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URD

PhD in Urban and Regional Development
IN VARIETATE CONCORDIA

2023 - Number 7
ISSN 2533-2139

Urban and Regional Development Ph.D. Programme ANNUAL REPORT 2023



Politecnico
di Torino



UNIVERSITÀ
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Interuniversity Department of Regional and Urban Studies and Planning



Urban and Regional Development Ph.D. Programme - ANNUAL REPORT

Editorial coordination: Marco SANTANGELO and Luca STARICCO

Graphic design: Cinzia PAGANO

Layout: Luisa MONTOBBIO

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Dipartimento interateneo di Scienze, Progetto e Politiche del Territorio, Politecnico e Università di Torino
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2023 - Number 7

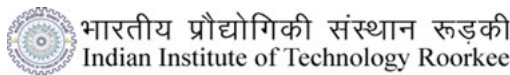
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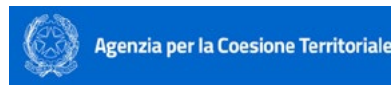


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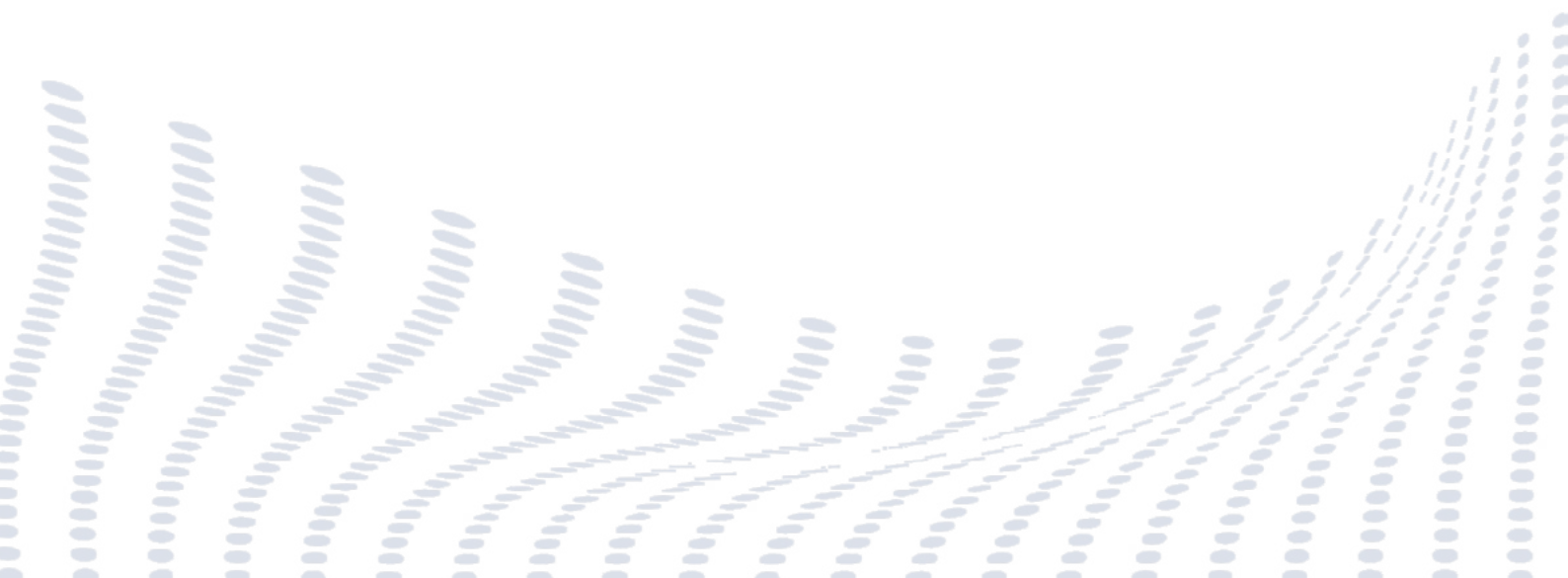
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INTRODUCTION

This report contains information on all the Ph.D. students enrolled in the interuniversity Ph.D. Programme in Urban and Regional Development (URD). The Ph.D. programme is hosted at the DIST, the Interuniversity Department of Urban and Regional Studies and Planning of the Politecnico di Torino and Università degli Studi di Torino.

