 and 3).

2. Foundation systems

The terrain on which the Cittadella stands is not suited to heavy buildings: the soil in the area is soft, the water table high and flooding from the river frequent. Indeed, water is still, in Alessandria, a constant menace and the last devastating flood took place fewer than thirty years ago. For this reason, wooden pile foundations were used throughout the site from when construction began, in the early 1730s. The research has uncovered the procedures and materials used for the foundation systems and established that, due to an early (1750) episode of structural failure in the S. Tommaso barracks, a heated debate developed, leading to the adoption of an improved system in the later 18th-century buildings. Accurate drawings have been produced by the research unit, representing the two foundation systems detailed in the construction specifications. The information and interpretation of this data allows conservation issues in the damaged barrack (where cracks and fissures are still apparent) to be approached and will act as a guide in further research and analyses of the structures in all the buildings.

3. Bomb-proof vaulting and massive roof structures

The constructions within the Cittadella built before 1815 were made to be bomb-resistant, or bomb-proof (à l'épreuve). 18th-century construction practices defined different ways to achieve this result, the most common ones being:

A) THE USE OF 'NORMAL' – or slightly stronger than ordinary, through the use of thicker top-level vaults – buildings, coupled with wooden roofs that could be dismantled in the event of a siege, thus leaving an open terrace that would then be protected by a layer of compressed earth and rubble, while temporarily

propping up the vaults and buttressing the external walls to support the increased weight and thrusts.

B) MASSIVE CONSTRUCTIONS with astonishingly thick walls and top vaults – the latter topped with layers of compact masonry (massiccio), forming the slope of the roofs and directly supporting roof tiles – that could withstand the impact of a bomb without being pierced or losing balance. Such technology seems to have been developed in the 17th century especially for powder magazines.

Both solutions are used in Alessandria, in one instance combined in the same building (the hospital), with a prevalence of the second method. In fact, the Cittadella's buildings constitute one of the most consistent and extensive examples in existence of 'Type B' bomb-proof construction. Our research has determined the specifications, debates and evolution in the use of this technique, in connection with the general planning of the buildings, the design of the vaults, the use of hidden iron and wooden ties and of ventilation tunnels. The major problems that have recently arisen at the Cittadella in roof maintenance and waterproofing make this part of our research a necessary step towards rehabilitation of the Cittadella's inner works.

Conclusions

Construction history, in our view, is not just ancillary knowledge to restoration. When related to social and economic history and to history of science, it is an indispensable research method when approaching a complex such as the Cittadella, where design and construction developed in the period recorded, combining different areas of professional knowledge and production: structural engineering, civil and military architecture, infrastructure planning, landscaping, ballistics, etc.

While we have barely opened up certain topics for further analysis, our research has improved existing knowledge and provided new insight in the following areas:

- **THE CONSTRUCTION HISTORY OF THE BUILDINGS**, from their origins to their present state
- **THE TYPOLOGICAL CHARACTERISTICS OF THE BUILDINGS**, and their transformation potential
- **THE DEFINITION OF GUIDELINES FOR FUTURE SURVEYS**, structural analysis and tests on materials, highlighting the urgent need for a detailed geometric survey and selected tests
- **THE ENHANCEMENT OF THE CITTADELLA'S ARCHITECTURAL HERITAGE**, with new narratives and details on construction that may be made available to the general public

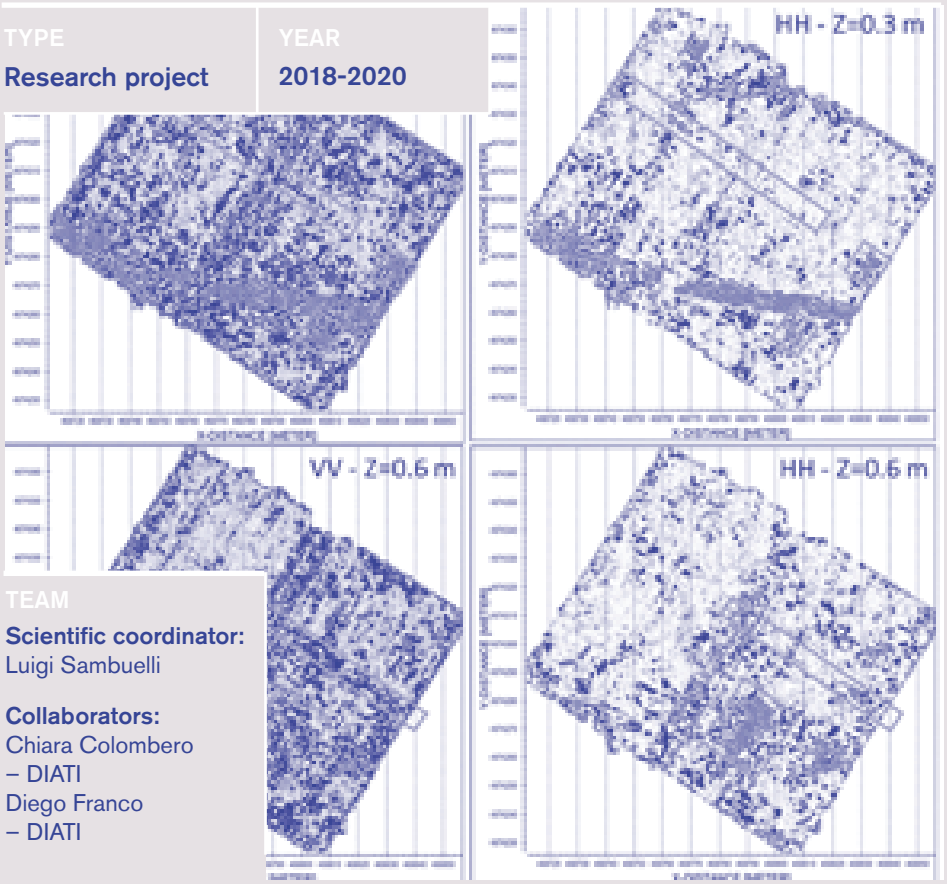
The research, finally, suggests that it would be necessary to pursue further historical investigation, especially on the construction history of the outer works and of the 19th- and 20th-century structures. Parts of this research have been discussed in conferences in Turin (FORTMED International congress, October 2018), Cambridge (Construction History Society, April 2019), Venice (IUAV/Société de Histoire de la Construction, International seminar on Expertise in architecture in the XVII-XVIII c.). Other research seminars have involved the staff of F*UL*L and colleagues from the CAST research group on the Cittadella.

Geophysical surveys and preventive archaeology

Ground-penetrating radar survey of pre-existing structures in the Bergoglio district (AL) under the Piazza D'Armi (Parade Ground)

TYPE
Research project

YEAR
2018-2020



1

TEAM

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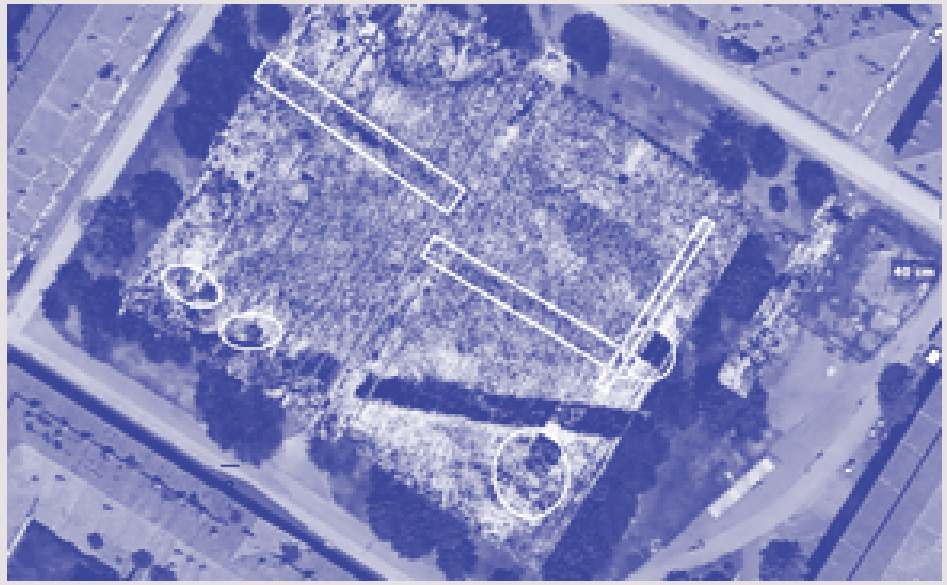
Luigi Sambuelli

Collaborators:
Chiara Colombero
– DIATI
Diego Franco
– DIATI

The last project on the Cittadella of Alessandria adopts innovative survey techniques.

The aim of the research is to identify buried remains of the Bergolio district under the present-day Cittadella of Alessandria. Given the context and the aim, ground-penetrating radar surveys were planned in the area of the parade ground, including the inner tree line. From November 2019 to January 2020, three surveys were completed on different dates, covering the eastern area of the parade ground. The data collected was processed and assembled in such a way that sections could be made at constant times, i.e. at constant depths, under the entire investigated area. The analysis of the results led to the following considerations: conducting the surveys on different dates, with different soil conditions highlighted a difficulty in making the data homogeneous; there are no evident traces under the investigated area of building plans with possible internal articulations (rooms and/or corridors); instead, scattered, quadrangular or aligned structures appear. The latter are oriented in a way that is not in line with the Cittadella's current main axes. In order to achieve greater homogeneity of data below the parade ground, a further measurement survey was planned, using a different type of radar, which allowed the entire area to be scanned on two consecutive days. The results of the latter survey are being processed.

The aim of the research is to detect structures or indications of buried structures ascribable to buildings or artefacts belonging to the pre-existing Bergoglio district under the present-day Cittadella of Alessandria. In order to achieve this aim, a ground-penetrating radar survey was conducted, covering the



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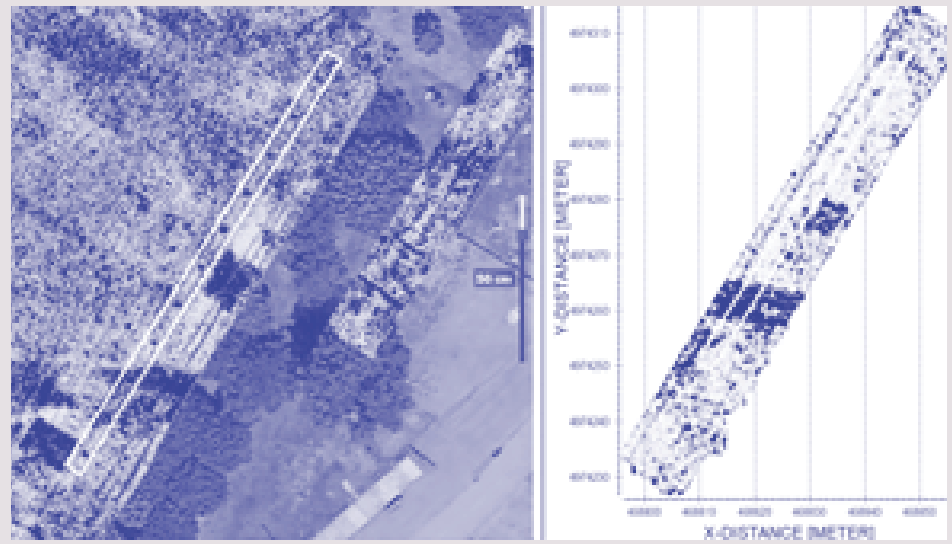
area of the parade ground, including the surrounding inner tree line. According to a reconstruction proposed by E. Piccoli et al. (E. Piccoli, C. Tocci et al., Cittadella di Alessandria. Storia dell'architettura e della costruzione. Relazione intermedia, July 2018), beneath the scanned area there should be traces of external and internal walls of some of the Bergoglio buildings (Figure 1).

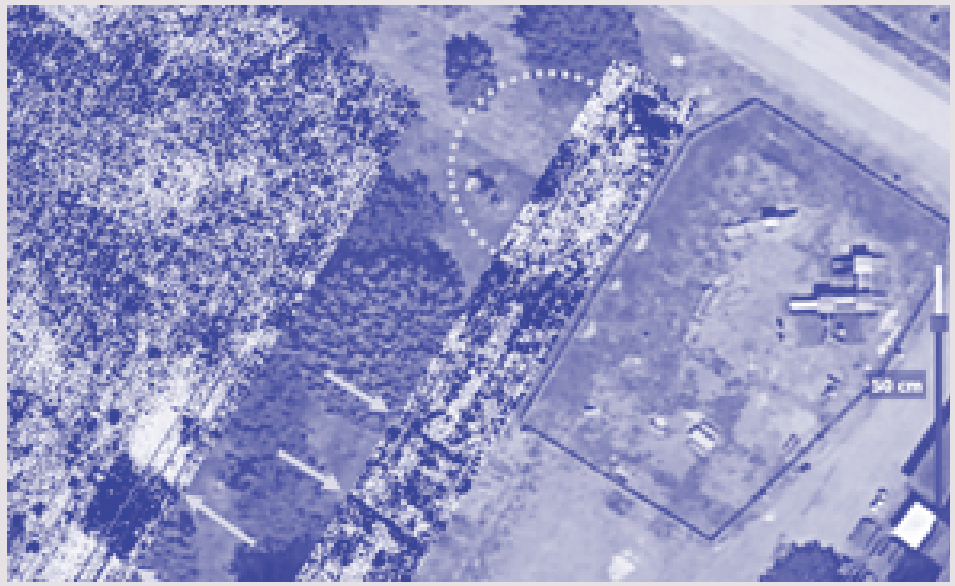
The extent of the areas to be investigated and the equipment chosen meant access to the site was required on different days. Changes in physical ground conditions due to weather events between one session and the next varied the ground-penetrating radar response. This condition, despite making the areas acquired in each survey readable, does not allow for a uniform representation and examination of all the data from all the surveys. For this reason, a final survey was conducted in October 2020 with special equipment that would allow data to be acquired over the entire area in a single day, limiting the variability of ground conditions as much as possible. A total of seven measurement sessions were conducted over a period from May 2018 to October 2020. Apart from the first one, which involved segments of wall considered significant in some of the Cittadella's buildings, the research focused on the parade ground (rectangle bordered in red) and an area adjacent to the playground (rectangle bordered in blue), as shown in Figure 2.

After a first partial measurement survey, conducted on 24 May 2018, activity resumed, planning the data acquisition for the entire eastern part of the central corridor of the parade ground. The acquisitions were conducted by sub-area, the vertices of which are shown in Figure 3.

After the surveys in the eastern area, conducted from November 2019 to February 2020, all radar profiles (468 profiles for about 17,000 m of radar tracks) were processed following the same procedure. The processing of all the profiles had an additional aim compared to the usual processing: to make the volume of the final data as uniform as possible, i.e. to eliminate as much as possible the differences, due to different soil conditions, between areas scanned at different times. The processed profiles were assembled in space, according to the acquisition coordinates, to obtain the data volumes below the eastern area. The volumes were sectioned at constant times to obtain 'horizontal' (timeslice) sections, in depth, of the reflection intensity.

3





4

The analysis of the timeslices allowed some reflective structures to be recognised, for example, in Figure 4, three well-defined although discontinuous reflective objects are highlighted. The equalisation of the radargrams obtained in the various surveys, however, is only partially successful. In fact, in order to minimise the effects due to acquisitions on different dates and to obtain more comparable information over the whole area, a further definitive survey was planned and conducted using a multi-channel radar over two days (21 and 22 October 2020), the data from which are still being processed.

Image captions

Fig. 1: Timeslice at an estimated depth of 0.4 m for VV profiles (propagation velocity 0.07 m/ns). Processing with IQMaps software. The areas outlined in yellow and blue highlight the most interesting events.

Fig. 2: Timeslices at an estimated depth of 0.3 m, 0.6 m, 0.9 m (from top to bottom), for VV (left) and HH (right) profiles (propagation velocity 0.07 m/ns). Processing with ReflexW 9.5 software. The blue rectangles highlight the most interesting events.

Fig. 3: Timeslice at an estimated depth of 0.5 m (IQMaps, left - ReflexW, right) for VV profiles (propagation velocity 0.07 m/ns). The blue rectangles highlight the most interesting events.

Fig. 4: Detail of the area adjacent to the timeslice playground at an estimated depth of 0.5 m for the VV profile (propagation velocity of 0.07 m/ns). The circle and yellow arrows highlight the events of most interest.

NPL

Reactivation of non-performing cultural heritage

TYPE
Research project

YEAR
2019

TEAM

Scientific coordinator:
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Research coordinator:
Elena Vigliocco

Architectural project:
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Definition of a recovery strategy of three cultural sites nowadays underused, underexploited and in differing– but progressive – states of decay. The aim of this multi-disciplinary research is twofold: (1) identify the intrinsic latent potential of these three pieces of Piedmont's cultural heritage; (2) design a new strategy for the activation of the latent potential, pursuing the preservation and enhancement of the assets under investigation. The aim of the research project is to establish a link between the three sites and the resources of the regions, which are peripheral and affected by gradual reduction in tourist flow. The project has three main objectives: (1) to improve the awareness and comprehension of the cultural heritage under investigation; (2) to bring together heritage and landscape so as to offer new ways to benefit from their combined social, economic, cultural and environmental values; (3) to promote and diversify cultural tourism so as to balance the exploitation of the different cultural resources, both in remote peripheral areas and high demand areas nowadays overexploited.

Three cases of non-performing legacies from the vast heritage stock of the Piedmont region.

Reactivation of non-performing legacies. Borgo Medievale, Borgo Castello and Fenestrelle Fortress

Elena Vigliocco

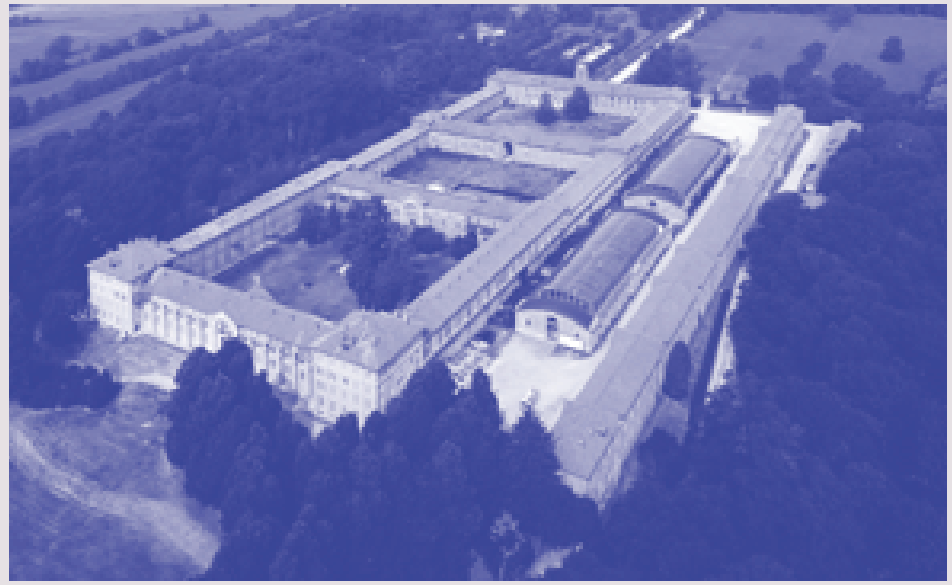
Over the last two decades, the number of sites under protection has increased exponentially all over the world. As an example, in 1973, the World Heritage List included only 12 sites; nowadays the number of sites has increased to 1092. While the number of cultural heritage sites is progressively increasing, the great economic recession has produced a significant contraction and redistribution of public investments. This contraction

has serious repercussions on spending capacity at all levels: the contraction of purchasing
capacity – deflation – leads to decreased production and employment and the need to redistribute state investments to prioritise the essential spending items, such as health, infrastructure, school and social care. This explains why in the 1990s investment in cultural heritage was concentrated on a few specific heritage highlights – such as the Palace of Venaria –, whilst today public efforts support sustainable policies and inclusive projects involving private stakeholders. In this new and more eclectic scenario, cultural tourism can play an important role for the development of those cultural sites and regions that include unknown and underused cultural resources, acting as the economic resource completing traditional public investment. Nowadays, each cultural itinerary is a regional project, grounded in the virtuous circle between the highly-related elements, resource, project and region. Cultural regions exist thank to projects developed taking into account their resources. In the same way, a project can generate new resources in the regions involved. Thanks to the development of new regional projects and through marketing strategies, regions can increase their cultural tourism attractiveness.
In the early '90s, before it was decommissioned, the Italian Government, the Piedmont Region, the Province of Alessandria and the City of Alessandria launched a series of administrative and research initiatives aimed at enhancing the Cittadella on account of its important cultural value. Despite the efforts, the outcomes were not successful and the Cittadella, emptied of The Borgo Medievale in Turin, the Fenestrelle Fortress and the Borgo Castello in Venaria Reale are three assets of cultural heritage that belong to three different sites with different characteristics. They have three elements in common: firstly, they are classified as monuments because of their historical importance; secondly, they are now used for cultural purposes because they have lost their original vocation; thirdly, despite their cultural value, they suffer from the phenomenon of undertourism. Three are the main causes of undertourism: firstly, the cultural site is not easily accessible because it is isolated or not located along typical tourist routes; secondly, the number of surrounding destinations and the consequent increase in competition is decreasing the number of tourists per heritage site; thirdly, lack of attractiveness. In relation to the latter, good destination management and marketing and a huge amount of government attention and funding characterise an attractive site.

These sites belong to the category of non-performing legacy (NPL) for the following reasons: (1) they experience a condition of risk linked to abandonment; (2) because of their original purpose, their renovation to new uses is difficult and complex. In order to safeguard this NPL, it is necessary to redefine its economic mechanism, which no longer boils down to simply cyclically injecting public money.

Borgo Medievale in Turin

The Borgo Medievale is part of Turin's Museum circuit. The village is the fascinating idea of Portuguese architect Alfredo d'Andrade. Built between 1882 and 1884, the project was designed for the Esposizione Generale Italiana (General Italian Exhibition). Through a collage of different selected existing medieval buildings spread across Piedmont, the Borgo is the reinterpreted reproduction of a medieval village. It was designed to be urban scenography, to be demolished at the end of the exhibition, but instead it became a public museum in 1942. Thanks to its location in the core of the Parco del Valentino and its high level of conservation, the Borgo Medievale is a particularly well-loved open-air museum. Nevertheless, its current economic sustainability is under question due to the absence of a marketing strategy. If the Borgo Medievale's strength is unguided access to its open-air spaces, its weakness is that the income from entrance tickets and renting out space are insufficient for its maintenance.



Borgo Castello in Venaria Reale

What makes this case study particularly interesting is its proximity to the Palace of Venaria, one of the guiding lights of cultural heritage investment policy in the '90s and one of the most important royal residences making up the Savoy corona di delizie (Crown of Delights) surrounding Turin. From a geographical point of view, Borgo Castello is the core of the Parco La Mandria, which borders the palace gardens. After the inclusion of the Palace of Venaria into the World Heritage List (1997), the great project of restoration and enhancement of the royal site began. €250 million was spent restoring and designing the palace and 80% of the allocated funds were from the EU. At the beginning the restoration project, the Borgo Castello was included, but in 2005 the renovation of the site was abandoned for administrative and economic reasons and all the funds were redirected to the palace. Since 2001, 60% of the Borgo Castello buildings are now unfinished and unusable, awaiting new funds. Only one third of the surfaces are currently used for cultural and administrative purposes. The unused and inaccessible parts are divided into two categories: those awaiting completion of works started and never finished; those awaiting a new restoration project aimed at halting their decline.

Fenestrelle Fortress

The Fenestrelle Fortress was erected between the 18th and 19th centuries in Val Chisone. Due to its huge size, it is known as the Great Piedmont Wall. In 2007, the World Monuments Fund added the fortress to its list of the 100 most important historical and archaeological sites of the world in danger. The Fenestrelle Fortress comprises three fortified complexes: the San Carlo, the Tre Denti and the Delle Valli, joined by a tunnel housing a covered staircase of 4,000 steps. The fortress has an area of 1,350,000 m2 and a length of 3 km spread over 650 m of elevation gain. After a long period of abandonment and decay, it was only in 1990 that the fortress has reopen as tourist site, visited by 20,000 people per year. The current tourist income is not, however, sufficient to maintain this huge fortified complex and a new strategic approach is needed.

The initial results from the three different tourist sites highlight the need to: (1) establish an alliance with tourist and local operators in order to choose suitable target audiences; (2) design a regional marketing strategy focused not just on one specific asset, but incorporating the various resources offered by the regions; (3) not consider quantity as the only criterion, but identify the correct balance between the positive and negative impacts of tourism. New adaptive reuse projects have to propose to stakeholders and policymakers a holistic governance approach, where value co-creation processes emerge from creative interactions between multiple stakeholders. An adaptive reuse project featuring at its core an NPL to be preserved and identifying a new place brand, must involve stakeholders such as residents, politicians, government bodies, promotion agencies and cultural and sport entities, delineating complex relationships between them. Without betraying the preservation of the cultural asset, any architectural design must cease to hide behind the 'sanctity' of its procedures in order to adhere to reality as much as possible.

NPL

Manufacturing Technology and Competence Center Turin

TYPE
Applied Research

YEAR
2017 – 2019

TEAM

Scientific coordinator:
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Coordinator:
Lucia Baima

Research group:
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Partners:
Equiter, Camera di Commercio, Compagnia di San Paolo, Fondazione CRT, Unione Industriale, Politecnico di Torino e Università di Torino, Città di Torino, Regione Piemonte.

The Competence Center aims to populate a former industrial space with innovative production forms.

The project proposal for the future MTCC - Manufacturing Technology and Competence Center of Turin - a meeting hub between the world of small and medium-sized enterprises, a research and training centre, and services such as business incubators and accelerators related to manufacturing 4.0 - was developed in parallel with the candidature of the Competence Center of Piedmont to the ministerial call Industria 4.0 created to finance the creation of meeting platforms between the world of small and medium-sized enterprises, university and research.
The winning CCP project, led by the Politecnico di Torino, the University of Turin and a consortium of 24 companies, proposes a space dedicated to research, experimentation, prototyping and the training of new high-level professionals through five physical and virtual pilot lines. The CCP is a meeting and exchange platform where small businesses can access know-how on innovation and production processes in the manufacturing sector.

Following this first phase, the scenario for the future MTCC opens up with the aim of complementing and intensifying the CC programme, creating a hub of knowledge and services to bring together various companies, start-ups, research centres, training centres, incubators and business accelerators, all linked to manufacturing 4.0.
The proposed programme aims not only to create a new innovation hub for the manufacturing sector, but also a networking centre for higher education and knowledge open to the city, with services such as coworking, workshops and event spaces open to the public.

The first MTCC project scenario, put together by Equiter with the collaboration of F*UL*L, was promoted by the main public and private institutions of Turin's business and academic sphere: the Chamber of Commerce, Compagnia di San Paolo, Fondazione CRT, Unione Industriali, the Politecnicno di Torino and the University of Turin, with the support of the City of Turin and the Piedmont Region.
capacity – deflation – produces production and employment decrease generating the necessary redistribution of states investments that have to privilege the essential spending items such as health,infrastructure, school and social assistance.

Method

The research method used by F*UL*L for the first proposal of the future MTCC is structured into the following points:

- Best practice and international cases studies
- Matrix of analysis
- Flexible layout

Best practice and international cases studies

The first research phase focused on the analysis of new and heterogeneous forms of manufacturing 4.0, with a special focus on the organisation and division of production phases and their spatial and logistical organisation. This first phase of the research was also enhanced by the analysis of best practices and international case studies that are very heterogeneous in terms of location, pre-existing buildings and types of buildings, implementation processes, strategies and project solutions, in order to investigate a diversified panorama of organisational and spatial models and governance functioning.
The selected cases - MTC based in Coventry, RDM in Rotterdam, Arena 2036 in Stockard, New Lab in NYC and Station

F in Paris - are analysed through a common grid based on the following points:

- Location and accessibility
- Layout and logistics
- Program of functions
- Actors
- Sustainability and energy system

The comparative analysis of these five projects allowed the first layout of the future MTCC to be defined based on the concept of an incremental and scalable matrix. The aim was to create an open, flexible system capable of adapting quickly to different programming of uses and functions, and at the same time being incremental over time so as to include new stakeholders and their demands for surfaces and volumes.
The structure of the matrix allowed an initial layout to be defined, divided into macro sectors - offices, laboratories, production areas, training rooms, halls and common areas - within which the spaces dedicated to the various players were divided: companies, research and training centres, and other services, taking into account their different dimensional/spatial, environmental and logistical requirements.

At the same time, each space is made hybrid and flexible in order to adapt over time to new uses, functions and types of spaces for teaching (e.g. hands-on teaching, spaces for student challenges etc.) and research (e.g. Interdepartmental Centres of the Politecnico di Torino).

Matrix of analysis

In parallel to this first phase, the selection of possible industrial areas within the perimeters of the City of Turin able to host the future MTCC began.
As with the comparables, the analysis of the areas was based on a comparison matrix structured according to specific indices and indicators:

- Size (footprint greater than 50,000 sq. ft.)
- Accessibility (connection to the city centre and permeability of the site)
- Time to market (status of single/fragmented property, constraints, reclamation, PRG compliance)
- Spatial analysis (free surface, existing building)
- Urban regeneration potential (proximity to places of interest)

From this analysis, the Steering Committee indicated the Mirafiori area - Ex Dai and Ex Gommatura - as the first candidate site for the initiative, thanks also to the Politecnico's desire to strengthen the current Design Campus.

Flexible layout

Given the characteristics of the area and the point structure of the two existing buildings, the first concept of the flexible and incremental grid over time, developed in the first phase of the study, is taken up and strengthened.

The proposed layout for the selected area is conceived, both in plan and vertically, as a three-dimensional matrix covered by a single equipped roof under which light volumes are organised as separate pieces dedicated to the different activities required by the different players. The organisational system of the grid makes it possible to divide the large space (hangar) into three sectors: the backbone of the offices and classrooms located along the Ex Dai building; the platform space where the light volumes dedicated to production, the various laboratories of the research and training centres and the makers' spaces can be located; and the volumes for additional services designed both for centre users and for external users.
The connective space between the different sectors is conceived as the main backbone connecting the different elements, but at the same time as a hybrid space for light functions or as an additional space to extend the individual volumes if necessary.

The incremental model over time allows the programme of uses, activities offered, services and players involved to be expanded, increasing the site's potential and its relationship with the city.

NPL

Adaptive Remediation

TYPE
Research project

YEAR
2019

TEAM
Matteo Robiglio, Tiziana Tosco, Federico Accorsi, Valerio Palma, Sarah Cutrì, LucaTeofani

From the imbalance between the increasing number of environmental contamination incidents and the limited availability of resources to be devoted to the interventions necessary to restore the original condition arises a need to develop new integrated strategies for the reuse of brownfield sites and industrial legacy. The research project entitled AdRem – Adaptive Remediation Toolkit concerns the development of strategies and methods to spatialise, visualise and manage interactions between soil reclamation and urban design in abandoned and contaminated industrial sites. The objective is to design a parametric toolkit to support the decision-making process involving the environmental engineer, engaged in the evaluation of feasible remediation techniques in sites characterised by the presence of a multi-contamination and the architect and urban designer, who deals with adapting the post-industrial city to new needs.

An increasing number of brownfield remediation interventions are taking place in urban contexts and related challenges are posed by the combination of reclamation processes, building reuse and adaptation. Following the real estate crisis of 2007-2008 and the consequent reduction in the demand for buildings, abandoned industrial sites have increasingly become an environmental, social and financial burden for urban communities. Compared to those sites located in active industrial areas outside cities, brownfield site regeneration in an urban context poses additional constraints, e.g. restrictions on site morphology variations – even temporary ones – and restrictions in use of the area, also connected to landscape characterisation and the overall perception of the place. Nevertheless, these areas patently represent a potential resource, since they are often embedded in the urban fabric, generally well-connected through infrastructure and equipped with a dense network of sub-services. In addition to environmental restoration and human health protection, transforming contaminated urban brownfield sites can offer significant advantages, including exploiting the existing infrastructure, preserving greenfield sites,

producing positive social and economic effects for nearby communities, including higher property values and reduced crime rate and all in all contributing to environmental, economic and social sustainability. In these situations, urban regeneration and brownfield reuse actions are potentially intertwined processes, even though they are rarely planned and designed as such.

The usual approach is still disjointed, with limited cross-disciplinary interactions among practitioners, namely the environmental engineer with regard to architectural restoration, is not easily accomplished, resulting in a fragmented design process and knowledge, as well as potential dispersion. On the one hand there is the need to redevelop and reuse large former industrial areas, now incorporated into the city fabric, which have been gradually abandoned. On the other hand, the past presence of manufacturing activities often lead to an alternation and contamination of the environmental matrices, thus posing potential risks to human health and the ecosystem, and compromising the attractiveness of the site for potential re-use plans.

A remediation process, unavoidable for the re-use of such areas, is commonly understood as a 'transition between two phases regulated by urban planning and building regulations', isolated from previous and subsequent actions, the objective of which is to 'clean the site completely from the residue of past use, to deliver it as a clean site for future use' (Robiglio et al., 2014). In this framework, the concept of adaptive remediation was developed as an evolution of the well-established adaptive reuse approach: remediation alternatives are considered not only in terms of technical and economical constraints (technical feasibility, safety requirements, capability to meet remediation goals, and budgetary constraints), but also in connection with the existing buildings and their historical and architectural legacies worth to be preserved, the expected re-uses and the planned functions of that area. The AdRem (Adaptive Remediation) approach has thus been defined, aimed at integrating the different disciplines (in particular, environmental engineering and architecture) involved in designing the reuse of brownfield sites, specifically applied to urban contests. As part of the project, a prototype decision support toolkit is being developed to help quantitatively screen and prioritise viable design alternatives. The toolkit is involved in the interdisciplinary design phase by processing sets of remediation techniques and architectural/urban solutions, following surveyed data and user-defined constraints. Remediation/reuse scenarios are computer-generated and screened by comparing remediation alternatives and design needs. Viable scenarios are then prioritised based on costs and timing. The outputs of the toolkit inform the last design step in the AdRem framework, when environmental and architectural designers identify the optimal integrated project, eventually using the toolkit in a recurring manner.

Future developments of the toolkit will aim at a better interoperability, in input and output, with existing software and formats used in risk analysis, architectural design and geographic information systems (GIS).

This project is the product of the intersection of three different disciplinary fields: architecture, environmental engineering, and data science.

Loft Working

Urban manufacturing spaces in North American cities

TYPE
PhD research

YEAR
2019

AUTHOR
Caterina Montipò

Urban manufacturing is the 'oldest, newest thing' going on in cities. It proceeds from the evolution of the oldest and the newest development of cities and industry. In the North American context, industry emerged contextually as rural and intra-urban trend. Rural areas soon turned into suburbs, thus making industry a metropolitan issue made of urban and suburban locations. After becoming a predominantly extra-metropolitan matter for a long time, manufacturing has also re-emerged as a metropolitan and urban trend. Urban manufacturing has taken shape within urban areas as a dense network of small/medium enterprises that operate in supple, peer-to-peer, decentralized networks of research, development, production, assembly, and distribution.

A PhD research developed in exchange with Carnegie Mellon University in Pittsbourgh. A journey through the spaces of manufacturing 4.0 in the United States.

For long, 'reindustrialization' narratives have focused on retaining large-scale standardized manufacturers, for whom it makes no sense to stay in cities. But innovation and economic trends move at a much faster pace than the physical city. When the attention on urban manufacturing finally arose, it revealed a plethora of unplanned or overlooked forms of making that had already made their way into an often-unprepared city through the reoccupation of vacant spaces. Different forms of production superpose and reshape the physical legacy left behind by the course of different economic trends and industrial paradigms. A first wave of reuse for production roots in the 1980s when cities were progressively oriented toward service economies. Then, a second wave emerged in reaction to the Great Recession, along with the spreading of technological innovations that have been consistently disrupting industrial and economic paradigms. What started as a last attempt to endure in cities by firms increasingly pushed to the fringe, it has then turned into a strategic choice. Today, firms set their workspace inside leftover buildings to take advantage of the contextual opportunity for a good location, access to affordable spaces, and renting rather

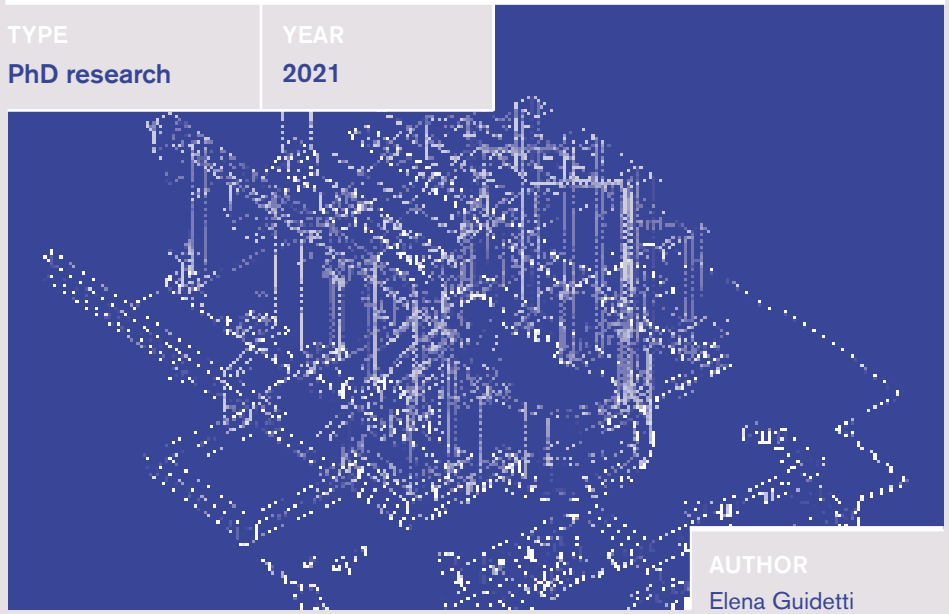
than buying or building new – hence ensuring more flexible commitments with one location as well as investing fewer resources in space. Urban manufacturing firms can usually adjust to almost any lofty space with no special requirements: the physical space remains determinant, but it has to weigh as little as possible in economic terms in favor of innovation, knowledge, and location. Also, the transition to a factory intended as a digital object has accelerated the trend. Urban manufacturing reshapes urban contexts in two steps. First, it reduces different building typologies into left-as-loft spaces able to adapt to a wide variety of economic and human activities. Lofts are open, generic, rough, and defined by their capacity in terms of space, location, and infrastructure – rather than a form or a function. Then, lofts are reconfigured as working lofts. Firms project and adjust their production process into the real space through a series of spatial actions and architectural devices that expand loft's capacity, both in its performance and quantity. By being affordable, disposable, occasional, distributed throughout metro areas, and diversified in their capacity and potentials, lofts have been the supporting system of urban manufacturing dynamics that move within fuzzy boundaries of formal/informal, public/private, global/local, temporary/permanent, non-profit/for-profit. Loft working heads towards multiple resolutions: reactivating a latent structure by turning it into a flexible and adaptable empowering tool (the loft); giving space to income- and job-generating economies (urban manufacturing); reconnecting a lost piece of the urban fabric with the city' and metro's socio- economic dynamics (placemaking). A process still under development that cities would be able to fully capture and take advantage from only through undetermined and unfinished strategies.

The potential of form

Assessing the transformative potential of existing buildings in post-functional Europe

TYPE
PhD research

YEAR
2021



AUTHOR
Elena Guidetti

The adaptive reuse of existing buildings is central to the contemporary architecture debate. This phenomenon has become so important that prominent architects argue that the total demolition of any historic building in the contemporary city seems unthinkable.
Within this debate, the concept of *potential* emerges as a commonly-used, but undefined term in the field of preservation: its meaning is questionable.

The notion of potential has been investigated by various disciplines through the centuries. For the first time here it is applied to architecture.

Stemming from the roots of the contemporary preservationist debate, the present research embraces well-established theories in building adaptation and the most innovative approaches such as 'experimental preservation','post-preservation' and 'counterpreservation', considering heritage as an evolving concept.

In the field of adaptive reuse, the recovery of 'untapped potential' in existing buildings is one of the main adaptation goals. Although the use of the term potential varies in the literature, there appears to be some agreement within the field of adaptive reuse that it refers to 'unexpressed transformability'.
This research aims to define, decode and assess the concept of transformative potential in existing buildings through a post-functional perspective.
The work intends to define this *potential* by its physical elements in the architectural realm. The theoretical objective of this research is to add the concept of transformative potential to the current preservationist debate. This novel notion may then widen preservation theory in evaluating existing buildings by 'tendencies' embedded in the architectural form.
The research is broken down into four main chapters; the first chapter serves as a theoretical framework based on a literature review. The critical literature review identifies many kinds of potentials and the present research chooses to develop transformative potential, mainly focusing on the physical features of buildings. Adaptive reuse theory presents 'building adaptation potential' as the sum of elements establishing the degree of freedom in adaptation. Moreover, how its loss can be prevented emerges as fundamental, without defining this potential.
The hypothesis addresses this transformative potential in the architectural form, considering this form as a state of equilibrium between the structure of space and materials. The thesis will investigate both the qualitative and quantitative evolution of the form, in morphology and materials, at a specific time and following diachronic and transcalar perspectives.
A well-established approach in adaptive reuse studies, the methodology of this work is to refer to collective case studies. The sample consists of 20 successful cases of buildings adapted across Europe in the last 15 years, including adaptation projects from radical to minimum intervention. The case study selection will consist of studies within a variety of morphostructural types. The classification of buildings in typologies covers the classical treatises spanning from Vitruvius to Durand. Here, the proposal is to unbuild the classical typological classification in place of a morphological one.
The methodology integrates three main methods. Firstly, the morphological analysis consists of a critical redrawing of original buildings, highlighting dimensional features and configurational aspects and their evolution in the urban context. Secondly, the retrospective embodied energy assessment shows the flow of primary materials in each reuse activity using an I-O simplified formula. Thirdly, the evaluation of decay stages applies a reviewed 'shearing layers' method to assess building integrity over time.
The task is to express the *transformative potential* as a relationship between dimensional features, embodied energy and rate of decay, outlining a pattern within existing features and adaptive reuse interventions. This *transformative potential* may give weight to multiple use options in existing buildings, disassembling traditional classification by original function.

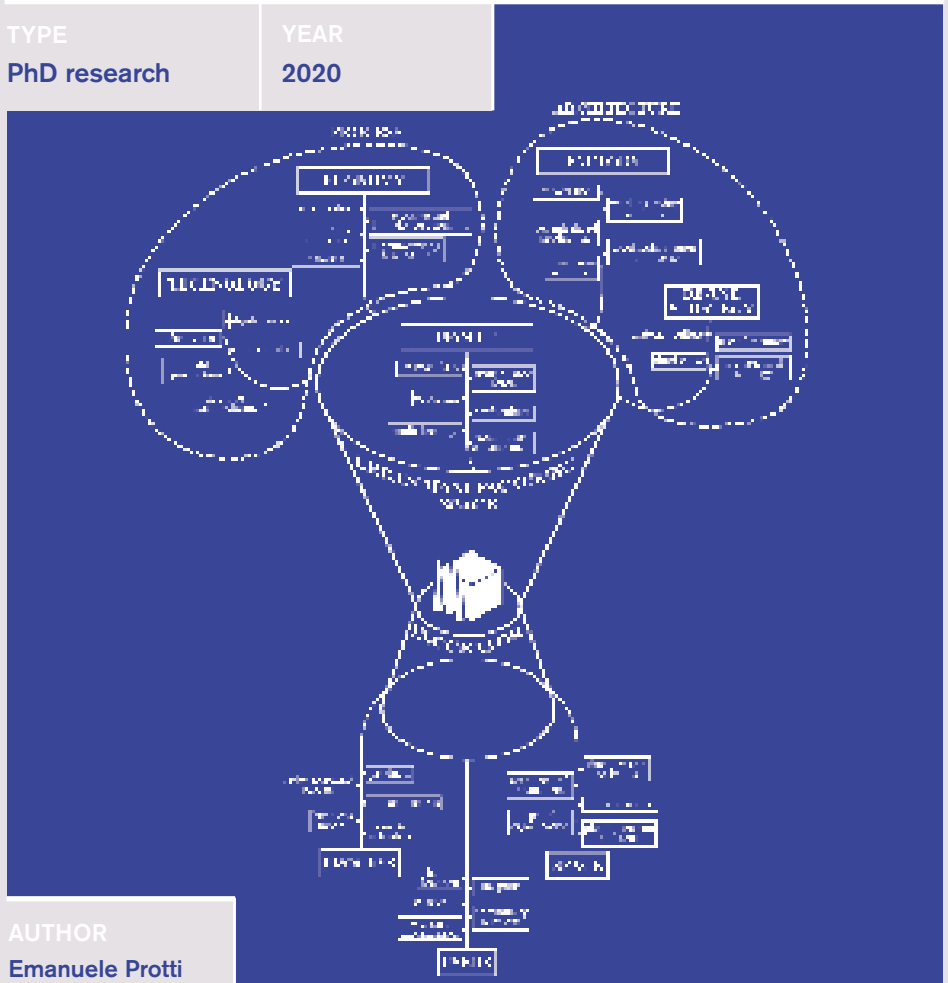
NPL

The Workspace [R]evolution

The comeback of Incubator and its role in the New Urban Economies

TYPE
PhD research

YEAR
2020



AUTHOR
Emanuele Protti

New spatial and social requirements are changing workspace dynamics, including redesigning the architecture of production. Local and national governments are giving new attention to dynamics between production, creative economies and the urban context. The effects of digitalisation and servitisation, the advent of Industry 4.0, new attention paid to craft and a culture of making and the role of knowledge and creative economies undermine the separation between urban and industrial space, restrictive zoning practices, emphasising the role of production in urban dynamics.