The Ph.D. programme is designed to train highly qualified doctors in socio-spatial dynamics of development. To do so, it aims at attracting motivated and qualified candidates from all over the world, offering courses and a research environment which corresponds to the highest academic and professional standards.

The programme is offered in English, and it has a multi-disciplinary approach that combines social and technical sciences (SSH and STEM). It is meant to promote individual talents by providing training and research opportunities in a wide variety of scientific fields that are grouped in three main research areas:

1. Urban and Regional Studies;
2. Spatial Planning, Evaluation and Management;
3. Technologies, Techniques and Methodologies for Sustainable Development.

Ph.D. students attend soft and hard skills courses organised around the thematic areas, and each student, supported by members of the Academic Board, can design a specific study plan to match their research and academic interests. The Ph. D. educational offer includes frequent contributions from scholars of other universities and promotes research and training activities in highly qualified institutions across the globe. As part of the programme, Ph.D. students are encouraged to organise seminars, promote events, and open the programme to the department, the academic community, and the society as a whole. The programme is based on the acknowledgement of the Ph.D. students' ambition to think beyond borders, both while completing their educational and academic training, and while searching for a job. Our Ph.D. may start an academic career or search for management positions in public or private structures, related to the planning and management of spatial transformation processes.

Career opportunities offered by doctoral training can be summarized as follows:

- Public and private scientific research carried out at national, European, and international level;
- University education;
- Spatial and urban management in national, state, regional and local administrations;
- Employment in transports and/or environmental protection organisations;
- Construction companies, real estate market;
- Local development agencies, urban development companies;
- Engineering companies and architecture consulting firm and professional offices.

The Ph.D. programme is focused on topics that are developed across the three main research areas. Furthermore, such topics can be related to four Sustainable Development Goals (SDGs) adopted by the United Nations Member States in the Agenda 2030:



SDG 11 Sustainable cities and communities

- Urban and regional governance
- Spatial planning
- Urban studies
- Human, economic, and political geography
- Built environment
- Real estate
- Natural environment
- Landscape
- Cultural heritage
- Social innovation



SDG 13 Climate actions

- Climate change
- Sustainable land use and territorial resilience
- Risk prevention and management
- Geomatics



SDG 9 Industry, innovation and infrastructure

- Transport systems
- Building information modeling
- Big data for spatial development
- Virtual and augmented reality for spatial development



SDG 7 Affordable and clean energy

- Renewable energy and energy transition
- Water management

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XXXVI CYCLE - 3rd YEAR STUDENTS

NAME **Marco ALIONI**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **Gravitational Geometries of Exclusion:
Infrastructuring injustice in Brescia (Italy) and Newark (New Jersey, US)**
TUTOR(S) Camillo BOANO, Antonio DI CAMPLI, Barbara BDIANI

ACADEMIC CONTEXT

- Kuttler T. and Moraglio M., eds., 2021. *Rethinking mobility poverty. Understanding users' geographies, backgrounds, and aptitudes*. London: Routledge.
- Marvi S. and Macrorie R., 2019. Bifurcated urban integration. The selective dis- and re-assembly of infrastructures. *Urban Studies*, 56(11), pp. 2207-2204.
- Sheller M., 2018. *Mobility Justice. The Politics of Movement in an Age of Extremes*. London-New York: Verso.
- Sugrue T., 2015. *The origins of the urban crisis. Race and inequality in postwar Detroit*. Princeton: Princeton University Press.

EXTERNAL COLLABORATIONS

- Department of Global Urban Studies at Rutgers University - Newark (New Jersey, US): Host for a visiting period (September 2022-March 2023)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

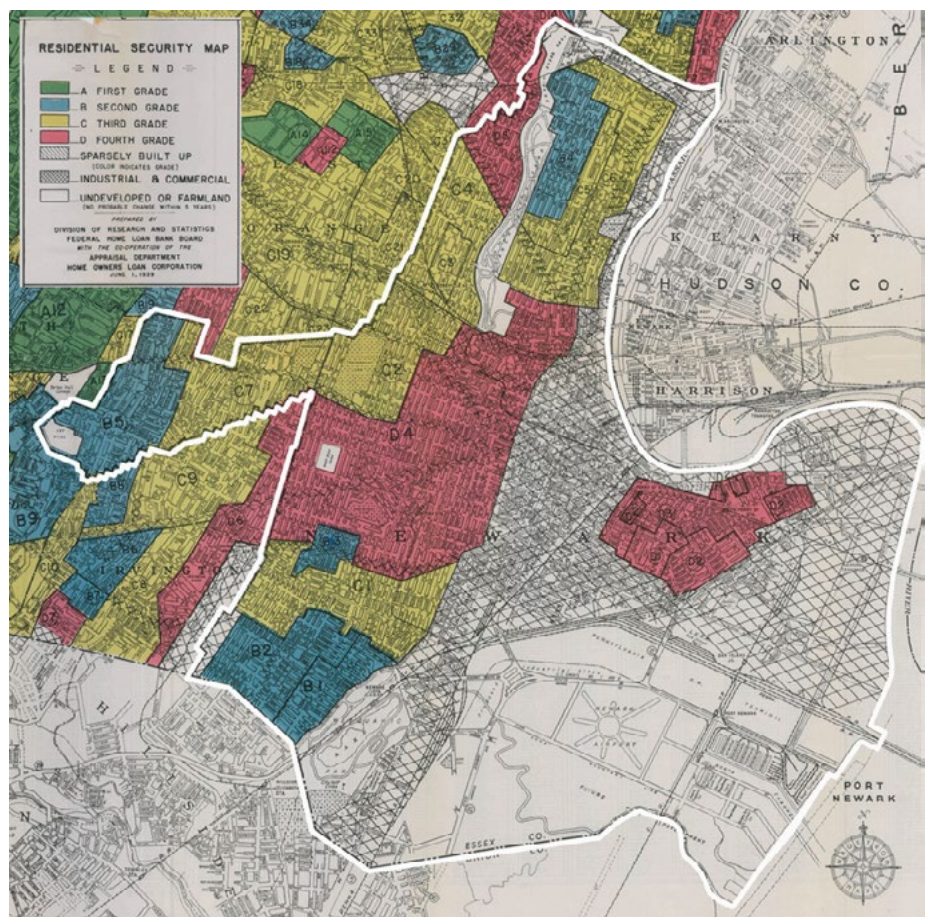
My research focuses on the strategies of post-industrializing urban development, with a specific focus on the socio-spatial relationships between urban mobilities, infrastructures, and injustice.

Brescia (Italy) and Newark (NJ, US) are the two singular territories my research has been dialoguing with. The dissertation explores the processes that brought Brescia and Newark to be configured as exclusive, unjust, and disjunctioned urban entities through both urban deindustrialization and post-industrialization.

In 2013, the first line of the subway of Brescia went into operation, after decades of fierce conflicts and negotiations over the «possible futures» of the city. The subway is a crucial dispositive of urban governance, which has been configuring Brescia as a (dis)junctioned Axial City.

Newark is a Black-dominated and severely poor city. The city is still suffering from a *perpetual* urban crisis started in the 1940s, that was not interrupted even by the season of massive redevelopment between the 1990s and the Great Recession. Newark has been infrastructured as a Teleport City, primarily serving the interests of the residents of the wealthier municipalities surrounding it.