This PhD dissertation highlights the urban potential of European manufacturing spaces.

This research identifies the Incubator model as a strategy for the reuse of vacant industrial buildings as space for urban manufacturing and creative industries. The model, based on the coexistence in the same building of different stakeholders and production facilities, has been recognised as a strategic urban component, a catalyst of local development strategies, community enhancement and new business creation.

NON-PERFORMING LEGACIESS | OUTCOMES

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Vigliocco, Elena. 2019. 'Beyond Museum / New Strategies of Preservation Applied to Oversized Architectures'. In *Il Patrimonio Culturale in Mutamento. Le Sfide Dell'uso*, 59–68. Bressanone: Arcadia Ricerche S.r.l.

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CULTURAL HERITAGE

QUOTE

Today the heritage is at risk of being erased not only by natural or man-made disasters, but also dissipated by interventions that jeopardise, if not its appearance (often falsely re-constructed or completely invented), then certainly its multiple and stratified values that make it irreplaceable and irreproducible, much more than a simple resource to be exploited.

LECTURE REFERENCE

Stefano Musso, in 11.01.2019, *Patrimoni(o) & dissipazione*, Urban Legacy Seminar Series, Sala Caccia, Castello del Valentino, Turin

HERITAGE

QUOTE

In the last fifty years -the time of two generations- the field of heritage has experienced a wide extension on several dimensions: chronological, topographical, categorical, and conceptual. The questions and causes generated by this phenomenon, including the very effect of heritage work itself, lead to explain why and how we need to move from the notion of heritage to that of patrimonial function.

LECTURE REFERENCE

Natalie Heinich in 14.09.2018 *L'extension du domaine du patrimoine*, Urban Legacy Seminar Series, Salone degli Svizzeri, Palazzo Chiablese, Turin

UNESCO

QUOTE

UNESCO Creative Cities Network is becoming entangled in the tension between city imagining and sustainable development. It poses a number of challenges, not least of which is determining what sustainability might mean to networks of cities formed to support and showcase creativity and local cultures.

LECTURE REFERENCE

Deborah Stevenson, in 10.06.2019, *UNESCO and the Making of Urban Cultures*, Spring Seminar Series 2019, F*ULL*, Toolbox, Via Agostino da Montefeltro 2, Turin

TRADITION

QUOTE

Are we getting more civilized or are we getting more barbarian? At least it's an open-ended question.

LECTURE REFERENCE

Yung Ho Chang in 26/10/2018, *South by Southeast*, Urban Legacy Seminar Series, Salone d'Onore, Castello del Valentino, Turin

ECONOMIC ORGANIZATION AND URBAN SPACE

EUS

What happens when the historical coexistence of the marketplace and urban space is displaced by digitalisation and globalisation?

The present research issue produced in the last years a sheer amount of scientific papers. This vast production output suggested to present the research issue directly with the abstract of the papers that were produced.
The following introduction by prof. Luigi Buzzacchi serves as an overview of the research topics, methods and findings.

The research works illustrated below were carried out thanks to the organisation and exploitation of several data sets including socio-economic data (the social city), on the one hand, and variables describing the urban morphology (the physical city), on the other.

New and promising analyses in these areas are favoured by the emergence of sources of big urban data that allow city function and outcome variables to be measured at higher frequencies and on more granular scales than before. Our research in these areas is aimed at generating an integrated structure of selected data on an urban and country scale, both national and international, with the aim of being able to measure patterns and trends.

Thanks to this rich dataset, we propose working on what economics, geography and their neighbouring disciplines can say about and learn from urban spatial structure (concentration of economic activities, developments on the periphery of cities, multicentricity, abandoned spaces, etc.). Moreover, our setting provides a natural framework – beyond the description of urban spatial structure and its evolution – for improving causal inferences, typically through combining structural data with exogenous shocks.

In recent years urban regeneration projects have tended to follow a pragmatic approach with the involvement of both the public and private sector. Over-reliance on 'traditional' private investments exposes urban development projects to financial volatility, tending to create unequal patterns of opportunities and services.

'Social innovation' is a nascent phenomenon that is undergoing significant activism in many European countries, and the urban dimension appears to be crucial for the clustering and growth of this new experience. The key role of academic research in this phase is to push the analysis beyond the mere 'labelling' of social innovation and improve our understanding of the actual structural and economic implications of the phenomenon.

At a simple level, urban administrations specialise in:

1. evaluating and enacting policies and regulations;
2. providing public services;
3. forecasting future activity for the sake of planning and policymaking.

All these activities can be greatly improved through new data measurements and analysis. By making their activities more data-driven, cities can fine-tune regulations, improve the allocation of scarce resources and predict future demands.

ECONOMIC ORGANIZATION AND URBAN SPACE

INDEX

EUS

Italy is in the Air(bnb)

The uneven diffusion of short-term rental markets between urban locations and selective tourism destinations

TYPE
Research project

YEAR
2021

ABSTRACT RETRIEVED FROM THE FOLLOWING PAPER:
Buzzacchi, Luigi; Governa, Francesca; Iacovone, Chiara; Milone, Francesco Luigi. 2020 Italy is in the Air(bnb). The uneven diffusion of short-term rental markets between urban locations and selective tourism destinations. Italian Journal of Regional Science, forthcoming.

Airbnb vs hotels in Italy explained.

Airbnb has been at the forefront of the reshaped hospitality industry for more than a decade. By limiting people's mobility, the Covid-19 pandemic radically affected tourism and the hospitality sector with a drastic reduction in the apparently incessant spread of Airbnb in Italy and beyond. As the data for 2020 are not yet fully available, this article depicts the spatial distribution of Airbnb in Italy in 2017-19 as a starting point for future analysis on the effects of the pandemic. The study is conducted using a dynamic panel model, with GMM-SYS estimation. Results show that, although the sharing economy is proposed as fair and equipotential, Airbnb turns out to be highly selective. The evidence indicates that 'access' alone, even if favoured by platforms, does not guarantee market power, and performances are much more concentrated than listings. Moreover, the urban appeal of Airbnb is confirmed; traditional hospitality turns out to be a significant predictor of Airbnb presence and performances; the economic condition of unemployment is positively associated with Airbnb presence.

EUS

Seizing local entrepreneurial opportunities in the platform-based era

Airbnb, gig entrepreneurs and middlemen

TYPE
Research project

YEAR
2021

ABSTRACT RETRIEVED FROM THE FOLLOWING PAPER:
Buzzacchi, Luigi; Grilli Luca; Milone, Francesco Luigi 2021
Seizing local entrepreneurial opportunities in the platform-based era: Airbnb, gig entrepreneurs and middlemen, working paper

Who's behind the multi-listing phenomenon of Airbnb?

This paper studies entrepreneurial opportunities at a regional level, focusing on the hospitality industry which has been recently disrupted by the arrival on the scene of the Airbnb platform. In line with novel literature on the sharing economy and entrepreneurship on digital platforms, we denote the presence of various figures of entrepreneurs on Airbnb, varying from typical gig entrepreneurs to more sophisticated companies managing hundreds of listings. This heterogeneity offers a unique opportunity to study differences between sharing-economy-derived forms of entrepreneurship (i.e. gig entrepreneurship) and middleman entrepreneurship (i.e. hosts managing multiple listings). Drawing on industrial organization literature on entry and carrying capacity, we analyze the determinants of entrants' behaviour. Thanks to a NUTS3 level dataset containing Airbnb data from 2017 to 2019 and the exploitation of General Method of Moments (GMM) methodologies in panel data, we highlight that gig entrepreneurs and middlemen are equally stimulated by demand size and labour market conditions but show different patterns in the seizing of entrepreneurial opportunities in relation to supply characteristics, the quality of demand and the stock of empty dwellings. More specifically, we find that the concept of carrying capacity is relevant, still perceived by middlemen only.

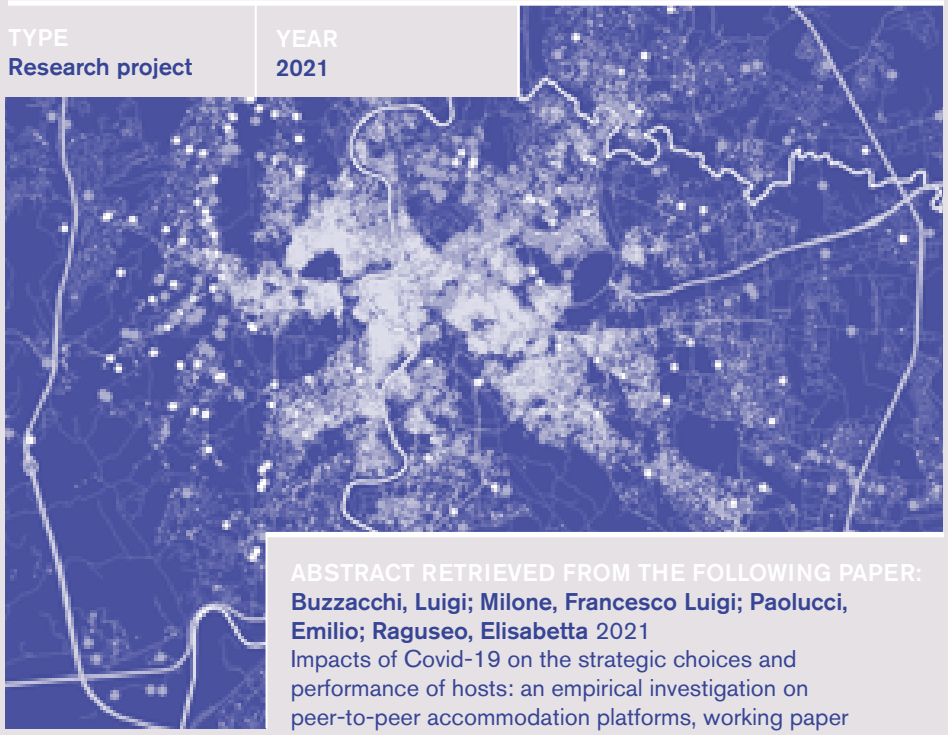
EUS

Impacts of Covid-19 on the strategic choices and performance of hosts

An empirical investigation on peer-to-peer accommodation platforms

TYPE
Research project

YEAR
2021



ABSTRACT RETRIEVED FROM THE FOLLOWING PAPER:
Buzzacchi, Luigi; Milone, Francesco Luigi; Paolucci, Emilio; Raguseo, Elisabetta 2021
Impacts of Covid-19 on the strategic choices and performance of hosts: an empirical investigation on peer-to-peer accommodation platforms, working paper

The working paper investigates the behavior of Airbnb hosts hit by the pandemic. The research used as case study the city of Rome.

In this paper we investigate how companies operating on a platform can quickly and efficiently adapt their strategy when facing an unexpected exogenous shock, focusing the attention on the role of platforms in influencing supply side strategies. More specifically, we study how hosts reacted strategically on the Airbnb platform to the Covid-19 pandemic. To this end, based on an empirical investigation on 4903 listings in Rome, our contribution is threefold: 1) we investigate the complementary strategies implemented online by hosts on the Airbnb platform in response to the Covid-19 Pandemic; 2) we analyze the efficacy of these strategies; and 3) we identify what hosts are better in combining complementary strategic choices for achieving higher performance under external shock. Drawing on the strategic choice theory, we discuss our findings which are at the intersection between strategic management and the literature on the online platforms. The findings in this paper provide insights for research and practice into how hosts rapidly adapted their online strategies in order to deal with an unexpected exogenous shock like the Covid-19 Pandemic.

Urban retail

TYPE
Research project

YEAR
2020

ABSTRACT RETRIEVED FROM THE FOLLOWING PAPER:

Buzzacchi, Luigi; Leveque, Philippe; Taramino, Roberta; Zotteri, Giulio 2020
Using betweenness metrics to investigate the geographical distribution of retailers. Environment and Planning B: Urban Analytics and City Science, 2399808320971303.

This paper investigates the behavioral relations between routes followed by consumer and the location choice of retailers.

In retail, a location's accessibility and attractiveness depends on the spatial distribution of other stores and consumers. In particular, the literature shows that a place is more attractive for retailers if the generic routes taken by consumers often pass through it. However, previous studies failed to consider that there are at least two possible consumer routes: job commutes from residential to workplaces and shopping trips among stores. In this paper, we analyze the impact of both consumer routes on the commercial patterns in Turin. The paper demonstrates that daily commutes to workplaces do not benefit retailers along the route as much as journeys for shopping purposes do. In particular, we show that the benefits that a store can enjoy when located on the route depend on the kind of goods it sells. Finally, the paper shows that stores selling homogeneous products and stores selling differentiated goods subject to comparison can benefit in different ways from being located in population hotspots and in commercial areas.

EUS

Agglomeration and the Italian North-South divide

TYPE
Research project

YEAR
2020 – 2021

ABSTRACT RETRIEVED FROM THE FOLLOWING PAPER:
Buzzacchi, Luigi; De Marco, Antonio; Pagnini, Marcello 2021
Le economie di agglomerazione e i divari Nord-Sud in Italia, Questioni di Economia e Finanza N. 637, Banca d'Italia, Roma

Northern and Southern Italy are deeply divided by inequities in the distribution of labor market opportunities and productive activities.

This paper offers novel evidence on agglomeration economies by examining the link between total factor productivity (TFP) and employment density in Italy. TFP is estimated for a large sample of manufacturing firms and then aggregated at the level of Local Labour Market Areas (LLMAs). We tackle the endogeneity issues stemming from the presence of omitted covariates and reverse causation with an instrumental variable (IV) approach that relies on historical and geological data. Our estimate of the TFP elasticity with respect to the spatial concentration of economic activities is about 6%, a magnitude comparable to those measured for other developed countries. We find that the TFP-density nexus contributes to explaining a large share of the substantial productivity gap between the northern and southern regions of Italy. We also show that no significant heterogeneity emerges in the intensity of agglomeration economies across the country and that the positive TFP difference in favour of the firms located in the North is not due to the tougher competition that exists in those areas.

EUS

Shifting the triangle

TYPE
Research project

YEAR
2021

ABSTRACT RETRIEVED FROM THE FOLLOWING PAPER:
Buzzacchi, Luigi; De Marco, Antonio; Governa, Francesca; Salone Carlo 2021.
Lo spostamento del triangolo: densità e trasformazioni economiche nella differenziazione spaziale del Nord Italia, working paper

The study analyzes the evolution of the economic-spatial organization of northern Italy over the last fifteen years with the aim of highlighting its internal differences and the progressive shift of the macro regional economic centre of gravity from the North-West towards the North-East. This objective, however, necessitates reflection on which unit of investigation is relevant for the economic-spatial analysis at regional scale. Assuming the hypothesis of multiscalarity, the North is first disarticulated starting from the minimum economically relevant scale – identified as the single local labour system – and then variously re-aggregated to recompose the areas of extension of the agglomerative processes.

The industrial triangle between Turin, Milan and Genova, has seen deep transformations from the second post-war times. This paper provides evidence of this shift.

The interpretation adopted recalls the role of density, a measure that incorporates in a non-arbitrary way the results of a more or less efficient allocation of resources with heterogeneous quality. The empirical strategy described here develops in three distinct steps. The first reports – mainly for descriptive purposes – the values of some relevant variables that illustrate the factors and the economic dynamic in Italian territories, with particular reference to the different aggregations of the geographical units that constitute the northern macro region. The second step then investigates the correlation between density and economic performance at the finer scale of the local labour system to understand whether, and to what extent, it is reasonable to expect that the divergence in regional dynamics in the North can be explained by differentials in terms of density. The third empirical analysis, finally, focuses on the relationship between density and performance at a more aggregated level to investigate the multiple scales in which the advantages of agglomeration are expressed. The composite evidence collected suggests that some of the sources of the competitive advantage acquired by the North-East in the last twenty years operate with a wider reach than that of the local labour market since the greater elasticity of the performance variables with respect to density appears to be clustered into a spatial entity that takes the form of a new industrial triangle. The presence of territorial networks with a larger extension than the functional areas examined requires a deepening of their shape and connective mechanisms.

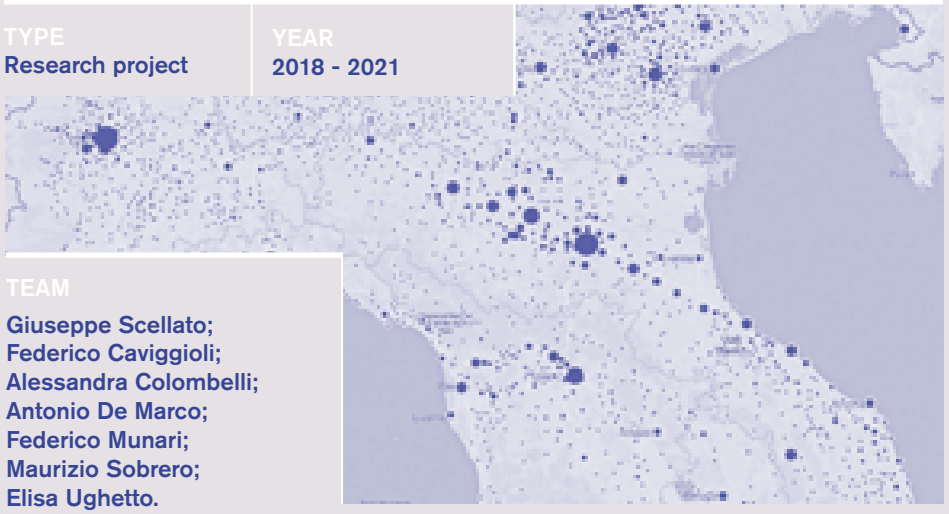
EUS

University research funding, patenting and technological impact, European Patent Office

(Academic Research Programme)

TYPE
Research project

YEAR
2018 - 2021



TEAM

Giuseppe Scellato;
Federico Caviggioli;
Alessandra Colombelli;
Antonio De Marco;
Federico Munari;
Maurizio Sobrero;
Elisa Ughetto.

The project studies the interplay between universities and co-localized firms when considering their innovation activities and the evolution of their technological portfolios. It undertakes two different lines of research. The first aims at analyzing the evolution of technological trajectories of universities and the specialization of co-localized firms in European regions (at the NUTS3 level) in the period 2003-2014, by also taking into account the moderating

This research project investigates the proximity relations between universities and innovative company ecosystems.

role of the nature of the funding received by universities. The second, and more experimental line of research analyzes the impact of funding on subsequent patents (both directly produced and indirectly affected), focusing on a specific research funding scheme, and collecting data at the level of awarded research projects. The findings of the study contribute to several streams of the existing scientific literature on the economic effects of public funding for science and research, on the assessment of the impact of research grants, on the determinants of university patenting and of university commercialization activities. The project builds on the generation and the analysis of a new original dataset that integrates data at European level from different sources (patent data, FP7 funding levels, university and NUTS3 level data). The research project also devotes a considerable effort to the improvement of methods for linking research projects and subsequent patents. The new data are exploited in order to address a number of key research questions related to the role and impact of patents as a tool to foster the direct and indirect deployment of academic research for the benefit of society and the innovation potential of firms.

University technology transfer and the evolution of regional specialization: the case of Turin

The paper is aimed at obtaining a better understanding of the role played by universities in the technological development and specialization of the territories in which they are located. Our metho-

dology adopts both quantitative and qualitative techniques. First, we provide evidence of the interplay between the technological specialization of universities and the evolution of the technological trajectories of firms located in Italian NUTS3 regions. We also propose an original taxonomy of university-region technological evolution processes that leads to the identification of four possible models and reveals substantial heterogeneity in university-region specialization processes. Finally, we analyze the underlying mechanisms of university technology transfer activities in more detail, by using the Politecnico di Torino as a single case study. The case examines how the university has changed its strategy by modifying the mix of exploitation and exploration strategies to continue increasing the technological proximity with the local ecosystem under conditions of rapid and radical change. Our work offers important implications for both regional technology policies and the management of universities.

ABSTRACT RETRIEVED FROM THE FOLLOWING PAPER:
Colombelli, A., De Marco, A., Paolucci, E., Ricci, R., & Scellato, G. (2020). University technology transfer and the evolution of regional specialization: the case of Turin. The Journal of Technology Transfer, 1-28.

Pattern of co-evolution of university patenting and technological specialization in European regions

The paper provides novel evidence on co-evolution patterns of the technological specialization of innovation activities of firms and academic institutions located in the same European region during the years between 2003 and 2014. We exploit a novel and unique dataset merging data on EU-funded R&D projects, universities, patents, and economic region-level data for a large sample of universities and firms co-located in NUTS3 European regions. Our results indicate the presence of substantial heterogeneity across the analyzed EU regions with respect to the co-evolution of industry and academia specializations. In particular, we find that the specialization into a new technological domain is led by the local academic research system only in a few cases. We also find that a number of factors, at both the university and regional levels, are associated with convergent or divergent processes in the relative specialization of the innovation activities carried out by firms and universities co-located in the same region.

ABSTRACT RETRIEVED FROM THE FOLLOWING PAPER:
Caviggioli, F., Colombelli, A., De Marco, A., Scellato, G. and Ughetto, E. (2021). Pattern of co-evolution of university patenting and technological specialization in European regions, Working paper.

The impact of university patenting on the technological specialization of European regions: a technology-level analysis

The paper aims at estimating the impact of university patenting on the subsequent dynamics that characterize the innovative activities of firms located in the same geographic areas. We exploit a large dataset of 827,627 patent families that are linked to 263 different European regions and 528 academic institutions. We set up an original framework in which the unit of analysis is the individual IPC code to account for the heterogeneity of the examined fields. The econometric modeling of technological diversification processes is implemented by using fixed-effect models with binary outcome response where the likelihood that a region becomes specialized in a specific sector is a function of the entry performed by the university system in that field. We also examine the moderating role of the technological distance between the portfolios of inventions filed by academic institutions and co-localized firms. We find a significant positive effect of the technological entry and a negative impact of the technological distance on the subsequent specialization of the hosting regions. We decompose such overall results by considering sub-samples based on the nature of the technology and the innovative performance of the region. Our findings are robust to alternative specifications of the models that include alternative measures of technological distance, different lags or decays for the regressors, and the presence of interactions between the entry and the technological distance.

ABSTRACT RETRIEVED FROM THE FOLLOWING PAPER:
Caviggioli, F., Colombelli, A., De Marco, A., Scellato, G. and Ughetto, E. (2021). The impact of university patenting on the technological specialization of European regions: a technology-level analysis, Working paper.

EUS

Airbnb in the real estate financial chain

Housing and policies in Southern Europe post-crisis territories

TYPE
PhD research

YEAR
2021

AUTHOR
Chiara Iacovone

This PhD thesis explores the consequences of the 2008 Global Financial Crisis on Southern European real estate markets.

Platform economies are a capillary presence in today's economic system. Through digital transmission and physical expansion, they represent a sprawling regeneration of capitalistic structure. Airbnb, as one of the main peer-to-peer rental platforms, captures the most profitable assets driving the global economy: the real estate market.

Considering the meaning that the term infrastructure can encompass in the structural analysis of urban economy, this research proposes a reflection both on the interpretation of Airbnb as a structural and infrastructural component of today's cities and on the analysis of its urbanisation force.
The research seeks to understand the development of Airbnb in the context of Southern European cities as an infrastructural development that finds its roots in austerity urbanism as a result of the 2008 financial crisis.
The comparative analysis of Airbnb data correlated with local policies of liberalisation of real estate and rental market allow a broader view on the development of Airbnb in relation to the global trend of financialisation of housing, retracing the political consequences of platform urbanisation.
What emerges is a complex system of different kind of infrastructure that merges and works together at different scales. The research aims to offer a zoomed-out, transcalar approach in the study of platform economies rather than a place-based analysis. It thus focuses on the role of Airbnb as an economic, political and digital infrastructure, inscribing it in a political economic perspective to better understand its structure and its performance as a global trend.

EUS

Retail, Agglomeration and Urban Morphology

TYPE
PhD research

YEAR
2021

AUTHOR
Roberta Taramino

What are the factors that influence the location choice of urban retail? The following PhD research investigates this matter starting from the economic theories on agglomeration.

Retail firms provide consumers with goods and services for consumption. They are an economic institution delivering explicit product or services at an observable market price, playing in an oligopolistic market.

Location choice is one of the most important decisions in retail. However, location is not meant to be only a spot on a map. The city can't be viewed as if it were located on a featureless plan, on which all land is of equal quality. It is the relative position that a retailer can occupy given the proximity to other stores, on one hand, and to potential consumers, on the other hand. It is a juxtaposition of social, economic and even morphological aspects of urban life, such as centrality and accessibility, layout and design, visibility and popularity, cluster attraction and spill-over. Hence, commercial city patterns are the result of a long process in which retailers deal with urban network, given that space is a scarce resource to be allocated with competitors. One possible outcome of a such important choice, that has never been a consequence of chance, is that activities agglomerate in areas that are considered as accessible and attractive by the consumers.
Our research has the objective to investigate the existent relationship between retail location, urban morphology and socio-economic performance in order to provide a critical interpretation of the commercial city patterns.

ECONOMIC ORGANIZATION AND URBAN SPACE | OUTCOMES

BOOKS AND BOOK CHAPTERS

Valz Gris, Alberto. 2018. 'Lavoro, Spazio, Movimenti: Mobilitare l'urbano Dentro e Oltre Il Capitalismo Delle Piattaforme'. In *Las Ciencias Sociales y La Edificación de Una Sociedad Post-Capitalista*. Universidad de Barcelona/Geocrítica.

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Valz Gris, Alberto. 2018. 'Lavoro, Spazio, Movimenti: Mobilitare l'urbano Dentro e Oltre Il Capitalismo Delle Piattaforme'. In *Las Ciencias Sociales y La Edificación de Una Sociedad Post-Capitalista*. Universidad de Barcelona/Geocrítica.

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Buzzacchi, Luigi, Francesca Governa, Chiara Iacovone, and Francesco Luigi Milone. n.d. 'Italy Is in the Air(Bnb). The Uneven Diffusion of Short-Term Rental Markets between Urban Locations and Selective Tourism Destinations'. F*ULL Working Paper 01*.

Buzzacchi, Luigi; De Marco, Antonio; Pagnini, Marcello. 2021. *Agglomeration and the Italian North-South divide*, Quaderni di Economia e Finanza, Banca d'Italia.

Caviggioli, Federico, Alessandra Colombelli, Antonio De Marco, and Emilio Paolucci. 2020. 'How Venture Capitalists Evaluate Young Innovative Company Patent Portfolios: Empirical Evidence from Europe'. *International Journal of Entrepreneurial Behavior & Research* 26 (4): 695–721.

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Iacovone, Chiara, Alberto Valz Gris, Astrid Safina, Andrea Pollio, and Francesca Governa. 2020. 'Breaking the Distance: Dialogues of Care in a Time of Limited Geographies'. *Dialogues in Human Geography* 10 (2): 124–27.

Marco, Antonio De, Giuseppe Scellato, Elisa Ughetto, and Federico Caviggioli. 2017. 'Global Markets for Technology: Evidence from Patent Transactions'. *Research Policy* 46 (9): 1644–54.

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PLATFORM ECONOMY

QUOTE

For us, logistics today is an absolutely privileged field of investigation, central to understanding the changes in the contemporary world. So this look at infrastructure and mobility has led us to develop reflections on platforms as infrastructure. We have started to analyse how digital platforms are materialising on the territory.

LECTURE REFERENCE

Niccolò Cuppini in 12.02.2020, *Platform labour in urban spaces*, Spring Seminar Series 2020, online lecture

HYBRID

QUOTE

What is Hybrid? Hybrid is a mix of things. It is a biological term and it is applied in urbanism. I also call this hybrid city a multitasking city because we are always doing everything, but it has to be functional and sustainable.

LECTURE REFERENCE

Nina Rappaport in 24.05.2018, *FULL* at *La Biennale di Venezia*, 17 Tesa 105 - Arsenale Nord - Venice

TRANSFORMATIVE URBAN DESIGN AND LANDSCAPE

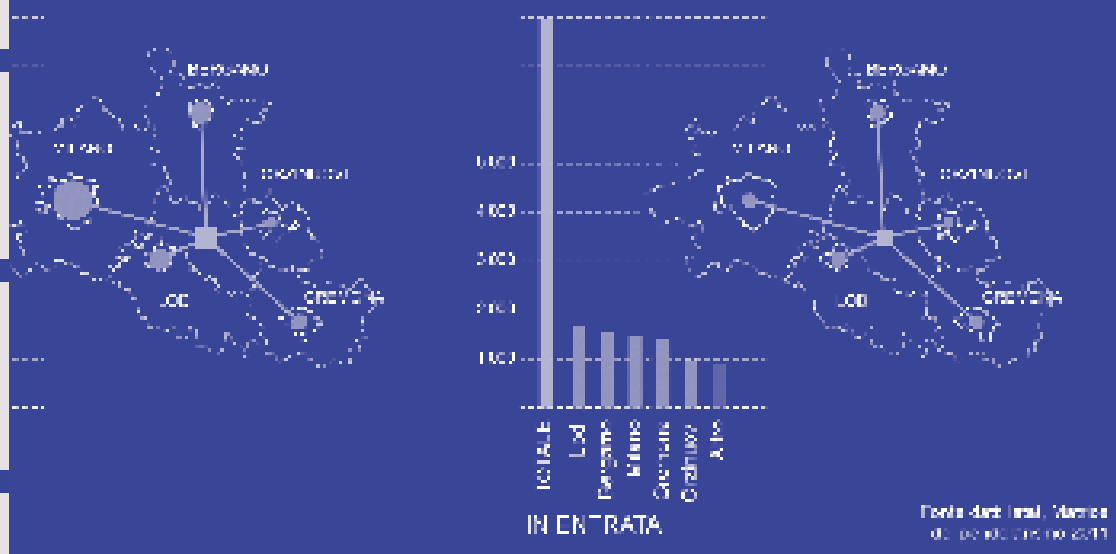
TUD

How to improve socio-technical projects to face the wicked problems of the city?

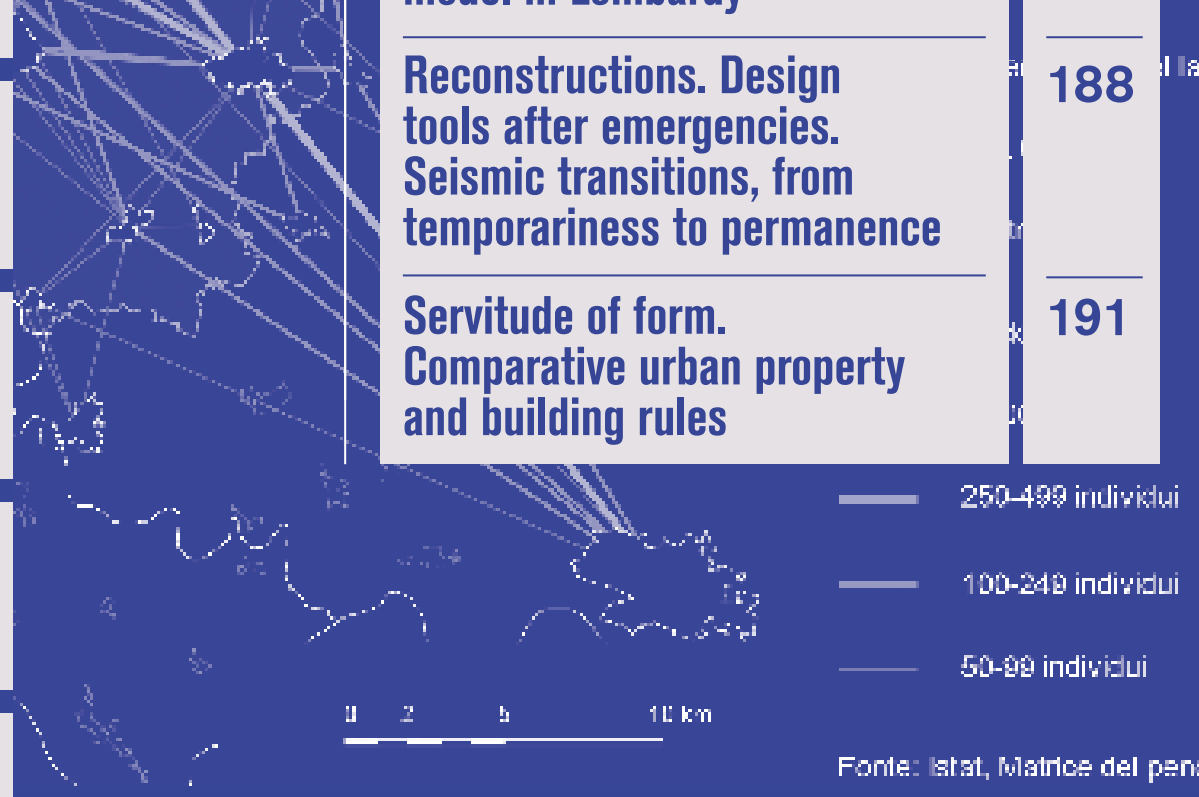
Since its foundation, F*UL*L has tackled the paradoxes of bureaucracy attached to urban rules and city codes. To fulfil this mission, F*UL*L has initiated various research studies to collect and review the current urban rules. *Re-coding* and the PhD research *Servitude of Form* serve as a repository of the state of the art of urban regulations and contain various ideas to redesign by redesigning the rules. Turin is the living lab of F*UL*L's research, and in 2021 the Metropolitan City asked the centre to produce the new 2021-23 Strategic Master Plan *Turin Augmented Metropolis* envisions 110 actions in the metropolitan area informed by the centre's multidisciplinary nature. The focus on urban legacies of F*UL*L's research finds application in large-scale and regional analysis for the urban regeneration of Lombardy and the seismic risk areas in central Italy.

Diagram of the commuting phenomenon by number of inhabitants in the Lombardy Region. Source: Istat.

FULL's research aims to define a model of territorial regeneration that looks at the existing fabric, the morphology of settlements and the specific recurrences of each context and territory analyzed.



TRASFORMATIVE URBAN DESIGN AND LANDSCAPE | INDEX



Re-coding

Rethinking the rules of cities

TYPE
Research project

YEAR
2018 - ongoing

TEAM

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Research group:
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Valerio Roberto Maria Lo
Verso, Maddalena Martina,
Guglielmina Mutani,
Anna Pellegrino,
Riccardo Ronzani,
Valeria Todeschi.

Throughout history, the codification of urban rules has taken many forms:

- The control and exploitation of nature-related phenomena;
- The regulation of litigation in the city of the modern age;
- Hygiene control during the second industrial revolution;
- The control of the image of the city through the catalogs of ornamentation;
- The coordination of urban forms in the practices of the new urbanism.

The Re-Coding project investigates the ordinary making of the urban fabric. In this context, the city is conceived as the combined result of spatial planning, market forces, swinging frames of reasoning, conformity to norms and individual expectations and aspirations. To do so, the Re-Coding project focuses on the role of urban codes in shaping the structure of our cities. Specifically, F*UL*L aims at exploring the intertwined connection between urban codes and city morphology. With urban codes a set of rules should be intended that regards singled out 'elemental types' (such as height, roofing, windows, and the like) and their relations within the built environment with no correspondence to a predetermined and unique location. Yet, the complexity of regulation system might hinder the immediate understanding of the extent and impacts that such regulations have on the built environment, particularly when the overlapping of well-intentioned regulations generated in different time frames result in distorted outcomes, such as use segregation, contradictory directions and scarce flexibility, to name a few, in a time in which cities have to deal with progressive modifications rather than massive greenfield expansions.

The complexity of the Italian regulatory system is an obstacle that we face daily. It slows down administrative works, makes it difficult to foreseen the effects of rules, and impinge heavily on the economic activities of citizens and businesses. The need for rationalization and optimization of such system is not new. Simplification and streamlining of bureaucracy have been keywords in the international political environment since the post-war period. Despite many efforts have been taken to overcome such issue – also due to the progressive increase of complexity of our societies and the consequential accumulation of rules and laws – the issue of complexity of regulation system cannot be considered solved yet.

1 An Effective Solution

F*UL*L has created the Re-coding project, as well as a research team that deals with the simplification of urban rules. The scope is to support policymakers and administrations to optimise the complex system of rules.

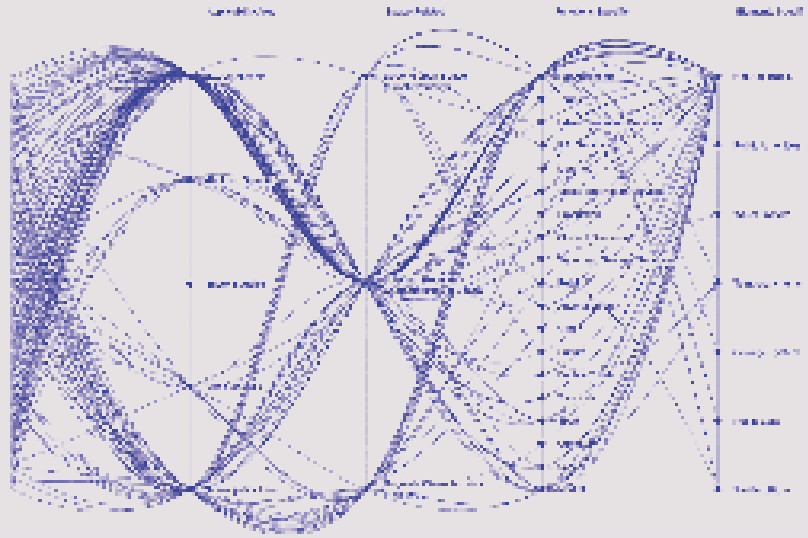
2 An Alternative Method

F*UL*L proposes a more radical alternative to the current procedural simplification approach. The method involves: reduction of procedural steps and distribution of responsibilities between actors involved. Existing rules are systemised and put in order. Overlaps, redundancies and contradictions are identified and reduced. Opportunities to reorganise the content within regulations or even to rewrite parts of the rules emerge.

3 An Opportunity to Be Seized

Making rules more readable and transparent means unlocking the potential for transformation of cities and regions.
A 'simple' city is a city in which:

Citizens can easily understand how to transform their properties, feel active in urban transformation and more involved in the system.
Municipalities – as well as provincial and regional administrations – can effectively facilitate ongoing procedures and transformations, rather than resolving disputes.
Companies are encouraged to invest in a context with clear rules that enable clear risk assessments.
Professionals can offer more competitive design costs thanks to simpler compliance verification.



4 An Exportable Model

The Re-coding team has been experimenting with this approach since 2018, working alongside the Municipality of Turin. Thanks to its interdisciplinary nature, the group has the skills to operate in different regulatory areas, including construction, energy, urban planning and environmental design. Through this method, which puts simplification at the core of the activity, F*UL*L is (re)defining an exportable and replicable model.

Turin Augmented Metropolis

TYPE
Applied research

YEAR
2020 - 2021

TEAM

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in collaboration with:
LINKS Foundation, TIRESIA (PoliMi)

Commissioned by:
Città Metropolitana di Torino

Torino Metropoli Aumentata (Turin Augmented Metropolis) is the concise, clear and communicable title that sums up the vision proposed by the MSP for the future of the metropolitan city. The image of augmentation means the construction of a new alliance between the city of Turin and its region, based on integration and complementarity, rather than opposition and otherness. Augmentation is determined by an updated interpretation of the concept of rebalancing, meant not as uniformity but as the enhancement of the differences and specificities of each metropolitan area. Augmentation is the transition towards a post-Fordist and post-pandemic metropolis, which harmoniously combines the natural and artificial environment, developing the potential of both to build equity, well-being and sustainability.

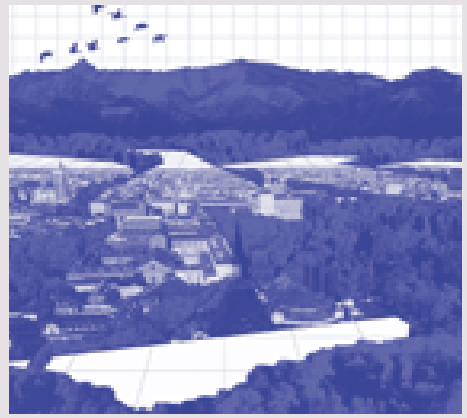
The Metropolitan Strategic Plan (2021-2023) faces a global challenge: the definition of a new balance between city and region, development and environment. At the same time, it interprets this challenge starting from a critical comparison with the local situation of the Metropolitan City of Turin, which is specific and exceptional compared to all other similar administrative entities in Italy. Turin is the Italian metropolitan city that includes the greatest variety of regions within its boundaries, since it is a metropolitan city of the plain, a metropolitan city of the hills and a metropolitan city of the mountains. This regional diversity gives rise to unprecedented potential, which the MSP aims to exploit, systematise and implement.

In order to realise this vision, the MSP proposes a substantial paradigm shift, giving a new centrality to basic infrastructure over sectoral policies. New tangible and intangible infrastructures support hybrid forms of connection and mobility, which are the fundamental prerequisite for quality diffusion in all the regions of the augmented metropolis. The MSP's challenge is to

ensure equal rights and equal opportunities for citizenship for all its inhabitants in every point of the metropolitan city.
The vision of Torino Metropoli Aumentata is structured within the six programme points of Next Generation EU, in line with the objectives defined by the Italian Recovery and Resilience Plan. The MSP pragmatically organises its objectives around the funding structure that will make them possible. It also identifies the objectives of the European cohesion policy and the sectoral programmes that might contribute to completing individual actions. Above all, it includes the affinity of its own highly cultural approach with that underlying the European document, committed to local implementation of the large-scale, long-term continental vision it proposes.
The MSP is arranged into six areas: a more productive and innovative Turin Metropolis (digitalisation, innovation, competitiveness and culture); a greener and more ecological Turin Metropolis (green revolution and ecological transition); a more mobile, accessible and connected Turin Metropolis (infrastructures for sustainable mobility); a Turin Metropolis that learns more (education and research); a more attractive, fair and equal Turin Metropolis (inclusion and cohesion); a healthier Turin Metropolis (healthcare).
This framework supports a complex but clearly hierarchical, three-level articulation. Each axis includes a series of strategies and each strategy unfolds into a series of actions to be implemented. In total, the MSP proposes 24 strategies and 111 actions to augment Turin. This three-part structure underlines the importance of coherence between objectives, policies and actions. The transformation of the metropolitan city can be effectively and positively oriented only through a solid and continuously verified connection between these three scales.

A more productive and innovative Turin Metropolis

The axis dedicated to augmenting the capacity to create value in the various economic sectors (agriculture, tourism, manufacturing, services, trade, public administration) through technology transfer, digitalisation, automation, cooperation in business networks, the construction of supply chains, process and product innovation and the promotion of the region and its products. It thus aims to augment the number of job and business opportunities and the attractiveness of the Turin metropolitan system for new initiatives and investments.

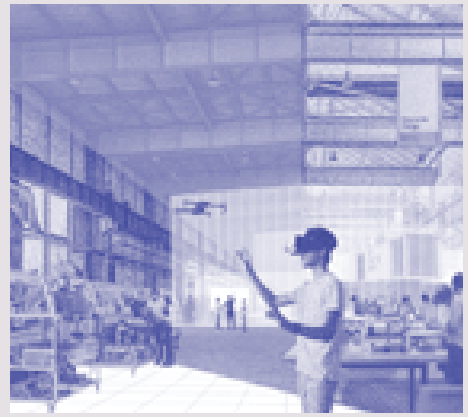


A greener and more ecological Turin Metropolis

This includes all the actions aimed at augmenting the ecological, environmental and landscape quality of the metropolitan area. These actions aim to reduce its ecological footprint, redefining its metabolic processes in a circular way and thus contributing through local actions to the global challenge of climate change.

A more mobile, accessible and connected Turin Metropolis

This suggests seizing the opportunity of the transformation of remote working commuting routines to improve connectivity and accessibility to and from the metropolitan region. It imagines the augmented metropolis as a '90-minutes metropolis' made up of '15-minute cities', where the ease and comfort of intermodal transport are ensured by an integrated and user-oriented MAAS (Mobility-as-a-Service) model. It promotes a differentiated use of collective transport over medium and long distances and of alternatives to the private car over medium and short distances. It projects connections outside the metropolitan area with the rest of northern Italy and the global world beyond the Alps, making gateways of metropolitan interest more accessible from all points in the region.



A Turin Metropolis that learns more

This axis stresses that it is essential to invest in the structural renewal of the metropolitan school infrastructure, in terms of buildings and the spatial model of education. It proposes seizing the opportunities experienced with distance learning during the pandemic and hybridising them with the quality of traditional teaching. It includes a series of actions aimed at strengthening and innovating vocational training, both at upper secondary school and university level. It emphasises the centrality of vocational degree courses, to be put into a system with proposals for lifelong learning and re-training of the already active workforce. It promotes and disseminates hands-on approaches to teaching, including in non-professional areas, as well as early schooling, with a view to gender balance, experimenting with hybrid forms of decentralised/autonomous management. It promotes relations between schools and the region in all contexts, making the school infrastructure a civic multi-service platform.

A more attractive, fair and equal Turin Metropolis

This aims to promote equal opportunities for personal and community development in the different parts of the region and for the entire population of the metropolitan city, so as to make it attractive again for residents and businesses. It includes actions aimed at introducing and supporting new forms of social housing and community residence, adapted to the specificities of the different local contexts, which can bring new inhabitants to areas with weak demographics, as well as prevent and recover situations of social exclusion. It suggests experimenting with and encouraging dual forms of metropolitan residence to strengthen links between the centre and peripheral areas.