The two cities represented fertile territories to be explored, to understand the forms of injustice emerging from the strategies of post-industrializing urbanization – in particular, the novel configurations of socio-spatial segregation in Italy and the United States.



NAME **Deepan ANBARASAN**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **Impact of automation and digitalisation on the transport sector. Focus on ICT technologies and specifically APC systems' impact in the transport sector and discussing methods of improving accuracy of a proposed APC system**
TUTOR(S) **Cristina PRONELLO**

ACADEMIC CONTEXT

- Li Y. *et al.*, 2020. A Case Study of WiFi Sniffing Performance Evaluation, *IEEE Access*, 8, pp. 129224-129235. <https://doi.org/10.1109/ACCESS.2020.3008533>.
- McCarthy C. *et al.*, 2021. A Field Study of Internet of Things-Based Solutions for Automatic Passenger Counting, *IEEE Open Journal of Intelligent Transportation Systems*, 2, pp. 384-401. doi: 10.1109/OJITS.2021.3111052.
- Mikkelsen L. *et al.*, 2016. Public transport occupancy estimation using WLAN probing, in *Proceedings of 2016 8th International Workshop on Resilient Networks Design and Modeling, RNDM 2016*. Institute of Electrical and Electronics Engineers Inc., pp. 302-308. <https://doi.org/10.1109/RNDM.2016.7608302>.
- Myrvoll T. *et al.*, 2017. Counting public transport passenger using WiFi signatures of mobile devices. *IEEE 20th International Conference on Intelligent Transportation Systems (ITSC)*. Yokohama, Japan, 16-19 Oct. 2017. pp. 1-6. <https://doi.org/10.1109/ITSC.2017.8317687>.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In recent years, there has been a substantial surge in automation and digitalisation, commonly labelled as the Fourth Industrial Revolution (4IR or Industry 4.0). This research aims to examine the impact of these technological advancements, stemming from 4IR, on the transportation sector, with a specific focus on Automatic Passenger Counting (APC) systems.

The study involves an in-depth exploration of APCs, encompassing their historical context, current applications, and potential future implementations. Additionally, a comprehensive analysis will be conducted to assess their effectiveness, cost-efficiency, and, notably, their accuracy. The objective is to ascertain whether the claims of high accuracy made by many APC providers in controlled environments hold true in real-world scenarios.

Furthermore, the investigation will encompass the examination of cost-effective APC systems that utilize Industry 4.0 advancements and contemporary ICT trends, such as Wi-Fi-based counting and machine learning-driven data analysis, with the primary goal of assessing their potential to enhance passenger counting accuracy.

To implement this research, a comprehensive methodology has been devised, consisting of five primary phases.

1. Overview of Study Design and Data Collection:

- Development of a tool for literature review data collection.
- Execution of a field study to validate the accuracy of existing APC systems.

2. Pilot Study: On-board Bus Survey:

- Site selection and data collection setup.
- Verification of accuracy and statistical analysis, including validation of system accuracy through manual count data and analysis of error patterns.
- Experimentation with accuracy improvement methods using additional datasets.

3. Bus Stop Survey:

- Conducting experiments with Wi-Fi probe-request detectors at bus stops and processing data using deep learning (DL) techniques and other methods for passenger count estimation.
- Design and implementation of a real-time dashboard for displaying passenger count information at bus stops.

4. Turin Bus Survey:

- Site selection and data collection aboard buses in Turin using Wi-Fi probe-request detectors.
- Application of various data analysis algorithms, including DL methods, to the collected data.

5. Performance Analysis:

- Comparative analysis of Wi-Fi probe-request detectors' performance under different conditions and using different methodologies to determine the most effective passenger counting approaches in this context.