A healthier Turin Metropolis

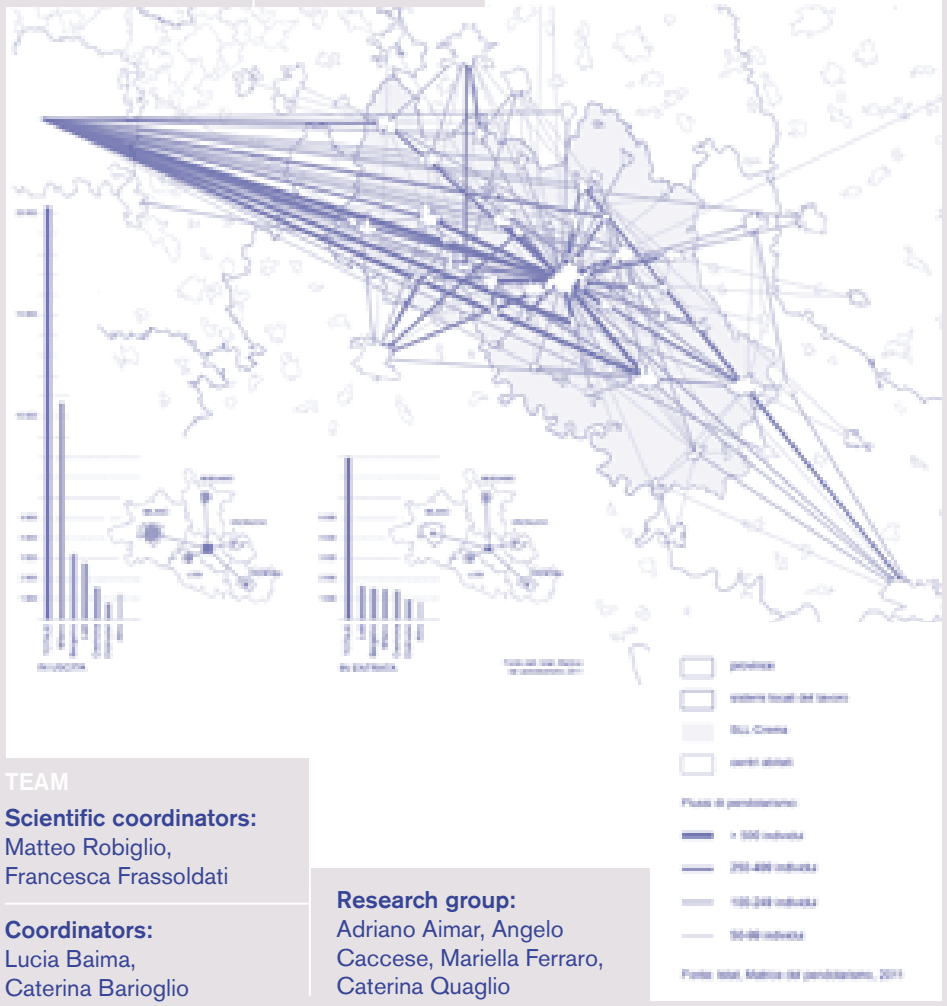
Starting with the centrality of the new Turin City of Health, investment in an integrated regional system of education, prevention and diagnosis which promotes equal accessibility of the health system throughout the region is proposed. This includes the possibilities of telemedicine and remote diagnostics. Its actions encourage making the environmental quality of the metropolitan city an active public health factor and an enabling infrastructure for a healthy and active lifestyle, as well as promoting health education, supporting active ageing, the social role of the elderly and intergenerational links.

Six axes, 24 strategies and 111 actions in just one region. It is important to underline that the six axes of the MSP refer to a single region: the metropolitan city of Turin; considered as a whole an equal space, but enhanced in its many areas as a place of positive differences. The six axes are implemented in each region but maintain their absolute local and global relevance and contribute as a whole to the single objective of the MSP: to augment Turin.

A new regional regeneration model in Lombardy

TYPE
Applied research

YEAR
2019 - 2021



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Coordinators:
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Research group:
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Urban regeneration has become a key concept in relation to urban transformation issues and in recent years has been effectively expressed in the development of ad hoc legislative instruments. The Lombardy region, for example, now has one of the most advanced legislations on urban regeneration. Although the tools available to administrations have proved very effective in dense and dynamic urban contexts such as Milan, however, their application in small and medium-sized urban areas remains an open question.

In these areas, the demand for regeneration is difficult to translate into a model of intervention transferable to every context. It is built starting from a process of analysing each region to recognise and interpret the specific context, intercept areas considered separate and incorporate often non-explicit social demands able to redefine the perimeters and ingredients of regeneration.

Starting with this consideration, the Future Urban Legacy Lab (F*UL*L) for the Lombardy Region - General Directorate for Regional and Civil Protection - and ANCI Lombardy have prepared a model for regional regeneration aimed at providing operational and specific solutions for each region by systematising existing regional, social and spatial resources. This model is proposed as a new regeneration toolbox to be used by municipalities and Centres of Competence, with the intention of guiding strategic planning and programming, implementation and management actions.

1- An Effective Solution

F*UL*L's research aims to define a model of regional regeneration that looks at the existing fabric, the morphology of settlements and the specific recurrences of each context and region analysed. The model prepared suggests a shift to an ordinary condition in which urban and regional regeneration are the structural and not the extraordinary form of urban processes.
F*UL*L's contribution aims to identify the possibilities offered by the Lombardy Region's law L.R.18/19 for urban and regional regeneration even in small and medium-sized urban areas, and at supporting local administrations in defining an effective intervention model able to take advantage of the potential expressed by the regions.

2- An Alternative Method

Early explorations

The analyses and field investigations conducted during the research in three specific and very different regions - the five municipalities of the Lecco area (Casatenovo, Missaglia, Besana, Monticello and Triuggio), the municipalities of the Cremasco area and Varedo -, as well as open dialogues with municipal administrations and local players, brought to light a real demand for parallel or alternative regeneration potential compared to an initial catalogue of sites shared at regional level.
From the large industrial precincts, in fact, reflection has been extended to the future of built-up areas and the widespread opportunities for regeneration offered by individual buildings; to the rethinking of the agricultural structure and the production cycle; to the organisational system of property; and to the entire environmental infrastructure as a whole.

The F*UL*L model

These early explorations not only brought to light rich possibilities of transformation that go beyond the scale of a single building, but also contributed to identifying three basic hypotheses on which the proposed regional regeneration model is based:

- **THE MODEL** is not an adaptation of urban regeneration prototypes.

- **THE HEART** of the matter is not pre-identified brownfield sites, but a demand for regeneration on a regional scale.

- **REGIONAL REGENERATION** requires local actors capable of acting as a network in the medium to long term.

These aims have been translated by F*UL*L into an operational tool that supplements the Lombardy model of regional regeneration and can be replicated, adapting to the specific needs of other contexts through a structure broken down into seven phases:

1- DEFINE THE FIELD OF ACTION AS A PROJECT AND STRATEGIC ACTION

Positioning in a field of action is a strategic project that identifies clear and defined intervention perimeters; the effects on which to measure the impacts remain modifiable in the course of the action.

2 - MEASURE THE REGION

Transformation potential is characteristic of each region and can be measured through a series of synthetic indicators. It is thus possible to identify certain regional recurrences and establish criteria for selecting and evaluating projects.

3 - REGENERATE FOR AND WITH THE LOCAL NETWORK

Urban and regional regeneration starts with the recognition and discussion with public and private actors who have a proven capacity for action (agency) and involvement in the region.

4 - LISTENING AND SHARING REGENERATION WITH LOCAL STAKEHOLDERS

Listening to and sharing the values of regeneration in an inclusive way allows the dialogue to be further extended beyond the perimeters of the previously defined scope.

5 - FRAMING AND PROBLEM SETTING

Problem setting and construction of a local regeneration framework, in accordance with the regional bodies, may eventually also help smaller contexts to develop strategic reasoning with respect to their own perspectives in the regional context.

6 - IDENTIFY TANGIBLE AND INTANGIBLE ASSETS STRUCTURING THE PROJECT ACTIONS

Following the interim phases and the progressive selection of the regional regeneration framework, it is necessary to identify the tangible and intangible elements susceptible to transformation on which to mobilise project actions.

7 - DESIGNING TARGETED TRANSFORMATION ACTIONS

The elaboration of specific strategies and actions for regional regeneration aims at activating cycles, including micro cycles, of mobilisation of local resources. The advisory role for Centres of Competence in providing a local interpretation of regeneration thus emerges.

This regeneration model is based on an exploration of regions' potential through specific and synthetic quantitative analyses. Methodologically, the measurement of local potential is developed through a series of mappings and indicators organised into four categories that frame successive decisions and priority definitions: Location, Regional Capital, Social Capital, Trajectories.

The three pilot cases researched were analysed in parallel, using similar sources and producing similar maps in order to ensure comparability, thus providing a replicable framework for the Centres of Competence.

3 - An exportable Method

For operational regeneration, in regions with differing characteristics, F*UL*L therefore proposes a model based on two main aims:

– **RECOGNISING THE SPECIFIC CHARACTERISTICS** and potential of an area, rather than just perimeter brownfield sites, leading to individual and unique outcomes in each working context.

– **BEING REPLICABLE** in the form of an 'intervention structure', emphasising a system logic instead of an area logic.

The method of examining the region proposed by F*UL*L therefore favours an operation of reframing and identification of a problem which may be different from the initial outline.
In order to make these reflections operational, capacity building is also needed through the action of Competence Centres, rethought as action, help desk and training centres, bringing new skills to municipalities. The identification and enhancement of local networks and actors that have demonstrated a capacity for action and involvement is a key factor in defining the resources that might fuel regeneration processes.

F*UL*L's research therefore contributes to defining a regional regeneration model that looks at the existing fabric, the morphology of settlements and regional recurrences to identify opportunities and potentials of the region that are not always evident and to prepare targeted regeneration strategies.

Reconstructions

Design tools after emergencies. Seismic transitions, from temporariness to permanence

TYPE
PhD research

YEAR
2022

AUTHOR
Ilaria Tonti

What range of solutions, both temporary and permanent, can be explored to counter earthquake damage in a seismic territory such as Italy?

Affected by endemic and recurrent natural disasters, Italy is a fragile territory by nature. In the last 50 years, six violent earthquakes have hit the country, of which three in the Central Apennines in the past 20 years alone.
The rules, processes and solutions for emergency management in Italy, and the world, have moved architectural design towards standardised solutions, lacking attention to regional complexities. All are combined with slow reconstruction processes often completed within 20 to 30 years of the event. Based on the 2016 seismic events in central Italy and the spatial impact of temporary solutions, the research reflects on the relationships between emergency and permanent urban settlements and their effects/transformations in that long time 'in between', from event to reconstruction.

Temporary architecture, temporality, experience of the emergency, permanence, spatial survey of impacts and open data are keywords that outline the starting point for understanding reality in continuous transformation and waiting for permanent reconstruction. What is meant by 'temporary'? What role does it play in the regions and what geographies does it produce? Which tools are used to survey, observe, investigate and re-design these regions? In the absence of an overall systemic and national-scale phenomenon perspective, the thesis aims to reflect on temporary management. Geospatial analyses support these reflections and the mapping method defines and decodes those 'theoretically' impermanent processes (from the geographic to the settlement scale).

The research is structured on two levels: on the one hand, an overview of the existing architectural literature review oriented towards clarifying the meaning of post-event temporariness; on the other hand, using geo-referenced information systems (GIS) tools to redraw, decode and compare the different forms and settlement transformation resulting from temporary solutions. Through an interdisciplinary approach, these technical methods, with their data acquisition and processing tools, cover all the research phases and are considered valuable tools to put cartographic representation, alphanumeric data and architectural practices in a relationship of tension, bringing out these new centralities defined as 'temporary'.

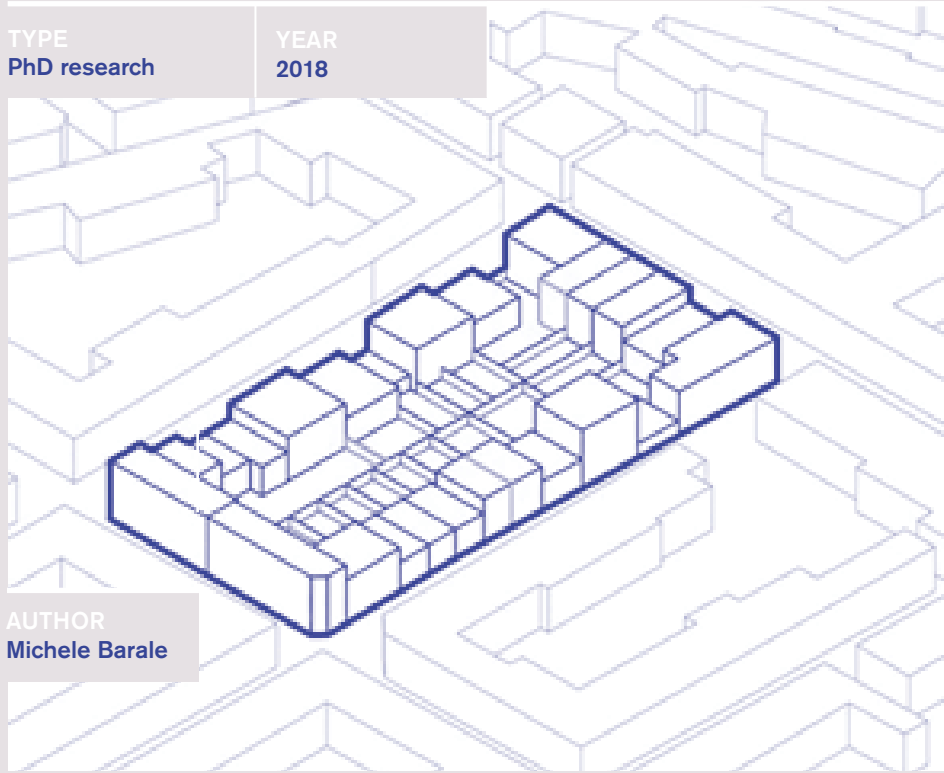
One goal is the construction of a diachronic and harmonised geospatial atlas (database) of 'temporary' emergency solutions, giving an empirical and accurate overview of the current state of the phenomenon in central Italy, measuring and representing on a regional and local scale, using stratification of heterogeneous sources and information, often not updated.
The task is to investigate the interaction between geomatic tools as a design tool for redesigning and recognising a potentially active role of monitoring at different times, using theoretical, practical and spatial multiscale frameworks.
From there, focusing on specific regional case studies in the inner area in central Italy, the perspective is to identify potential transformative capacities and new scenarios of the two half cities, the new temporary one in relationship with the existing one that has been destroyed.

Servitude of form

Comparative urban property and building rules

TYPE
PhD research

YEAR
2018



AUTHOR
Michele Barale

Ordinary construction, which makes up most of the fabric of a city, is the product of rules and regulations. The rules that determine the morphological characteristics of ordinary building constitute a little explored field of study, from the point of view of both town planning and architectural design.

The relationship with the scale of the building, the explicit and implicit motivations that gave rise to them and the inherited meanings that continue to apply to the form all escape you. The literature of so-called 'urban rules', inaugurated by Lehnerer, has brought attention to the effects of rules on a building scale; it is still, however, fragmentary and mainly focused on American case studies. The long European tradition of building regulations, on the other hand, developed within the legal culture of civil law, represents a field of research that has been much neglected by critical debate. This thesis investigates the relationship between ordinary building construction in cities and, borrowing terms from private law, the discipline of jus aedificandi, taking a historical perspective and a planning approach. The investigation is conducted in France, the United Kingdom and Portugal. The urban rules under investigation determine construction on the property boundary, between private properties and between public- and private-owned properties: their design behaviour is studied, investigating the definition of the device (building instrument prescribed by the rule, to the realisation of which the lawfulness of building is subordinated) in an historical context. This approach is adopted to restore the correct substance to the norm, reconstructing the process of synthesis of implicit meanings, urban and design components, and legal aspects. Fundamental to this is the integration of legal literature from the fields of legal history and construction law, through which an attempt is made to provide an interpretative contribution that does not diminish the content of the rules. The method adopted integrates urban literature (architecture, town planning and history of the city) with legal literature, using graphic and narrative methods. The graphic support forms an integral part of the method: by means of sections and axonometry, the role of the device in relation to the building is represented, in order to shed light on the implicit meanings contained in the urban rules. This thesis investigates the development of two typical building regulation tools: the distance between buildings and the relationship between building height and road infrastructure. The instrument of the distance between buildings is studied in its Parisian origins (1580), where it was adopted to regulate the co-owned wall; these rules are placed side by side with the regulation of the party wall in British legal and urban culture from the 12th century onwards. The definition of height, on the other hand, is traced back to three case studies in which viability, alignment, decency and the contrast between private and public property are intertwined: the French façade ordinances (17th-19th centuries) and the reconstruction regulations of London (1667) and Lisbon (1759). Both instruments are considered to limit the right to build. On a second level, the thesis outlines the process of preparing the instrument of building regulations set out by the Napoleonic system. It investigates its intertextual character, the models of the city that it conveys, the formal legacies instilled in building and construction, and the characteristics of permanence and continuity of the European city provided by the rules. The aim of this research is to offer an interpretative and critical analysis of a current instrument, the building regulations (building code), together with the exploration of an interdisciplinary methodology with which to study the regulatory aspects of building design in the city.

TRANSFORMATIVE URBAN DESIGN AND LANDSCAPE | OUTCOMES

BOOKS AND BOOK CHAPTERS

Barioglio, Caterina, Daniele Campobenedetto, Marianna Nigra, Michele Francesco Barale, Francesca Frassoldati, and Matteo Robiglio. 2019. *Re-Coding. Ripensare Le Regole Della Città*. Dipartimento Di Architettura E Design - Politecnico Di Torino.

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Frassoldati, Francesca and Matteo Robiglio. Forthcoming. Regolare la città per la sua trasformazione. Spunti da un dialogo con la Città di Torino. in «Territorio».

Barale, Michele. Forthcoming. Sguardi sul confine. Le regole urbane sulle aperture dalla Coutume de Paris al Codice Pisanelli. in «Territorio».

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MORPHOLOGY

QUOTE

By morphology do you mean the way we try to understand form in the architectural or urban context? Is there a sort of underlined work that allows you to understand both the categories with something in common

LECTURE REFERENCE

Josè Araguez in 07.12.2018, *The Building,* FULL lectures, Sala Caccia, Castello del Valentino, Turin

SPECIFICITY

QUOTE

Specificity still allows it to address or refer to whatever we are supposed to be good at, our particular expertise as architects and urban designers

LECTURE REFERENCE

Josè Araguez in 07.12.2018, *The Building,* FULL lectures, Sala Caccia, Castello del Valentino, Turin

PRODUCTIVITY

QUOTE

Another idea that is very characteristic to the discourse of productivity in Brussel is that architecture is serving as a bottom-up urbanism. A lot of the masterplans and urban development strategies turn out to be too slow or too bureaucratic, so a lot of innovations of typologies and urban form it's happening in the field of architecture

LECTURE REFERENCE

Dieter Lessen (51N4E) in 14.02.2020, *Hybrid Factory Hybrid City Symposium*, FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

RIGHTS

QUOTE

When it comes to fundamental rights, it is essential to force the specialities, to force the academic barriers

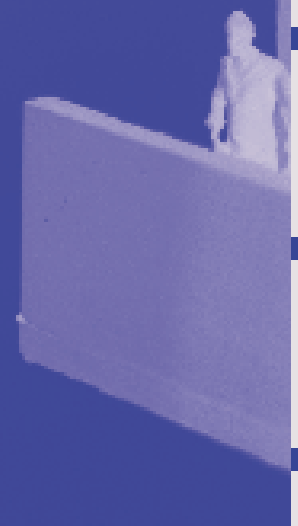
LECTURE REFERENCE

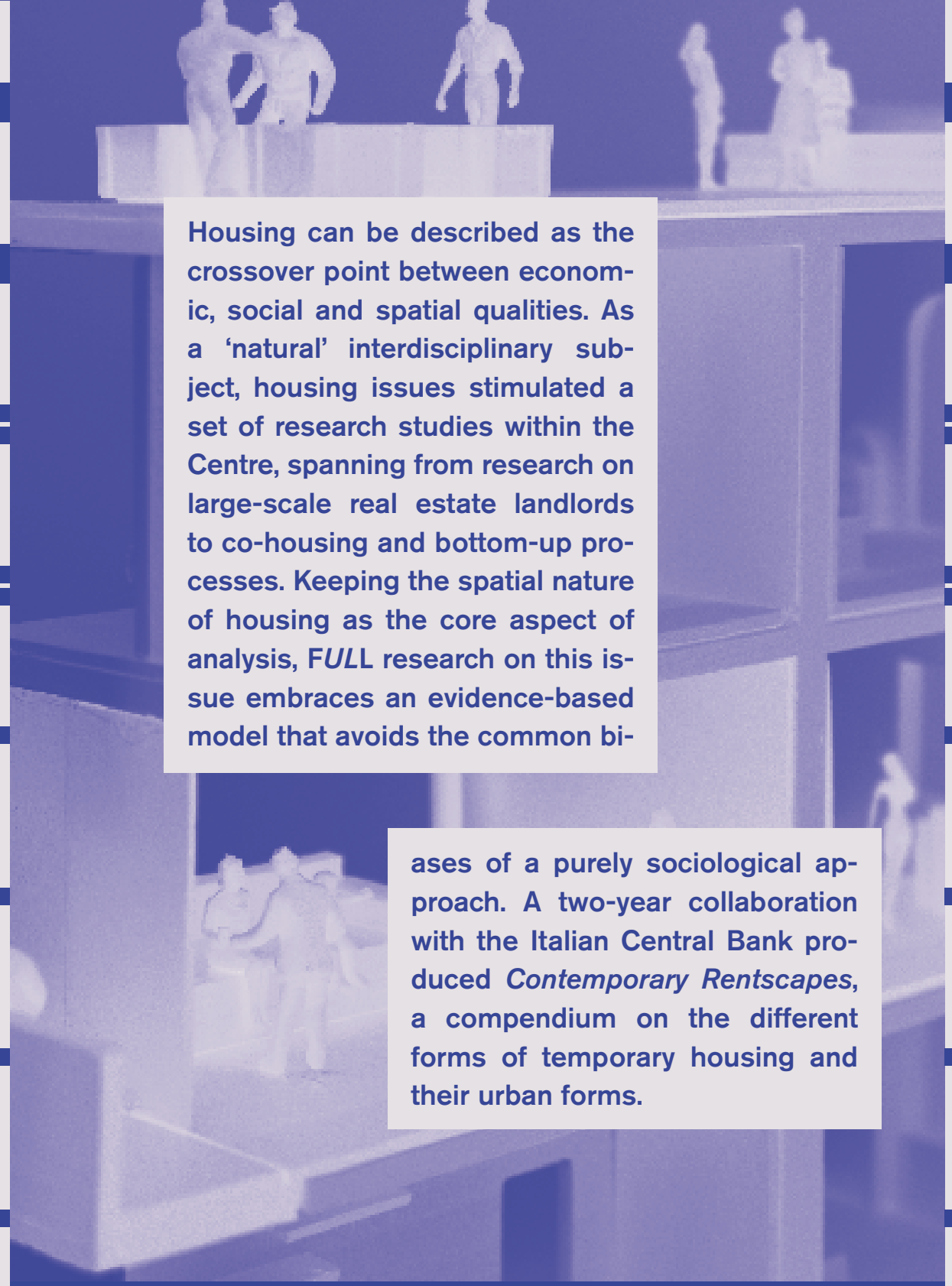
Vladimiro Zagrebelsky, in 12.10.2018, *Architettura e Ingegneria in riferimento ai diritti e alle libertà fondamentali*, Urban Legacy Seminar Series, Sala Luigi Ciminiera, DAUIN, Turin

NEW HOUSING ISSUES

NHI

What are the possible approaches to deal with the current housing crisis?





Housing can be described as the crossover point between economic, social and spatial qualities. As a 'natural' interdisciplinary subject, housing issues stimulated a set of research studies within the Centre, spanning from research on large-scale real estate landlords to co-housing and bottom-up processes. Keeping the spatial nature of housing as the core aspect of analysis, F*UL*L research on this issue embraces an evidence-based model that avoids the common biases of a purely sociological approach. A two-year collaboration with the Italian Central Bank produced *Contemporary Rentscapes*, a compendium on the different forms of temporary housing and their urban forms.

New Domestic Rentscape investigates the crystallisation into architectural forms of the dynamic tenure of rent. Further research is ongoing on the social involvement in community-led housing models and alternative housing models in general.

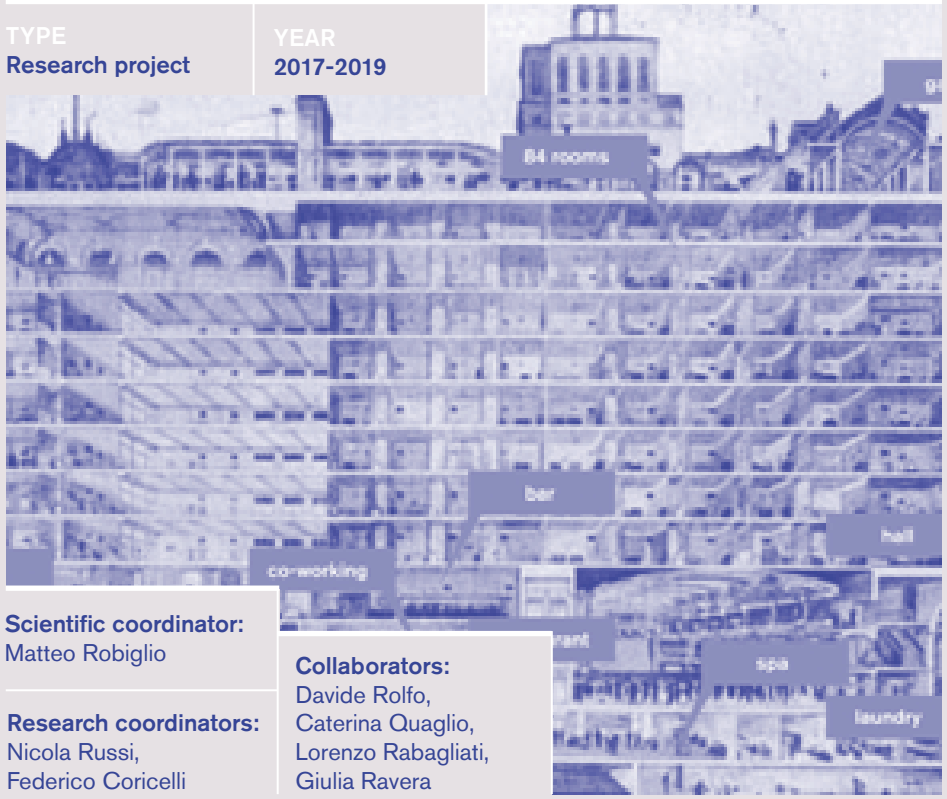
Italy is a country of homeowners. However, according to national statistics, cash renters do not seem disadvantaged in relation to their landlords: 9 million of tenants spend an average of 400€ per month on their rent (only 14% of the average national income). In major cities, these figures change radically. In the case of Milan, the affordable rental flat area is of about 30 sqm -the area corresponding 30% of median rent over the median city income-, while the median area of rental flats in the city is 70 sqm.

INDEX

Contemporary Rentscapes

TYPE
Research project

YEAR
2017-2019



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Research coordinators:
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Collaborators:
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Lorenzo Rabagliati,
Giulia Ravera

**Contemporary Rentscapes is a biennial research project funded by Sidief Spa (Bank of Italy), focusing on transformative strategies for large rental housing stocks.
The first part of this project was published in the book Re-housing, 'La casa come dispositivo di integrazione' (The House as an Integration Device), (Politecnico di Torino, 2018). Triggered by the need for a generational turnover of the urban tenant, F*UL*L demonstrated the flexibility of a portion of early twentieth-century housing stock through a toolkit of micro interventions. The second iteration of the project (Living beyond Property) investigates the innovative global offer on the private rental market, mapping and decoding the patterns and connections between private and public space in the serviced domestic realm.**

What would be the consequences in a city where no one owns a home, but everybody can rent a house?

turnover of the urban tenant, F*UL*L demonstrated the flexibility of a portion of early twentieth-century housing stock through a toolkit of micro interventions. The second iteration of the project (Living beyond Property) investigates the innovative global offer on the private rental market, mapping and decoding the patterns and connections between private and public space in the serviced domestic realm.

Contemporary rentscapes

Contemporary rentscapes is a biennial research project funded by Sidief Spa (Bank of Italy) focusing on transformative strategies for large rental housing stocks.
The first part of this project was published in the book Re-housing, la casa come dispositivo di integrazione (The House as an Integration Device) (Politecnico di Torino, 2018). Triggered by the need for a generational turnover of the urban tenant, F*UL*L demonstrated the flexibility of a portion of early twentieth-century housing stock through a toolkit of micro interventions. The second iteration of the project (Living beyond Property) investigates the innovative global offer on the private rental market, mapping and decoding the patterns and connections between private and public space in the serviced domestic realm. This section of the project will be published in the book Abitare oltre la proprietà (Living beyond Property) (Politecnico di Torino, 2019).

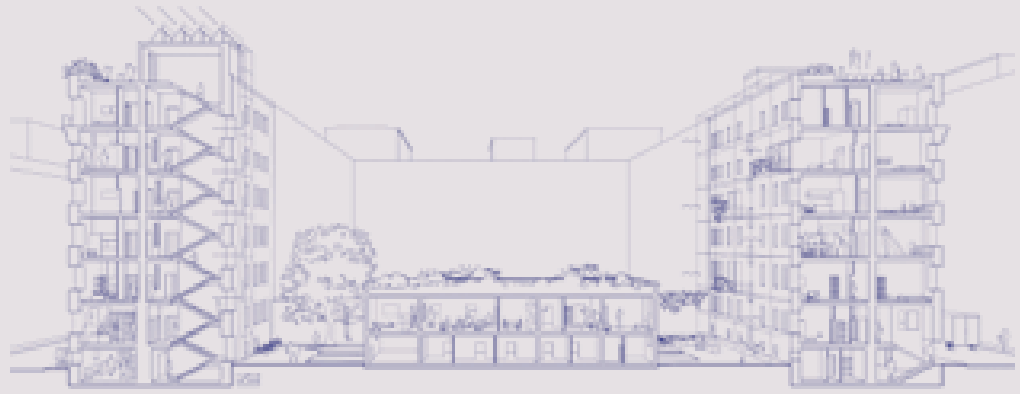
Re Housing (2018)

Can housing serve as an enabling factor to integrate new citizens? On 8th August 1991, the ship Vlora landed 20,000 Albanians on Italian shores. Since then, a lot has changed.

During the last twenty-five years, immigration from a wider and wider spread of foreign countries has coincided with radical cultural and economic transformations in Italy. The social fabric in Italy has been deeply changed by the interaction between different cultures.

This mutation has not been compensated for by a significant renewal in the built environment, historically characterised by an inertia towards inflexibility. The progressive mutation of life conditions of Italy's new residents is leading their housing demand to increasingly converge with that of more and more Italians. This unexpressed potential can be reimagined today as a resource to forecast strategies of renewal in the existing urban fabric and build a common ground, a place of sharing and integration.

Integrating housing with the city's new technological services and housing models today opens up the possibility of externalising much of the infrastructure embedded in the domestic unit. This phenomenon not only allows new housing typologies to be conceived, but also allows a portion of the existing housing stock to be radically transformed. The traditional housing models, characterised by a rigid and inflexible compartmentation, can be redesigned into flexible, open systems thanks to the application of new spatial strategies and new management tools. Transforming under-utilised rooms in new collective spaces and organising innovative management systems allows a new conception of housing to be formulated. A new form of housing able to meet the demand of new Italians.



From specialised housing towards an original policy

The Italian city, with its sheer quantity of public space and high-density urban blocks, has for centuries represented an efficient model of integration between the individual and the collective dimension. This model, which in the recent past has seemingly been replaced by a sprawl of detached houses, is today becoming an actual one infilled with new ways to live and new

conceptions of inhabitation of the private and public spaces of the house. New housing typologies, developed inside dense portions of the city, allow innovative forms of integration between the private and the public dimension. The porosity of a densely-built city, subdivided in its core by a fragmented private property structure, represents the fertile ground to develop a system of housing and services distributed in the city in an efficient network instead of a one-size-fits-all model.

Living beyond property (2019)

Italy is a country of homeowners. However, according to national statistics, cash renters do not seem disadvantaged in relation to their landlords: 9 million tenants spend on average €400 per month on their rent (only 14% of the average national income). In major cities, these figures change radically. In the case of Milan, the affordable rental flat area is about 30 m2 – the area corresponding to 30% of median rent over the median city income –, while the median area of rental flats in the city is 70 m2.

Cities are the place where Engels' Wohnungsfrage has always unfolded in its more severe form, historically in purpose-built housing typologies like Berlin's Mietskasernen, the tenements of New York and the Parisian immeubles de rapport.

In post-war Europe, the deprived social conditions associated with these typologies triggered experimentation in the field of social housing, assigning to the state also the role of great landlord. The mass provision of housing led to the dimensional standards still in use in planning regulations. Paralleled to this mainstream story, some housing typologies were designed and optimised based on human body dimensions. The hotel, from its first conception at the end of the 18th century in the United States, has always been an incubator for domestic innovation. Today, if we observe major cities across the globe, we find hybrid housing typologies, mixing the spaces and services of the hotel with the notions of comfort and security typically associated with the traditional rental flat. Rental housing in this sense operates simultaneously as a dwelling and as a constellation of included services. Units of reduced size are combined with common areas and facilities in single buildings. Plus, housekeeping service and hotel-like management are usually included in the rental fee. Depending on budget and target users, this can take the form of co-living for students and professionals, luxury or branded apartments, serviced apartments and apartments for elderly people.

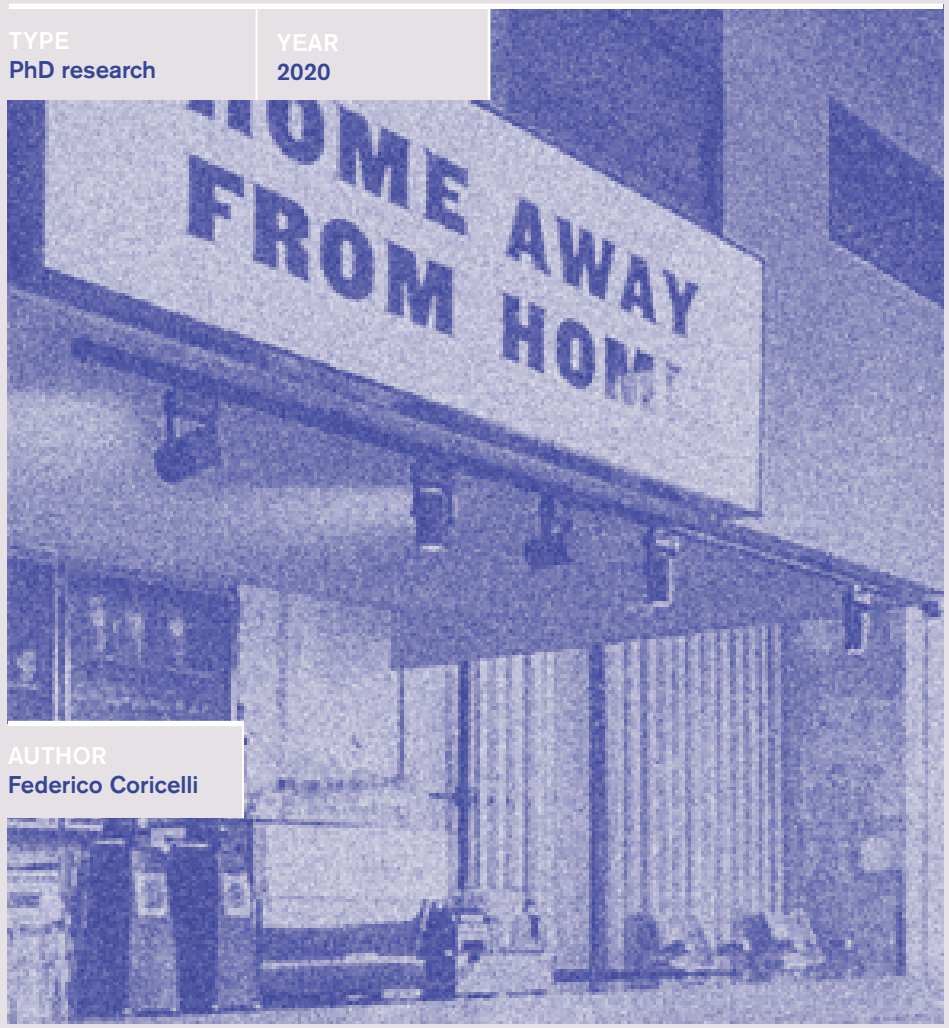
What would be the consequences of a city where no-one owns a home, but everybody can rent a house?

New Domestic Rentscape

A Critical Insight into Middle-class Housing

TYPE
PhD research

YEAR
2020



AUTHOR
Federico Coricelli

This dissertation aims to investigate the transformative potential of the existing residential Italian real estate, and its capability to absorb new collective housing models as co-living.

Major Western cities are experiencing an increasingly unaffordable private rental market and the diffusion of the single-person household as its typical dweller.

Since post-war times, the constant increase in rent prices has not matched the stagnating trend of salaries. For Engels, this was the inevitable trajectory of capitalist market economy, penalising cash renters that have not found stability in the 70% majority of homeowners in Western democracies. Looking at the long run of modernisation as the history of privatisation, the enclosures of land initiated in England in the sixteenth century can be observed to be coupled by a cultural process of individualisation of the self in terms of worship, labour and the quest for independent living space. This shift culminates in the modern industrial home, where a functionalised domestic sphere tends to separate places of privacy from those of social representation. For lower incomes, this distinction collapses in the single living/kitchen room.

In order to combine the quest for privacy with necessary and optional collective spaces, several collective housing formats have been conceived since the nineteenth century.
The hotel is the first housing typology and social technology conceived to host a community of strangers, capable of combining in a single building the generic space of the room with collective and public services. In the late 1920s, urbanists and thinkers such as Hilberseimer and Teige proposed hotel-like residential models as the most efficient housing form for a fu-

ture egalitarian city. This would happen with the abolition of domestic unpaid labour through professional housekeeping and the inclusion of services into the building.In the digital era, co-living combines the principles of the hotel with the logics of the sharing economy, giving place to a hybrid model redefining the typical residential mixed-use building.

This dissertation aims to investigate the transformative potential of the existing Italian residential real estate and its capability of absorbing new collective housing models, such as co-living. Banks, charities, insurance companies and property companies rent thousands of units in Italy's main cities, mainly located in central areas.

Institutional landlords played a key role during the twentieth century in the simultaneous expansion of the middle classes and the neighbourhoods they inhabited. Distributed across major Italian cities and built between the 1920s and 1980s, these buildings share an ordinary character, as they were designed to embody the values of domestic comfort and self-representation of the modern European middle class. The case studies considered are entire buildings owned by a single landlord – a rare feature in a private rental market almost monopolised by an archipelago of isolated individual-owned units.

Contemporary housing demand in Italy has radically changed from previous generations, both in socio-economic terms and in the cultural understanding of comfort.

Major socio-economic shifts have contributed to distancing potential tenants from the available stock, provoking a dual mismatch between demand and supply. Firstly, an overall aging population of 6.3 million of over-65s is currently living alone, often in houses with five or more rooms.

Secondly, 66% of the population between 18 and 34 years old still live with their parents. If data and statistics suggest a mere quantitative solution – namely subdividing further the available stock – this research aims to investigate by means of architectural design and spatialisation the effective potential of the Italian middle-class housing stock.

The hypothesis is that a set of stress tests of downsizing on the residential unit raises several open-ended questions on the architectural limits to flexibility, the financial limits of a 'micro-unit' housing stock and the contested status of shared and collective space within the domestic realm.

NHI

Community-led housing development

A key ingredient for a new housing architecture and policy

TYPE
PhD research

YEAR
2022

AUTHOR
Silvia Cafora

Within the global picture of financialisation of land and territory required by neoliberal national policies, housing becomes a financial tool, neglecting its nature as a common good, as reported by Raquel Rolnik, UN special rapporteur on adequate housing.

This PhD research explores bottom-up community-led strategies for housing issues such as commodification, housing tenure and provision.

In light of this, this research reflects on the paths that commoning efforts in the housing sector can take in the complex contemporary situation, in which neither the state nor the market is fully capable of offering satisfactory solutions for a just and sustainable provision of basic urban resources as delineated by UN's 2030 Agenda. This attempt will be articulated around the analysis of European examples, such as the Mietshäuser Syndikat, CLT, Trias and Edith Marion Foundations, showing the re-emergence of forms of community-led and collaborative housing, in order to sketch an image of the innovative models and strategies of housing tenure and provision from a common perspective.
The analysis focuses on spatial and architectural innovations that those models put into practice; on legal and economic instruments created and able to empower the communities to decommodify building stock and increase housing rights. It is important to study community-led practices, their level of autonomy and self-organisation, able to trigger new concrete solutions for housing issues and a democratic governance for a series of players involved in the complex development of housing projects, as responsible makers and users of the resource that their homes constitute.

Tailor—made housing

How to improve housing affordability and adequacy through innovation of the cohousing model

TYPE
PhD research

YEAR
2023

AUTHOR:
Ludovica Rolando

The gap between the average wage and the cost of living in metropolises has led to conceiving the home as a luxury item, rather than as one of humans' primary needs. The rentability criterion of the domestic space of the current real estate market has greatly increased the cost per square metre by partitioning spaces to increase the proportional income. In fact, smaller and more unhealthy spaces are rented at higher prices. The architectural model of existenzminimum has been corrupted by capitalist logics of profitability of space, forgetting human rights and well-being.

How to rethink domestic living to promote greater access to the house? How would it be possible to calibrate each intervention on the future inhabitants of domestic space?

The present research stems from the binomial of housing and democracy. These two concepts were associated by modern architecture under the slogan: a home for everyone (CIAM Congress,1929). Over time, extreme rationalisation and standardisation of mass housing led to a strict functional segregation and a quantitative approach, whereby a sustained housing production would meet the demands of low-income groups (Tosi, 1994).

What should democratic living be like? Is it the industrial anonymity and standardisation of Hannes Meyer's 'Co-op Interieur' (1926), a single generic cell that belongs to the entirety of the metropolis as a universal basic right, replicable indefinitely? Or is it tailor-made housing where a diversified offer, based on different income brackets, is combined with the design of a domestic space which reflect the needs, values and desires of each future tenant? The needs and activities of future tenants became the new criterion of relevance during the 'housing revolution' of the 1970s: the idea that dwelling is an act (Habraken, 1972)

and the notion of housing as a verb (Turner, 1976) are key themes. As a result of this paradigm shift, the cohousing model was born. It combines individual private housing with collective spaces characterised by flexibility. It allows costs to be reduced and spaces customised through participatory design. It was born in northern Europe and then spread to English-speaking countries and continental Europe, having entered a new stage of development since the 2000s in the rest of Europe, especially in the south.

Is it possible to design a model of cohousing that can be reproduced on a larger scale, overcoming the limitation of punctual, disaggregated enclaves, to help ensure housing accessibility in an effective way? This investigation focuses on the critical analysis of this typology to meet the most diversified contemporary needs. International case studies are chosen for the innovative characteristics of the management model (software) or physical model (hardware) and then analysed regarding both replicable typological aspects and the different possible approaches in terms of supply, the role of the social manager, the contractual variety, the social mix and the guarantees offered by the service. The aim is to analyse how the paradigms of flexibility, customisation and hybridisation translate architecturally and whether a participatory process is more effective. The goal is to outline, through ethnographic study and action research, that cohousing is a model, not a typology and can therefore be interpreted differently depending on the context; public administrations, recognising the trend, can act as facilitators through dedicated policies; the inclusion of users is a tool to ensure the effectiveness of the project; sharing spaces helps to reduce costs and, together with the low cost process and tax incentives, ensures access to affordable housing that is also tailored to the wishes of future users, combining solidarity networks and social value in inclusive, adequate and sustainable housing.

NEW HOUSING ISSUES | OUTCOMES

BOOKS AND BOOK CHAPTERS

Cafora, Silvia. 2021. 'A Community Cohousing in Roccaporena'. In *HEALING CULTURE, RECLAIMING COMMONS, FOSTERING CARE A PROPOSAL FOR EU CULTURAL POLICIES*, 123–30. Napoli: Italian Institute for the Future.

Coricelli, Federico, and Chiara Iacovone. 2021. 'Poseur Real Estate. Home Staging as an Enabling Commodification Practice'. In *Rehab*, edited by Angelo Sampieri, Fabrizio Paone, and Quirino Spinelli. Jovis Verlag.

Coricelli, Federico, Caterina Quaglio, Matteo Robiglio, Davide Rolfo, and Nicola Russi. 2018. *Re-housing. La Casa Come Dispositivo Di Integrazione*. Quaderni del Future Urban Legacy Lab - Politecnico di Torino.

Coricelli, Federico, Matteo Robiglio, and Silvia Cafora. 2020. 'Le Case "Co". Dalle Cooperative Abitative Ai Modelli Di Cohousing: Genealogia e Declinazioni Dell'idea Di Abitare Insieme'. In *Abitare Pioniere. Innovazione Democratica e Nuovi Paradigmi Economici in Risposta Alla Finanziarizzazione*. Fondazione Giangiacomo Feltrinelli.

Coricelli, Federico, Matteo Robiglio, and Nicola Russi. 2019. *Abitare Oltre La Proprietà*. Quaderni del Future Urban Legacy Lab - Politecnico di Torino.

CONFERENCE PROCEEDINGS

Cafora, Silvia. 2021. 'Territori in Contrazione e Diritti in Contrazione, Accesso Ed Eccesso Del Patrimonio Costruito.' In *DOWNSCALING, RIGHTSIZING. Contrazione Demografica e Riorganizzazione Spaziale*, 23–30. Torino: Planum Publisher.

CULTURE

QUOTE

We swim in it like fish in the water, but to what extent we have lost control over it and its consequences?

LECTURE REFERENCE

Franco Remotti in 06.07.18 *Noi e la cultura come i pesci nell'acqua,* Urban Legacy Seminar Series, Salone d'Onore, Castello del Valentino, Turin

SQUATTING

QUOTE

What do I mean by squatting? Broadly speaking I am talking about the living in or using otherwise of a dwelling without the consent of the owner.

LECTURE REFERENCE

Alex Vasudevan in 18.05.2020 *Assembling the Autonomous City: Spatial Politics and the Legacy of Urban Squatting,* Spring Seminar Series 2020, online lecture

DIGITAL TECHNOLOGIES AND DATA SCIENCE FOR CITIES

DTT

How to map and design urban form and actions keeping the data open and public?

Digital representation of the city. Technology is conditioning the way we visualize, represent and design: the methods we build our knowledge on .What are the limits and scope of currently adopted digital representations of the city?

The inherited knowledge from the excellent engineering departments of PoliTo allowed F*UL*L to produce extensive critical reflections on the effects of digitalisation on the city. In particular, F*UL*L researchers explored the opportunities connected to instant responsiveness enabled by 5G technologies in various branches of the urban realm. Firstly, the research on *Urban Mobility*, also developed in parallel in a PhD thesis, focuses on predictive models that could allow decision-makers to reshape the city efficiently to avoid traffic and implement limited traffic zones. *Augmented Reality* Heritage investigates augmented reality (AR) as a means to get rid of the expensive and inefficient analogue wayfinding and sign systems currently adopted in most cultural institutions. The role of digital tools in representing the city is critically explored in the PhD dissertation *City Twins*, introducing the issue of openness of data and the multi-layered design opportunities presented by complex representational means. *Digital Open Urban Twin* expands the theories on digital twins of other industries, serving as an up-to-date living repository to intervene in the city and understand its dynamics. A team of F*UL*L researchers successfully applied the initial findings of the work on the digital twin in *Triggering Potentials*, research on the dismissed real estate of the municipality of Turin that has never before been analysed and mapped from a multidisciplinary perspective.

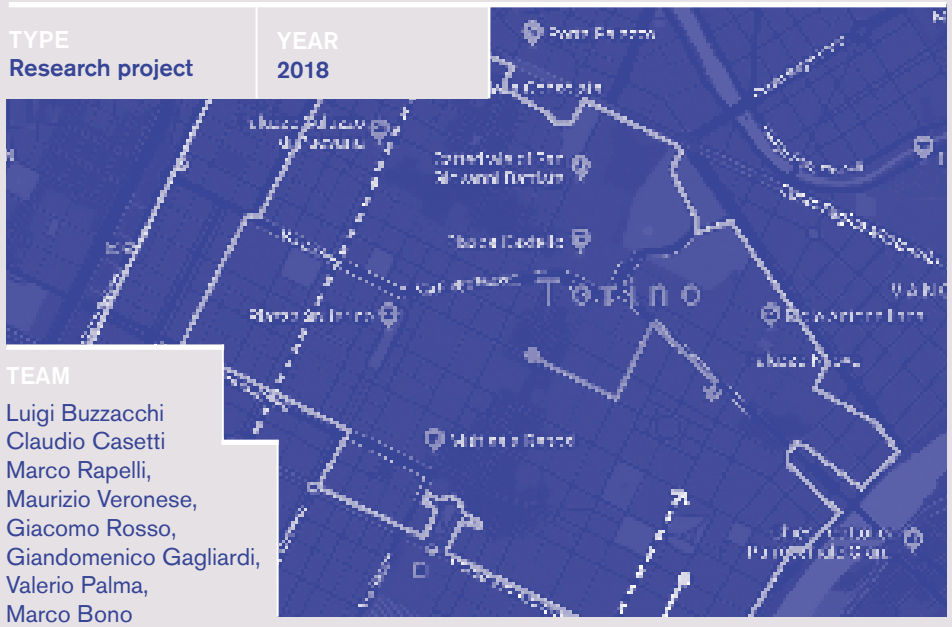
DIGITAL TECHNOLOGIES AND DATA SCIENCE FOR CITIES

INDEX

Urban Mobility

TYPE
Research project

YEAR
2018



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The project concerns the feasibility study of a new traffic policy in the central area of Turin. The new traffic policy is in line with those adopted in many European cities. The goal of the project is to conduct an impact analysis of the policy. In order to do that, social, economic and transportation studies were performed.
The social and economic aspects were evaluated analysing the positive and negative externalities and using a cost/revenue model. Impacts on transportation level were inspected through a traffic simulator programmed specifically for this case study.

In the present study, the urban traffic simulator SUMO (Simulation of Urban Mobility) was used to analyze in detail the behavior of the urban network and traffic in Turin after the application of new policies for access to the central area.

In the first part of the project, a report was drawn up on the principles on which the design of road pricing tariff tools is based, essentially focused on the concept of externalities caused by the phenomenon of urban mobility and on the mechanisms to 'internalise' these externalities. Subsequently, a review of the empirical evidence is proposed on the effects, effectiveness and quantitative evaluation of the application of government instruments of externalities caused by mobility, focusing in particular on pollution and congestion, following both the lenses of literature and the 'motivations' that drive the adoption of these policies. The report ends with a particular focus on the description of the main road pricing experiences implemented on a European scale (London, Stockholm and Milan) and on the discussion of how much these experiences may suggest to those wishing to design new hypotheses of intervention of this type.

The second part of the work is dedicated to the analysis of the current behaviour of those who, for various reasons, travel in motor vehicles that involve crossing the cordon of the Limited TRAFFIC ZONE (ZTL) in Turin. These behaviours are very varied throughout the day, including in relation to the type of people travelling. The 'estimate of the request for access and transit in the ZTL' for groups of individuals and during the various hours of the day will be more or less reliable depending on the quality of the information concerning the behaviour of those who access, stop or transit in the area. In this regard, the available information largely refers to precise data relating to a few more or less significant days. It was therefore not possible to measure the reliability of the estimates that follow, with respect to which we have only a few qualitative confirmations available. Once the volumes of journeys by purpose, distribution over time and type of individual were best estimated, it was possible to identify a

series of scenarios in which different reactions are associated to the introduction of the access tariff, and consequently to attribute an effect to each scenario in terms of congestion, emissions and revenues. The information available did not allow a 'forecast of future demand' in the strict sense, an exercise that, however, proved to be limited in terms of effectiveness even in the previous experiences narrated in the scientific literature. For this reason, it was considered appropriate to compose plausible scenarios in which different elasticities of demand emerge. The result is an assessment of reasonable upper and lower limits for changes in demand. Which scenario will then be realised depends on many variables, in many cases completely unpredictable and in part not yet determined, such as tariffs, methods of communicating the policy and characteristics of the offer of alternative transport solutions. In the present study, the urban traffic simulator SUMO (Simulation of Urban Mobility) was used to analyse in detail the behaviour of the urban network and traffic in Turin after the application of new policies for access to the central area.

The map of the Municipality of Turin and its surroundings was derived from OpenStreetMap and imported into the simulator via the **NETCONVERT** library. Since the objective of this study is to analyse the impacts of new central area regulation policies, the following changes have been made to the map to simplify the model:

- All roads within the 2.5 km diameter circle were considered around the geometric centre of the **ZTL**, which we will call the Central **ZTL**.
- Only the main and secondary roads outside the Central **ZTL**, but within the Municipality of Turin, are part of the model.
- Outside the boundaries of the Municipality of Turin, only the roads of higher hierarchical level were taken into consideration (motorways, motorway links, main roads).

All the pedestrian paths, cycle paths and tracks used for trains or trams and roads closed to traffic were removed from the map.

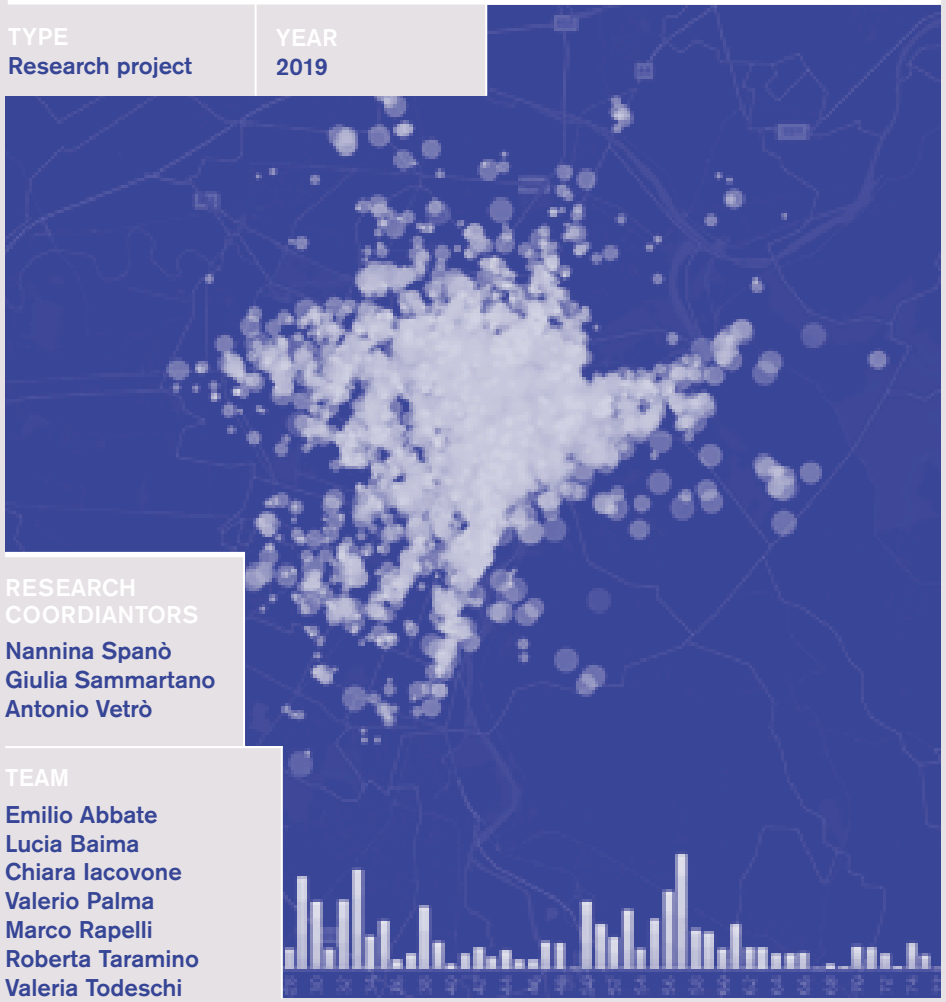
The next step involved analysing average speeds with zero flow (the speed that on average a vehicle has on the given road in zero traffic conditions) on the roads included in the model. The data is cross-matched with the average data calculated by the Supervisor system (**SV**) and those made available by the Google API Distance Matrix service. From these speeds, with random logics, a maximum speed on the road was attributed, between the average speed with zero flow increased by 20% and the same speed decreased by 20%. This process made it possible to obtain a no-load speed map capable of taking into account realistic travelling speeds, which could deviate from the speed limits dictated by the Highway Code due to excess or dearth. Once the offer model (graph) was defined, the question model was constructed. For this purpose, the OD Matrix of the SV was used for the School Day type. In the SUMO simulation model, each vehicle randomly chooses a starting road and an arrival road within the limits, respectively, of the origin zone and the destination zone.

Once a road of origin and a destination has been defined for each vehicle, the route is chosen according to the criterion of the minimum path according to Dijkstra's algorithm, using the road travel times as weights. However, since the routes are calculated a priori, all vehicles that have to move from one area to another will choose the same roads with minimum travel time. In this way, choices that may be excellent a priori, are no longer good in the course of the simulation. Adaptive routing has therefore been added to the model that allows vehicles stopped in the queue for a time above a set threshold to calculate an alternative route with less travel time. In order to predict possible impacts of the policy on transportation, two scenarios have been created using the model described above. A first scenario in which the central area is accessible at all hours for everyone and a second scenario in which the area is closed all day and nobody can enter. For both scenarios, measures of travel times, average speeds and emissions were extracted and compared.

Digital Open Urban Twin / 3D City Model

TYPE
Research project

YEAR
2019



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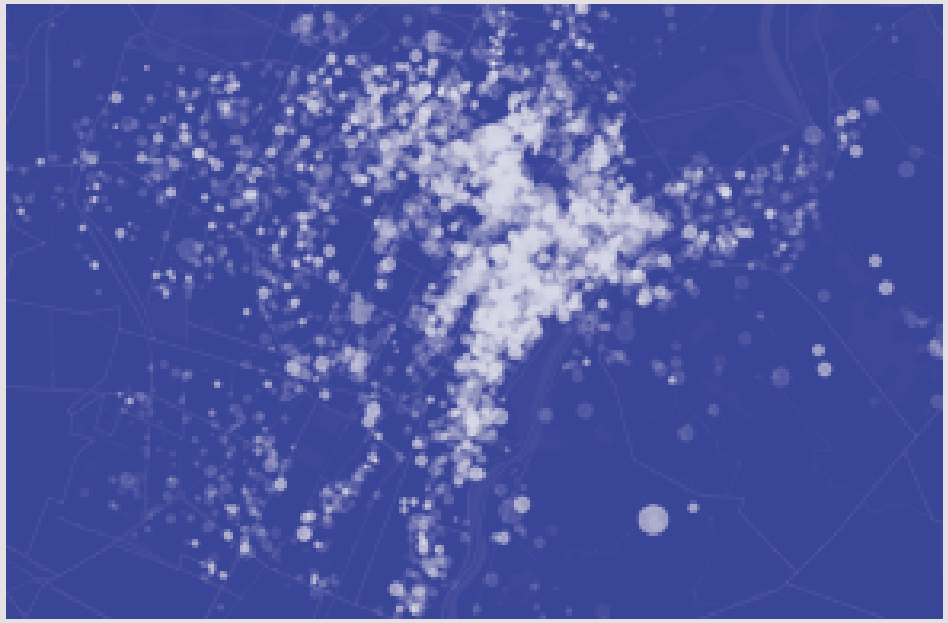
The 3D City Model - Digital Twin project works on the development of studies concerning digital urban models of the DOUT - Digital Open Urban Twin project (2018-2019). The purpose, in the outline of DOUT, is to study the integrated methodological approach for the generation of an open data platform to collect, integrate and manage data and information on an urban scale and to simulate the actions and effects of policies on cities. The preliminary phase of the research involved the exploration of BIM-GIS-oriented urban-scale data modelling platforms and their adaptability and compliance with principles of standards and interoperability (e.g. 3DS-Dassault Systèmes 3D experience). The project also works towards implementing a methodological approach and technological process to structure a spatial database base on the case study of the City of Turin. This 3D city model is intended as an innovative concept of Digital Twin, which is a digital replica of the city, not only capable of reproducing the existing physical conditions, but also integrating morphological and semantic aspects, and, in the future, able to implement forecasting algorithms capable of formulating hypotheses on the effects of urban dynamics and policies.

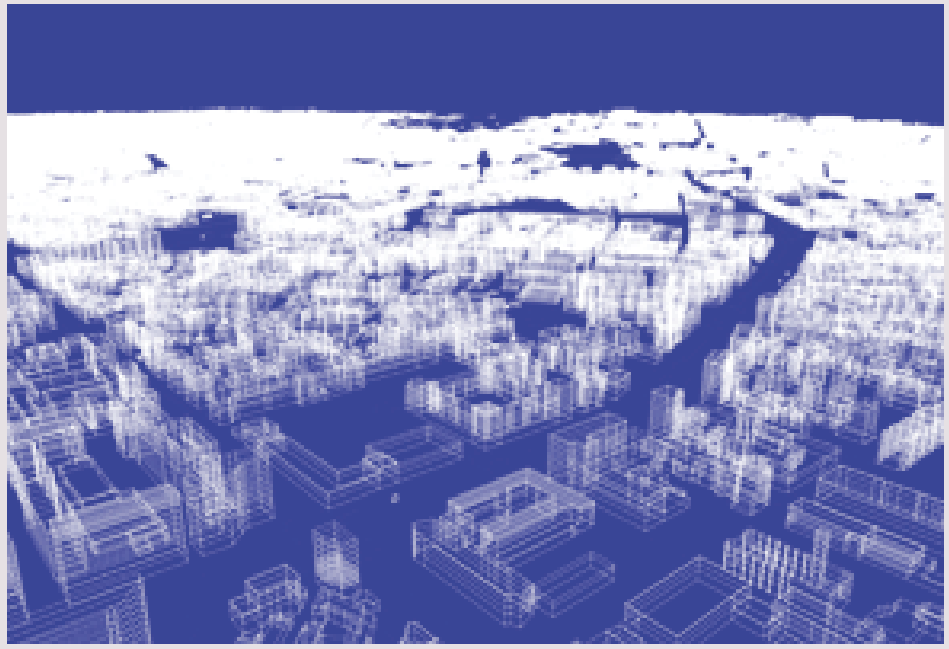
The topics that this research project is going to progressively face, in an interdisciplinary analysis perspective are: the geometric problem, the semantic problem, the relations problem, the thematic content problem.



3D City Model – Digital Twin

In the framework of urban studies analysing the phenomena and transformation processes of today's city for planning and design purposes, the multi-disciplinary approach is a huge challenge. The possibility of benefitting from a 3D enhanced representation of reality, beyond the traditional 2D maps, provides an advanced spatial analysis on an urban scale for the study of the socio-economic phenomena driving urban regeneration.
In order to analyse and monitor these dynamics, it is essential to have geo-spatial tools that manage geographic data, in the form of numerical cartography and 3D models, allowing the identification and quantification of urban transformations and any area that needs further urban regeneration interventions, in order to implement localised actions, preserving the built heritage of the city. For this reason, acquisition tools, measurement techniques and multi-source and multi-content products derived from geomatics approaches are a valuable support for the analysis and modelling of the urban legacy and built space, as well as the human phenomena that constitute the city.

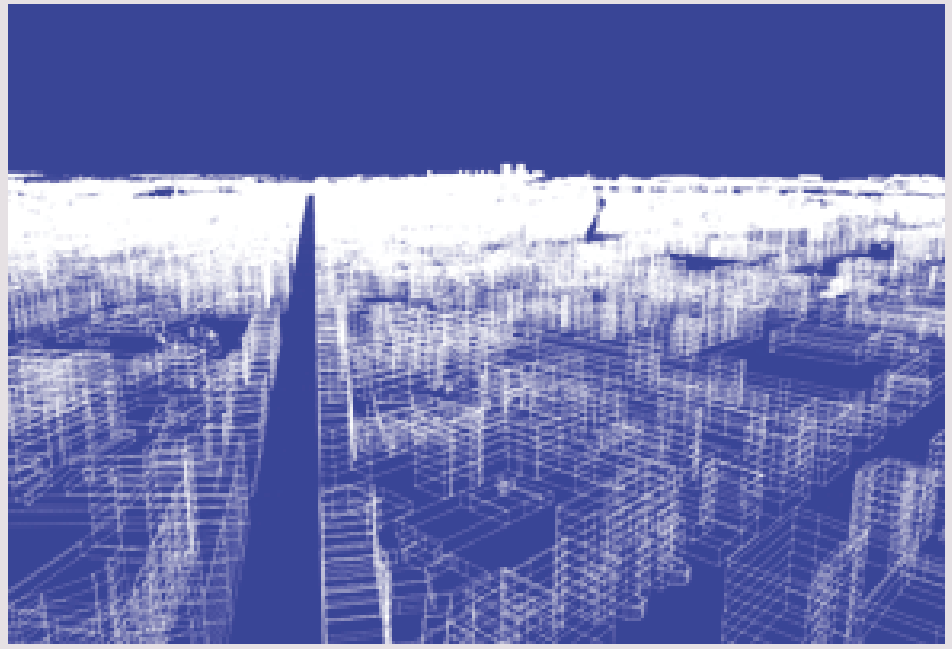
The geomatics research applied to city modelling is used to investigate issues related to the concept of 3D city models in the last 10 years. The current perspective of this research is the possibility of modelling not only 3D and semantic information of urban objects, but also multi-dimensional information, especially related to past time resolution, in order to simulate future behaviour. In fact, in recent years, 3D city model and Digital Twin concepts have become increasingly relevant, not only in the field of geomatics, but also in various fields of research, such as urban planning, urban regeneration activities in the field of cultural heritage and then in the monitoring of city transformation processes. Currently, the research is still far from being solved and is represented by the integration of standards, formats and modelling techniques adopted by GIS regional analysis systems (focused on the production of regional numerical maps) and BIM and HBIM databases (fundamental for 3D relational parametric modelling on an architectural scale). It will therefore be fundamental to manage and adopt different data sources within platforms able to manage and test their flexibility for possible integration within a unique relational, structured and multi-content/multi-scale geographical database.
The topics that the 3D City Model - Digital Twin research project will progressively cover, in an interdisciplinary analysis related to the design and structure of 3D city models, are: the geometric problem, the semantic problem, the relations problem and the thematic content problem.
Based on these assumptions, starting by analysing the standards (preferably using an open-source approach), structured geospatial data, tools and methodologies available today, the project focuses on defining an urban modelling code for a design and planning tool able to support local decision-making processes, in the form of a 3D geographical database (.gdb) suitable for hosting complex and interconnected thematic data (on built heritage, energy consumption, noise studies, traffic analysis, ground information, etc.). This is conducted with particular consideration of a possible definition, through the support of



geo-processing operations, of a model able to detect and identify the different levels of each building entity (derived from structured cartography of spatial data infrastructure implemented and updated).
The research objective is therefore to develop a geometrically and semantically structured 3D city model related to the municipality of Turin, on the basis of parametric spatial rules defined ad hoc and capable of representing urban phenomena, modelling the historical stratifications of the city and evaluating how these layers can interact within a three-dimensional modelling environment in order to replicate past and simulate future transformation and sustainable scenarios through platforms adoption dedicated to urban simulation.

THIS FIRST PHASE OF THE RESEARCH WORKED IN THREE SPECIFIC DIRECTIONS:

1. DATA. The collection, harmonisation and updating of geographical datasets and thematic data available on the city of Turin (F*UL*L metadata index) for the structuring of a multi-scale and multi-content geographical database. The experimentation



of data acquisition and processing of data from mobile mapping systems on an urban scale. The collection and use of multi-temporal datasets on the city of Turin by means of historical aerial photogrammetric datasets and consequent correlation of multi-temporal DSMs for the detection and assessment of urban transformations (Abate et al., 2019).

2. 3D MODELS. The treatment of aerial Lidar/photogrammetric data in the form of raster/vector DSMs for the integration of information related to roof shape and trend. The investigation of GIS-BIM tools capable of managing multi-scale modelling and able to ensure increasing interoperability between the two systems and corresponding languages and standards. The generation of simplified 3D models with semantic content and with ground-level optimised information structure (see the Triggering Potentials project and Technical Report).

3. VISUALISATION. The development and optimisation of spatial analysis tools and data representation strategies through 2D, 2.5D and 3D spatial visualisation (Triggering Potentials project).

Augmented Reality Heritage

TYPE
Research project

YEAR
2018 – 2020

TEAM
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This research project concerns the development of digital technologies to enhance the accessibility and management of cultural sites and the exploration of the related digital information. The project is currently employing artificial intelligence to make data networks and digital environments accessible from physical space. We developed a mobile app that allows users to access information about buildings and works of art just by pointing the camera at the object. The app is capable of connecting the real city to relevant, context-aware documents such as images, texts, maps and 3D models. It builds on original developments of convolutional neural network techniques aimed at recognising architectural features. The app offers an access point to an as-yet under-exploited network of digital information, not through a catalogue or a predefined route on a map, but just by framing the urban context through a mobile camera. A vast amount of multimedia information can be linked to the elements of a city, answering questions on how to make the newly available information easily and sustainably reachable.

Italy has 49 cultural sites on the UNESCO World Heritage Sites list. Despite this, only the 0.7% of Italian GDP is allocated to culture. Could digital tools help to improve accessibility and knowledge about heritage?

Arch▪i – Architectural Intelligence

The city is now producing brand-new information on itself, in terms of quality and kind, in the form of data that can be stored, organized, analyzed. Current technical needs are format standardization, information gathering, management and selection, data processing and visualization... This is leading to unprecedented developments of the tools. New networks of relationships among documents can be defined and rapidly redefined, according to continuously updating needs and contents. In this complex information topology, the physical form of

architecture maintains a key role, on which even the most up-to-date elaborations can be founded.

Italy has 49 cultural sites on the UNESCO World Heritage Sites list. Despite this, only the 0.7% of Italian GDP is allocated to culture[1]. Sites such as the Imperial Fora in Rome or Pompeii and Herculaneum host millions of visitors each year but can't provide appropriate informative services on site and face management and maintenance problems. At the same time, due to low tourist flows, many small, isolated or less known historical and archeological sites, cannot afford surveillance and maintenance and thus are not accessible. We need to optimize the available resources in order to guarantee the protection of cultural heritage and to enhance its value.

1 Source: Eurostat, General government total expenditure on 'recreation, culture and religion', 2015. https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20170807-1 (accessed on 26 March 2019)

The research project called **ARCH•I – ARCHITECTURAL INTELLIGENCE** concerns the development of digital technologies to enhance the accessibility and the management of cultural sites and the exploration of the related digital information. We think that mobile computing technologies can overcome the limitations of traditional information tools and allow novel interactions with monuments and works of art. The project is currently employing artificial intelligence (AI) to make data networks and digital environments accessible from the physical space.

Deep learning for architecture

In recent years, the diffusion of large image datasets and an unprecedented computational power have boosted the development of a class of AI algorithms referred to as deep learning (DL). Among DL methods, convolutional neural networks (CNNs) have proven particularly effective in computer vision, finding applications in many disciplines. While AI is just beginning to interact with the built environment through mobile devices, heritage technologies have long been producing and exploring digital models and spatial archives. Hence, the digitalization of cultural information offers structured and ready-to-use sources of knowledge that can be retrieved through the flexible features of AI. The interaction between DL and state-of-the-art information modeling is an opportunity to both exploit heritage databases and optimize new object recognition techniques. A specific approach to automated architecture recognition could change the way in which data on the urban environment are collected, processed and analyzed, and could provide more effective ways to access data. The Arch•i project developed a mobile app that allows users to access data about buildings and works of art just by pointing the camera at the object. The app is capable of connecting the real city to relevant, context-aware documents such as images, texts, maps, and 3D models. It builds on original developments of CNN techniques aimed at recognizing architectural features. The app is based on two main blocks of software: (1) an online, geographic-enabled database that makes it possible to upload different types of document and the related information or metadata; (2) the DL part, which is stored on the device and requires a very small amount of disk space. The app offers an access point to a yet under-exploited network of digital information, not through a catalogue or a predefined route on a map, but just by framing the urban context through a mobile camera. A vast multimedia information can be linked to the elements of a city, answering questions on how to make the newly available information easily and sustainably reachable.

What's next

The Central Archaeological Area in Rome and the historical center of Turin are the first test fields of the developed "AI guide". But CNNs are general models and can be trained to recognize a wide range of objects in different contexts. Therefore, we plan to extend the project to other sites, covering different scales and time spans. We also plan further developments for the integration of the proposed AI technologies and semantic

spatial databases, in order to: (1) make the system more scalable, to store online large amounts of data that can be retrieved when needed; (2) exploit the interoperability of the spatial information, i.e. connecting building information modeling (BIM) data to the environment explored through the app; (3) allow access to a detailed information, i.e. performing DL recognition at the scale of building details, thus recognizing monument parts or categories of constructive elements, decorations, materials.

Furthermore, we are bridging our first experiments with AI and other technologies:

- **AR** allows the interaction with 3D digital models, and can superimpose precise spatial information layers on live images of the real environment;
- **5G** cellular mobile communications will make immediately available large amounts of data, redefining location-based services and content access;
- **IOT** devices can enable access control and enhance on-site experience, providing cost-effective monitoring solutions which do not need physical presence of supervising personnel.

The work carried out also points out possible connections between the virtual environment and the contemporary city. DL models could be trained to recognize building types or structural components, while the related information could integrate energy performance, structural behaviors, construction phases.

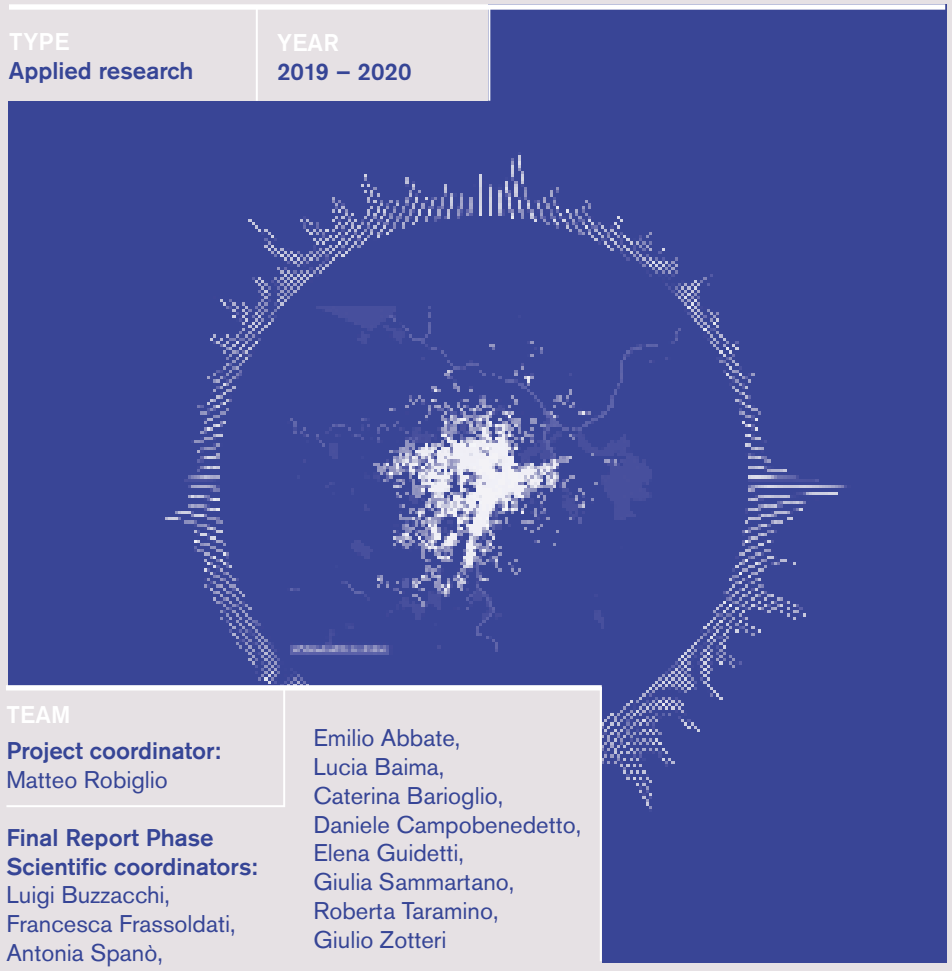
The underlying assumption of the research is that architecture has a key role in approaching technologically advanced tools. Form is a means to identify physical, observable, tangible facts and it can be used to produce shared models of the complex and multi-layered urban space. On this basis, our project intends to be a contribution to the recognition, structuring and operational use of architectural form.

Triggering Potentials

The enhancement of urban cultural heritage as a strategy to reactivate city regeneration processes.

TYPE
Applied research

YEAR
2019 – 2020



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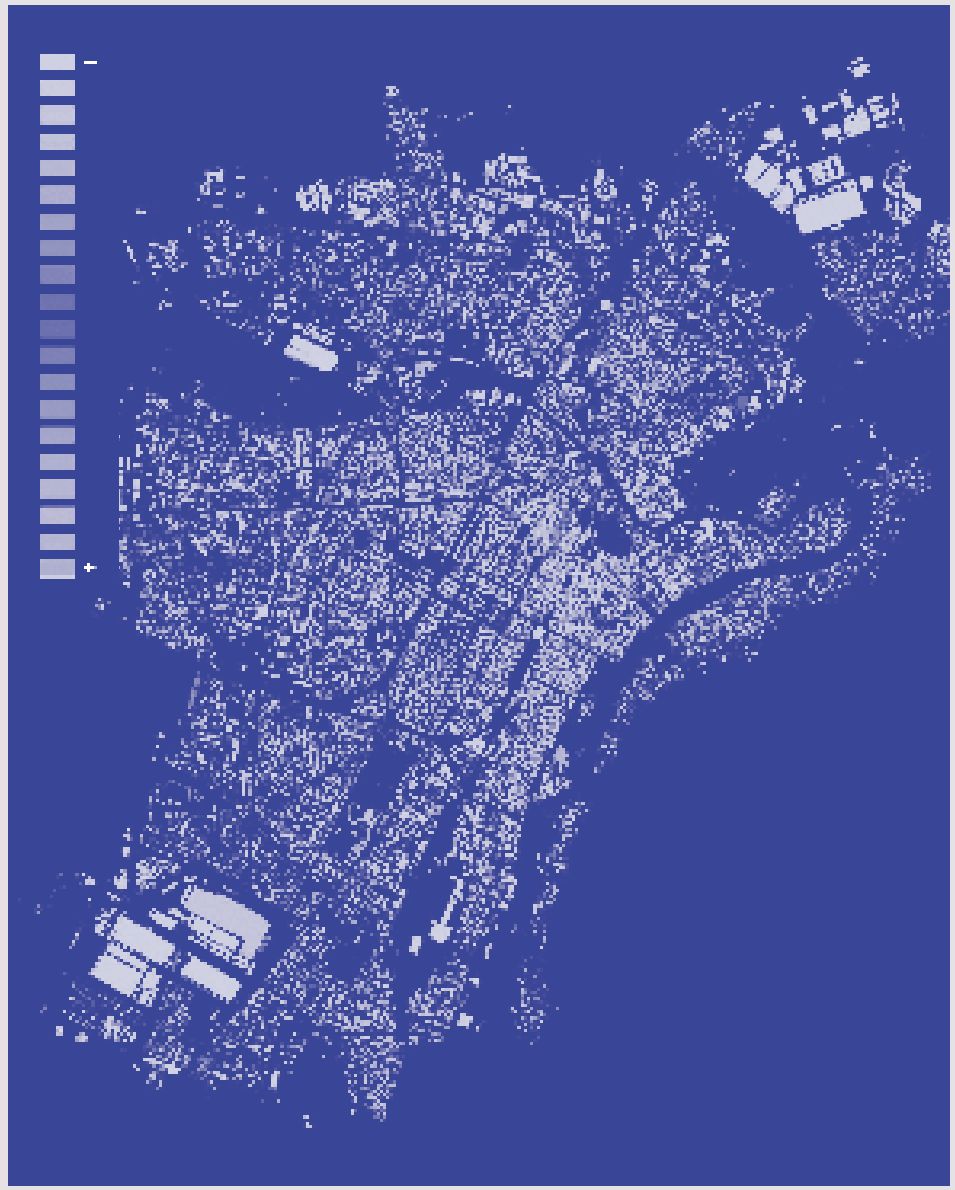
In a context of widespread and heterogeneous availability of transformable assets in the urban fabric, not just property owned by the municipality, Future Urban Legacy Lab has proposed a paradigm shift.
It integrates the analysis of the availability for use of the municipal built heritage with a reflection on the intensity of use, the dynamics of transformation and the potential for transition. The phenomenon of availability is understood as a set of dynamic relationships between components in the built space of the city (the buildings, the morphology of the blocks and their aggregation), and not as isolated episodes. This approach allows municipal properties to be placed within the broader framework of the availability of assets and spaces for use in Turin, and to enrich the interpretation by also examining other urban phenomena.
Through this framework, the transformation potential of the assets is defined by identifying various indicators, capable of informing evaluations and intervention strategies applicable to assets of different types and consistencies, going beyond the scope of the initial investigations performed. The interest of the research team was to develop reasoning on the economics of intensity of use and the risk profile associated with transformation potential.

1. A multi-disciplinary approach

F*UL*L through the Department of Architecture and Design, proposes integrating the analysis of the availability for use of the municipal built heritage with a reflection on the intensity of use, the dynamics of transformation and the potential for transition.

Turin is a laboratory that has produced experiences capable of providing an overview of these issues, such as TorinoAtlas and the editions of the Giorgio Rota report, through specific and sector-specific studies. In a context of widespread and heterogeneous availability of transformable assets in the urban fabric, not just property owned by the municipality, F*UL*L proposes a paradigm shift. The phenomenon of availability is understood



as a set of dynamic relationships between components in the built space of the city (the buildings, the morphology of the blocks and their aggregation), and not as isolated episodes. This approach allows municipal properties to be placed within the broader framework of the availability of assets and spaces for use in Turin, and to enrich the interpretation by also examining other urban phenomena.

Through this framework, the transformation potential of the assets may be defined by identifying various indicators, capable of informing evaluations and intervention strategies applicable to assets of different types and consistencies, going beyond the scope of individual case studies.

The interest of the research team is to develop reasoning on the economics of intensity of use and the risk profile associated with transformation potential. Regeneration processes may fail or not be triggered despite the mobilisation of resources. We believe that regeneration should not be prescribed as a one-size-fits-all solution to all available uses of the built heritage.

Failure is particularly helpful in codifying the potential, allowing the reasons to be traced to the intrinsic characteristics of the asset or the management conditions. In analysing built heritage, F*UL*L therefore refers to a specific economic assessment, required by the call, mapping the 'real options', i.e. the possibilities for undertaking 'risk' actions associated with heritage, as well as for deferring them pending more predictable contextual conditions or renouncing them completely.

The method proposed by F*UL*L is based on a transdisciplinary approach that envisages a continuous and integrated comparison between applied techniques and economic, management and design skills, restoring urban phenomena through the analysis of large quantities of data and targeted focus, in order to reflect on and operate within the city.

2. The method: measure, recognise, value

F*UL*L is developing projects relevant to the issues raised by the call: preparing strategies for rehabilitating underused cultural sites identifying their potential (for the Piedmont Region); exploring the relationship between the distribution of commercial activities and urban form (with the Chamber of Commerce); reorganising spatialised data on Turin and prioritising codes and regulations for the purpose of regeneration (for the City of Turin - support to the drafting of PRG variant).

Through experiments in the field of regeneration of polluted sites and by examining urban phenomena, F*UL*L is also developing technical platforms for the integration and interoperability of data on the city, functional to a context of transformation of the existing fabric.

Based on the experience gained, F*UL*L proposes a working method that is developed through:

- **MEASURING AND REPRESENTING AVAILABILITY** starting from the municipal heritage by spatialising the phenomenon and relating it to other dynamics of use of the built environment.

- **RECOGNISING ASSET TYPES** through classification according to distribution, construction and morphology categories.

- **DESCRIBING THE POTENTIAL OF AVAILABLE PROPERTIES** starting from the aggregation of common possibilities and critical issues, in order to propose enhancement strategies.

2.1. Measuring and representing available properties

2.1.1. SPATIALISING DATA

In order to spatially represent the phenomenon of availability for use, F*UL*L proposes an integrated system between the data related to municipal properties (which will be made available by the

contracting station), the open data of the Municipality of Turin and the Metropolitan City (including Geoportal, Museo Torino, OICT, ISTAT and Smartdatanet-Yucca), and the new spatial data processed by the interdepartmental centre, thus enhancing the existing wealth of knowledge through:

1. Fine-grained representations that can add significant detail to existing analyses.
2. New mappings of phenomena that are still poorly mapped.
3. Representations that bring out latent or unexpected phenomena by relating spatialised databases.

2.1.2. IDENTIFYING INTENSITY OF USE

F*UL*L proposes extending the concept of 'availability' to under-utilised properties. Through indicators built on intensity of use, it will be possible to map not only disused properties, but also the degree of use where properties are used.

In order to investigate heterogeneous municipal properties, it is proposed to identify specific indicators of under-use by functions/types of assets, starting with data on municipal properties (e.g. intensity of use of schools compared to demographic data and other indicators to be agreed upon). Intensity of use makes it possible to consider all municipal properties, even those that are only partially used, in the definition of development strategies.

2.1.3. INTEGRATING GEOGRAPHIES OF AVAILABILITY

In order to interpret the potential of the available municipal properties, F*UL*L proposes integrating the analysis with a geography of data and sources related to other types of available properties (privately-owned or owned by public persons other than the administration). The interdepartmental centre is developing projects that can build indicators of availability of use for specific categories of assets. By cross-referencing data on active licences with information on buildings (surface, use, estimated population) and their morphological characteristics, F*UL*L is, for example, mapping commercial spaces not in use in Turin. The interdepartmental centre is also developing Airbnb data in Turin in order to allow the examination of phenomena of residential property use otherwise invisible to traditional demographic analyses.

2.1.4. VERIFYING RESULTS THROUGH CONTROL OPERATIONS

In order to verify and examine the results of measurements and mappings described so far, F*UL*L proposes experimenting with integrating detailed localised data with focus and tuning operations, by:

- Analysing changes in urban morphology over time by comparing 3D aerial data collected at successive times, and corresponding digital surface models (DSM).
- Integrating localised data to track the actual attendance at a location (e.g. GPS open tracking of users, telephone cells etc.).
- Aggregating co-generated inputs combined with geo-referenced data through crowdmapping and mobile mapping tools.

5G USE CASE. Smart Tourism

The potential of the 5G infrastructure to enable micro-localized content for tourism

TYPE
Research project

YEAR
2019

TEAM
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Valerio Palma,
Andrianaivo Louis Nantenaina,
Luca Galleano

The extensive development of 5G technology, capable of providing access to a large amount of data at a higher speed, opening the field to new developments and possibilities. What opportunities does this technology offer when applied to the city?

The European project 5G-EVE (5g-eve.eu) aims to create a horizontal validation platform for extensive testing of 5G standards. The project develops and connects the infrastructures of several European sites (Greece, Spain, France and Italy) to create a single end-to-end service.
Within the 5G-EVE project, F*UL*L PoliTo is developing a vertical application of the platform, focused on the 'Smart Tourism' use case. F*UL*L's research therefore aims to investigate the potential of infrastructure in fostering new methods of accessing cultural information, based on real-time interaction with physical space - within buildings, sites or parts of cities. This approach is based on the use of augmented reality (AR) and micro-localisation technologies and aims to enhance the user experience by providing contextual information accurately related to the perceived space, at both architectural and urban scales.

2019 was a year of extensive development of 5G technology, capable of providing access to large amounts of data at higher speeds, opening up the field to new developments and possibilities. This is the background to the European project 5G-EVE (5g-eve.eu), funded by the European Union as part of the public-private partnership of H2020 projects, with the aim of creating a horizontal validation platform for extensive testing of 5th generation mobile network (5G) standards. The project develops and connects the infrastructures of several Eu-

ropean sites (Greece, Spain, France and Italy) to create a single end-to-end service. Within the 5G-EVE project, F*UL*L PoliTo is developing a vertical application of the platform, focused on the 'Smart Tourism' use case. F*UL*L's research therefore aims to investigate the potential of infrastructure in fostering new methods of accessing cultural information, based on real-time interaction with physical space - within buildings, sites or parts of cities. This approach is based on the use of augmented reality (AR) and micro-localisation technologies and aims to enhance the user experience by providing contextual information accurately related to the perceived space, at both architectural and urban scales. The trials are taking place at a portion of Turin's Spina 2 already equipped with 5G infrastructure, namely between the Officine Grandi Riparazioni (OGR) event centre and Turin Porta Susa station. The work involves developing an app for mobile devices capable of requesting and receiving data from a server via the 5G network. The transmission range is exploited to obtain spatial models and large amounts of multimedia information. The edge computing capabilities of the infrastructure are also used to keep the data received from the device up-to-date, based on the user's location and activities, defined through GPS, AR and other location-aware technologies.

An initial prototype validated the general characteristics of the app. The tool is divided into two parts relating to the two scales of data granularity, architectural and urban. The first part aims to show in AR information about services and landmarks in the context, overlaying labels on the images in open areas. On an architectural scale, and also in closed environments, the second component of the prototype uses AR to display more detailed information (theory, images and videos, structured data).
These functions were tested within the OGR area, where the AR experience was activated through the recognition of works of art. It is also possible to activate a navigable 3D map with information on services within the facility.

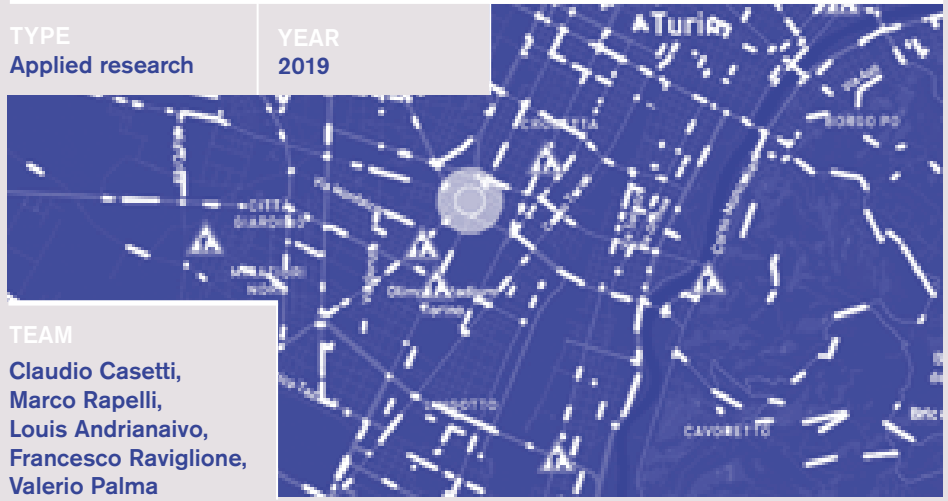
Starting with this prototype, the area of application is being extended to the various sites covered by the validation infrastructure (Grattacielo Sanpaolo, Stazione di Porta Susa, Carceri Le Nuove and OGR) and further functions are being introduced. These include AR indoor navigation functions - e.g. for platform access at the station - AR functions based on tracking three-dimensional objects through point cloud scans, virtual tour experiences with spherical images - in particular at the Carceri Le Nuove museum - and access to geo-spatial and historical information on the urban fabric of Spina 2.