NAME **Fabio BALLATI**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE Automatic Passenger Counting and Smart Ticketing system analysis and evaluation in MaaS context
TUTOR(S) Cristina PRONELLO, Lorenzo CARLI

ACADEMIC CONTEXT

- Grgurević I., Juršić K. and Rajić V., 2022. Review of Automatic Passenger Counting Systems in Public Urban Transport. *Springer International Publishing*, 978-3-030-67240-9, pp. 1-15.
- Koźlak A. and Pawłowska B., 2019. Mobility-as-a-service for improving mobility in smart cities – a comparative analysis of selected cities. *Prace Naukowe Uniwersytetu Ekonomicznego We Wrocławiu*, 63, pp. 31-46.
- Olivo A., Maternini G. and Barabino B., 2019. Empirical Study on the Accuracy and Precision of Automatic Passenger Counting in European Bus Services. *The Open Transportation Journal*, 13, pp. 250-260.
- Qureshi K. and Abdullah H., 2013. A Survey on Intelligent Transportation Systems. *Middle-East Journal of Scientific Research*, 15. pp. 629-642.

EXTERNAL COLLABORATIONS

- Leonardo SpA
- MOBYFORALL S.r.l.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Mobility as a Service (MaaS) is an integrated platform enabling through a single online interface commuters to plan, book, and pay for trips needing multiple mobility providers. This new MaaS paradigm provide tools for data collection and analysis to better understand mobility needs and provide tailored information to users, as shown by recent studies in the field of Intelligent Transport Systems (ITS).

Among ITS, two tools provide a large amount of useful data for mobility patterns definition of public transport users: the automatic Passenger Counting (APC) system and the Smart Ticketing system.

The APC systems are used onboard public transport vehicles to understand vehicle load and the relevance for users of stops and routes through analysis of these data. Many different solutions have been developed. For example, weight-based systems, device-based technologies (Wi-Fi and Bluetooth), and infrared and video image recognition solutions.

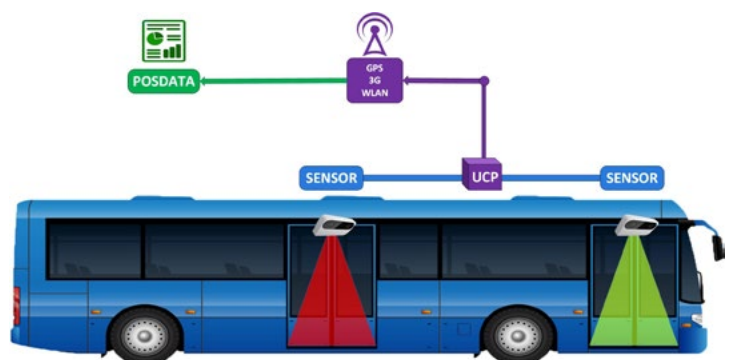
Smart ticketing aims at facilitating seamless transport of people, reducing travel time, facilitating a multimodal journey, and saving money. Quick response code (QR code), Near Field Communication (NFC), EMV payment (Europay, Mastercard, and Visa) smart ticketing technologies help transport operators and authorities to deliver a better transport ticketing service for their passengers.

In this study, both APC and Smart Ticketing systems are compared using the benchmark analysis, a structured approach developed to enhance the performance of an organization, process, or product.

After identifying the object of comparison and collecting the data, the benchmark analysis is structured in three steps: 1) identification of the criteria for characterise the systems (e.g., implemented technology, accuracy, robustness, interface, etc.); 2) definition of KPIs (key performance indicators) to allow to measure the performance of those systems and support the companies in their selection; 3) assessment of the systems according to defined criteria and KPIs.

The outcome if the research will result in two classifications that will allow companies to more easily and accurately identify which e-ticketing and APC systems to adopt, considering the constraints related to the budget they have available and the laws and rules in force in their country.

By using and merging the data from the two systems, it will be possible to obtain more detailed information that will enable the rescheduling of public transport routes with a data-driven approach.