The system under construction is based on a structure of two virtual machines, the first of which enables geo-query web services that filter data and functions according to the buffer area in which the user is located, while the second hosts the geospatial database that contains the files to be sent to the devices and the related metadata. The system makes it possible to develop light applications that keep the minimum amount of data needed locally, i.e. on the physical memory of the device, while leaving it to the 5G structure to quickly update or stream the information and ensure a smooth and rich user experience.
Lastly, an automated testing system was set up to detect the KPIs (key performance indicators) of the architecture developed even without the app needing to be used in the field, but using an emulator of the app itself, which reproduces the queries and receives the required content from the server.

5GAA demo

TYPE
Applied research

YEAR
2019



TEAM
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Marco Rapelli,
Louis Andrianaivo,
Francesco Raviglione,
Valerio Palma

November 2019. For this use case, Politecnico di Torino, Fiat Chrysler Automobiles, Tim Italia, 5T S.r.l. and Links Foundation worked together. The aim of the project is to create a navigation system based on GPS information from FCA. Based on this real-time mobility, information is generated by 5T, translated into DENM standard messages by Links and pushed in real-time on the Polito Digital Mobility (DM) Platform through a Tim AMQP Broker server, which provides the 5G network. The Turin Digital Mobility Platform, developed by the Politecnico di Torino, is an online model which can be used both as a navigation system and as an info-mobility service. Connected with a GPS system, provided by FCA for the purpose of this demo, it is capable of showing the position on a map environment. The use case presented at the 5GAA demo is called Urban Geo-referenced Alert.

City twins
Digital urban models between description and abstraction

TYPE
PhD research

YEAR
2021

AUTHOR
Valerio Palma

The use of digital spatial models generates opportunities and critical points for the redefinition of the idea of the city and its parts. Can an operable dimension of urban morphology be identified to clarify the character and purpose of the city models we adopt? Which spatial units used in operational urban systems can be shared between techniques and disciplines for the integration and operational use of information about the city?

Topic 1.
Spatial models of cities as 'operational systems'.

According to a dominant optimistic narrative, the use of information technology to collect and coordinate large amounts of data enables increasingly accurate knowledge of urban phenomena and offers solutions to the challenges these phenomena present.
This reliance on computational logic comes under heavy criticism from urban studies. The connection of digital and physical infrastructure (hardware and software) that can be called an 'urban operating system' is a social and technical process that replicates a fixed and univocal reading of the urban, marked by market rationalities, and not able to propose a transformative interpretation of the city. Hypothesis. The increasing amount of digital information is constrained by unsatisfactory city models that limit the understanding of the urban and the operational outcomes of interventions.

Topic 2.
Digital tools and the role of abstraction in models.

The evolution of technologies, favouring the volume and immediacy of data transmission, makes the theoretical processes that precede the production and accumulation of information less obvious. These processes correspond to the abstraction, from the complexity of reality, of categories and methods, or to the definition of a model itself. Although manipulation of symbols is the main capability of computers, using big data, a 'brute force' approach to the simulation of reality (based on the amount of data) has prevailed over the production of functional simplifications.
Hypothesis. The effectiveness of a model is linked to the transparency of the abstractions that constitute it, and to the possibility of adapting them to the purpose for which the model is used.

Topic 3.
The shape of the city as a tool for interpretation.

Current approaches to urban morphology tend not to meet one another in common elements or terms to indicate relationships between elements, classifications and scales of analysis. This is in part a consequence of the ideological positions taken in the morphological debate that, between the 1950s and 1970s, involved Italian schools of thought and a wider European panorama. Among the aspects studied by urban morphology, the physical form is indicated as the point of reference to coordinate the different approaches and, above all, to correlate the other aspects the discipline deals with. It effectively acts as a 'registration mark' for the alignment of different cognitive layers.

Hypothesis. Urban morphology can be an interpretative tool to coordinate the many levels of information that refer to urban space.

The research methodology includes the systematic study of a subset of digital city models. So-called urban digital twins integrate different sources of spatial information to enable analysis and management of a city, and have the ability to update rapidly and produce or induce transformations of the real twin. The models collected are analysed according to the principles of urban morphology, identifying the underlying spatial units and studying their relationships with the stated aims of digital twins and with the general objective of interdisciplinary information sharing.
The aim is not to discuss the ontological aspects of urban form, but to clarify and render falsifiable the processes of abstraction, generalisation and prediction through which models are constructed and employed.

Mobility applications for a smart city environment

TYPE
PhD research

YEAR
2021

AUTHOR
Marco Rapelli

This PhD dissertation is closely related to the Urban Mobility research work.

The testing of vehicular communication technologies, the study of urban mobility patterns and the evaluation of new traffic policies cannot dispense with vehicle mobility simulation. As is often the case, the larger the dataset, the better it is. Indeed, in recent years, many projects in the fields of mobility or vehicular communication have sought new traffic simulators with extended areas of investigation, possibly covering a whole city and its suburbs. In this spirit, we have modelled an urban traffic simulation in a 600-km2 area in and around the Municipality of Turin, leveraging the SUMO tool. This project aims to report in detail the methodology we followed in creating this dataset. Our results demonstrate that a complete modelling of such a wide area is possible at the expense of minor simplifications, reaching a very good level of approximation.

DIGITAL TECHNOLOGIES AND DATA SCIENCE FOR CITIES | OUTCOMES

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TECHNOLOGY

QUOTE

Digital technologies enable an emerging phenomenon of bringing back production to the center of cities in a more technological, citizen-oriented, small scale oriented way.

LECTURE REFERENCE

Vicente Guallart in 24.05.2018, F*UL*L at La Biennale di Venezia, 17 Tesa 105 - Arsenale Nord - Venice

TOOLS

QUOTE

The agenda is to develop tools to actually represent the economic capacity of a certain region, space or city and the way that it operates through logistics.

LECTURE REFERENCE

Hyuming Pai in 24.05.2018, F*UL*L at La Biennale di Venezia, 17 Tesa 105 - Arsenale Nord - Venice

ARTIFICIAL INTELLIGENCE

QUOTE

I am particularly interested in the place of artificial intelligence and machine learning as kind of a temporality in management and technology in many ways, as a sort of an idea of limits that are modified, and forms of speculation and extraction that can be produced.

LECTURE REFERENCE

Orit Halpern in 22.05.2020, *The Planetary Experiment: On Artificial Intelligence, Habitat, and Future of Life*, Spring Seminar Series 2020, online lecture

INNOVATION

QUOTE

The digital revolution is not a radical innovation per se, but a recombination of existing or recently introduced technologies based on cyber-physical integration.

LECTURE REFERENCE

Andrea Bonaccorsi in 21.06.2018, *Verso una visione conflittuale della innovazione*, Urban Legacy Seminar Series, Sala Caccia, Castello del Valentino, Turin.

URBAN CLIMATE ACTIONS

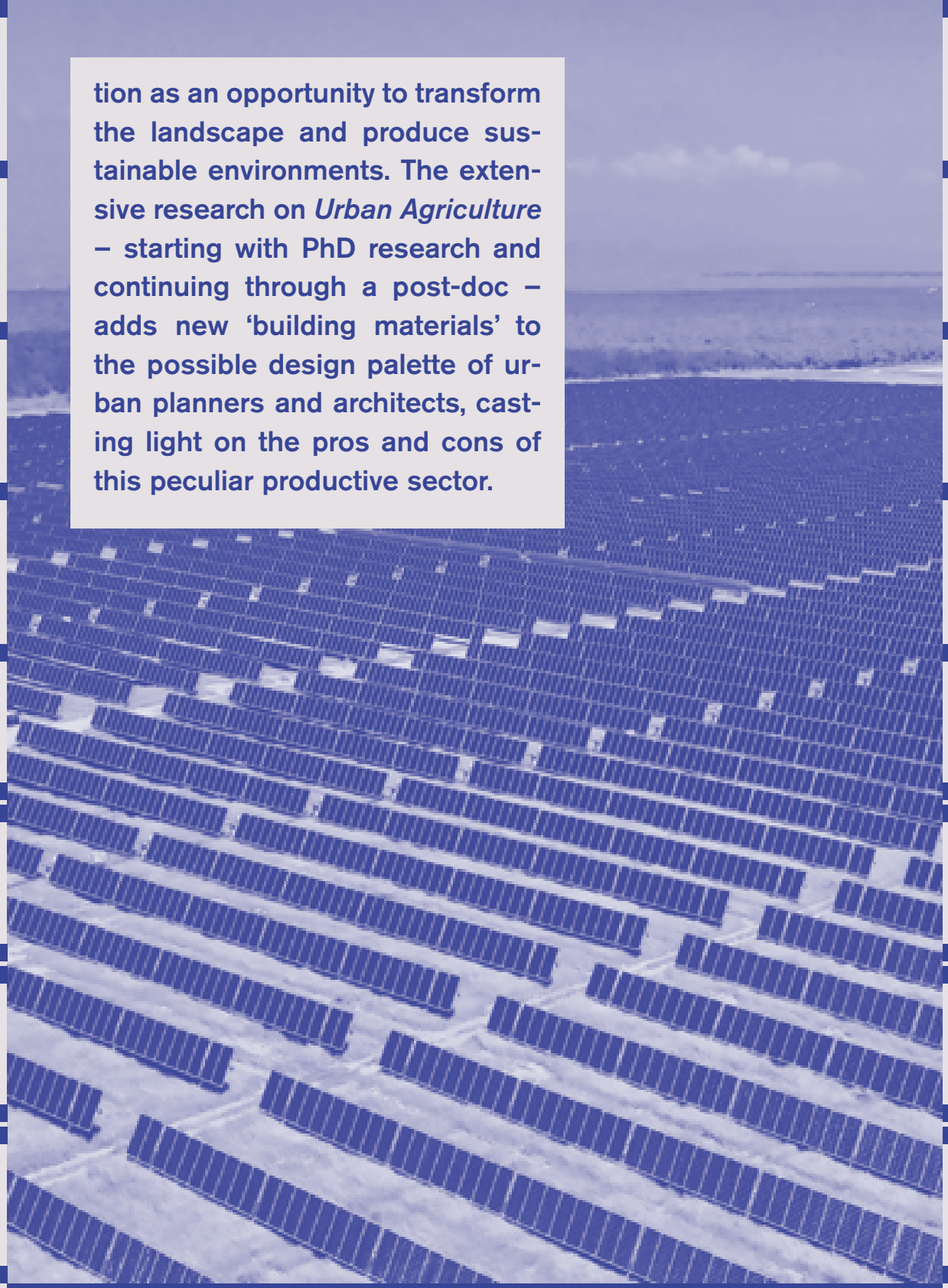
UCA

How does climate change the economy and design of cities?

This research issue is interdisciplinary by definition.
The holistic response to climate change can only be formulated through a socio-technical understanding of the phenomenon.

Even if sustainability and climate change are cross-sectional issues with F*UL*L's research, some projects more than others address these matters directly. Albeit with the risk of falling into conventional understandings of climate change, the investigations produced have in common their critical approach that aims to debunk sustainability in its symbolic form and focus on design opportunities. The *DMDT* software development is an example of optimisation aimed at a holistic view of sustainability that includes all the United Nations Sustainable Development Goal (UN SDG) guidelines. The research on the feasibility of extensive solar power stations follows suit in proposing energy produc-

tion as an opportunity to transform the landscape and produce sustainable environments. The extensive research on *Urban Agriculture* – starting with PhD research and continuing through a post-doc – adds new 'building materials' to the possible design palette of urban planners and architects, casting light on the pros and cons of this peculiar productive sector.

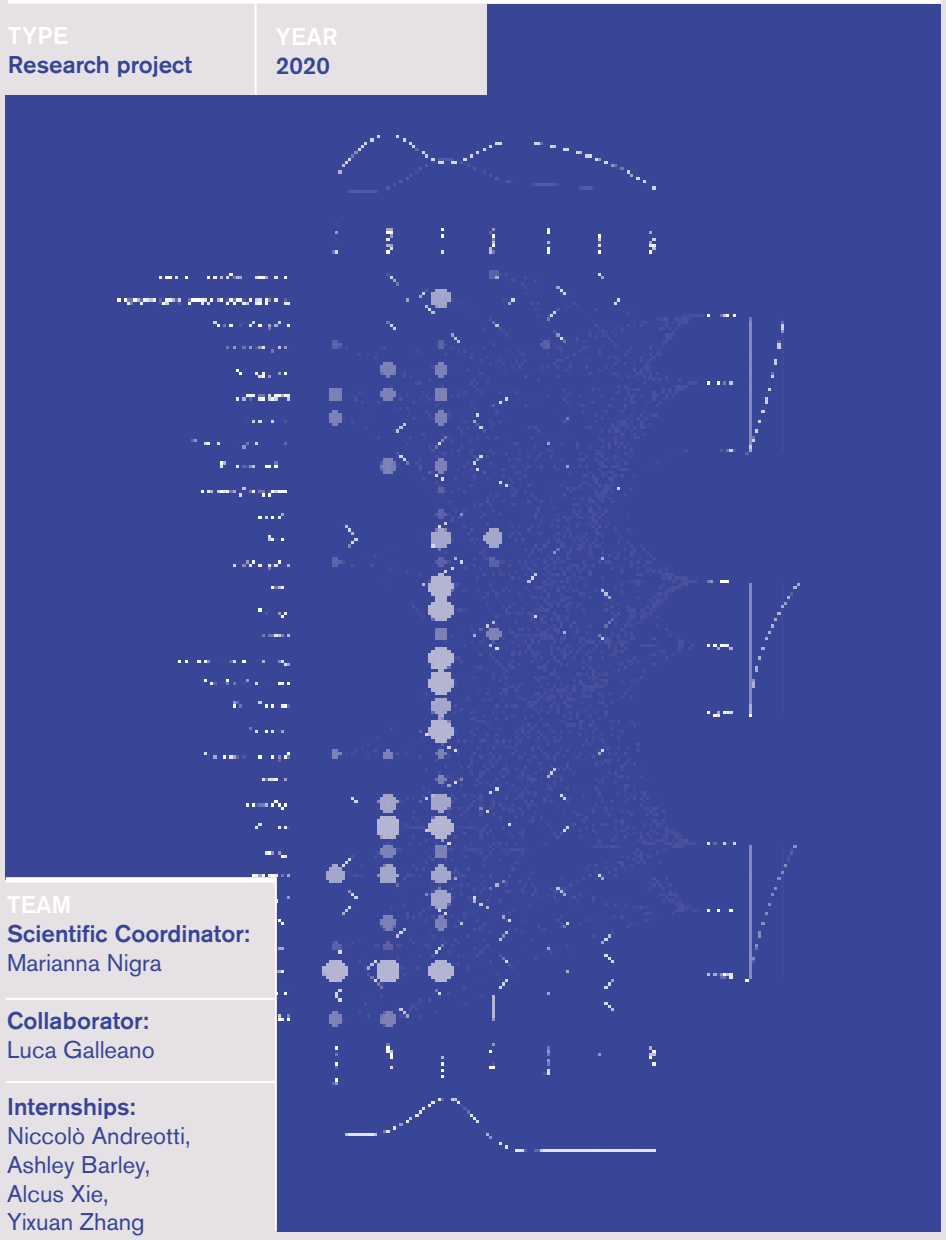


URBAN CLIMATE ACTIONS | INDEX

Design Management Dynamic Tool

TYPE
Research project

YEAR
2020



TEAM
Scientific Coordinator:
Marianna Nigra

Collaborator:
Luca Galleano

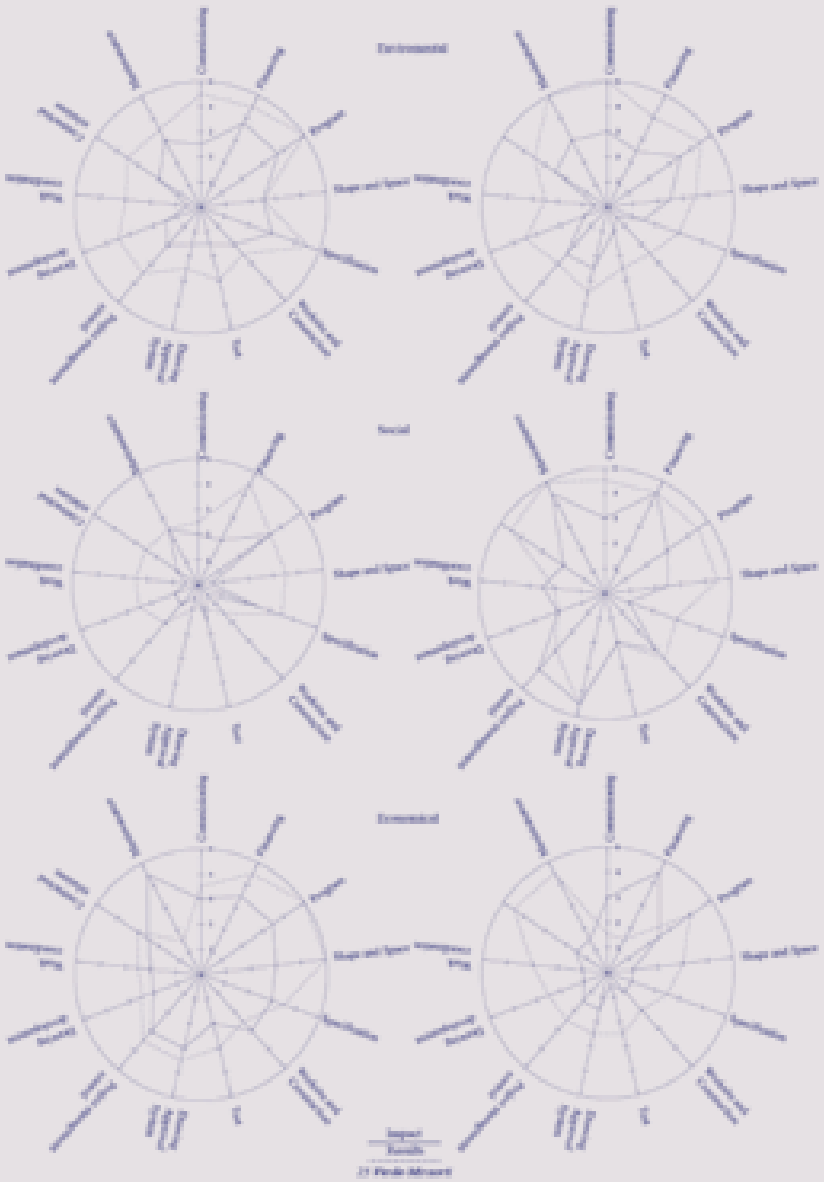
Internships:
Niccolò Andreotti,
Ashley Barley,
Alcus Xie,
Yixuan Zhang

How can environmental, economic and social sustainability objectives be integrated into a project management model? this research illustrates a possible methodology.

The aim of this research project is to explore and highlight the relationship between socio-economic context and design organisation, in order to improve the management of urban and architectural projects by design. To do so, the scope of this research is to implement a Database and a Design Management System and Dynamic Tool (DMDT) to assist preliminary phases of design and definition of strategic design approach and sustainable development. Building upon ongoing research, this work aims to explore the relationship between sustainable economic models and the management methods for the built environment, by developing and refining a design and management tool that could support decision making, design, delivery and management of sustainable urban and architectural projects.

Introduction

Building upon ongoing research, this work aims to explore the relationship between sustainable economic models and the management methods for the built environment, by developing and refining a design and management tool that could support decision making, design, delivery and management of sustainable urban and architectural projects.



Theoretical Background

Neoclassical economics studies define innovation as a primary source of economic growth (Schumpeter, 1942; Solow, 1956; Schmookler, 1966; Freeman, 1970; Scherer, 1982; Ruddock & Ruddock, 2009), as well as a key component of company competitive advantage in market economies (Barney, 1986; Bettis & Hitt, 1995; Teece, 2007). Higgin (2013) explained that the interest in the connection between economic growth and the limits of Earth's natural resources had been lacking up until 1972, when members of the Club of Rome (politicians, business people and scientists) published an alarming report regarding the potential collapse of physical growth on Earth due to pollution, depletion of resources and excessive population growth. Since then, many authors have explained that the paradox exists between the concept of economic growth, progress and innovation and the one of sustainable development (e.g. Higgin, 2013; Gauvin, 2011, Meadows, Meadows & Randers, 1972; Haapanen, Liisa & Tapio, Petri, 2016). Particularly in the context of architecture and management of the built environment, the call for sustainability and resilience has triggered the need for a paradigmatic shift in many parts of the industry. Such changes span from the proposals for new design strategies to the development of novel management systems for emerging social, environmental and economic challenges. Yet, the ability to define effective design methodologies and methods to enhance the management of resources and sustainable innovation by design seems to be complex and to suffer from the dominance of management systems and methods developed within the aegis of neoclassical economic models.

Objectives

The aim of this research project is to explore and highlight the relation between socio-economic context and design organisation, in order to improve the management of urban and architectural projects by design. The scope of this research is thus to implement a management tool to assist preliminary phases of design and definition of strategic design approach.

Methodology and Methods

This research focuses on the relationship between innovative architectural projects and their management. This work thus relies

on case-study methodology and analyses a number of case studies of successful urban and architectural projects to statistically explore the recurring relations between design organisation and effects produced.

The methods utilised are as follows:
- **DATA COLLECTION** (building component descriptions, procurement methods utilised and project output)
- **DATA ANALYSIS** according to innovation management theory
- **STATISTICAL ANALYSIS** of recurring relations between design decisions and socio-economic and environmental output
- **DESIGN MANAGEMENT DYNAMIC TOOL** implementation through an algorithm refined based on the newly acquired dataset
- **IMPLEMENTATION OF A DATABASE** to refine the feeding of the Design Management Dynamic Tool
- **TESTS ON POSSIBLE RELATIONSHIP WITH BIM**

Expected output

The significance of this research is its ability to provide a dynamic tool for the effective introduction of sustainable innovation through design, optimising environmental resources and maintaining the economic feasibility of a project. Moreover, its ability to envision the potential social, economic and environmental effects in the preliminary phase of projects might contribute to the creation of collaborative environments and resilient organisational business forms, as well as the enhancement of effective communication across multidisciplinary players and stakeholders, involved in the definition of vision for our future built environment. The application of the model might provide assessment of the role of the players involved in projects, socio-economic and environmental results, innovation levels and competences required to absorb innovation and reduce risk.

Urban Agriculture

TYPE
Research project

YEAR
2019

TEAM
Maicol Negrello

This research investigates the role of architecture and space as infrastructure for new forms of urban agriculture. In the last decade, thanks to technological innovation, this activity has assumed the characteristics of urban manufacture, turning into a profitable business. As in all pilot projects, however, there have been failures, which have made the research even more interesting. The analysis of the case studies (unsuccessful and successful) has led to a determination of the main characteristics of this new production by defining tools and best practices for future achievements.

Holistic approach for large PV plant design and operation

TYPE
Applied Research

YEAR
2021

TEAM

Scientific coordinatorr:
Elena Vigliocco

Work group:
Mauro Berta,
Alessandro Casasso,
Luca Davico,
Enrico Fabrizio,
Antonia Spanò,
Filippo Spertino,
Paolo Tamborrini,
Roberta Taramino,
Tiziana Tosco,
Elena Vigliocco,
Giulio Zotteri

The mitigation of the potential impacts of renewable plants on the environment, biodiversity and communities is the key to making renewables sustainable in the long run. In particular, the large land use of utility scale photovoltaic (hereinafter, PV) plants could suffer from social acceptance problems and requires the protection of land from potential biodiversity loss, habitat fragmentation, water stress, etc. This is worsened in all contexts where marginal or industrial lands are insufficient or not available. The principal goals of the research project are focused on field demonstrations and innovative methodologies aimed at utility-scale PV impact mitigation through a multidisciplinary approach able to take into account: (1) multi-purpose land use (crops/flora and vegetation); (2) wildlife habitat and biodiversity preservation: and (3) conservation of ecosystem services. The approach is based much less on a logic of reaction to criticalities and much more on a proactive approach aimed at identifying opportunities for creating shared value (CSV) between private PV companies and regions. These activities are focused on dialogue with stakeholders and socio-environmental analyses, in order to identify effective interventions that meet local needs and production targets.

The progressive increase in temperature reminds us of the urgency of using renewable energy sources. What are the strengths and weaknesses of photovoltaic systems?

New holistic approach for PV plants design

Elena Vigliocco

To act innovatively in a region, it is necessary to design together both the artefact and the relationships that affect it. With reference to the UN 2030 Agenda for Sustainable Development, the concepts of prosperity and collaboration take on programmatic relevance, requiring a shift from an approach that asks how to achieve a result to one that thinks about the motivation for action. The value of an innovation, in this case the large-scale

photovoltaic plant, is therefore not only measurable through the economic feedback or the degree of novelty that this innovation brings to the market, but also by the value and benefit it brings socially, environmentally and certainly economically. The relationship between the project and the region shifts the attention from the observation of the region as the context for the project to the region as the object of intervention, understood as a relational system, highlighting the proactive and generative role of new practices to activate new economies and sustainable processes from an environmental, economic and social point of view. Attention has therefore shifted not so much to the region as to the relational networks established within it; a shift can be identified from the physicality of the products, to the idea of region, to the relationship with users. This means that to act innovatively in a region, it is necessary to design together both the artefact and the relationships that affect it. This requires a different approach, calling for innovative action, moving from an approach that questions how to achieve a result to one that works by reasoning about the motivation for such action. The value of an innovation, in fact, is not measurable through the economic feedback or the degree of novelty that this innovation brings to the market, but by the value and benefit it brings socially, environmentally and certainly economically. It is thus possible to move from a techno-centric to a human-centred perspective. It is therefore essential to identify a design methodology, capable of guiding the idea of the region, analysing its needs and requirements, and thus bringing out its potential and values useful for the development of innovative concepts and projects. In this way, the design process can be managed by virtuously involving both material and non-material aspects and, knowing what exists in the area, connecting and re-evaluating knowledge, research and enterprise. In view of the fact that the location phase of large-scale PV plants, due to its complexity, but above all due to the delicacy of certain highly emotive aspects, cannot be tackled using assessment methods that use exclusively one-dimensional criteria such as technical or economic ones. For this reason, the working group includes seven disciplinary areas: Architectural Design (with Mauro Berta and Elena Vigliocco); Systemic Design (with Paolo Tamborrini); Environmental Sociology (with Luca Davico); Topography (with Antonia Spanò); Environmental Engineering (with Alessandro Casasso and Tiziana Tosco); Energy (with Enrico Fabrizio and Filippo Spertino); and Management Engineering (with Giulio Zotteri and Roberta Taramino).

The work plan is divided into four parts within which the different disciplinary components will be able to dialogue with one another.

The four Work Packages (WP) are broken down into:

- **ANALYSIS OF THE STATE OF THE ART (WP1)**, which will collect data on the collective opinion that local communities have developed in relation to three selected case studies following the implementation of large-scale photovoltaic plants.
- **PVP THEORETICAL MODEL (WP2)**, relating to the four interpretative clusters of the holistic analysis, which will diagram an interpretative map/model (D1) of the input data related to the design of a large PV plant.
- **PVP EMPIRICAL MODEL (WP3)**, which will map an area of interest through the state of the art and resource analysis, identifying strengths and weaknesses, critical issues and opportunities.
- **HOLISTIC MODEL FOR LARGE PHOTOVOLTAIC PLANTS (WP4)**, which will develop an operational toolkit applicable in other similar contexts (D2) that will be elaborated in relation to the state of the art (WP1) and the results of empirical mapping (WP3).

There are two expected deliverables: D1 – Holistic map/model for PV plants (WP2, month 8); D2 – Visual data report (holistic matrix) for PV plant (WP4, month 18).

Architecture for urban agriculture

TYPE
PhD Research

YEAR
2019

AUTHOR:
Maicol Negrello

From the early 2000s, the focus on global issues, such as global growth, climate change and food security have shaken the various scientific disciplines. Among the most pressing problems is the need to ensure agricultural pro-

If cities continue to grow will vertical farms, urban agriculture, hydroponics and aquaponics be the future of the primary sector?

duction systems that can respond to urban population growth. Architecture has also tried to make its own contribution to the global debate by creating the concept of a new type of urban farm: the ZFarm. A Zero Acreage farm makes it possible to cultivate inside or on top of buildings, unlike on-soil techniques. These utopian projects have been forced to face technical, economic and environmental feasibility challenges. Architects and designers have, however, been experimenting with new solutions for years to transform them into viable production methods. This integration of agriculture with architecture is almost entirely new, with very little research having been conducted on the architectural features of commercial indoor farms (Caputo, 2012).

This is because, before technological innovation such as LED and no-soil growing techniques, scholars had investigated the link between architecture and agriculture as a historical relationship between production and place of consumption, farmland and built environment, or agricultural activities and the structures supporting them, mostly using a planning and architectural landscape approach. In contrast with these approaches, this thesis attempts to firstly analyse the evolution of agricultural spaces that have become urban, built and indoor, then going on to define new forms through a survey of case studies, and finally preparing a toolkit using best practices derived from the case studies investigated in the research.

The thesis comprises three sections. The first section gives an overview of the evolution of urban agriculture spaces, how these practices have been linked to different needs over the centuries, and which roles they had in the urban environment (e.g. Victory Gardens). This section also defines the research framework and provides the basis and the assumption for developing the topic of the research. The 'city-agriculture' integration is investigated, starting by evoking some topical projects more related to urban design and planning, such as 'Broadacre City' (1934–35) by F.L. Wright and 'New Regional Pattern' (1945–49) by L. Hilberseimer. The studies conducted on the continuous productive urban landscape (2012) by A. Viljoen et al. and the first example and studies on agriculture integrated with buildings investigated by M. Gorgolewski, J. Komisar and J. Nasr in the publication 'Carrot City' (2011) consolidate this research background, approaching the pivotal point: architecture for urban agriculture. Hence, the second section defines the research topic: indoor commercial ZFarms and an in-depth analysis thereof (typologies, characteristics and weak points) through case study analysis. Given the lack of official sources and solid scientific literature, this method has been chosen as a tool to analyse the architecture and the relationships that ZFarms establish with the city. This section answers the research questions on the identification of the spaces for urban ZFarming and defines the issues encountered by this new form of production. The methodology used is as follows: firstly, define what is meant by a case study; subsequently identify case studies; and, finally, analyse the components of the object from an architectural-formal and relational-urban point of view. The book 'Case Study Research and Applications: Design and Methods' (2017) by Robert K. Yin was used to guide the analysis. I collected data from field surveys where possible. I also gathered information from protagonists in the sector, conducting semi-structured interviews with stakeholders, such as urban farmers, consultants, agronomists, professors, architects, developers and experts in the cities of Montréal, Toronto, New York, Boston, Chicago and Detroit. The initial analysis was preparatory and useful in understanding the strengths and weaknesses of urban indoor ZFarms. This allowed the elements considered more virtuous and, therefore, more reproducible to be identified and a 'practical design toolkit' to be created that might prove helpful for architects, urban planners and municipalities. This represents the third and final part of the research.

Smart Energy Solutions for Sustainable Cities and Policies

TYPE
PhD research

YEAR
2020

AUTHOR
Valeria Todeschi

The civil sector is the biggest energy consumer in the EU: 97% of the EU building stock is not energy efficient and only 0.2% of residential buildings in the EU are undergoing significant restructuring.
The development of Urban-Scale Energy Models (USEMs) is currently the goal of many research groups due to increased interest in evaluating the impacts of energy efficiency measures in cities. USEMs are useful to explore energy efficiency solutions on a neighbourhood or district scale and to quantitatively assess retrofit strategies and energy supply options, leading to more effective policies and management of energy demand with energy supply. Since the relationship between urban form and buildings affects energy performance, USEMs can be used to obtain lower energy demand by improving the morphology and the material used in the built environment.

This PhD research addresses three sustainable development goals of the UN Agenda 2030: affordable and clean energy (7), sustainable cities and communities (11), climate action (13).

The aim of this PhD research is to investigate and create new USEMs with the support of Geographic Information Systems (GIS) to drive smarter use of energy, and to match it with more efficient energy sources that are available, especially to help public administrations define policies adapted actual building stock. Within this research project, urban-scale energy models for different European cities (i.e. Turin IT, Essen DE, Fribourg and Geneva CH) have been designed. The novelty of this kind of urban energy model is that they add a number of variables to the energy balance of the built environment to take the urban context into account. These variables are: (i) thermal radiation lost to the sky, quantified using the sky view factor (SVF); (ii) solar exposure, described considering information pertaining to the main orientation of the buildings and the relative height of the neighbourhood with respect to its surroundings; (iii) the urban canyon height-to-distance ratio (H/W), used to quantify hourly incident solar irradiance (percentage of sunny surfaces).

The main aims of this PhD research are as follows:

- **EVALUATE ENERGY-USE DRIVEN VARIABLES**, using sensitivity analysis to assess the energy performance of buildings at an urban/district level. Some variables can be defined as fundamental and other variables can be added to improve the accuracy of the results. The influence of the scale of data should also be identified, since some data applies at a building scale, while other data applies at a block scale or at a district/urban scale
- **DEFINE A PROCEDURE** to harmonise and process the input data using the existing open-source databases in place for almost every city in the world (municipal technical maps). These models are based on GIS tools also used for regional/urban analysis
- **EVALUATE AND OPTIMISE EXISTING ENERGY-USE MODELS** at an urban scale (bottom-up, top-down, statistical, engineering and machine learning energy models)
- **VALIDATE THE ACCURACY OF MODELS** created using data measured in three different cities with varying building stocks, users and climates to test the capabilities of the models to adapt to different conditions and their replicability potential
- **ANALYSE THE RELATIONSHIP** between urban morphology and building energy performance with implications for solar availability in urban areas, to optimise solar gains and harness solar energy as a renewable resource for local energy production in densely built-up contexts
- **PROMOTE THE USE OF SMART GREEN SOLUTIONS** (e.g. green roofs) with financial mechanisms and incentives, and identify effective energy policies, considering the actual characteristics of the buildings, the population and the urban morphology (e.g. for building codes)
- **DEVELOP A PLATFORM** as a support decision tool to help stakeholders, urban planners and policy makers to plan sustainable cities and smart energy systems, while ensuring energy security, affordability and environmental sustainability for more resilient cities.

URBAN CLIMATE ACTIONS | OUTCOMES

BOOKS AND BOOK CHAPTERS

Nigra, Marianna, and Mario Grosso. 2019. *Progettare La Complessità in Architettura. 15 Tesi Magistrali in Architettura per Il Progetto Sostenibile Del Politecnico Di Torino*. Maggioli Editore.

CONFERENCE PROCEEDINGS

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Della Santa, Francesco, Maria Ferrara, Matteo Bilardo, Alessandro De Gregorio, Antonio Mastropietro, Ulderico Fugacci, Francesco Vaccarino, and Enrico Fabrizio. 2020. 'Application of Deep Learning to Design Renewable Energy Systems Fo a Zero Energy Multifamily Building'. In *15th SDEWES Conference Cologne 2020*. SDEWES Centre.

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SCIENTIFIC PAPERS

Bilardo, Matteo, Maria Ferrara, and Enrico Fabrizio. 2020. 'Performance Assessment and Optimization of a Solar Cooling System to Satisfy Renewable Energy Ratio (RER) Requirements in Multi-Family Buildings'. *Renewable Energy* 155 (C): 990–1008.

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Ingaramo, Roberta, Maicol Negrello, and Matteo Robiglio. 2020. 'Oltre Il Verde Urbano: Prove Di Agri-Architettura in Città'. *Il Giornale Dell'architettura*.

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Nigra, Marianna. 2017. 'Complexity Theory as an Epistemological Approach to Sustainability Assessment Methods Definition'. *DS 87-5 Proceedings of the 21st International Conference on Engineering Design (ICED 17) Vol 5: Design for X, Design to X, Vancouver, Canada, 21-25.08.2017*, 159–68.

Todeschi, Valeria, Guglielmina Mutani, Lucia Baima, Marianna Nigra, and Matteo Robiglio. 2020. 'Smart Solutions for Sustainable Cities-The Re- Coding Experience for Harnessing the Potential of Urban Rooftops'. *Applied Sciences* 10 (October): 27.

INTERDISCIPLINARITY

QUOTE

Specialization, professionalization, reduction of complexity are an ideological choice, not a destiny.
Our culture lost its foundation: the project.

LECTURE REFERENCE

Carlo Olmo in 11.06.18 *Le legacy urbane tra patrimonio, diritti e innovazione*, Urban Legacy Seminar Series, Salone d'Onore, Castello del Valentino, Turin

RENOVATION

QUOTE

The energy renovation of existing buildings is a measure that is at the top of the public policy agenda with ambitious objectives that aim to reduce greenhouse gas emissions and the consumption of under carbonated energy.

LECTURE REFERENCE

Margot Pellegrino in 18.06.2020 *Net-zero energy renovations*, Spring Seminar Series 2020, online lecture

POST - PANDEMIC CITY

UCA

Which architectural and urban strategies should be applied to face COVID19 emergency?

During the initial outbreak of the pandemic, F*UL*L researchers gathered to understand how they could proactively contribute to the ongoing emergency through their research. The role of schools was and is central to the debate on the reaction to the pandemic. Collaborating with Fondazione Agnelli, a team of F*UL*L researchers provided evidence that Italian schools have many unused spaces that could be open to the city surroundings. *Re-school* produced a set of strategies to implement the urban role of Italian schools that envisions futures well beyond the post-pandemic period.

In Italy, one of the main political challenges for the future is how to renovate efficiently the decaying public stock of school buildings. These buildings are often rich of unused or underused spaces, that could serve for the involvement of local communities especially in hardly accessible areas.

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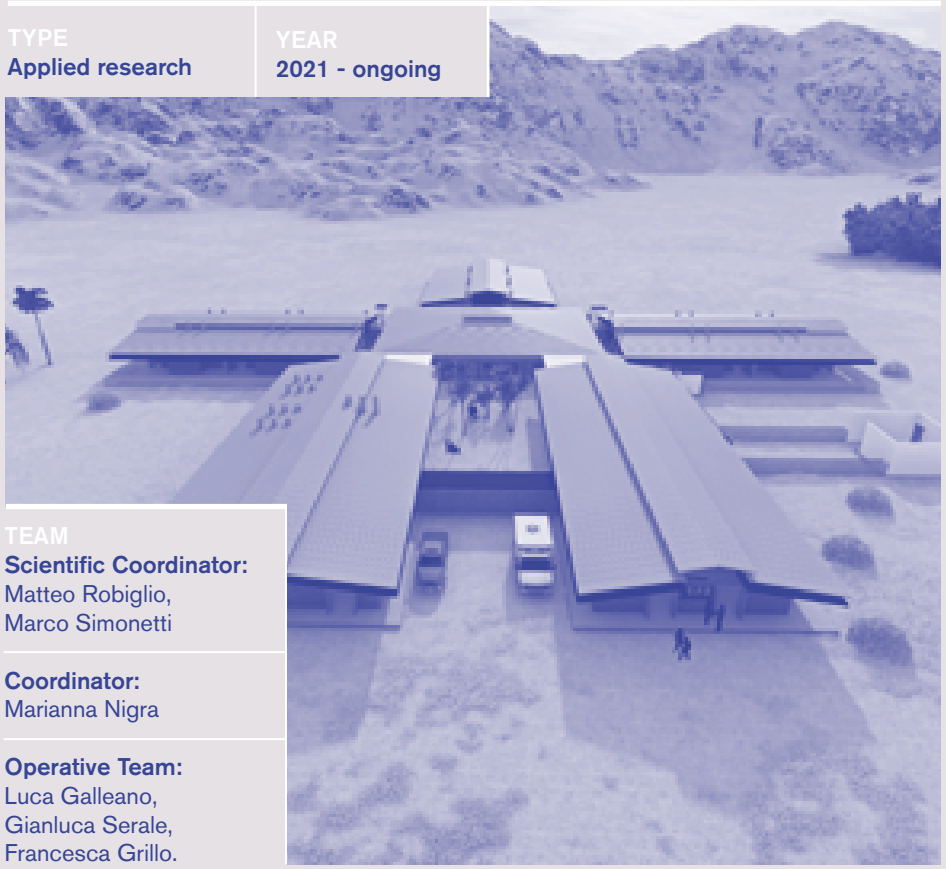
With the same ethos, a team of researchers embraced the challenge to design and measure the feasibility of healthcare structures for the treatment of acute respiratory illnesses (like COVID-19) in the Global South. The World Health Organization directly commissioned the ongoing research.

The *Next Generation Urban River Park* focuses on the revitalization of the major urban park in Torino. The *Real Estate Innovation Manifesto* seeks for alternative ways to develop the city also taking into account wellbeing and healthcare issues.

Severe Acute Respiratory Infections Treatment Centre

TYPE
Applied research

YEAR
2021 - ongoing



TEAM
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Marco Simonetti

Coordinator:
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Francesca Grillo.

The collaboration between F*UL*L and World Health Organization focuses on exploring the role of built space in the management and containment of the pandemic, through the definition of innovative and sustainable approaches.

Social distancing due to the spread of the COVID-19 pandemic involves the redesign of living spaces and hospital facilities. To this end, F*UL*L is collaborating with the World Health Organization.

In particular, the project is based on the collaboration between the Future Urban Legacy Lab and World Health Organization (WHO) with the aim of supporting Helpdesk COVID-19 Severe Acute Respiratory Infection (SARI) Health facilities design Support Network. Specifically, the work will concentrate on:

1. **Technical project design for SARI health facilities according to information provided;**
2. **Specific technical support upon request on existing problematic architectural aspects, advise on possible alternative solution;**
3. **Support with evidence-based technical guidance tools and development of resource materials related to topics;**
4. **Advise on appropriate technology and development & research of new applicable techniques.**

The research group focuses on providing: support the WHO Helpdesk COVID-19 Severe Acute Respiratory Infection(SARI) Health facilities design; support the WHO OSL Heath and technical unit; and support WHO Member states on responding to ad-hoc request and/or adapting and developing technical innovation to fulfil needs in response to Covid-19 event.
The first phase of the collaboration between the Politecnico di Torino and the World Health Organization WHO - Téchne focused on the design of a Severe Acute Respiratory Infections (SARI) treatment center in the city of Dori in Burkina Faso. This work was carried out in synergy with Future Urban Legacy Lab and the DENERG Energy Departments of the Politecnico di Torino with the World Health Organization - Téchne, and the Nazi Boni

University of Bobo-Diolasso in Burkina Faso. The work carried out redefined an existing spatial scheme of the hospital, providing compositional, technological and environmental solutions to respond to the need to adapt the ventilation health parameters required by WHO - Téchne in a context of energy and material scarcity. These indications were produced following some studies and simulations conducted on experimental aspects defined in collaboration with the on-site personnel of the WHO - Téchne and Professors by the Nazi Boni University of Bobo-Diolasso in Burkina Faso. The work achieved the definition of compositional and engineering solution that could respond to the request of relying on natural ventilation in context of scarcity to respond to the emergency of COVID-19 in health structures. This project has allowed WHO – Téchne to refine the ventilation and spatial scheme parameters for all SARI treatment centers in similar climatic zones and has stimulated interest in the relationship between engineering, architecture and health. Furthermore, the interest in this project has prompted possible funds for the construction of prototypes to be tested at full scale of sections of the building. The second and current phase of the collaboration sees the involvement of the Politecnico di Torino in collaboration with WHO - Téchne and UNICEF for the design, simulation and verification of the spatial / compositional and ventilation aspects of the 'High Performance Tents'. This work focuses on the redefinition and verification of existing tents, which are not designed in response to health emergencies not related to airborne diseases as in the case of COVID-19. In order to make these tents usable even during the current pandemic, the Politecnico di Torino is simulating and verifying the ventilation requirements for different climatic areas, in order to manage and contain any infections and consequently, establish the spatial and morphological parameters necessary for the correct use of one or more assembled curtains. Also in this case, a possible allocation of funds is under discussion to envision a prototyping and test activity to carried out at the premises of Politecnico di Torino.

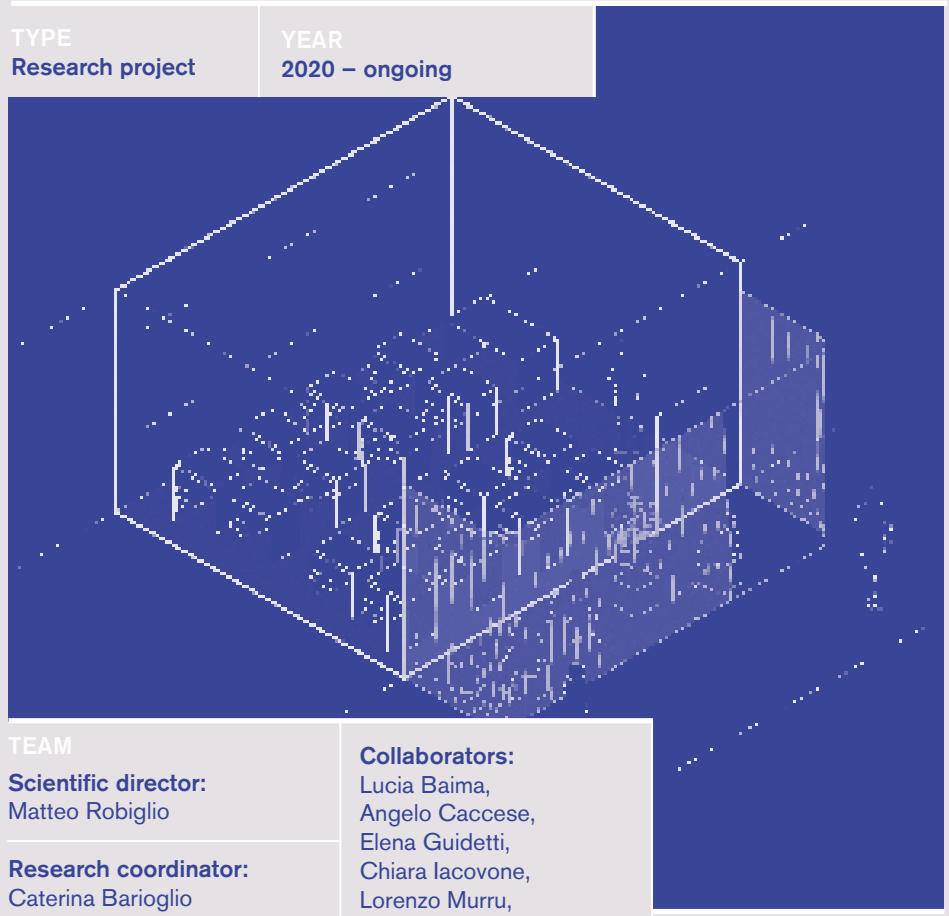
PPC

Re-school

How to rethink the school starting with spaces

TYPE
Research project

YEAR
2020 – ongoing



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Fondazione Agnelli:
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Martino Bernardi
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Stefano Molina
Raffaella Valente

For this research project *FULL* has collaborated with Fondazione Agnelli. The project has had great visibility in national newspapers.

The Re-school project is the result of a collaboration between Fondazione Agnelli and the Future *Urban Legacy* Lab that aims to offer tools for the regeneration of the Italian school building stock by addressing issues of safety, environment and educational innovation. The research has taken the form of a series of projects developed over different, complementary phases. The first outcome was the document "Fare Spazio" (July 2020), a study aimed at supporting local authorities and school administrations in the context of the uncertainty surrounding the return to school during the pandemic. Between October 2020 and July 2021, a direct request from teaching staff at the school Istituto Comprensivo C. Alvaro - P. Gobetti in Turin provided the opportunity for an experimental application of the principles identified in Fare Spazio. In parallel, the research team was awarded funding under the FISR 2020 – Covid call for proposals launched in May 2020 by the Italian Ministry of University and Research (MUR) with the project 'Re-school. Rethinking educational spaces in latent pandemic conditions', aimed at creating an interactive web application to provide school principals, local authorities, teachers and pupils with a practical tool for recognising the resources - in terms of space - available in school buildings, in order to assess possible transformations. Finally, these experiences have led to more extensive collaboration with local and regional authorities (the Metropolitan City of Turin and the Piedmont and Lombardy Regions) with the aim of systematising knowledge on school infrastructure as a support for strategic planning on a regional scale.

The starting point: support decision-makers in adapting school spaces

In recent months, school principals and local authorities have faced the challenge of a critical transition from an extraordinary to the ordinary management of the school building stock. Starting from very concrete problems and re-contextualizing them into a broader perspective, the Re-school project aims to offer a method of action and a "toolbox" useful to those who are working on the difficult task of regenerating school spaces. In order to do that, it is however necessary to overcome the logic that has guided school regeneration projects so far, which varied between an experimental and qualitative approach on individual pilot cases on the one hand, and extensive retrofitting actions aiming at meeting minimum requirements rather than at the effective quality management of a comprehensive action plan. The research intends therefore to elaborate an alternative model of intervention in order to propose an action plan on the regional scale which tries to fill the gap between these two extremes on the basis of two fundamental assumptions: firstly, to take into account the whole stock of buildings of the regional infrastructure and, secondly, to select priorities for intervention and enhance the quality of transformations.

The method: from typology recognition to design action

To tackle the issue of developing an action plan for operational regeneration on territories with different characteristics, the research team developed a model aimed at integrating the identification of recurring typologies of school buildings in their physical consistency with the specificities and potentials of different territories.

Measure

Italian Regions have access to an extraordinary amount of data on the school building heritage - collected in the national databased SNAES (Sistema Nazionale dell'Anagrafe dell'Edilizia Scolastica) and in its regionals "nodes" the ARES (Anagrafe Regionale Edilizia Scolastica). Quantitative and qualitative analyses based on these data sets make it possible to identify and quantify recurring criticalities (e.g. with respect to the issue of sustainability and energy efficiency) and spatial resources (e.g. surplus space in schools in non-urban areas). In doing this, the research aims to spatialize and systematize our knowledge of the school infrastructure and to elaborate an overview of the existing assets in terms of transformation potential.

Assess

The second step involves classifying school buildings (defined by their layout, structure, settlement, etc.) and their micro-urban context (accesses, relationship with the street network, etc.) according to some recurrent typologies. These typologies result from multiple historical, legislative, and technical seasons which are reflected in continuity and occurrences in the school building stock across Italy.
The typological classification is furthermore intertwined with the distribution of buildings on a territorial scale: this connection aims at identifying statistically significant categories, which can provide a concise but comprehensive description of the national school infrastructure. This approach allows the research team to explore the potential of transformation on an architectural level without renouncing a territorial perspective.

Select

By introducing evaluation parameters (e.g. resources available for transformation; cost-benefit analysis etc.) the results of the measurement can be evaluated and prioritized against regional objectives. In this way, the analyses developed in the previous phases can provide guidelines to identify priorities for intervention on a regional scale. So, through this methodological approach, the research moves "from measurement to action" providing useful tools for local authorities to identify priorities of intervention and to develop strategic planning actions.

First outcomes

Different outcomes were produced at various stages of the research project. The first phase of the work resulted in the drafting of a document entitled "Fare spazio. Idee progettuali per riaprire le scuole in sicurezza" (Make space. Design ideas to reopen schools safely), published online in July 2020. This report aims to provide design ideas, primarily addressed to school principals, in order to adapt educational spaces to the COVID-19 emergency and to ensure the best environmental conditions for a safe return to school. As a result, the whole report is conceived as a "toolbox", for technical and non-technical users, valid to identify the more suitable spaces for transformation and the techniques needed to do so. Reflecting the contingency of the report - elaborated under the the COVID-19 pandemic - the suggestions are meant to be timely, achievable with the available resources and reversible.
Another outcome of the "Re-school" research is the report "Dentro Fuori Oltre. Ripensare gli spazi dell'Istituto Comprensivo 'C. Alvaro - P. Gobetti' a partire dalle sue potenzialità" (Inside Outside Besides. Rethinking the spaces of the school building 'Istituto Comprensivo C. Alvaro - P. Gobetti' starting from its potential", submitted to the school's manager and teachers at the end of July 2021. The report presents the results of the research project on the

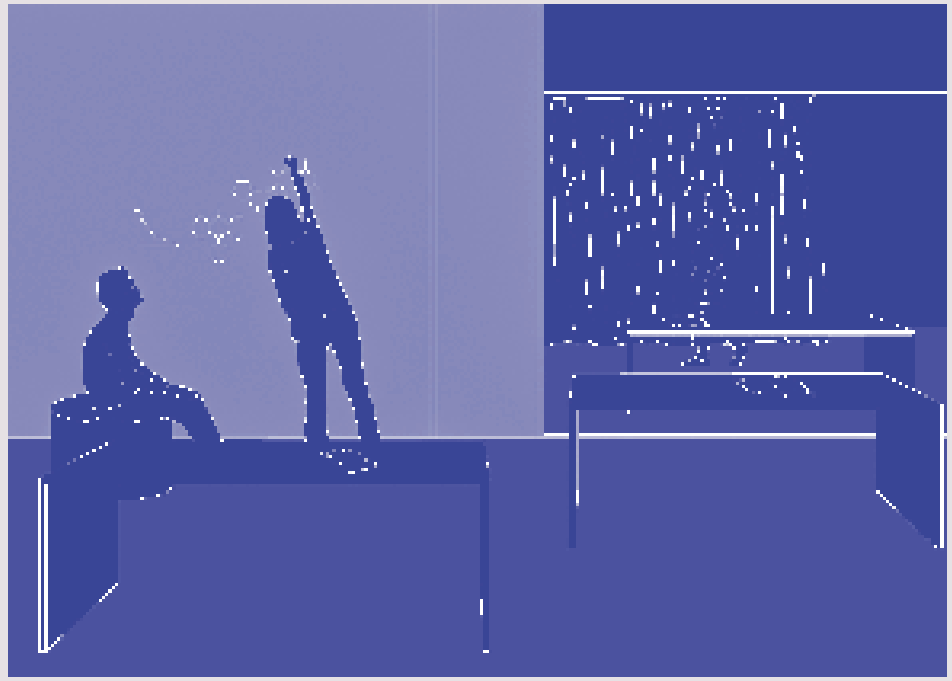
internal and external spaces of the school in collaboration with the teaching staff. The work aims to share analysis and design ideas to be used as a starting point for the development of architectural projects which are able to meet the needs of an enlarged school community and as a stimulus to educational innovation, even in changing and uncertain planning conditions.

Two further products are currently under development. Firstly, the project "Re-school. Rethinking educational spaces in latent pandemic conditions" developed within the framework of the FISR 2020 - COVID call for proposals, is going to create an interactive web application to support school directors and local authorities in identifying the transformative potential of school buildings. More specifically, the project aims to create an interactive website with a simple and intuitive interface to lead users through a series of questions to identify the spatial resources of a specific school. The outcomes of the query system are both the recognition of the transformative potential of school buildings based on parameters such as morphological characters, building type and position on the lot, settlement situation (etc.), and a collection of design suggestions according to the needs declared by the user.

Finally, in the extensive research projects just launched as the result of the cooperation with the Metropolitan City of Turin, Piedmont and Lombardy Regions, the objectives of the work have definitely moved from an emergency logic (dealing with immediate/short term and possibly temporary/reversible transformations) to a medium-long term transformation perspective. In the preliminary phases of these works were elaborated the tools and methods for systematization of the knowledge on a territorial scale and laid the groundwork to support local authorities in defining guidelines for strategic planning.

Next steps

In the coming years, school buildings will be one of the main targets in the allocation of European and Italian funds. In this context, as a next phase, the Re-school research project aims to become an effective tool to support Italian local authorities in the elaboration of guidelines and strategic planning measures for the transformation of the existing school building stock. Following the methodology tested and implemented in different contexts during the first stages of the research project, a number of analytical processes combining the territorial and architectural scales will be employed as a starting point to identify areas and priorities of intervention (e.g. assessing weaknesses of a technical or regional nature, or questioning the relationship between spaces and didactic activities). After focusing on the emergency in the first phase of the work, the second phase covers medium- and long-term transformations, thus bringing to the forefront further issues and above all, an effort to re-conceptualize the relationship between schools and the territories in which they are located. In a framework in which tools and funds are and will be available for a substantial restructuring of the Italian public infrastructure, the aim is, therefore, to support the vitality and capacity for initiative of local realities through the development of an effective and replicable operative model.



Real Estate Innovation Manifesto

TYPE
Applied research

YEAR
2021 - 2022

TEAM
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Enrico Maggi

In early 2021 Assoimmobiliare partnered with F*UL*L to produce an innovation manifesto of Estate. Assoimmobiliare is the official Italian association of the real estate industry, including a vast array of actors spanning from engineering companies to developers. The association is divided into committees focused on specific issues. F*UL*L collaborated with the innovation committee.
The manifesto is the closing act of a year-long process. The need for a manifesto was part of a series of actions stimulated by the pandemic and its effects. The associates of Assoimmobiliare were asked to participate in three workshops to develop the manifesto collectively. Italian cities' specificities and urban fabric are the starting point and testbeds of F*UL*L's research. How to innovate the specific real estate products of the Italian city through digitalization and sustainability? The committee gathered the first ideas during the first workshop. The event was organized in a collaborative format in virtual breakout rooms, where each component provided a "postcard from the future". The interactive nature of the first meeting allowed us to collect ten macro-issues. The second step consisted in asking the associates to answer the ten questions in another joint forum. As a result, F*UL*L produced a position paper where all the issues are intertwined and projected towards a global understanding of the phenomenons that the future real estate should take into account, without forgetting that Italy is built on a thick layer of history. The issues of mobility, green energy, inclusivity, diversity, and information technology, are just a few of the topics developed during this ongoing process. With the help of external special guests as Mario Calderini of Politecnico di Milano –expert in social economy–, Paola Cillo of Università Bocconi –expert in innovation–, and Vicente Guallart of IaaC Barcelona –expert in urban sustainability–, F*UL*L was able to convey the vast theme of innovation to a synthetic vision that will provide the industry with a blueprint for innovative practices.

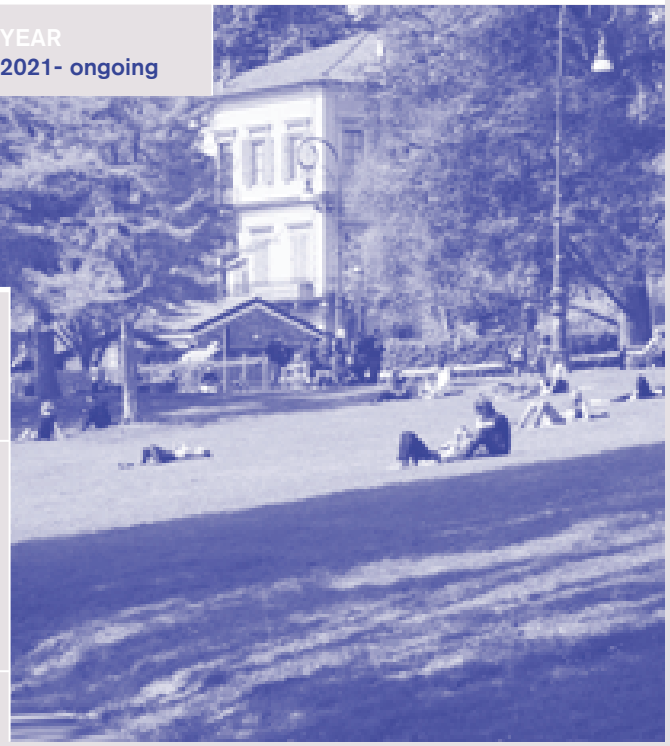
What are the challenges for a responsible real estate sector of the future? FULL assisted Assoimmobiliare in the production of a manifesto to attempt to answer the question

PPC

Next Generation Urban River Park

TYPE
Research project

YEAR
2021- ongoing



TEAM
Scientific Coordinators:
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Elena Vigliocco

Team:
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Roberto Revelli,
Matteo Robiglio,
Tiziana Tosco,
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Angioletta Voghera

Executive coordinator:
Laura Martini

Parco del Valentino is one of the city's best-loved parks and a place where the city's collective memory is condensed. This is the place where Christine of France chose to build her royal residence in the 17th century, enlarging and transforming a river villa overlooking the Po. It is also where the International Exhibitions of the late 19th and early 20th centuries were held, as well as the Valentino Grand Prix motor races. Today, the park, which is the

The Parco del Valentino is the major urban park of Torino. The EU Recovery Fund aims to regenerate it as a strategic site for the post-pandemic city.

centre of gravity of the Po river system, is an important place for the people of Turin, both because it is enjoyed by many on a daily basis and because it contains tangible evidence of its history that is still visible to this day. Some examples include the Castello del Valentino and the Borgo Medievale, but also architectural structures with a more recent history, such as Torino Esposizioni. As part of the Next Generation EU funding, the Italian Ministry of Culture has identified the enhancement of Parco del Valentino as one of the 14 cultural attractions located in Italy to be rehabilitated through ad hoc funding and planning. Of the €1,460 billion programmed for the 14 strategic sites, the funding set aside for enhancing Parco del Valentino is €103 million.
The aim of the master plan is to enable the City of Turin to identify the most effective spending strategy aimed at maximising the effect of investments related to the expected structural funds in order to produce positive socio-economic impacts and lasting domino effects.

Generating impact and producing a domino effect
Elena Vigliocco

From the point of view of assessing the impact of cultural heritage investments on local and non-local economies, research and studies conducted at European level clearly show how cultural heritage generates positive economic, social, cultural and environmental impacts. The mapping developed by the European

project Cultural Heritage Counts for Europe (2015) highlights the potential of cultural heritage as a key factor for sustainable and inclusive development. The data collected and presented shows that preserving cultural heritage functions as a 'multiplier' through which investments can have positive impacts beyond those initially foreseen, thus increasing the level of benefits and sustainability of the initial investment.
From the perspective of having to use collective resources to conserve heritage of cultural interest, the allocation of resources becomes a central issue in relation to the exceptional number of properties identified as such. The ICOMOS document entitled European Quality Principles for EU-Funded Interventions with Potential Impact upon Cultural Heritage (2019) introduces seven assessment criteria through which to measure ex ante the resulting potential economic value of cultural heritage. The seven criteria are: (1) knowledge-based: research and knowledge of the asset; (2) public benefit: remembering the responsibility towards future generations; (3) compatibility: maintaining the 'spirit of the place'; (4) proportionality: doing what is necessary but as little as possible; (5) discernment: calling on previous knowledge and experience; (6) sustainability: making sure the intervention lasts; (7) good governance: controlling the process as part of the intervention. These criteria represent the interpretative grid through which the master plan for enhancing Parco del Valentino is planned and constructed.

Dimensional data:

Overall area	**421.000 m²**
Areas of the buildings on which intervention is taking place	**54.094 m²**
Surfaces made more permeable	**20.000 m²**

The aim of enhancing Parco del Valentino is to increase the appeal of the park and the axis of the Po through a blend of actions woven into the site to generate positive socio-economic impact and trigger a domino effect. The ultimate aim is both to renew the attention of residents and to encourage the new interest of users interested in cultural and sustainable forms of tourism.

In order to pursue these aims, the City of Turin intends to act along two lines of action:

1. Environmental redevelopment of the park as a tourist attraction and centre for higher education.
2. Redevelopment of municipally-owned buildings, including those currently used for entertainment activities, which are a key element in the perception and use of the park as a place of leisure.
3. The aim of the master plan is to enable the city to identify the most effective strategy to maximise the effect of investments related to structural funds in order to produce socio-economic impacts and a lasting domino effect.

The aims of the master plan are:

1. Define the destination hypothesis/hypotheses of the different structures present with the aim of providing the city with a mix of compatible and sustainable uses (alternative hypotheses).
2. Define one or more hypotheses for the distribution of funding (rules and stakeholders).
3. Compare different ways of managing projects and related contracts (variety of contract types).
4. In relation to the different design and procurement methods, establish the timeframe for completion and testing of the works.
5. Identify a project management and governance model (direction).
6. Identify any synergies of the project with other funds related to digitalisation and communication. In order to maximise the effectiveness of the master plan, a multidisciplinary and systemic approach is proposed to reconnect the preliminary and indispensable interpretative aspects with the project scenarios that will be identified.

The master plan is divided into two closely interconnected macro sections. The aim of the first section is to assess the residual and unexpressed potential of the area under investigation.

The drafting of the study subdivides the observation into two levels of detail: the micro-scale, in which the intrinsic potential of the Valentino park system is assessed (open and closed spaces, types of users, stakeholders involved, etc.); the macro-scale, in which the park is interpreted as a piece of two urban interpretative systems: the ecological system connected to the river stretches that interconnect the large urban parks; and the cultural and leisure system that expands above all in relation to the city's cultural centre, but then has clear ramifications throughout the city. The aim of the second section is to construct alternative intervention scenarios enabling the City of Turin to orientate (or reorientate) the renewal and enhancement process in order to maximise the socio-economic impact of the planned investments. In this second section, we intend to develop alternative, perhaps more 'adventurous' scenarios to suggest options that could intercept the progressive identification of the spending 'rules' that at the moment are not completely defined. Each scenario will be developed from the point of view of identifying the layout of uses, the necessary investments, the timeframe of expenditure and, finally, the related opportunities and critical issues. The idea is that the master plan may be an open, but not undefined instrument, capable of suggesting options that might be activated depending on the conditions that may arise.

POST-PANDEMIC CITY | OUTCOMES

SCIENTIFIC PAPERS

Nigra, Marianna, Simonetti, Marco, Galleano, Luca, Robiglio, Matteo. 2021. Natural ventilation in support of health structure in context of scarcity during pandemic. Architectural Engineering and Design Management (submitted).

Nigra, Marianna, Simonetti, Marco, Galleano, Luca, Robiglio, Matteo. 2021. Sustainable Innovation for Emergency. Sustainability (submitted).

Nigra, Marianna, Simonetti, Marco, Galleano, Luca, Robiglio, Matteo. 2021.Designing Innovation with Nature – The Burkina Faso Experience. Architectural Engineering and Design Management (submitted).

Nigra, Marianna, Simonetti, Marco, Galleano, Luca, Robiglio, Matteo. 2021.Climate and Pandemic: Two Key-Factors for Sustainable Innovation Design. Architectural Engineering and Design Management (submitted).

Barioglio, Caterina and Daniele Campobenedetto (edited by). 2021. Re-school. Ripensare la scuola, a partire dagli spazi, DAD – Politecnico di Torino.

REPORTS

Gavosto, Andrea, Marco Gioannini, Stefano Molina, Raffaella Valente, Matteo Robiglio, Caterina Barioglio, Chiara Iacovone, et al. 2020. 'Fare Spazio. Idee Progettuali per Riaprire Le Scuole in Sicurezza'. Future Urban Legacy Lab - Politecnico di Torino.

Robiglio, Matteo, Caterina Barioglio, Daniele Campobenedetto, Marco Cappellazzo, Giulia Sammartano, Andrea Gavosto, Raffaella Valente, Martino Bernardi. 2021. Analisi sui dati dell'Anagrafe Regionale dell'Edilizia Scolastica in Lombardia.

CONFERENCE PROCEEDINGS

Nigra, Marianna, Simonetti, Marco, Galleano, Luca, and Serale, Gianluca. 2021. 'The Role of Natural Ventilation in Designing an Airborne Disease Treatment Centre in Burkina Faso', Plea Conference: *"Will cities survive? The future of sustainable buildings and urbanism in the age of emergency."*

Nigra, Marianna, Simonetti, Marco, Galleano, Luca, and Serale, Gianluca. 2021. Sustainable Innovation for Emergency: The Design of the UNICEF High Performance Tents. *ICED 23: 'Design in a Complex World'*

REPRESENTATION

QUOTE

Could the city be an analogy of the human brain?

LECTURE REFERENCE

Franco Farinelli in 15.10.18 *Che cos'è una città?*, Knowing the Urban Beyond Cartographic Representation, Sala Caccia, Castello del Valentino, Turin

PLANETARISM

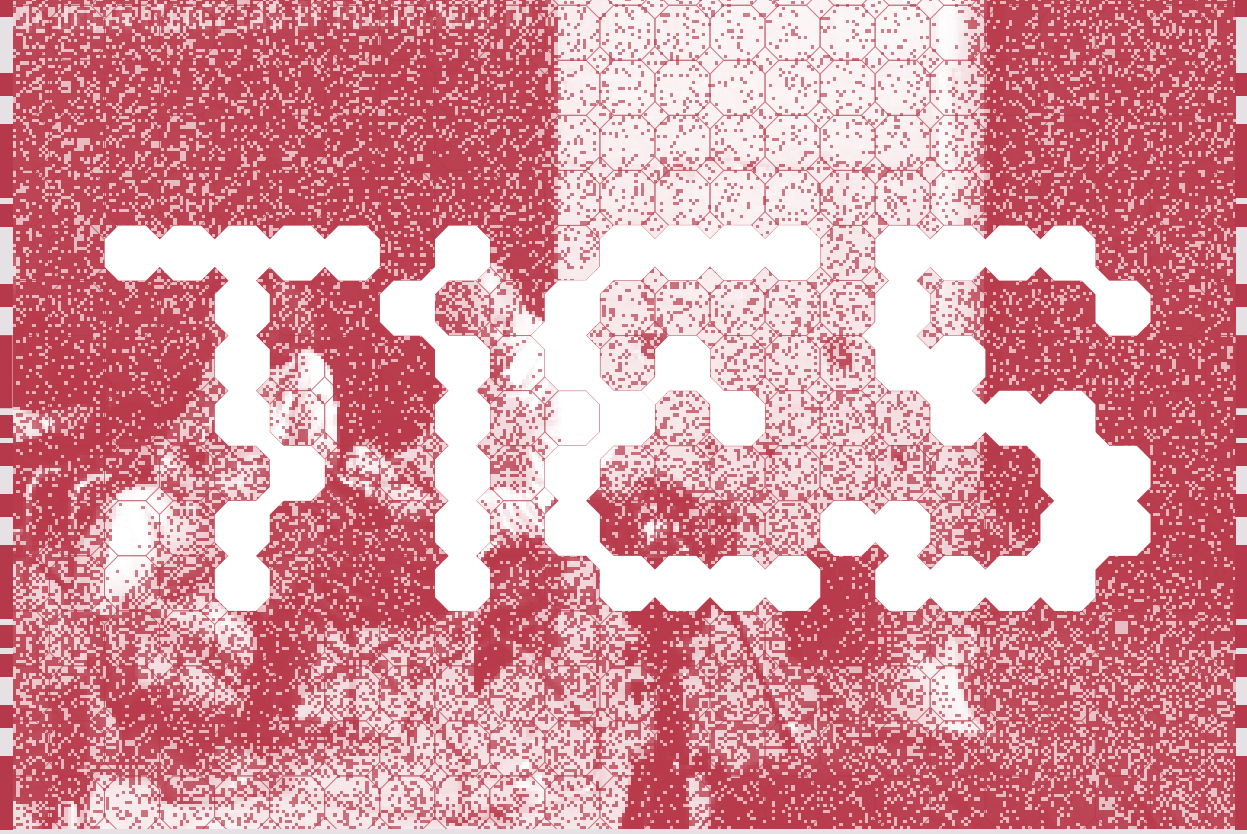
QUOTE

The advent of airborne spatiality is the beginning of a second global phase, which through aviation, electromagnetic waves, satellite telecommunication systems, space travel and information technology has shaped a new space and a new spatial consciousness.

LECTURE REFERENCE

Marco Vegetti, in 08.02.2019, *L'invenzione del globo*, Knowing the urban beyond cartographic representation, Sala Caccia, Castello del Valentino, Turin

60 hours of frontal lessons, 224 hours of workshops,98 hours of lectures, 14.700 hours of exhibitions.



TEACHING 320

This section contains the description of different PhD and master courses.

SCHOOLS 334

The summer and winter schools involved master students from all over the world.

LECTURE SERIES 346

Each year *FULL* promoted at least one series of lectures as part of its public program.

EXHIBITIONS 370

FULL hosted several exhibitions in its lab and in other locations in Turin.

TEACHING

How to structure a PhD course led by an architect,an engineer, and a geographer?

Socio-technical Urbanization

TYPE
Teaching

YEAR
2018

TEACHING STAFF
Francesca Governa, Luigi Buzzacchi

The aim of the course is to present the socio-technical approach to urbanization processes, with special attention on socio-economic issues and inequalities in the urban realm which contribute to marginalization. The course builds on the activities of the new interdepartmental research centre F*UL*L, which aims to provide knowledge in the field of urban studies, to design socio-technical innovation scenarios for relevant global urban challenges and to support local decision-making processes. It is also related to the "Socio-technical design for transformative urbanism" course (DASP PhD programme).

The course focused on urban inequalities as a lens to look at socio-technical problems.

The course can be divided into four parts.

PART 1 and **3** provides the student with a basic understanding of the prevailing disciplinary approaches. **PART 2** and **4** are organized as discussions and seminars of the arguments proposed in the lectures of **PART 1** and **3** respectively.

In particular, **PART 1** is devoted to general approaches to the study of the city, including planetary urbanization studies and post-colonial approaches together with microeconomic fundaments of urban development. **PART 2** deals with a relevant specific theme at the center of academic discussion: difference, inequality and marginality

Socio-Technical Design For Transformative Urbanism

TYPE
Teaching

YEAR
2-24 June 2018 (Turin, Rotterdam, Brussels)

TEACHING STAFF
Francesca Frassoldati,
Matteo Robiglio

The aim of this DASP course is to discuss action-research in the design field as the means to reframe socio-technical aspects of urban challenges.

As a practice, design activity delves into man-made things (defined in literature as what characterizes material culture and/or the artificial world). The designer is concerned with both how things are and how they ought to be in order to attain goals and to function. Therefore, being related to the social definition of goals and functioning, design problems are recognised as ill-defined, ill-structured, or "wicked". In this light, design has been conceptualized also as a specific approach to reasoning: "Design has its own distinct 'things to know, ways of knowing them, and ways of finding out about them'" and places at its core the language of "modelling". We adopt here the definition of research-by-design as the actions of defining, redefining, and challenging the problem-as-given mindset – from the early stages of problem setting throughout the transformative attitude by which problems are addressed, up to the test and evaluation of possible applications.

The course took part mainly during a field trip in Rotterdam and Brussels.

The course builds on the activities of F*UL*L-Future *Urban Legacy* Lab., based at PoliTo, that aims at providing knowledge and action in the field of relevant global urban challenges and support to local decision-making processes. The ambition is for F*UL*L to establish a model of research practice that can be transferred to advanced education at PoliTo.

In line with latter objective, we would like to provide PhD candidates who are attending this course with the possibility to reflect on their own research work through the lenses of "research-by-design". Is there a conceptualization step in which "designerly ways of thinking" have changed your research issue? The topic you are studying is not relevant in itself (whether the research work regards a building, an urban site or an abstract notion...). We encourage you to think about your research as being part of a polytechnic environment in which many application of "research-by-design" are possible.

We suggest three alternative angles to start with (you are invited to develop ONE of them based on your interests):

A) BY DESIGN, you confirm, clarify, or reframe a given problem;
B) BY DESIGN, you change the matter of interest (this applies to research works that aim at having an impact on their matter of study);
C) STUDYING A SPECIFIC ISSUE, you reflect upon others' design action.

"From the course summary:
We are looking for interesting applications in diverse contexts and from different domains to drive discussions and test well-established theoretical frames of reference.
Please submit an abstract (less than 500 words) or two slides with a description of the design application you would like to share by 2 June. Please include the following information in your submission:

- when did you start thinking in terms of design in your research work?
- how do you characterise yourself: as a producer or user of design applications?

– what kind of challenges did you have to overcome?

- what triggered your design activity (i.e. describing,controlling, verifying...)?

- how did you check whether the way you use design in research achieve sound results?

Materials will be discussed in the first introductory meeting on 7 June. Authors will be invited to reconsider their initial submission at the end of the itinerant workshop organised from 22 to 24 June."

Hybrid Factory / Hybrid City

Economic and spatial integration of industry in the city

TYPE
Teaching

YEAR
2019

TEACHING STAFF
Professor:
Nina Rappaport

Teaching assistant:
Caterina Montipò

Throughout history cities have been magnets for entrepreneurs and inventors, where workers are plentiful, energy resources often close at hand, transit options fluid, consumers nearby, and marketplaces abundant. This synergy between resources, suppliers, and consumers is symbiotic, reinforcing urban dynamism and energy,

Nina Rappaport was invited as visiting professor for one year at Politecnico, bringing her deep knowledge on urban hybrids and production spaces.

and capable of being harnessed for worker well-being and equity. Today, industrial production is being redefined for advanced manufacturing, robotics, lean production, and just-in-time manufacturing impact the design of both the factory and the urban industrial landscape; to keep up, the policies that shape our urban landscape need to change. Consistently, and perhaps paradoxically to some, economies contain two types of industry simultaneously: the mass production of global supply chains populated by low-skilled workers and with increasing automation, alongside the small-batch production of highly skilled engineers and technology operators, craftspeople, and entrepreneurs.

Course description

The latter new manufacturing is cleaner, smaller, and lighter, and its urban footprint shares little in common with the more widespread form of industry, allowing it to inhabit dense urban manufacturing sites. But zoning laws, building codes, and economic development policies designed to segregate dirty manufacturing from the rest of the city have not kept up with these technological revolutions. If we can focus on ways to return manufacturing to cities through land use and economic policies, a potential exists to redefine the urban factory at a crucial time in history when rapid technological advances are catalyzing cross-fertilization, tech innovation, and job development. This opportunity demands new architectural and urban design typologies that activate the open and cosmopolitan city with

visual textures and activity. Land use and economic initiatives that guide the future of the new economy's productive city must influence the provision of flexible industrial space that is able to adapt—free of onerous and outdated regulations—to meet the challenges of financial and spatial pressures. While the "diverse city" is an oft-lauded part of today's zeitgeist, it is a fragile ideal that is often lost because politicians too often tilt the balance to the highest bidder; this has led to today's urban homogeneity. The research here can inspire policies that connect public to private, federal to state, city to neighborhood, and community to household and have the potential to provide ample space and incentives for manufacturing in cities, ultimately providing places for jobs providing sustainable livelihoods. With Vertical Urban Factory, a project by Nina Rappaport that includes a book, exhibition, films, and consulting to encourage the return of manufacturing to cities, the recognition of a new form has made policy makers, manufacturers, and designers aware of the importance of maintaining space for making things. With the continuous need for blue collar low skilled jobs and the change in manufacturing from large to small, polluting to clean, and clustered to dispersed there is a potential to encourage mixed-use spaces at the scale of the diwstrict to that of the building and thus make things everywhere.

Expected Learning Outcomes

In this course, seminar students will use their own areas of expertise and geographies of research to understand the factory and the urban industrial landscape as a result of zoning and building codes, production and logistics management, access to infrastructures, financing and economic issues, design and space layouts. These different topics will be observed from the perspective of workers, owners, and goods with the purpose of developing policy ideas and recommendations that support the job creation and mixed-use environments through the reintegration of production as a ingredient of the urban economy.

Expected Results

The final result will be compiled into a thematic book that compares similar issues and perspectives on urban industrial dynamics across different geographies, industrial sectors, scales, and areas of expertise to propose provocative policies.

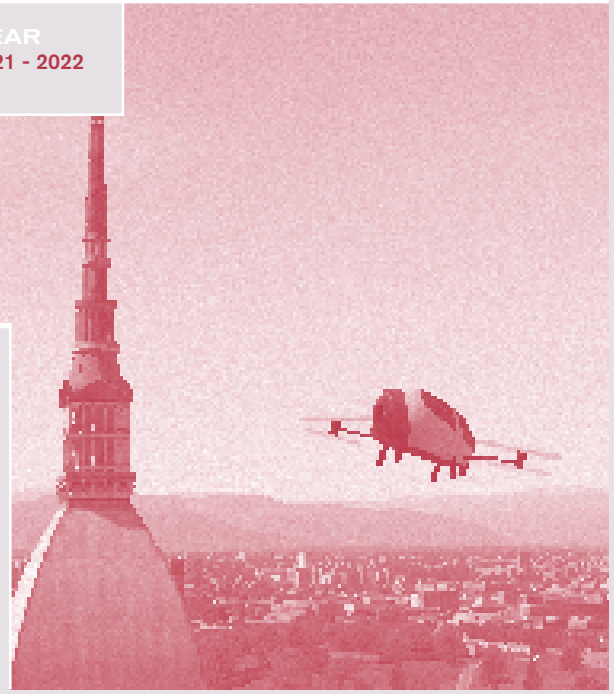
Course structure

The class will involve lectures, workshops, fieldwork, and research on-site and off that incorporate economic geography, industrial technology, spatial planning and design, and future scenario planning. Case studies can be based in Africa, China, Europe with Torino as a local touchstone. Visiting lectures will supplement the regular teaching.

Metrosky

TYPE
Teaching

YEAR
2021 - 2022



TEAM
Matteo Robiglio,
Laura Martini,
Giulia Sammartano,
Matteo Gianotti,
Matteo Umberto Poli (PoliMi),
Paolo Pari (Digisky),
Veronica Spadoni (Digisky),
Marco Becucci
(Pininfarina Spa),
Giovanni de Niederhäusern
(Pininfarina Spa)

The project aims to strengthen, in the cities of the future, the relevance of intelligent urban mobility and its social fallouts, in relationship with metropolitan territories and local aerospace industries. In fact, the experience of Italy and Turin in aerospace-related industries and systems is well-recognized as a national and regional asset.
The innovative form of fast transportation by electric Vertical Take-Off and Landing aircrafts (eVTOL) will lead to the radical renovation of airspace in the near future and will require new urban configuration assets, in coordination with space agencies and regulatory entities. This is now happening at international level.

In 2021 FULL was asked to participate in a feasibility research for vertical urban aircrafts for individual mobility in the city of Torino. The research started with the following course at Alta Scuola Politecnica, the joint excellence master programme of Politecnico di Torino and Politecnico di Milano.

In this context, the METROSKY project focuses on the development of the Metropolitan Air Mobility Infrastructure (MAM) meta-project for people and goods transport, in this innovative system conception based globally on eVTOL aircraft, vertiport distribution as urban furniture, and the overall control and management system. The infrastructure devices consist of aircraft and landing/charging buildings hubs (vertiports inserted in the urban context) for short and medium range connection at metropolitan-scale mobility.
The proposal can investigate user-oriented demands in the human dimension of transportation, and boost targeted business on infrastructure design (aircraft and vertiport hubs). The goal is to develop a feasibility study and prototype of the MAM vertiport component. The technology-driven approach proposed to the Team aims to develop a proposal to enable mobility infrastructure systems, involving local stakeholders in terms of awareness and impact on the territory. In fact, the Città Metropolitana Torino (CMTo) area and local communities, as beneficiaries of the project, are involved in the design proposal.

SCHOOLS

30 students, 20 professors,
26 collaborators,
from 8 different universities.

TRANS–USE

TRANS-forming industrial legacy. Spatial and economic models of re-USE

DATES
10-24 July 2019

TYPE
School

TEAM

Scientific committee:
Alberto Bologna, Michele Bonino, Francesca Frassoldati, Liu Jian, Matteo Robiglio

Teaching:
Alberto Bologna, Luigi Buzzacchi, Uri Cohen, Yaniv Edri, Francesca Frassoldati, Liu Jian, Ruth Liberty-Shalev, Matteo Robiglio, Tiziana, Tosco, Song Yehao, Zheng Xiaodi

Coordinators:
Giorgia Cestaro, Laura Martini, Caterina Montipò, Maria Paola Repellino

Tutors:
Federico Accorsi, Deng Huishu, Giorgia Greco, Ruth Leonov, Marta Mancini, Matteo Migliaccio, Lidia Preti

Participant universities:
Politecnico di Torino, Technion Israel Institute of Technology– Faculty of Architecture and Town planning and Tsinghua University – School of Architecture, School of economics and management

FRAMEWORK
Bando summer schools 2019 supported by Politecnico di Torino

The summer school aims to share, in an international comparative framework, innovative approaches and tools for the synergistic design of financial instruments, environmental recovery procedures and urban master planning operating in complex market conditions on large-scale obsolete industrial sites that embody controversial legacies. Participants will focus on the analysis of case studies of urban industrial legacy and urban production transformation. They will be asked to develop a toolkit (in terms of architecture, urban planning, landscape design, management, environmental and economic sustainability) and present it publicly at the end of the summer school.

Case study

Comparative overview of international case studies and focus on Thyssenkrupp Torino, Corso Margherita 400, as a test-case to re-discuss and refine working and investigation methods.

Methodology

The transformation and re-signification of a physical place in the city imposes interdisciplinary approaches and scientific investigation tools. The identification of economic models of reuse linked to the redevelopment project of industrial buildings / areas that are in search of a new identity need to take into consideration the contributions given by architectural and urban composition, environmental engineering, landscape architecture, industrial and information engineering, economic-political geography, urban economy and engineering for industrial production, all at the same time.

The project is built not only on an interdisciplinary ground but involves also an international team of scholars. The possibility of hosting interventions, contributions and criticisms of projects carried out jointly by professors of foreign Universities invited by PoliTo.
The research project will be organized in 4 steps:

1. PRELIMINARY RESEARCH and overview of international best practices of economic and spatial models of industrial legacy re-use.

2. TRANS-USE: TRANS-FORMING INDUSTRIAL LEGACY. Spatial and economic models of re-USE. A joint interdisciplinary and international summer school between Politecnico di Torino and Tsinghua University of Beijing, School of Architecture, School of economics and management, held in Turin from 10th to 24th of July 2019.
Teaching activities will test "in the field" and discuss the various theoretical frameworks, methodological and design approaches. The subjects of investigation of the summer school will not only represent a topic for interdisciplinary analysis and design activity, but they will serve as a test-case to re-discuss and refine working and investigation methods on the Europe-China axis.

1. STUDENTS WILL FOCUS ON THE ANALYSIS OF CASE STUDIES of urban industrial legacy and urban production transformation. They will be asked to develop different strategies, scenarios and visions that will be collected and exhibited in a public event at the end of the school.

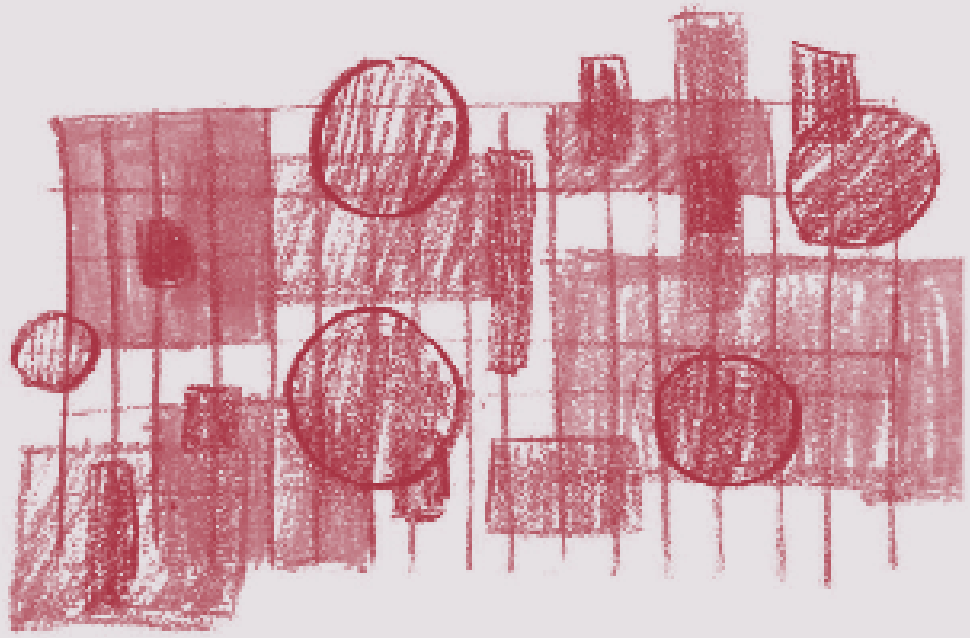
2. THE FINAL OUTPUT OF THE SUMMER SCHOOL WILL BE A TOOLKIT (in organizational, architectural, urban, construction, environmental and economic sustainability terms) which develops and improves an analytical approach through "research by design" method, concerning transformations at architectural and urban scales and the question of industrial legacy.

Outputs

For each step of the research project the outputs will be:

1. An Atlas of case studies of industrial legacies at the global scale;
2. Open seminars;
3. A Report of different scenarios: booklet;
4. A toolkit book: it will transform this applied experience into an opportunity for scientific research, further developing the "research by design" method, explored during the summer school. All these outputs will contribute as a preliminary activity to support a future design competition on the specific case study.

Students from all over the world gathered in Turin to reflect on the issue of industrial reuse.



PARTICIPANTS

Adriano Aimar, Politecnico di Torino

Farzaneh Aliakbari, Politecnico di Torino

Yingnan Chu, Tsinghua University

Mekael Youssef Emad Farid, Politecnico di Torino

Fabian Hilla Fella, Technion Israel Institute of Technology

Tamar Fradkin, Technion Israel Institute of Technology

Antonia Hassin Ella, Technion Israel Institute of Technology

Zhihao Huang, Tsinghua University

Dmytro Khyzhniak, University of Florence

Luca Lagorio, Politecnico di Torino

Zhengxiang Li, Tsinghua University

Stefano Mondozzi, Politecnico di Torino

Niharika Niharika, Politecnico di Torino

Azadeh Nikmanesh Elahi, Politecnico di Torino

Alina-Roxana Salahoru, Politecnico di Torino

Sharon Ester Sarfati, Technion Israel Institute of Technology

Yuyan Xia, Tsinghua University

Jacky Yeh, Tsinghua University

INDUSTRIAL REMIX

Framing the role of manufacturing in city making

DATE
21-30 January 2020

TYPE
School

TEAM

Scientific committee
Eran Ben-Joseph; Mary Anne Ocampo;
Matteo Robiglio; Francesca Frassoldati

***FULL* team:**
Elena Guidetti; Emanuele Protti; Simone Parola; Samuele Sciarretta; Riccardo Ronzani; Lucia Miglietta; Luca Galleano; Laura Martini; Maicol Negrello; Marianna Nigra; Lucia Baima; Giulia Sammartano; Emilio Abbate

Organized by:
MIT International Science and Technology Initiatives (MISTI Italy, MITOR Project);
MIT Department of Urban Studies and Planning;
Politecnico di Torino, Future Urban Legacy Lab;
Municipality of Torino

Evolution is the only certainty of the industry. The factory system continued to change its spatial, technological and social attitude during the last two centuries from the domestic and workshops system, an essential part of everyday city life, to be located in the outskirts, detached from the dens fabric of the city and connected to global logistics chains. Today, IoT technologies, emerging production process and a new attitude of "learning by doing" are bringing out the potential of manufacturing and production as an essential part of cities economy and life.