NAME **Simone BELTRAMINO**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **Spatial Planning for Energy-Resilient Territories and Cities**
TUTOR(S) **Guglielmina MUTANI, Grazia BRUNETTA**

ACADEMIC CONTEXT

- Brunetta G., Ceravolo R., Barbieri C.A., Borghini A., de Carlo F., Mela A., Beltramo S., Longhi A., De Lucia G., Ferraris S., Pezzoli A., Quagliolo C., Salata S. and Voghera A., 2019. Territorial Resilience: Toward a Proactive Meaning for Spatial Planning. *Sustainability*, 11(8), pp. 11-19.
- De Pascali P. and Bagaini A., 2019. Energy Transition and Urban Planning for Local Development. A Critical Review of the Evolution of Integrated. *Spatial and Energy Planning*, 12, pp. 35.
- Mutani G., Santantonio S., Brunetta G., Caldarice O. and Demichela M., 2021. An energy community for territorial resilience: Measurement of the risk of an energy supply blackout. *Energy and Buildings*, 240, pp. 110906.
- Sharifi A. and Yamagata Y., 2016. Principles and criteria for assessing urban energy resilience: A literature review. *Renewable and Sustainable Energy Reviews*, 60, pp.1654-1677.

EXTERNAL COLLABORATIONS

- Responsible Risk Resilience Centre (R3C): co-financer of the PhD grant
- University of Southern Denmark (SDU): host for visiting

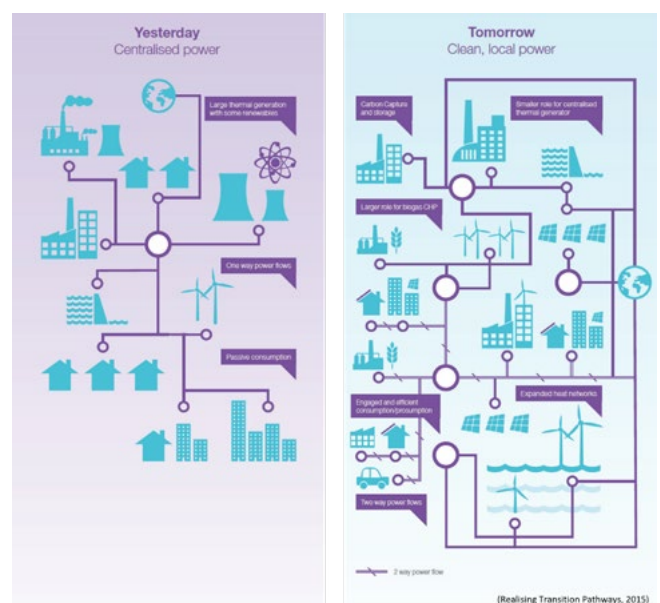
HIGHLIGHTS OF THE RESEARCH ACTIVITY

This research focuses on spatial planning for energy-resilient territories and cities. It addresses the energy transition in line with the climate-neutral 2050 strategy by integrating energy systems development within urban areas. The importance of incorporating the energy issue into the decision-making process is widely recognized, in particular by the 2016 Urban Agenda within the framework of the EU SDGs. The energy transition is one of the priority issues to be addressed in developing an integrated energy system within urban areas that must guarantee that cities effectively mitigate climate change and achieve their decarbonization goals.

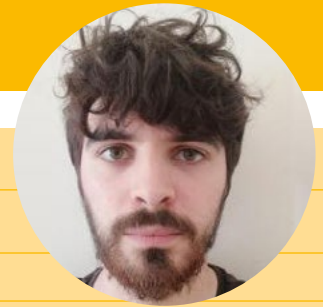
The EU Clean Energy for All Europeans package facilitates the energy transition through various measures aimed at improving the security, sustainability, and competitiveness of the energy system. These aspects are closely related to the importance of energy supply and demand spatial proximity. In this context, Energy Communities (ECs) offer a solution for energy security and access to clean energy. Renewable Energy Communities (RECs) meet the needs for energy security and accessibility to a clean energy economy, making urban areas more self-sufficient and resilient.