Turin has had an emblematic role in the late twentieth-century Italian industrial history. Its history is representative of the Fordist industrial model in Italy. Turin was Fiat's one-company-town, the "automobile factory city", and one of the vertices - with Genoa and Milan - of the industrial triangle of the North-West. Starting from the 80s, with the beginning of the deindustrialization processes, Turin tried to change its development model by disconnecting itself from its crisis-marked industrial legacy. For more than twenty years, the industrial image of the city has been denied and the urban agenda has focused more on diversifying the local economic base starting from tourism, major events, university, and research centers. In the years following the 2008 crisis though, that post-industrial development model gradually began to wear itself out and the local manufacturing system could emerge again with a strong role - although still minor - and as an important actor in the urban ecosystem.

The bibliography selected here expresses this tension between the two models, Fordist and post-industrial, and the impact they have had on the urban fabric of the city. Places that played a fundamental role in the twentieth-century manufacturing activities are now marginal and forgotten, or transformed and redefined in order to adapt to recent changes.

POLITECNICO DI TORINO PARTICIPANTS

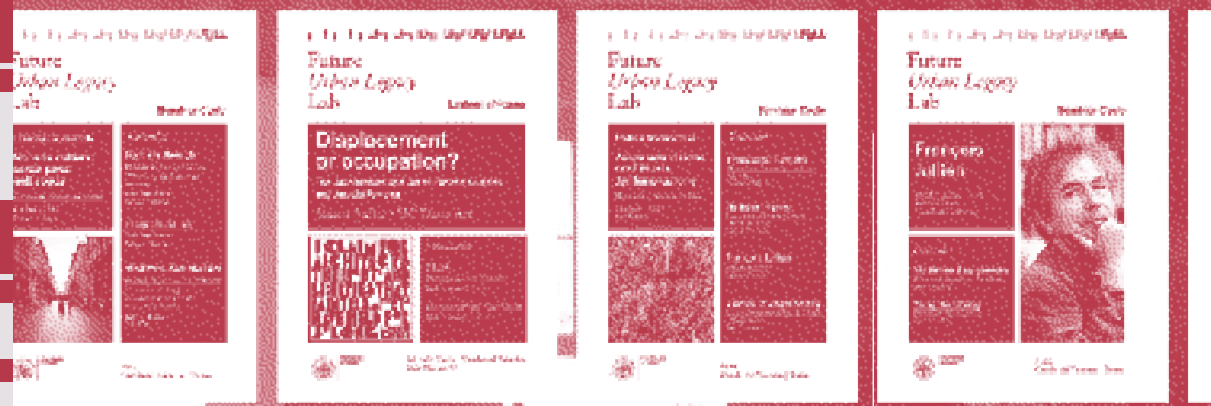
Deniz Gemici
Daphne Fabbri
Ola Wykrot
Mateusz Ryjak
Ziyi Nie
Sahar Naz Taleb Nezhad
Alp Arda
Aleksandra Wykrota
Afsaneh Tayebi
Heqi Li
Andrea Orellana

GRADUATE STUDENTS OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT):

Fiorella Belli
Bahij Chancey
Sofia Gulaid
Lamice Halaby
Amber Kim
Laura Kim
Allison Lee
Angeles Martinez
Maria Lucia Morelli
Mora Orensanz
Ziyu Ran
Tanvi Sharma
Prathito Wisambodhi

LECTURE SERIES

How to group different lectures under a common theme to stimulate a broader debate?



African Lectures

TYPE
Lecture series

YEAR
2018

African Lectures focused on the role of urbanization and new technologies in African cities and the wider geopolitical context.

05.03.18
Displacement or Occupation?
The Architecture and Art of Pancho Guedes and Angela Ferreira

Lecturer: Matteo Robiglio,
Moderator: Simon Sadler
Discussant: Pierre Alain Croset

Sala caccia, Castello del Valentino, Turin

17.04.18
Dalla città africana all'Africa delle città
Presentation of the issue n 81 of Territorio

Moderator: Matteo Robiglio
Lecturers: Cecilia Pennacini, Francesca De Filippi, Miriam Bodino, Arturo Pavani

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

20.06.18
Innovation and startups in African cities

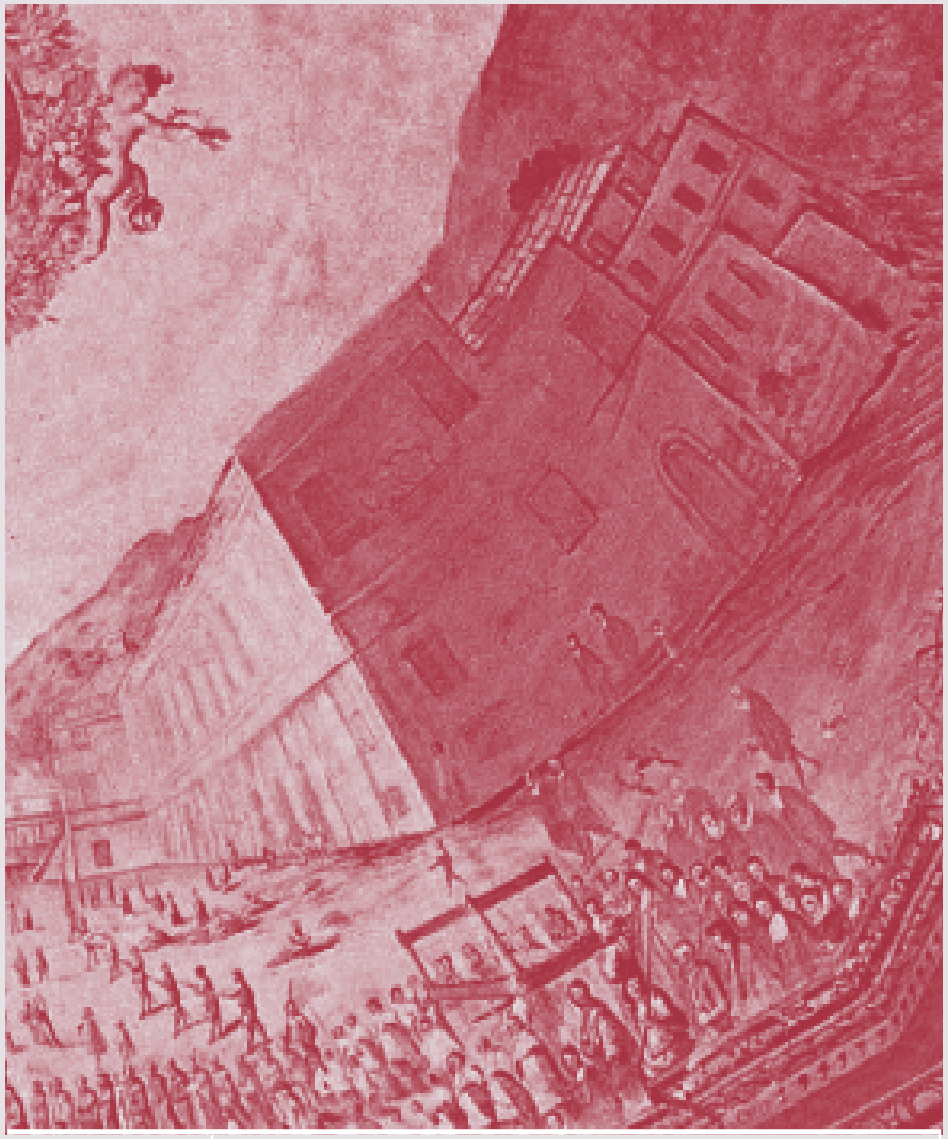
Moderator: Matteo Robiglio

Lecturers: Martino Ghielmi

Marc Lepage UNDP
Paolo Cascone
Discussant: Luigi Buzzacchi

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

Urban Legacy Seminar Series



TYPE
Lecture series

YEAR
2018 - 2019

Different guests from different fields exploring the urban legacy meaning and potential

The Urban Legacy Seminar Series, curated by the architectural critic and historian Carlo Olmo, focused on the contradictions and issues gravitating around contemporary urban challenges such as heritage, preservation, culture and technology. It is a cycle of seminars that explores the meaning and implications of F*UL*L's keywords.The debate aims to produce a theoretical basis that reformulates the concept of urban legacy by creating a lexicon that supports the concept.The common places of the twentieth century no longer exist, and the narratives linked to these places are no longer sufficient to describe what remains of them. At the end of the last century we went from keywords based on the history of industry to keywords of urban nature founded on 'absence'. Emptiness becomes heritage, and buildings or fragments of buildings come fully into the process of becoming legacy, highlighting the problem of the continuous reconstruction of a repressed memory. The challenge is to reconstruct a common-basis vocabulary with the necessary historical depth to redefine the legacy of the industrial city. Today, this city needs the foundations of its own legitimacy, its own borders, and its actors and rhetoric.

11.06.18
Le legacy urbane tra patrimonio, diritti e innovazione

Lecturer: Carlo Olmo,
Discussant: Matteo Robiglio

Sala d'Onore, Castello del Valentino, Turin

21.06.18
Verso una visione conflittuale della innovazione

Lecturer: Andrea Bonaccorsi
Discussant: Giuseppe Scellato

Sala Caccia, Castello del Valentino, Turin

06.07.18
Noi e la cultura come i pesci nell'acquae

Lecturer: Francesco Remotti
Discussant: Francesca Governa

Salone d'Onore, Castello del Valentino, Turin

14.09.18
L'extension du domaine du patrimoine

Lecturer: Nathalie Heinich
Discussant: Edoardo Piccoli

Salone degli Svizzeri, Palazzo Chiablese, Turin

28.09.18
Comment être efficace? Entre modélisation et maturation
(entre pensée européenne et pensée chinoise)

Lecturer: François Jullien

Sala d'Onore, Castello del Valentino, Turin

19.10.18
Architettura e Ingegneria in riferimento ai diritti e alle libertà fondamentali

Lecturer: Vladimiro Zagrebelsko
Discussant: Juan Carlos De Martin

Sala Luigi Ciminiera, DAUIN, Turin

26.10.18
South by Southeast

Lecturer: Yung Ho Chang
Discussant: Michele Bonino

Castello del Valentino, Turin

14.12.18
La metamorfosi delle costruzioni e una nuova utopia urbana

Lecturer: Lorenzo Bellicini
Discussant: Isabella Lami

Sala dello Zodiaco, Castello del Valentino, Turin

11.01.19
Patrimoni (o) & dissipazione

Lecturer: Stefano Musso
Discussant: Francesca Frassoldati

Sala Caccia, Castello del Valentino, Turin

Knowing the urban beyond cartographic representation

TYPE	YEAR
Lecture series	2018 – 2019

A cycle focused on urban geography and its conceptual framework.

Knowing the Urban Beyond Cartographic Representation tackled the established disciplinary boundaries of geography under the impulses of the digital realm and contemporary culture.

05.10.18
Metageographies of Urbanization?

Lecturer: Nikos Katsikis
Discussant: Alberto Valz Gris

FULL,Toolbox, Via Agostino da Montefeltro 2, Turin

08.02.19
L'invenzione del globo?

Lecturer: Matteo Vegetti
Discussant: Carlo Olmo

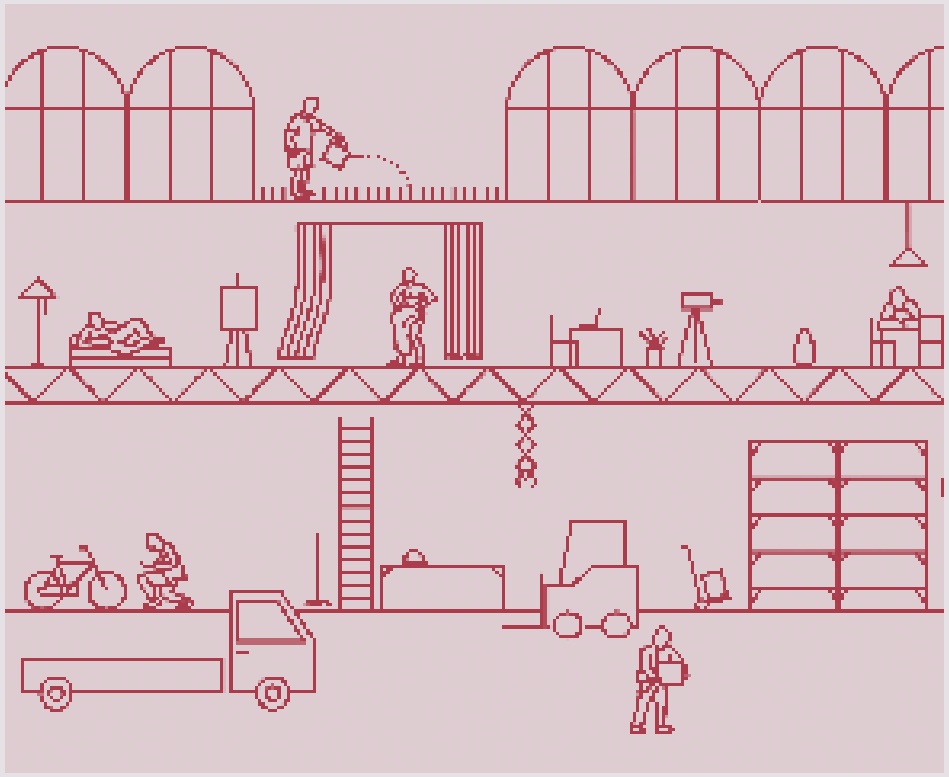
Sala Caccia, Castello del Valentino, Turin

15.10.18
Che cos'è una città?

Lecturer: Franco Farinelli
Discussant: Francesca Governa

Sala Caccia, Castello del Valentino, Turin

Hybrid Factory / Hybrid City Symposiumn



YEAR	TYPE
2020	International symposium

This gathering of architects and urbanists will address questions such as how can manufacturing be combined with other uses in cities, what can the hybrid factory do for the future of industrious, innovative, and inclusive cities, and where do zoning, building, and local regulations enhance or hinder opportunities?

Organized by prof. Nina Rappaport, the Symposium saw the participation of a dozen of well-known practitioners and scholars.

14.02.20

Hybrid Factory Hybrid City Symposium

The Architecture and Art of Pancho Guedes and Angela Ferreira

Lecturer: Nina Rappaport Bram Arets (*TRANS Architecture*), Frank Barkow (*Barkow Leibinger Architects*), Andrea Caputo (*Andrea Caputo Architecture*), Giovanna Fossa (*Politecnico di Milano*), Nicholas Gilliland (*Tolila + Gilliland Atelier*), Djamel Klouche (*l'AUC*), Dieter Leyssen (*51N4E*), Nicola Russi (*Laboratorio Permanente*), Markus Schaefer (*Hosoya Schaefer Architects*), Lars Scharnholz (*INIK*), Giulia Setti (*Politecnico di Milano*), Ward Verbakel (*Plusoffice Architects*), Ianira Vassallo (*Politecnico di Torino*), Juan Lucas Young (*Sauerbruch Hutton*)

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

F*UL*L Seminar Series

22 lectures divided in 4 cycles with international guests.

At the start of 2019 the F*UL*L board decided to form an organising committee to launch a series of international seminars. The committee is made up of young researchers and PhD students belonging to the Centre who have therefore had the chance to expand their networks, entering into contact with university lecturers and researchers from all over the world.
The first Spring Seminar Series also involved the young researchers of the Centre using the Colloquium format. An hour-long seminar consisting of a 10-minute presentation followed by a 50-minute discussion. The colloquium always focus on texts that have already been published or are awaiting publication which are sent to all participants in advance so they can study them and formulate questions.
Due to the pandemic, in 2020 the Seminar Series was held in the F*UL*L virtual conference room. To make the materials accessible to as wide an audience as possible, the seminars were later transformed into Podcasts which were made available on the main platforms.

YEAR
2019

TYPE
Lecture Series

05.02.19
Architecture of Millennial Development

Lecturer: Andrea Pollio

FUL, Toolbox, Via Agostino da Montefeltro 2, Turin

12-15.05.19
F*UL*L invited to Technion Haifa

12.05 Why Did We Go Interdisciplinary, And How

12.05 Hybrid Tools For The Future Of Our Past

14.05 Mixing Disciplines And Skills In Fundamental And Applied Research At F*UL*L (Workshop)

Lecturer: Matteo Robiglio

Gallery, Faculty of Architecture and Town Planning, Haifa

22.05.19

Re-housing. La casa come dispositivo di integrazionea

All'interno della conferenza: Riqualificare L'esistente A Partire Dall'alloggio

Lecturer: Nicola Russi
Discussant: Marta Averna, Paolo Bozzuto, Giovanni Tommaso Muzio, Gennaro Postiglione, Roberto Rizzi

Off Campus San Siro, Via Gigante, Milan

05.06.19

Adaptive remediation supporting integrated design of brownfield re-use

Lecturers: Matteo Robiglio, Tiziana Tosco
Moderator: Rajandrea Sethi

Aula Bibolini, DIATI, Politecnico di Torino, Turin

05.02.19

UNESCO and the Making of Urban Cultures

Lecturer: Deborah Stevenson
Discussant: Alberto Vanolo

***FULL*, Toolbox, Via Agostino da Montefeltro 2, Turin**

12-15.05.19

Rethinking urban codes for production and innovation

Lecturer: Eran Ben-Joseph
Moderators: Nina Rappaport, Matteo Robiglio

***FULL*, Toolbox, Via Agostino da Montefeltro 2, Turin**

FULL Seminar Series | Spring – Fall 2020

TYPE
Seminar series

YEAR
2020

Spring 2020

12.02.20
Platform labour in urban spaces

Lecturers: Niccolò Cuppini
Discussant: Alberto Valz Gris

Online

31.03.20
Oltre la ferrovia. Tracce di modernità e urbanizzazione lungo le Chemin de Fer Djibouto- Éthiopien

Lecturers: Matteo Gianotti
Discussant: Andrea Pollio

Online

18.05.20
Assembling the Autonomous City: Spatial Politics and the Legacy of Urban Squatting

Lecturers: Alexander Vasudevan
Discussant: Laura Martini

Online

23.04.20
New domestic rentscape. A critical insight into middle-class housing

Spring Seminar Cycle 2020 (*FULL* Lectures)

Lecturers: Federico Coricelli
Moderator: Chiara Iacovone

Online

22.05.20
The Planetary Experiment: On Artificial Intelligence, Habitat, and Future of Life

Lecturers: Orit Halpern
Discussant: Fabio Iapaolo

Online

18.06.20
Net-zero energy renovations

Lecturers: Margot Pellegrino
Discussant: Giulia Sammartano

Online

11.06.20
Mines of zero-emission city

Spring Seminar Cycle 2020

Lecturers: Alberto Valz Gris
Discussant: Chiara Iacovone

Online

Fall 2020

07.10.20
Sustainable innovation potential in the Re-use of buildings

Lecturers: Elena Guidetti, Marianna Nigra

FULL, Toolbox, Via Agostino da Montefeltro 2, Torino

15.11.20
Femtech

Technology and Mutations on women's body
all'interno di: Biennale Tecnologia - Mutazioni per un Futuro Sostenibile

Lecturer: Tiziana Terranova, Roberta Tassi

Moderator: Laura Martini

Online

20.11.20
Building nostalgia, reinventing imperial legacies: Divergent engagements with Ottoman heritage in Istanbul & Beiruti

Lecturers: Ryan Centner

***FULL*, Toolbox, Via Agostino da Montefeltro 2, Turin**

20.11.20
Leggendo tra corpi

Lecturers: Cristina Bianchetti, Mirko Zardini

Online

FULL Seminar Series | Spring 2021

YEAR
2021

TYPE
Seminar series

This series brought together four leading researchers to speak about today's most experimental approaches in the field of preservation theory, spanning from critical heritage studies, post-preservation, entropy, and non-traditional approaches to material conservation and *counterpreservation*.

20.05.21
Counterpreservation
Lecturers: Daniela Sandler
Online

10.06.21
Curating Decay in the Living Room
Lecturer: Caitlin DeSilvey & Martin Grünfeld
Online

17.06.21
Embracing Change
Lecturers: Cornelius Holtorfa
Online

01.07.21
The Future(s) of Unfinished Ruins
Lecturer: Pablo Arboleda
Online

FULL Lectures

Lectures at *FULL* represented the core moments of exchange and debate. The issues and subjects discussed pertained to the most diverse cultural domains.

TYPE
Lectures

YEAR
2017 - 2021

2017

14.01.17
L'economia fondamentale a due anni dal manifesto

Lecturers: Angelo Salento

Sala Zodiaco, Castello del Valentino, Turin

15.01.17
Esplorazioni nei territori della produzione

Seminario interno

Castello del Valentino, Turin

31.10.17
Cittadella di Alessandria. Scenari di riuso adattivo.

Lecturers: Matteo Robiglio

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

14.11.17
Retail Industry Observatory: The Case Of Turin

Lecturer: Matteo Robiglio

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

12.12.17
Intelligenza artificiale e città

Lecturers: Juan Carlos De Martin Centro Nexa

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

24.11.17
Global and Regional Water and Food Security Challenges

Lecturer: Noam Weisbrod

DIATI, Politecnico di Torino, Turin

14.01.17
New perspectives of integration

Rethinking an italian Housing

Lecturers: Matteo Robiglio, Nicola Russi, Federico Coricelli

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

2018

12.02.18
Vertical Urban Factory

Lecturer: Nina Rappaport

Aula Magna, Lingotto, Turin

14.01.17
Deep learning: Architettura Urbanistica e Beni Culturali

Lecturers: Prof. Roberto D'Autilia

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

07.12.18
The Building

Lecturers: Jose Araguez
Discussant: Alessandro Armando, Michela Rosso, Nicola Russi

Sala Caccia, Castello del Valentino, Turin

18.12.18
Urban Digital Commons and The Future of Cities

10°Nexa conference
Lecturer: Nexa Center, FULL

DAUIN, Politecnico di Torino, Turin

2019

29.01.19
Field Notes

Lecturer: Alberto Valz Gris, Matteo Gianotti

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

04.07.19
Costruire una fortezza di pianura nel secolo dei Lumi

Materiali, tecniche, teorie, negli edifici "alla prova" della Cittadella di Alessandria

Lecturers: Edoardo Piccoli, Cesare Tocci
Discusant: Luisa Papotti

FULL, Toolbox, Via Agostino da Montefeltro 2, Turin

09.07.19
Coping with Crisis in Developmental Urbanization: The Case of Songdo City, South Korea

Lecturers: Francesca Frassoldati
Discusant: Francesca Governa, Andrea Pollio

Sala Caccia, Castello del Valentino, Turin

2021

04.03.21
Airbnb and Cultural Heritage. A Population Game Model for the Expansion of Airbnb in the City of Venice

Lecturer: Sophia Arbara, Roberto D'Autilia

Online

10.03.21
The Home as Factory Examining the Spatial Typology of Micro-Businesses in Western Urban Cities

Lecturers: Angela Loescher Montal

Online

EXHIBITIONS

How can we represent the outputs of research work through an exhibition?

ACTAR Publisher

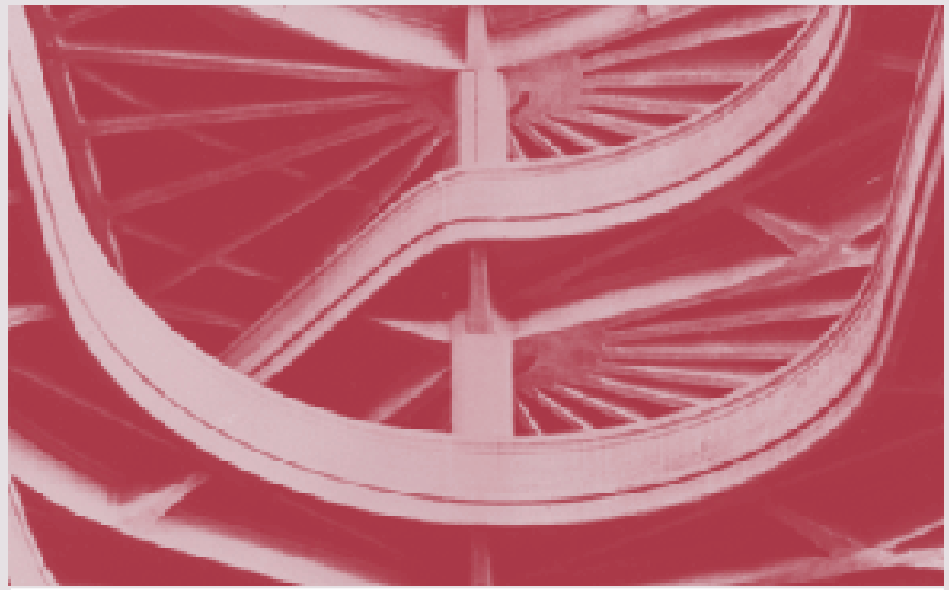
CURATED BY
Ramon Prat,
ACTAR Publisher

PERIOD
13.10.17

EXHIBITION VENUE
F*UL*L, Toolbox,
Via Agostino
da Montefeltro 2, Turin

ACTAR for F*UL*L, work in progress. The event took place during the Graphic Days and hosted at the Interdepartmental Centre the Future *Urban Legacy* Lab . The exhibition gived the opportunity to present, together with Ramon Prat of ACTAR publisher, the work in progress for the construction of F*UL*L's logo and visual identity. The meeting was aimed at the whole community of Politecnico di Torino

Vertical Urban Factory



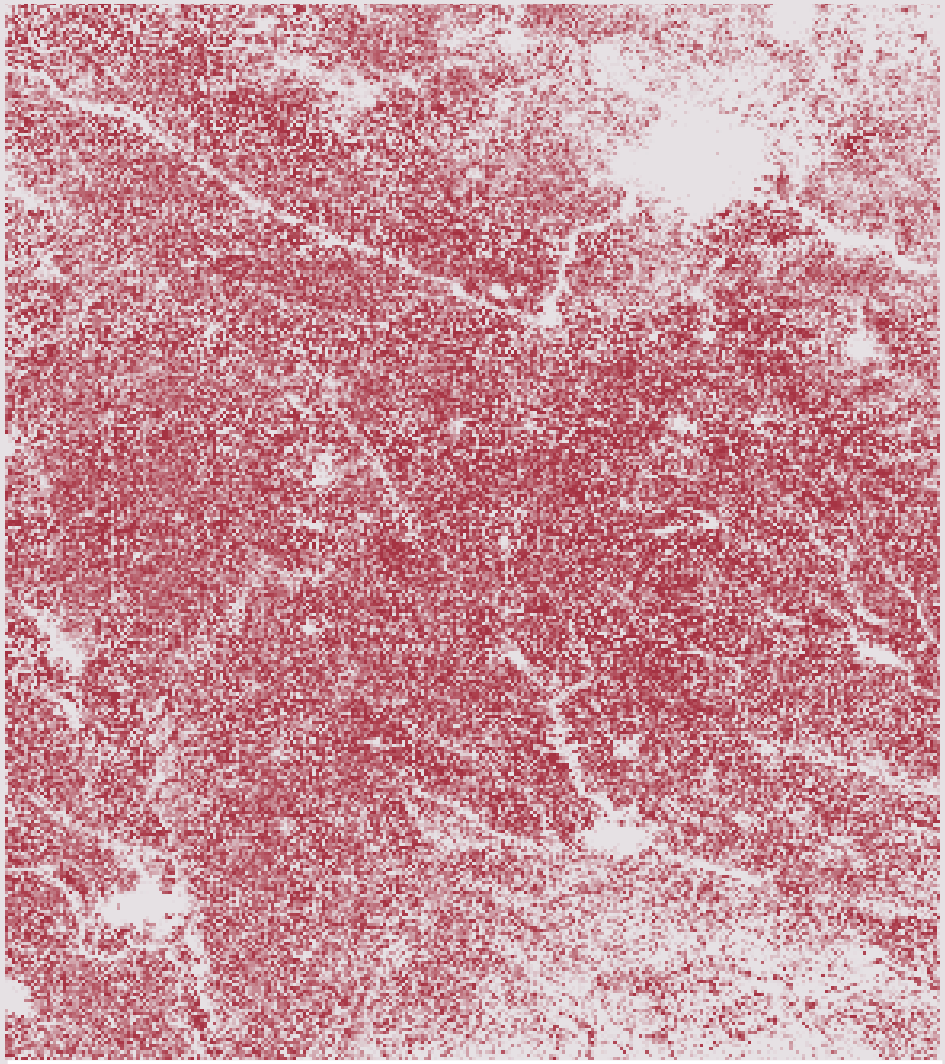
CURATED BY
Nina Rappaport

PERIOD
12.02.18 –
15.03.18

EXHIBITION VENUE
Lingotto, Via Nizza 230, Turin

The exhibition presents innovative methods of architectural design, structural engineering and implementation applied on emblematic industrial buildings since the early twentieth century till today. An appropriate response to the faltering economies of post-industrial nations, this exhibition focuses on two central questions: can we again build factories offering sustainable solutions adapted to the autonomous cities of tomorrow? And at a time when the manufacturing sector is deploying clean processes and producing on a smaller scale, how can the city think to integrate new factories into its fabric?

Metageographies of Urbanization



CURATED BY
Nikos Katsikis

PERIOD
11.10.18
–
14.10.18

EXHIBITION VENUE
F*UL*L, Toolbox,
Via Agostino da
Montefeltro 2, Torino

Nikos Katsikis was invited from Harvard GSD to present his work on cartographic representation through a set of video installations.

Geographies of Ecological Surplus explores urbanization as a process of re-organization of the world ecological value, through a series of visualizations that build upon a critical instrumentalization of global geospatial datasets. Agglomeration zones, although covering no more than 3% of the earth's surface, are directly interconnected through their bio-geographical interdependencies with the transformation of the rest of the 70% of the total land surface currently used. This "other 70%" mostly hosts landscapes of primary production: agricultural, grazing and forestry zones, sites of resource extraction and waste disposal. This project aims to shed light upon these largely invisible "operational landscapes" of planetary urbanization, highlighting their critical role in organizing social and ecological resources. A series of cartographic visualizations offers a macroscopic overview of the operationalization of the planetary terrain through the globalization of primary production, accompanied by two additional series of visualizations focusing on industrialized operations of agriculture and mining across the American continent.

China goes Urban

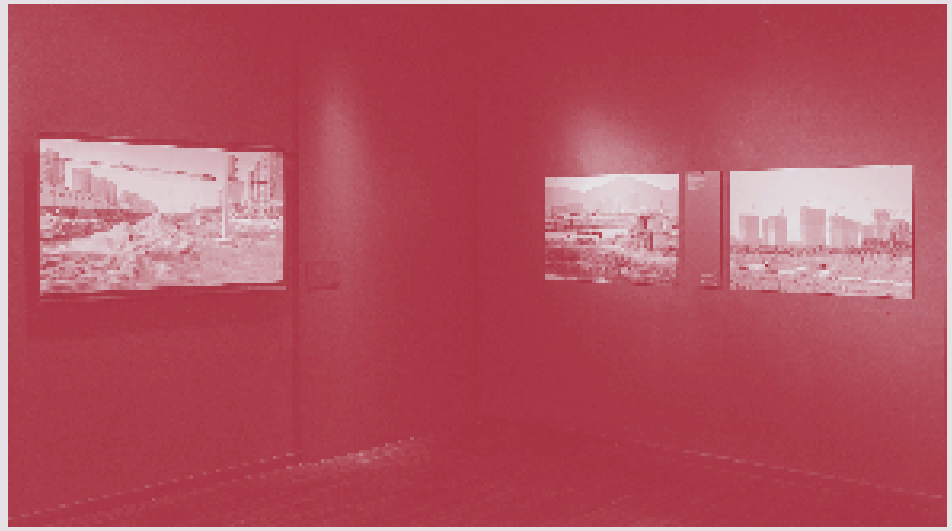
CURATED BY
Michele Bonino, Francesca Governa, Samuele Pellecchia, Francesco Carota, Francesco Merlini, Liu Jian, Angelo Sampieri, Maria Paola Repellino

PERIOD
16.10.20
–
10.10.21

EXHIBITION VENUE
MAO, Museo di Arte Orientale Torino. Via San Domenico 11, Turin

In 1978, 18% of the population in China lived in urban areas. Since then the number of inhabitants in cities has increased approximately 1% per annum and currently makes up 60% of the total population. New infrastructures and settlements have gradually modified the landscape, transformed property rights, swept away administrative boundaries, and “gobbled up” rural spaces and villages.

The rapid, disruptive process of Chinese urbanisation unfolds before our eyes. Understanding it is not easy. Existing categories and models are useless. If we believe Chinese urbanisation to simply be an exaggeration and a flaw, we are effectively ignoring the fact



it constitutes an epochal change, one which redefines roles and relationships not only from a geo-economic and geopolitical point of view, but also from the point of view of culture, imagination and possibilities. A change that the current pandemia makes ever more deep and hard.

China Goes Urban proposes to change viewpoint, to look at reality rather than pigeonhole it in predefined categories and models. It is an invitation to explore the world by travelling through the city and architecture of today and tomorrow and circumnavigating the concept of city: although we all think we are familiar with and understand this seemingly simple concept, it shatters in the multiplicity of the contemporary urban.

Tongzhou, Zhaoqing, Zhengdong and Lanzhou are the new towns where we start to explore and where the exhibition begins.

The exhibition was held at the Museum of Oriental Arts in Turin. It is the first exhibition of this scale ever held in Italy on Chinese urbanization.

PERSPECTIVES

The opening pages of each section of the book follow a journey in the concept of urban legacy. The first one (INDEX) shows mass urbanization overtaking nature. The FACTS section reveals its counterpart: neglect. RESEARCH is opened by a fringe territory between wilderness and hyper control. ACTIVITIES take place in the urban rooms that changed use multiple times during the centuries. This section (PERSPECTIVES) explores the urban form to its smallest unit. Finally, COLOPHON captures a still frame of the Anthropocene: *urban legacy* relates to nature and culture without any legible distinction.

MATTEO ROBIGLIO *IN CONVERSATION WITH FULL RESEARCHERS*

Of all the interdepartmental centres of the Politecnico di Torino, F*UL*L was supposed to be dedicated to heritage. Where did the idea of urban legacy come from and what impact has this epistemological shift had? What contribution can the research experiments of F*UL*L make to the disciplines that deal with traditional heritage?

The decision not to use the keyword heritage and to replace it with the word legacy was a deliberate, strategic and I believe, in hindsight, a useful and intelligent one. It acknowledged the fact that the heritage sector was highly consolidated and, to some extent, had become rigid and calcified, and that we needed a term that enabled us to look at the past and the things that are passed onto us by the previous generations. I use the word "generations" thinking about Maurice Halbwachs and the wonderful pages he dedicates in "La Mémoire collective"[1] to the living connection between the generations that it is incorporated in difficult objects, in the spaces of the city, in the stones of the city. We felt that the topic of the past needed to be reorganised in some way, and in the meantime we saw the boundaries of the concept of heritage expanded, broadened, diversified and enriched. As such, we needed a more secular term free of disciplinary powers. Precisely because a specific field of knowledge had developed around heritage, we felt that legacy was a term that would allow us to start talking about the past again without necessarily being weighed down by consolidated definitions.

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The second merit to using the word legacy was the possibility of turning the concept of heritage around to face the future and asking, perhaps naively, if the memory of all objects that we receive from the previous generations should be conserved just because they pertain to the past. As a collective we cannot say that their existence is reason alone. It is obviously to all of us that in the case of Notre Dame its mere existence is reason enough. Even if the archdiocese of Paris decides one day that people will no longer worship there, the beauty and importance of this object justify its conservation, its care by the collective. The same cannot be said of everything we include in the field of heritage or that we receive from the past. This line of thought preceded, contributed to and anticipated a broadening of the disciplinary debate taking place at the same time in the field of heritage. We know about this process also through the acquisition of terms like curated decay, counterpreservation, which we have also sought to explore: F*UL*L has always strived to work on the construction of concepts, categories, mental tools, mental weapons, mental instruments, as well as practical techniques, recognising that innovation, including technological innovation, has a theoretical component which cannot be cancelled, which is not innocent and which is connected with a political underlayer based on a particular stance. I think this moment of enlightenment of a few years ago also involved a stance that brought us into contact with newer experiences in the field of heritage and at this point in the course of being incorporated into the thought structures that we initially wanted to break away from.

1 F Halbwachs, Maurice, and Jeanne Alexandre. 1950. *La mémoire collective*. Paris: Presses Universitaires de France.

Interdisciplinarity is the core value of F*UL*L. Dealing with urban legacy, what are the challenges and results of sitting different types of engineers, architects, economists and geographers around the same table?

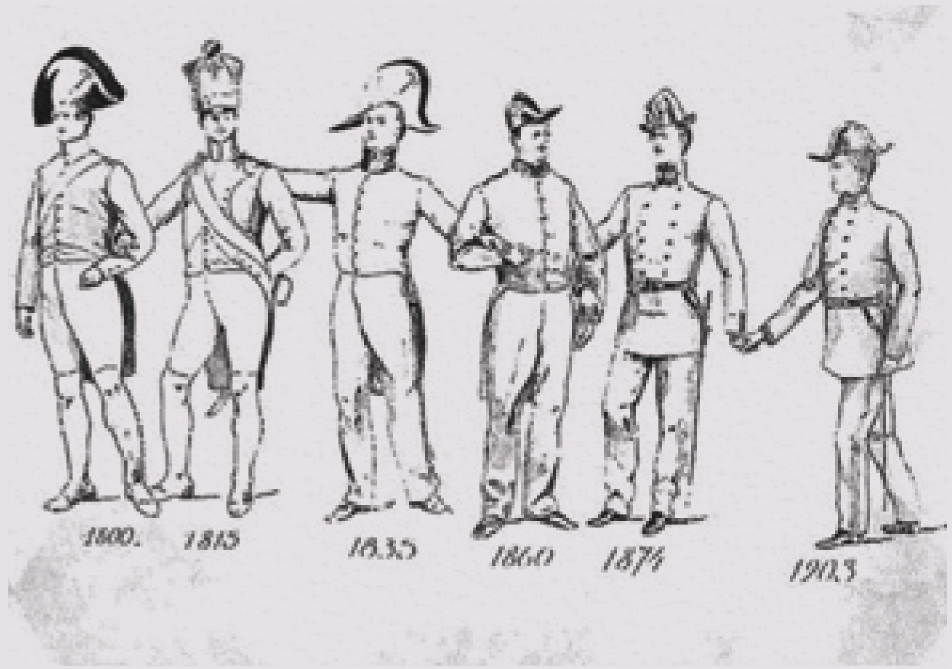
To start with, interdisciplinarity is a bit like the Golden Fleece, the Holy Grail: something to strive for but that you will probably never attain. So when I compare our declarations of intent with what we have done, what we have managed to do, our results have been very limited and meagre. But when I compare these meagre results with other experiences going on around us, I think they contain some very valuable insights. Going back to the previous question, the concept of *urban legacy* encompasses this multidisciplinarity and turning it to face the future removes any innocence from the questions that we ask in the various disciplines. Let me give you a simple example, if I remain in the comfort zone of *heritage* and I ask what the prospects of the economic valorisation of an asset are, two lines later I will very probably be talking about trying to convince the taxpayer that we should all support the cost of restoring Notre Dame after the fire and I don't think that this is up for discussion. I don't think we would all agree quite so readily about much of the industrial legacy, for example, that our communities and societies have inherited for the last 200 years as a result of successful industrial development, whether in the US, northern or southern Europe, and soon also in China and the former Soviet Union. If I ask myself this question, on the one hand I need economists and geographers, because I have to rethink categories, tools, methods of assessment, real estate development models, models of reuse. At the same time I am asking questions that may also be embarrassing or uncomfortable, in the best possible way, at the heart of the various disciplines because they force people to reconsider archetypes, models, categories. For example, let's consider what it means to deal with legacies that technically speaking have negative value, in the sense that if you want to buy it, and I am the seller, I have to give you money because the environmental

debt incorporated in the land we are exchanging is much higher than the potential value of the real estate development. Let's ask what this means in legal terms, also in terms of soil decontamination techniques when we change the timeframes. The challenges are staring us in the face and are those of the cities and in the cities, and here I include the economy, the societies, the cultures, the techniques with which we dialogue and to which we apply our knowledge. One of the best things I've learned while working at F*UL*L is that whatever your specialist field of knowledge in a polytechnic, your idea is very likely to finish up in a city. Whether it is a sensor, an economic model, a feasibility model, an interpretation of how society changes, whether it is a form of architecture or a mobility model, in the end, when this idea or technology becomes tangible, it is applied to or comes face to face with reality, with the urban space, with its form. Perhaps what is different now compared to previous eras is that for the most part this urban, geographical, territorial space already exists, it is pre-existing, perhaps it has always been pre-existing. Since we became fully aware of the cultural nature of our landscapes, the urban geographies in which we move, this space is all pre-existence, there is no space free of it, not even in nature, even the wilderness is the construct of a society that projects its desire for another place onto a theoretically or ideally uncontaminated space: this is also part of the legacy idea. This was something of a discovery. At the end of the day, a polytechnic deals with the city and there is little else. Just outside of the body they cure, a biomedical engineering colleague begins looking at facilities, institutions, production systems, and notes that all of this takes place inside hospitals, inside factories, inside laboratories, inside white rooms, inside inpatient wards or places of experimentation which are once again urban, accessible, mobile, contemporary, present, possible, useful. The city is therefore the real workplace of an engineer, even more so than the architect.

The other important element of this 4-year experience is that the most fertile ground for interdisciplinary collaboration is not necessarily the closest ground. As an architect I don't need an interdepartmental centre to talk with a civil engineer or town planner: I speak to them ordinarily in the regular professional associations, there is no need for great interdisciplinarity to speak with your neighbours. The most promising fields are those in which the archer is further away and targets disciplines like economics, on one hand, and electronics, computer science and environmental and energy disciplines on the other. The further away the archer, the more profitable and surprising the results that hit the mark or which he tries to aim for. As we have glimpsed in the work we have done, what we must make sure of is that all polytechnic research has a transformative nature, i.e. a design nature. It must regard the organisation of a positive and deliberate change to the world that surrounds us, a world that is urban, territorial, as I have already said. This means safeguarding the dimension of the design challenge in all engineering and in all disciplines of the project, reporting the concept of the project, which is the specific way we take care of the world, or at least us humans in societies that have produced the polytechnic as a way of organising knowledge, expertise, techniques, their transmission, their development: we understand things by planning their transformation. Even with the disciplines more occupied with interpreting the world, the common denominator has always been the idea of transformative interpretation. It is an idea for which even conceptual weapons, even the tools of reflection are instruments intended for and intent on transformation, that the interpretation of the world is not an innocent description but the forcing of things to produce change and in this sense its nature of transformative intentionality is completely analogous to that of the engineering or architecture project.

The Centre is structured to combine different viewpoints on specific global issues. These issues raise socio-technical problems. For example, the research carried out by F*UL*L on artificial intelligence and cultural heritage seeks to answer the question of both how and *with what* form of transport will we visit the Imperial Fora in Rome in the immediate future. How does this approach differ to that of *problem solving*?

The key point is *problem solving*. *Problem solving* is a historical construct that derives from project management, it is a vision that imagines that problems exist and that the work of the engineer or architect is to provide solutions. The problem with our problems is that we don't know who controls these problems. Many of our disciplines were structured on the basis of given paradigms, in which our disciplines, in some way, received a mandate from outside, from society, from politics, from economics and interpreted it technically. At least since the time of the nuclear engineering crisis this has no longer been the case: rather than a crisis within nuclear engineering, at a certain point nuclear engineers no longer understood what they were supposed to be doing. From the outside society recognised that a certain agenda that implied a certain use of that knowledge was no longer viable. Rightly or wrongly, we have returned to this question in recent years, in recent days, and it is an extremely interesting debate as all *wicked* and *nasty* debates are. Can we adhere to the sustainability agenda in a non-ideological way, doing without nuclear? Maybe, maybe not, it isn't my field, I don't have the answer, but it is a complex question. Why did I choose this example? Let's take the relationship between bioethics and biomedicine, for example, which shares the same type of structure. The problem we are facing is not so much one of problem solving, if only it were just *problem solving*, but one of the construction of the problem, its *framing*. I believe this



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is the most valuable activity we tried to carry out each time we addressed problems that we had either set ourselves or received from the outside: we did so - or we tried to do so, I don't know if we always managed - by firstly trying to ask ourselves what the type of problem was and what the question was, rather than actually answering the question, in so doing also safeguarding the political independence of *polytechnic* knowledge as compared with its exclusively executive use. I like to recall that the polytechniciens carry a sword in their historic uniforms and this means that they are, let's say, permitted to use violence in organised form, which is the prerogative of the State, but this is their political form, so much so that we find the Saint-Simonians at the barricades on numerous occasions during post-revolutionary, post-imperial France. This implies a move beyond any idea of the presumed innocence of techniques, if this ever existed, an old positivist legacy that no longer convinces anybody, that instead leads to a need to view problem making as embracing one of expressions of Herbert Simon[2], and so we are in the mid-60s, around the time I was born, and this shows just how long this issue has been on our agenda and how urgently we need to address it, it is the construction of the problem that forces us to

confront its nature, to use the language of Bruno Latour[3], socio-technical theorist. A socio-technical and therefore political nature of the design solution that is constructed on the basis of the deconstruction and reconstruction of the design question, is inextricable and inseparable. This means not only asking ourselves what the vehicle is but how it moves, getting into a debate that isn't only technical. Once I decided that the vehicle was the car, I constructed a very strong problem frame that enabled me to predetermine, simplifying to a great degree, an entire series of problems which at that point can be technical. Yet, even when I enter the frame in which the vehicle is the car, it is fundamental to ask if this car belongs to an individual or is shared, if it is owned or hired, if it stays inside certain parts of the building or certain parts of other places. For all of this there is no intrinsic technical reason or natural economic optimum, there are equilibriums that imply a value dimension and political discussion which is what our societies need: they need to be able to take this political discussion forward in an informed, structured way while respecting the fact that it is a political discussion. I believe that from this point of view the pandemic has completely opened our eyes to the science, technical and society relationship with all the contradictions that we have seen and experienced in two years of remote learning, lockdowns etc. The issue is that *problem solving* is the easy part of the problem, the complicated part is *problem setting*, the construction of the *frame* in which things make sense.

2 Simon, H.A. 1996 (first ed. 1968). *The Science of the Artificial.* Boston: MIT Press.
3 Latour, B. 1988. *Science in Action: How to Follow Scientists and Engineers Through Society.* Harvard University Press.

F*UL*L was founded alongside other interdepartmental centres of the Politecnico di Torino to respond to complex problems through interdisciplinary research. The international research panorama seems to be conceptually aligned with this practice but technically it is fragmented into micro-niches of hyper specialisation through journals, conferences and disciplinary sectors. Is it possible to envisage experiments like F*UL*L transferring their model also to the general structure of the university of the future?

This is a permanently open question and I would say that we should almost regard it as a tension, a contradiction that we inhabit, which we live with without being able to solve it. On one hand we need strong, solid vertical guidelines that permit the evaluation, the construction of knowledge, peer review: we have found that the least worst model of agreeing about something is establishing that something is a fact and that some things are better than others. I believe the pandemic has demonstrated the importance of this need to socially construct a temporary agreement, always modifiable, always reviewable with facts, data and numbers. We have said many times at F*UL*L that interdisciplinarity is based on strong disciplinarity. Before speaking other people's languages you have to be proficient in your own, whatever it may be. Having said that, if you look at it in organisational terms, interdisciplinarity, which is a form of tension, represents the challenge of constructing matrix organisations, to use the jargon. These organisations have vertical elements, be it disciplines, departments, any series of pieces of organisation that identify themselves most closely with a specific set of consolidated knowledge and that are dedicated to increasing it, transmitting it, improving it and also preserving it as this consolidated knowledge represents an extremely valuable legacy. This must be accompanied - and knowing how to accom-

pany isn't easy, either in organisational terms or in terms of the sociology of organisation - by structures dedicated to problems, issues, perhaps also consumable, that switch on and off, that are not necessarily permanent, that have another temporality, but which have the same level of dignity and are able to bind. It is a bit like as if we all had a dual citizenship every time, a vertical and a horizontal citizenship. Binding knowledge ahead of a transformative design goal helps to solve the question: knowledge is organised in matrix form in the clouds that traverse the vertical guidelines, when these have to respond to a question posed internally or externally that necessitates the combination of knowledge in new configurations.
The challenge then is from here to take that innovation into the structure of the vertical guidelines, not an easy task and something that requires a few modest innovations which introduce, which inject a few acknowledgements of the value of interdisciplinarity in careers, in scientific evaluation, in the structure of *publishing*, etc. Nothing out of the question, but something to urgently add to our agenda otherwise interdisciplinarity will always be a luxury for those who have come to the end of their career and, no longer subject to the problems of assessment and progression, feel free to branch out into fields that do not necessarily increase their impact, their "ranking" in an immediately recognisable way. For the institution interdisciplinarity is a long-term investment: it won't bear fruit in the short term - there is no patent tomorrow on the interdisciplinary subject - but it does respond strongly to the challenges that society poses the institution. And, if I may say so, it is also a reminder of where we come from, our heritage, our identity, because the polytechnic was born when universities had already existed for a good five hundred years. It was born to respond to the practical questions of a State that wants to systematically organise its territory for production and economic reasons, that wants to define infrastructure, control. These are our roots, this is who the polytechniciens are, the European polytechnic schools like the German technical universities are our roots. All of this corresponds to our mission, corresponds to where I think we should be heading but also where we come from in depth.

3

Over the years the Centre has promoted a very rich public programme of lectures, exhibitions and teaching with an average of at least one or two events a month. As well as guests of international standing, like François Jullien, many of the events have been organised with bottom-up committees of the youngest researchers in the F*UL*L community. This organisational "anarchy" has led to some very productive moments because the Centre's PhD students and researchers have been able to present their ongoing work to guests invited ad hoc. How has this type of public programme influenced the research of F*UL*L? What is the potential of these bottom-up seminars?

Within the idea of the bottom-up seminars and lectures there was the idea, first of all, that a knowledge community is a community of equals and, therefore, that anyone in this community has the right and also the responsibility to organise discussion opportunities. This is the best aspect of the academy: the freedom to dedicate your time to reflection, speculation, comparison and dialogue as a responsibility. As such, the bottom-up format is not revolutionary, here too it is simply a return to our origins. When we say among equals we really mean the possibility of being equal, which in the history of the academy is marked by the acquisition of a PhD. "Ph" stands for "philosophers", which means that at this point you are able to participate in discussions in your discipline, your sector, on an equal footing: so when you are able, you must do so. Then, quite simply, there is an anarchic organisation, i.e. one that is not hierarchical. I believe this is required in cultural circles because culture suffers, research suffers with too much hierarchy, organisation is necessary but within certain limits. This anarchy has

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enabled us, at the same time, to explore different areas depending on the interests of the researchers, obligating them however to always openly publicise their work. When the time comes for discussion, whether it is a Zoom seminar or a conference, it should ideally be open to people who perhaps aren't here - we aren't going to fill a stadium with the things we learn - but it should always be an open window also for friends of the university, which is part of the city, part of the State, a part of society. You mention Francois Jullien[4]. His was certainly an important lecture for us on the problematization of some concepts with which we were working, but on the other hand the audience in this case was not specialist. A "star" helps in this sense but part of our role in any case is also to reopen the university because if we want it to encompass and represent a place for transformative reasoning in terms of our contemporary society, our city, we must ensure that it is always both ideally and practically in a position to listen and to open itself up. One of our methods is also to produce public programmes of communication, discussion and debate.

4 See in the ACTIVITIES section of this book the Urban Legacy Seminar Series

Almost two of the Centre's four years have been marked by the pandemic. Albeit "remotely", the Centre immediately took part in various activities launched in response to the emergency on various levels. From healthcare facilities in the Global South with the collaboration of the World Health Organization, to the reorganisation of school spaces in dialogue with special experts like the Agnelli Foundation, and through to the enabling strategies project for the entire area of the Metropolitan City of Turin with the Strategic Plan. From this "acceleration" - typical of moments of crisis - what patterns of research do you think can be pursued or implemented also on the post-pandemic landscape?

Firstly, in the history of research and science I think there is a close connection between emergency and research, scientific progress. The development of physics in the 20th century would not have happened without the nuclear arms race, both before with the Manhattan Project and after between the two powers that won the Second World War, just like medicine would not have progressed in the same way without health emergencies. The space race and all its implications and powerful technical-economic and industrial consequences would not have existed without the pressure of an emergency. I always think of John Kennedy who made two great speeches during his presidency. The first was the one in which he says we will go to the moon in 13 years and come back. The second was the one where he says that we will solve the problem of the ghetto, following the protests. It is significant that we went to the moon and came back in less than 10 years and a large amount of the technology we use now can be traced back to that space race. I would say that we haven't solved the problem of the ghetto which has perhaps got even worse because it has a different structure, a structure referred to as the *wicked problem*[5] in literature. This takes us back to what I was saying before about the need for a problem frame that maintains the complexity of the problem in its description, something that contradicts intrinsically analytical interpretative models based on the separation and reduction of complex problems into simple parts. I think that this frame is obsolete, we talked about it in the 1970s and also at this Polytechnic in the 1990s. Acceleration is fundamental but more than this I believe that moments of crisis give us the urgency to take tangible action: you really have to do it, you have to try and achieve results that can be transferred into reality. This is a crucial vaccine particularly for polytechnics in Italy, a key enzyme, this driver to take action and to construct and achieve by doing, i.e. a recursive epistemology that incorporates the experiment in the project and incorporates in the modification of the question the results of an experimentation with solutions. What I believe Herbert Simon called "defining a problem proposing the solutions"[6] or something like that: when seeking the solution I go back to and change the description of the problem. In the acceleration typical of moments of crisis this takes place with extraordinary spatial-temporal compression which is very useful because otherwise institutions, like all organisations, tend to follow their own internal rhythm which is a little removed from what is happening in the world. So crises are welcomed, we have had this pandemic but I think we can envisage many more. During a crisis we revert to a form of organising research that I think we have lost particularly in Europe, and that is mission-driven research. This approach identifies major issues that are not presented in a detailed ex-ante description of disciplines, expected outputs or required knowledge, as too often happens in the organisation of research requests from national and European institutions, for example, but leaves the social question open, allowing knowledge to try and traverse its different descriptions and interpretative solutions.

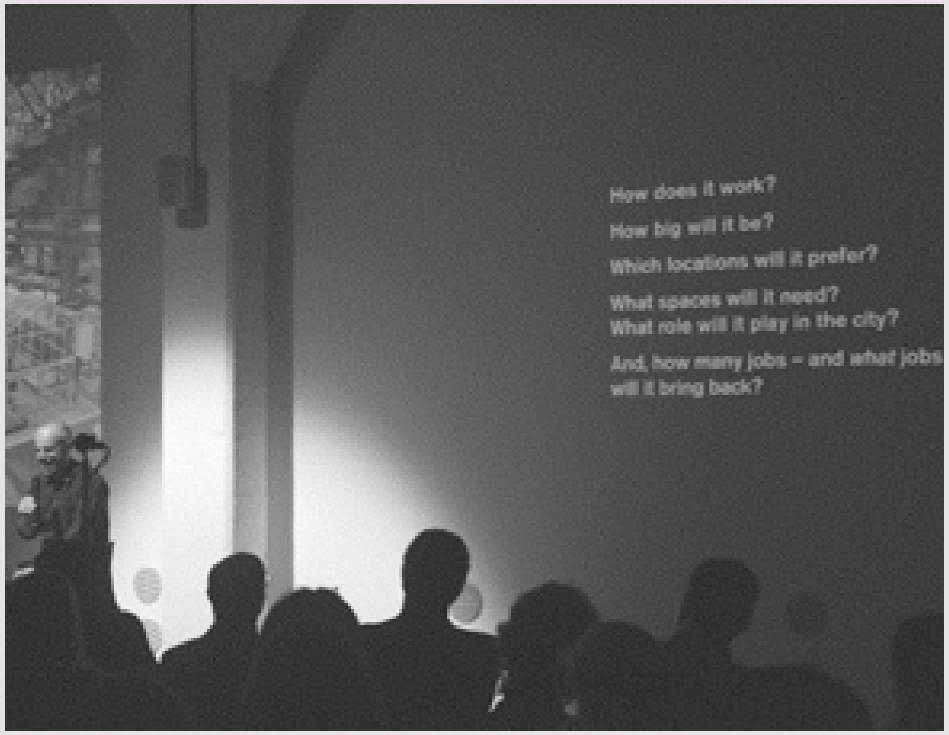
5 Buchanan, R. 1992. "Wicked Problems in Design Thinking". Design Issues, Vol. VI(2): 5–21.
6 See note 2

During the F*UL*L kickoff meeting a knowledge tree representing the branches of the different lines of research of the Centre was presented. However, it was stated from the off that rather than following a linear pattern like a family tree, the tree would be subject to grafts, denser branches in some areas and blossom in others. What future prospects can be anchored to this structure?

I think that F*UL*L has made a lot of starts, some of which more promising than others, and that we have perhaps laid the groundwork for the development of other possibilities. I think that the most interesting prospects are those that have brought together disciplines that are quite far removed from each other. For example, I am thinking about the relationships between urban modelling, the presence of sensors in the city, the ability to collect data also from the devices that we carry around with us, interpretative models and the possibility of designing/planning the future of the city. I mention this because as well as perhaps being the most promising, it is also the one that brings together the different fields of knowledge in the most complex way, allowing us to envision the possible modification of the social, institutional and regulatory organisation of the transformation and therefore of the future of our cities and societies, that takes its leave of mechanistic paradigms and actively takes on the complexities of the challenges that face us, which require an organisation model not just of knowledge but also for its incorporation in the space we inhabit on spaceship *Earth* in its various forms that is different from that of the 20th century.

Basic research and the applied research have both formed part of the Centre's activities in the last four years. Reading about the various research issues in this report – the research "families" – it is interesting to note how a PhD thesis, a paper or a study commissioned by an institution often have common roots, or are even triggered by each other. How can these types of exchanges between the tables of the lab and the tables of the outside world be managed in the future?

I think there are two important things from the, to some extent, privileged viewpoint of the coordinator who was at an intersection of the network, not hierarchically but centrally, and nothing else because I saw everything. I think these types of exchanges are possible first of all if you keep the possible origin of the research issue open and not hierarchical. The research issue could be the demand of a mayor, the request of an institution, it could be a private investor, it could be the curiosity of a young researcher, it could be something eating away at an elderly professor. It doesn't matter where it comes from, what counts is where it is heading and how it is shared, structured and capable of triggering more complex thought. The exchange between the table of the lab and the tables of the outside world, also here, is fundamental and probably requires a rethink of the role of universities, and polytechnics in particular, in relation to the outside world, and how we define it when we think about forming contracts, an approach that must be different from the one we have pursued until now. The approach we have pursued till now is based on the idea that there is knowledge which, like goods, can be the subject of a contract and technologically transferred to the outside, generating positive economic effects. I believe this vision is very limited because, based on what I have seen in these years, in many cases the external world has lost the ability to clearly articulate simple questions that can draw on



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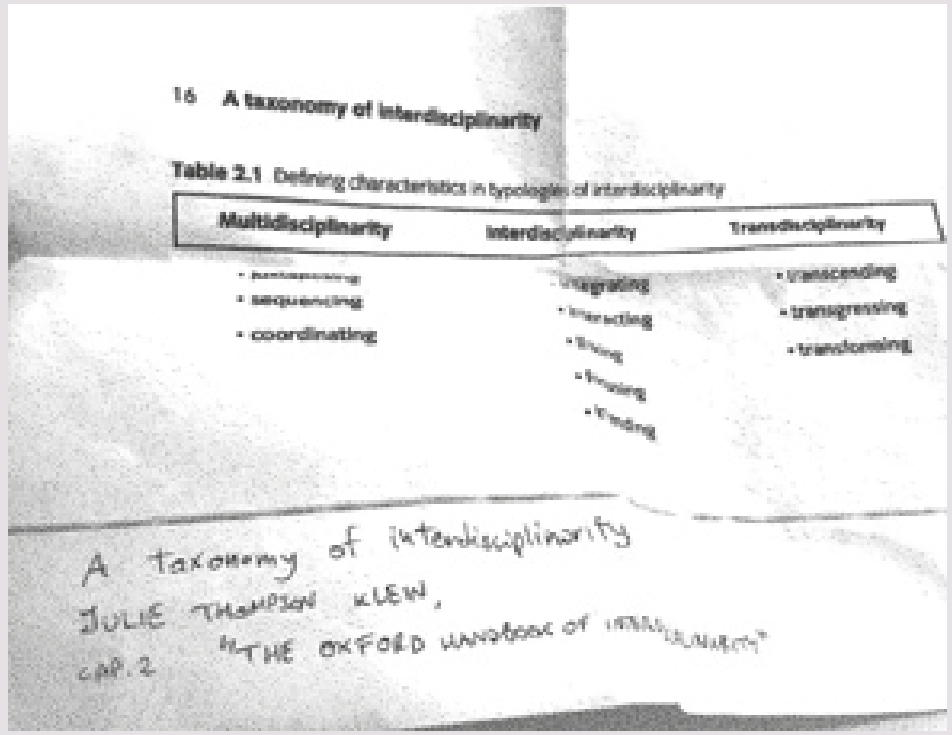

6

a hypothetical reserve of invention, innovation, products in the academy for the answers. Not because the exterior has become stupid but because the things we deal with have become more complicated for everyone. Our role should probably be that of acting before the market, together with the market, together with institutions, together with the public sector, together with the private sector to redefine the agenda, taking full advantage of the freedom we have as an academy of researchers compared with professionals, technical experts, market operators in defined roles, to reorganise the question. While it is simple to answer a question about how you organise a certain number of people to work inside a certain space, it is a bit more difficult to answer the question of how we will work tomorrow. While it is relatively difficult but not complex to construct an image, designing for example a sensor that prevents vehicles from colliding, envisaging how we will get around tomorrow is a more complex technical answer. This goes for looking after, living, moving around, staying together, for learning, i.e. for all of the major functions that make up our social lives and to which we apply our technologies, our hypotheses and our designs. So in reality I think this exchange between working groups should go back upstream a bit and return to constructing a new dialogue between politics and technique, between society and technique. This requires both a greater commitment on our part and an awareness that to do so we have to take a risk, and that there is no innocent place where we can exercise fully protected from the contradictions of the society in which we live.

LIST OF FIGURES

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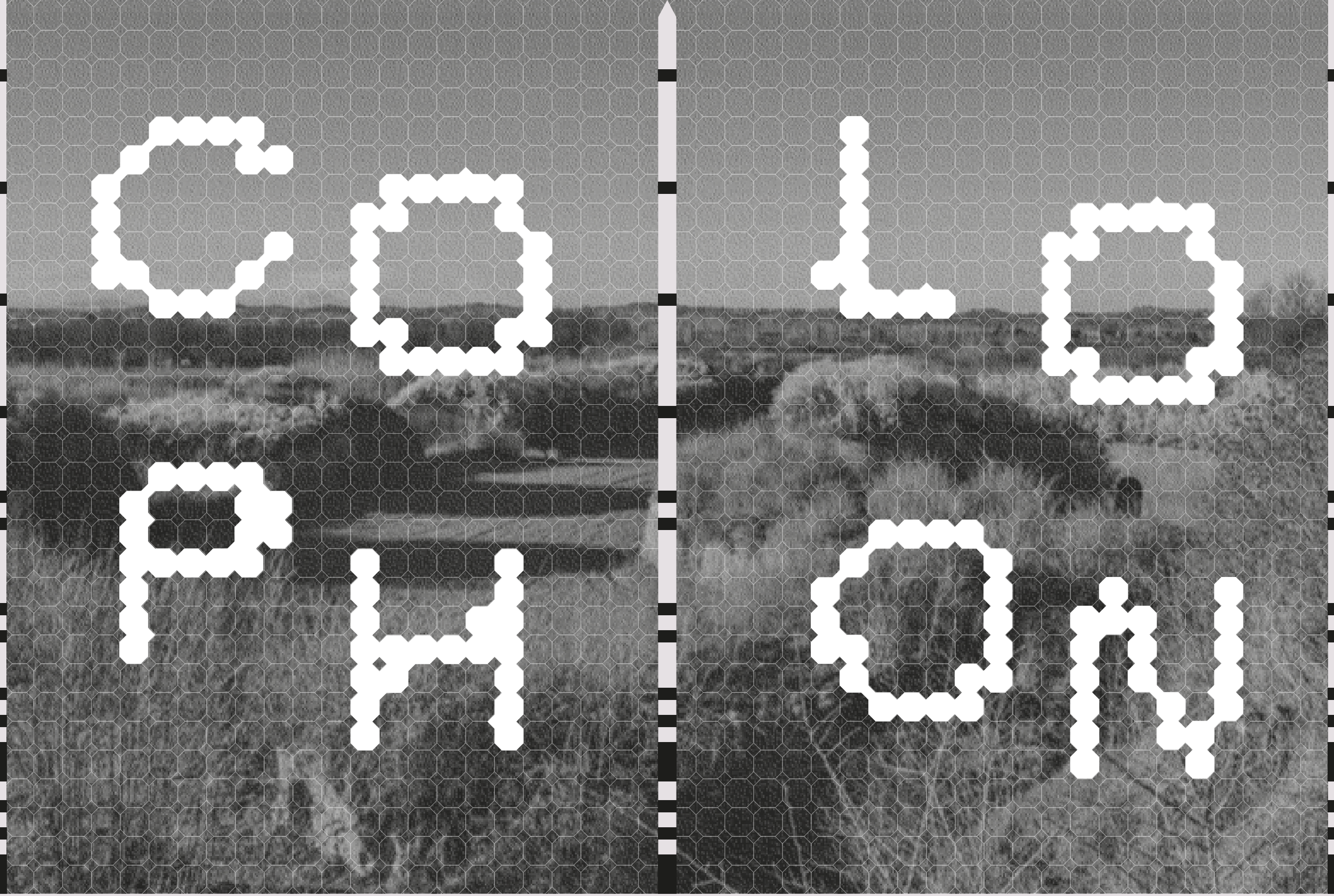
2 Historical uniforms of the École polytechnique of Paris

3 Workers of the Radiation Laboratory of the MIT, Boston. 1940

4 Abandoned Industrial site in the outskirts of Turin

5 F*UL*L Kickoff Meeting. 17.11.2017

6 Diagram from The Oxford Handbook on Interdisciplinarity. J. T. Klein. 2017


colophon
FULL
A REPORT. 2017–2021

COLOPHON | BIOGRAPHIES

Project manager

Matteo Robiglio

is an architect and urban designer. He is a Full Professor at Politecnico di Torino. After 20 years of practice in community architecture and urban regeneration with Avventura Urbana, he founded in 2011 with Isabelle Toussaint the office TRA (lit.: in-between). In 2014 TRA and the community foundation Benvenuti in Italia jointly founded the non-profit social innovation start-up HOMERS, recognized as PoliTo spin-off, promoting bottom-up cohousing projects for the reuse of abandoned buildings. He was a member of the Scientific Committee of the Centre for African Studies, of Rebuild and of the recovery project of Giancarlo De Carlo's University Colleges in Urbino of the Getty Foundation. He is a German Marshall Fellow in Urban and Regional Studies. He has also been a visiting lecturer in many universities such as the Carnegie Mellon of Pittsburgh, the Xi'an Jiaotong-Liverpool University in Suzhou, the Technion of Haifa, and the MIT in Boston.

Executive manager

Laura Martini

is an architect PhD, since 2017 she is the executive manager at F*UL*L – The Future *Urban Legacy* Lab. Her research interest lies in the area of urban theories, psychogeography, and urban countercultures. As part of the informal research group luoghisingolari.net and as a PhD candidate at Politecnico di Torino she did field research on the relationships between underground, radical spatial practices, real estate values and metropolitan conflicts.She has co-authored with D. Vazquez, the book: Che cosa è un luogo singolare? Scritti del Centro di Ricerca dei Luoghi Singolari. 2004-2016. 2018, Aracne Ed., Roma.

Deputy project manager

Francesca Governa

is a PhD in Spatial Planning, she is an urban geographer and Full Professor of economic and politic geography. She is part of the Academic Board of the PhD in Urban and Regional Development. She is involved in research activities at national and international level on four main issues: local development processes and policies; urban margins and spatial justice; urban development and the rescaling of the urban realm; Urban China and urbanization processes in the Global South. She has carried on fieldworks in European, North African and Chinese cities.

Scentific Board

Luigi Buzzacchi

is Full Professor since 2000 at the Politecnico di Torino, where he teaches courses in urban economics and industrial organization. He also taught insurance economics and financial markets economics in various universities. His research interests lie in the area of urban and regional economics, insurance and financial markets (in particular, contract theory, ownership structure, venture capital contracts, and innovation incentives), economics of risk and uncertainty, regulation and public policies, firm size distribution and spatial competition, economics of professional sports.

Claudio E. Casetti

is a Full Professor at the Department of Control and Computer Engineering, Politecnico di Torino, Italy.He has published more than 200 papers in peer-refereed international journals and conferences on the following topics: Transport and network protocols in wired networks, IEEE 802.11 WLAN, Vehicular networks, Ad hoc and sensor networks.Also given Tutorials on vehicular networks at major IEEE Conferences, including IEEE ICC, IEEE Globecom, IEEE CCNC and IEEE VTC. He has served in the Technical Program Committees of the main international conferences in the networking field.

Juan Carlos De Martin

is a Full Professor at the DAUIN Department of the Polytechnic of Turin, he co-founded and co-directs the Nexa Center of Internet and Society. Since 2011, he is a Berkman Faculty Fellow at the Berkman Center for Internet & Society of Harvard Universityand Senior Visiting Researcher at the Internet and Society Laboratory of Keio University (Tokyo). It is known for its activities in the Internet and the Society, with particular attention to issues of copyright in the digital age and net neutrality. Often writes in the daily "La Stampa" as a columnist on issues related to digital technologies and their impact on society.

Enrico Fabrizio

a PhD in Energy Technologies at the Politecnico di Torino and at the INSA de Lyon, since 2015 is Associate Professor at the Energy Department of Politecnico di Torino. From 2008 to 2015 he has been assistant Professor at the DISAFA Dept. of the University of Torino. He carries out research activities in the fields of zero-energy buildings performance simulation and optimization, environmental control for animals and plants, impacts of renewable energy technologies and energy poverty issues.

Francesca Frassoldati

is Associate Professor at the School of Architecture of Politecnico di Torino since December 2015. From 2008 she has been working at the South China University of Technology. Out of a long-term commitment to understanding processes, tensions, and spatial effects of socio-economic transformations in the habitable world, her major lines of work address rural-urban interaction and urban regeneration processes with particular emphasis on the use of spatial design in public discourse.

Paolo Giaccone

is currently Associate Professor in the Department of Electronics Telecommunications of Politecnico di Torino.Between August 2000 and September 2001 he was visiting researcher in the Information Systems Networking Lab of Prof. Balaji Prabhakar at the Electrical Engineering Department of Stanford University. In February 2002 he obtained the PhD degree at Politecnico di Torino, with a dissertation about “Queueing and scheduling algorithms for high performance routers”.

Marco Carlo Masoero

holds MSc degrees in Civil Engineering from Politecnico di Torino and in Mechanical and Aerospace Engineering from Princeton University. He is a Full Professor at Politecnico di Torino in the Department of Energy “Galileo Ferraris”(1995-1999 and 2012-2015). He is International Faculty Affiliate in the Department of Mechanical and Industrial Engineering of the University of Illinois at Chicago. His teaching, research and consulting activity focuses on two main areas: Energy Efficiency in Buildings and Technical Systems, and Applied Acoustics.

Antonio Santangelo

is a semiologist. He studies the relationship between digital technologies and society. He carries out this research at the Nexa Centre for Internet & Society of the Polytechnic of Turin, together with an interdisciplinary group, composed of computer engineers, lawyers and economists.He teaches Semiotics and Philosophy of Language, Semiotics of Text and New Media Languages at the eCampus Telematics University and Semiotics of Television at the University of Turin.

Giuseppe Scellato

holds a PhD in Economics and is a Full Professor at the Department of Management and Production Engineering (DIGEP) and the Future *Urban Legacy* Lab (F*UL*L) of Politecnico di Torino, where he teaches Corporate Finance in graduate programs and Economics and Management of Innovation in post-graduate programs. During 2015-2018 he has been the Vice Dean of the College of Industrial Engineering and Management. Since November 2018 he is the president and CEO of the Innovative Enterprise Incubator of Politecnico di Torino.

Tiziana Tosco

is an Associate Professor at DIATI - Politecnico di Torino since April 2018 and formerly She was Tenured Assistant Professor in the same department.She is co-responsible of the Environmental nanotechnologies Laboratory at DIATI and the responsible for Internationalization of the Environment and Land Engineering Bachelor and Master programs. She is Professor of the MSc course Reclamation of Polluted sites and in other courses of the MSc of Environmental Engineering and in the Specializing Master Program of Water for Civil and Industrial uses at Politecnico di Torino.

Antonio Vetrò

is Assistant Professor at the Department of Computer and Control Engineering, at Politecnico di Torino. He is also Senior Research Fellow at the Nexa Center for Internet and Society and at the Future *Urban Legacy* Lab, both at Politecnico di Torino. Currently, Antonio is conducting research on how to detect and mitigate potential discriminations deriving from biases in the data and in the algorithms of decision systems.

Giulio Zotteri

is Full Professor at Politecnico di Torino where he currently teaches Distribution Logistics, Marketing, and Urban and Regional Economics. Giulio has published more than 20 articles in international journals on the above topics. Giulio is part of the Consortium on Operational Excellence in Retail and has studied the retail sector for more than 20 years.

Faculty

Edoardo Piccoli

is Associate Professor since 2000 at the Politecnico di Torino, where he teaches courses in urban economics and industrial organization. He also taught insurance economics and financial markets economics in various universities. His research interests lie in the area of urban and regional economics, insurance and financial markets (in particular, contract theory, ownership structure, venture capital contracts, and innovation incentives), economics of risk and uncertainty, regulation and public policies, firm size distribution and spatial competition, economics of professional sports.

Nina Rappaport

is an architectural critic, curator, and educator. She is publications director at Yale School of Architecture and editor of the biannual publication Constructs (numbering 35), the exhibition catalogs (numbering 48), as well as the school’s book series (22 to date). She is the director of the project/think tank the Vertical Urban Factory, which includes an exhibition with graphic design by Sarah Gephart of MGMT Design and the exhibit design by Studio Tractor. The show was most recently displayed at EPFL's Archizoom in Lausanne, and the Gallery at Industry City, in Sunset Park, Brooklyn”.

Nicola Russi

is an architect and Associate Professor at Politecnico di Torino. He studied at TU Delft and at Politecnico di Milano, where he obtained his Phd in 2007. In 2008 he founded the architectural practice Laboratorio Permanente in Milan with Angelica Sylos Labini. He won the international competition for the masterplan of Farini and San Cristoforo railway yards, participated in the 16th and 14th Venice Biennale International Architecture Exhibition and received the Honour Mention for the Golden Medal for Italian Architecture in 2012 with the project "The landscape has no rear".

Luigi Sambuelli

took service as a Full Professor of Applied Geophysics at the Università di Cagliari and in November 1995 he moved to the Politecnico di Torino with the same role. From April 2015 he is full Professor of Applied geophysics at the Politecnico di Torino. His main interests are the application of geophysics to archaeology, architecture, tunneling, geotechnics and hydrogeology.

Nannina Spanò

is Associate Professor in the discipline 08-Civil engineering and architecture / 04: Geomatica from 2014, at Politecnico di Torino - Department of Architecture and Design. He teaches several courses in the I, II and III level programs in Architecture (bachelor course) and Architecture for sustainable design (Master of science course) and Geomatics for Architectural and Landscape Heritage (doctoral course); since 2007 he has been a member of the board of Professors of the PhD program in Architectural and Landscape Heritage.

Elena Vigliocco

is an architect, Phd in Theories and Construction of the Architecture (2005), since 2017 she is Assistant Professor in Architectural and Urban Design at the Politecnico di Torino. In 2019 she is Visiting Professor at the Pontificia Universidad de la Javeriana in Bogotà. Her research interests are focused on issues concerning adaptive reuse of cultural heritage. As architect, she is author of the renovation of the Astra Theatre and of the Paideia Centre both in Turin.

Research fellow

Federico Accorsi

is an environmental engineer specialized in the field of reclamation and monitoring of contaminated sites. He acquired a high level of technical / commercial knowledge, holding positions of responsibility for projects located throughout the national territory and for each phase of the project: sizing, reclamation, offer formulation, personnel supervision and management of construction site, communication with Italian / foreign customers. He focuses on: integration of the remediation processes in the architectural restoration project, monitoring and modeling of biogas emissions into the atmosphere.

Adriano Aimar

is an architect graduated from the Politecnico di Torino and Politecnico di Milano as an alumnus of the Alta Scuola Politecnica. His master thesis has been developed within F*UL*L and it explored the non-spatial relationships among urban venues based on the analysis of Instagram social urban data. His research work has been focusing afterwards on data analysis for urban and regional development. He is currently an MBA fellow at the Collège des Ingénieurs in Turin.

Lucia Baima

is an architect, PhD and Research Fellow at F*UL*L - Politecnico di Torino.
She holds a PhD in Architecture, History and Project. Her research activities investigate the role of Intensity as a dynamic parameter able to reveal the potential of spaces and projects to catalyze multiple uses and kinetic processes. Her doctoral dissertation and forthcoming book explore the concept of Intensity within the city of New York City. She collaborated as a teaching assistant in architectural and urban design studios at the Politecnico di Torino where she has graduated after a period of studies in Barcelona. Previously she worked with several architectural offices. For six years she has been a part of MARC Michele Bonino e Subhash Mukerjee Architects as project manager for several awarded projects. With MARC she participated at the 12th and 13th Biennale of Architecture in Venice. She is the author of several articles and publications on Intensity issues and co-curator of the special issue of UrbanisticaTre *Sharing of public spaces* (2015).

Caterina Baroglio

is Assistant Professor at the Department of Architecture and Design of Politecnico di Torino. She earned a PhD in History of Architecture and Urban Design in 2016 with a dissertation carried out between Turin and Columbia University in New York City. Bridging history and design, her research relates to urban regeneration processes, with a main focus on the spatial effects of urban rule and socio-economic transformations. From 2016 to 2018 she worked for the masterplan project of the Politecnico di Torino. Since 2018 she has been editor of the ARDETH - *Architectural Design Theory* magazine.

Angelo Caccese

is an architect. He graduated at Politecnico di Torino after a period of studies between Turin, Buenos Aires and Madrid. His master thesis, entitled *The Airbnb effect: architecture and urban consequences of a new way of trading homes* was carried out during a period of seven months as visiting student at School of Architecture of Madrid (ETSAM). He collaborated with several architectural offices and formed part of the research group LoCUS from the Universidad Politecnica de Madrid. He currently collaborates with F*UL*L and he is a freelance architect.

Daniele Campobenedetto

is an Assistant Professor in Architectural and Urban Design at Politecnico di Torino. He holds a PhD in History of Architecture and Town Planning from Politecnico di Torino and in Architecture from Université Paris Est. His research activities investigate especially the role of rules and bureaucracies in urban transformation. He has been part of the PoliTo Masterplan Team and he is a funder and an editor of the journal ARDETH - *Architectural Design Theory*.

Federico Coricelli

is an architect graduated from the University of Florence. He holds a PhD from Politecnico di Torino. He is the author of various articles and publications on housing issues. During the past years he worked for several architectural offices and collaborated independently in several competitions, some of them successfully awarded. He collaborated as teaching assistant in architectural design studios at the University of Florence and Politecnico di Torino. Since 2017 he is partner at UHO, an architectural office based in Paris.

Marco Cappellazzo

holds a master's degree in Architecture Construction and City with a thesis project developed on the areas of Parco di Porto Conte in Alghero. The purpose was to describe, through GIS and rapid mapping technologies contribution, the municipality's territory, leaving out the usual glance of coasts confined only for seaside tourism, and rethinking the legacy of military architectures from the IIWW as hubs to further new strategies of development both for tourism and for residence. He cooperates with lab G4CH and F*UL*L. His research deals with geo-spatial science techniques for the documentation of Cultural Heritage by use of GIS mapping and data analysis approach.

Luca Galleano

is an architect. He has graduated at Politecnico di Torino with a thesis entitled "Designing with autonomous relationship properties of complex systems: a parametric approach to achieve building sustainability". He is specialised in computational design and sustainability architecture, indeed is also a WELL AP and LEED Green Associate. He collaborated with several architectural offices, and he currently collaborates with F*UL*L as part of the WHO Covid-19 Helpdesk project and he is a freelance architect.

Antonio De Marco

is Assistant Professor at the Department of Management and Production Engineering (DIGEP) and the Future *Urban Legacy* Lab (F*UL*L) of Politecnico di Torino, holds a PhD in Economics and Complexity at Collegio Carlo Alberto and a M.Sc. in Management Engineering at Politecnico di Torino. In the last few years he has been involved as Research Assistant in a number of projects funded by the European Commission, gaining an in-depth knowledge of advanced methodologies for patent data-mining and technology intelligence.

Marianna Nigra

is a Research Fellow at Politecnico di Torino. She is an experienced Architect with a demonstrated history of working in the research industry and a PhD focused in Management, Production and Design from Politecnico di Torino. She has strong International experience, developed by collaborating with The Melbourne University, Australia; The Vrije Universiteit, Amsterdam; and Strathclyde University, Glasgow, Scoltand, and a number of French architectural practices in Paris, France. Her work focuses on the management of complexity in sustainable architecture, encompassing concepts of economy, building physics, and architectural design. She has collaborated with a number of Institutions in support of the definition of policies and strategies to enhance the sustainable development of the built environment. She is currently collaborating with the World Health Organization (WHO) to support the research against the diffusion of covid-19 in health infrastructure and public spaces.

Andrea Pollio

holds a PhD in Economic Geography and Urban Studies from the Institute of Culture and Society, Western Sydney University. His research interests coalesce around the relationship between urban economies and technological innovation in African cities. Andrea is currently Marie-Sklodowska Curie Fellow (grant no 886772) jointly at the Future *Urban Legacy* Lab (through DIST) and at the African Centre for Cities, at the University of Cape Town. His project addresses the impact of private Chinese finance on the transformation of African cities that lie on the 21st century Maritime Silk road.

Caterina Quaglio

is a doctoral student in "Architecture. History and Project" at the Politecnico di Torino. She graduated in architecture in Italy in 2015, spending two years abroad for exchange programs in Brussels and Madrid. Since her master thesis and during an internship in Chile, she has worked on the issue of public housing. Her PhD research is focused on the policies and practices of public housing urban regeneration, studied through in-depth analysis of three European case studies.

Maria Paola Repellino

graduated in Architecture in Politecnico di Torino and then obtained a PhD with a thesis on the dynamics of transformation of industrial heritage into creative places in Contemporary China. Since 2016 she is a post-doc researcher at the Polytechnic of Turin, where she coordinates a research in collaboration with Tsinghua University and EPFL dedicated to the Chinese new towns: within the program she curated the exhibition-seminar at the Beijing Design Week 2016 and the cycle of conferences on the new Chinese urbanization along the new Silk Road.

Giulia Sammartano

is architect and PhD in Geomatics. She cooperates with lab G4CH and F*UL*L. The research interests in geo-spatial science born in the Geomatics techniques for 3D documentation of Cultural Heritage by use of multiple digital approaches: 3D modelling by LiDAR, SLAM mapping, close-range and UAV photogrammetry, data analysis and GIS mapping. She is part of DIRECT Team Polito for emergency surveying, and 2016 Polito Task Force post-eartquake mission. She participates at PRIN 2015 and takes part in the Italian Archaeological Mission in Hierapolis of Phrygia in Turkey (2015, 2017, 2018).

PhD candidate

Silvia Cafora

is a Phd researcher at Politecnico of Turin where she is working on new radical approaches to collaborative housing. She studied Architecture between Milan (Politecnico) and Valparaiso in Chile. She early developed an interest in the right to the city, focusing on the abandon of public spaces in urban areas and their informal re-use by citizens. She led a research at PUCV Escuela de Arquitectura y Diseño in Valparaiso, Chile with the theme Obra Habitada, *housing from everyday life*, creating international symposiums in Paris (ENSCI), Santiago de Chile, Milan. She collaborates with Feltrinelli Foundation in Milan in the Housing research team. As a professional she worked at the first co-housing projects in Milan, and she is now part of Homers in Turin.

Matteo Gianotti

is a PhD researcher working on urbanization in developing countries. He studied architecture and urban planning at Politecnico di Torino, Università IUAV di Venezia and Chalmers University of Technology (Gothenburg). His Master's thesis focused on urban development strategies in response to climate change. He worked in the Urban Planning Unit at UN-Habitat (Nairobi) and with Subhash Mukerjee architectural design studio (Turin).

Elena Giudetti

is a PhD Candidate in Architecture, History and Project and a PhD fellow at F*UL*L. Her research focuses on the *transformative potential* in existing buildings. Until 2018, she was a freelance architect and a teaching assistant at UniFe, taking part in the organization of two international workshops in Sarajevo. During 2017 she worked in Zimoun Contemporary Art Studio in Bern. In 2017 she graduated at the Faculty of Architecture of Ferrara, with a thesis focused on adaptive reuse of a post-industrial site in Porto, in collaboration with the FAUP.

Chiara Iacovone

is an urban geographer with a background in architectural studies. She holds a BA at Roma Tre University and a MA at Politecnico di Torino both in Architecture; she graduated with a research thesis on the urban transformations in Berlin. She continued her career mostly oriented on urban studies, experimenting with different tools and media to investigate space. Her interests concern with questioning urban dynamics and looking at contemporary cities through different lenses. She has collaborated with art galleries across Europe with visual research projects. From November 2017, she became part of F*UL*L.

Francesco Milone

is an engineering and Management student at Politecnico di Torino. Interested in Economics, Strategy, Innovation and new Business Model Development. Worked as an assistant research scientist about economics and management field. The focus of this research is on "Platform business models". As case study, a particular attention is kept on Airbnb. In order to perform this analysis this research needs an important effort as data analytics due to the greater amount of data that have to analyzed,all results are elaborated in a simple visual way and in detailed reports.

Valerio Palma

holds a master's degree in Architecture and Urban Design from the University of Roma Tre (2016). He has been a research fellow at the ReLOAD Lab of the University of Padova (2016-2017), dealing with interoperable digital models for architectural cultural heritage. His work at F*UL*L focuses on the use of quantitative models and digital tools for urban design and the analysis of urban transformations.

Marco Rapelli

was born in Turin (Italy) on December 5th, 1992. He got his B.Sc. in Telecommunications Engineering (2015) and his M.Sc. in Computer And Communication Networks Engineering (2017) both at Politecnico di Torino. He then joined F*UL*L (Future *Urban Legacy* Lab), an inter-disciplinary center of Politecnico di Torino, where, in November 2018, he started his PhD under the supervision of Prof. Casetti. As main research interests, he is working on mobility studies and large-scale urban traffic simulators.

Ludovica Rolando

is an architect and PhD student in Architecture History and Design at Politecnico di Torino. She studied Architecture between Politecnico di Torino and UCL Université Catholique de Louvain. She collaborated with TeamMinus, Beijing (2016) and Miralles Tagliabue EMBT, Barcelona (2019/2020). She is now focusing on Contemporary Housing Models and she recently joined F*UL*L.

Agostino Strina

is an architect and a PhD Candidate in Urban and Regional Development at Politecnico di Torino. He holds a master's degree in Architecture for the Sustainability Design with a thesis focused on the internal areas of Sardinia, with the aim of rethinking some trajectories of regional development. His research deals with theories and cultures of contemporary urban design, with a particular focus on the relation between urban and rural, investigating the role of production landscapes and infrastructures. On these issues, since November 2020, he is conducting his research at F*UL*L. He is also member of Politecnico's research group China Room, as junior fellow, and teaching assistant in Urban Planning at Politecnico di Torino.

Roberta Taramino

is a M.sc in Engineering and Management at Politecnico di Torino.Her research grants to provide information to public institutes in order to improve the commercial system of cities. Understanding how consumers and close commercial environment react to a large-scale supermarket opening, using an innovative method to measure the impacts and studying the business model for the reuse of historical buildings in the urban landscape are two of the issues I've dealt with.

Valeria Todeschi

graduated in Regional, Urban and Landscape-Environment Planning at the Polytechnic of Turin in 2016, with a thesis on "Energy sustainability at the urban scale. Energy consumption models of buildings in Turin and potential development of the district network". She started a PhD in Energetics on F*UL*L project "Smart Energy Solutions for Sustainable Cities and Policies" at Polytechnic of Turin in 2018. The PhD aim is to drive smarter use of energy, matching it with the available energy renewable sources on the territory to help policy makers in defining effective policies adapted to the real energy-use.

Ilaria Tonti

is an architect and a PhD researcher working on reconstruction design tools post-earthquakes emergencies. She studied architecture between Piacenza (BA-Politecnico di Milano) and Turin (M.Sc. - Politecnico di Torino). Her Master's thesis focused on the regenerative value of residual urban spaces and adaptive strategies for Turin. During 2019, she followed the research "FARB 2016 - Learning from catastrophes: methods, tools and techniques for the realization of resilient settlement systems " of the Politecnico di Milano. With her PhD research, she became part of two Interdepartmental Centre of PoliTo: F*UL*L and PIC4SeR.

Past fellow

Didem Turk

is a city planner and PhD candidate in the Architecture History and Project at Politecnico di Torino. Her background is urban planning and urban design. She received her bachelor's degree in Middle East Technical University (METU) from the City and Regional Planning Department. She pursued her Master degree in Urban Design at METU in the context of post-conflict urban areas. In the meantime, she followed studio related to parametric design. She is currently conducting a research on comparative urban morphology at F*UL*L in collaboration of Transitional Morphologies Research Unit. Her field of interest is urban morphology, comparative urban morphology studies, and parametric design.

Alberto Valz Gris

works as a geographer. He holds an M.Sc. In Architecture (Politecnico di Torino) and an MA in Fine Arts (Sandberg Instituut, Amsterdam). Combining theoretical reflection and on-field research into textual contributions and audiovisual productions, his work aims at transforming the relationship that humans entertain with the surrounding biosphere.

Emilio Abbate PhD candidate

cooperates with lab G4CH-Laboratory of Geomatics for Cultural Heritage at PoliTo and F*UL*L-Future *Urban Legacy* Lab. He researches tools and survey methods for identify and implement HBIM model applied on Cultural Heritage, for monitoring, conservation, restoration and Finite Element Analysis (FEM). His interests are focused on the generation of BIM models from Point Clouds: modelling BIM from laser data and photogrammetric using object-oriented parameterization.

Louis Andrianaivo Research fellow

is a *research fellow* from the department of Computer Science of Polytechnic University of Turin. He has graduated from the department of Mathematics, University of Roma Tre. His topic is the application of parallel programming in cryptography, statistical simulation and machine learning. Currently, his main contribution with Future *Urban Legacy* Lab is the use of machine learning algorithms in the field of Architecture and Urban design. He is working under the supervision of Professor Claudio Casetti.

Michele Barale PhD candidate

is a journalist and a PhD candidate in Architecture, History and Design. He graduated in Architecture at Polytechnic of Torino, with a master thesis concerning typo-morphology research developed at Forma Urbis Lab in Lisboa (FAUL). Since may 2018 he is editor of In_bo journal (University of Bologna). Active in dissemination of local, architectural and urban culture, he worked as journalist and he is member of local organisations.

Natalia Bonilla Research fellow

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COLOPHON

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