This union of users is fundamental to promoting energy sustainability, bringing energy consumption together with energy production, with the aim of “producing energy where there is a demand of energy” that implies a spatial component. Therefore, Renewable Energy Communities are an opportunity to increase the integration grade between energy and spatial planning, to face the current challenges such as climate changes and catastrophic events.

The research constructs models and tools for analysing energy systems at an urban scale using a place-based approach. It combines technical analysis of databases with the construction of energy-spatial strategies to improve multilevel coordination between public authorities. The goal is to find the intersection between spatial planning and energy through the development of energy-driven plans and platforms that utilize energy models and actively engage citizens.



NAME **Luca BERTOCCI**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE *All'Arcipelago! Turbulent geographies, ambivalences, and wet futures from the Planetary Flood*
TUTOR(S) Marco SANTANGELO, Camillo BOANO

ACADEMIC CONTEXT

- Brenner N., 2014. *Implosions/Explosions: Towards a Study of Planetary Urbanization*. Berlino: Jovis.
- Cacciari M., 2020. *L'Arcipelago*. Milano: Adelphi
- Moore J., 2015. *Ecologia-mondo e crisi del capitalismo*. Verona: Ombre Corte.
- Negri T. and Hardt M., 2004. *Moltitudine*. Milano: Rizzoli.

EXTERNAL COLLABORATIONS

- PortCityFuture (<https://www.portcityfutures.nl/home>)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Let us see the globe, as it was the first time. It is nothing else but a huge archipelago, which wetness permeate mountains, human and non-human bodies, the planetary metropolis, and air. Nevertheless, that is not a static or cartographic geography, but a turbulent one. Moreover, sea levels are rising because of climate change. The same goes for flooding risks, which are also due to the growing in rain intensity. Many authors (Moore, 2015; Brenner, 2004) have highlighted the relation of co-production between the ecological emergency and planetary urbanization under the pressure of capitalist and colonial political-economic forces. Considering those studies, my research develops an unprecedented hypothesis: what if the planetary metamorphosis of the city and the historical revealing of exceeding non-human natures were also a *chance* for thinking about emancipation and exodus from capitalism?

Firstly, I go back to Lefebvre and advance the figure of the *social architect* for embodying the French philosopher's proposal about the urban revolution as a matter of socializing urbanism. Then, by cross-reading him through Negri's and Hardt's (2004) political thought, I offer the *urbanistic life of the multitude* as an update of Lefebvre's hypothesis. Thirdly, thanks to Moore's Marxist perspective, the ecological issue is gained, and the *metabolic life of the multitude* appears as a productive way for thinking about social change as production-of-environment.

Finally, the *Archipelago* (Cacciari, 1997) is offered as a possible urban-political project (or figure) for facing the planetary flood and moving beyond capitalism. Moreover, such a figure is also confronted with some visions of floating urbanization, and some national strategic planning programs of rivers' water management in the Netherlands. In depth interviews have been conducted with architects, geographers and engineers involved in such projects. After that *transduction* movement, the Archipelago has finally appeared as a fruitful instrument for seeing territories of exodus. They are emerging as ambivalence from currently existing and always negotiated production-of-environment.



General aim of the research is claiming for strong and more attention upon the coming *planetary flood*. Ethically, the gaze is here always turned to possible political planetary alternatives beyond capitalism and the State.

NAME **Francesco BRUZZONE**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE Green and equitable mobility: solutions for peripheral areas
TUTOR(S) Federico CAVALLARO, Silvio NOCERA

ACADEMIC CONTEXT

- Bruzzone F., Cavallaro F. and Nocera S., 2022. The effects of high-speed rail on accessibility and equity: Evidence from the Turin-Lyon case-study'. *Socio-Economic Planning Sciences*, p. 101379.
- Bruzzone F., Cavallaro F. and Nocera S., 2023. The definition of equity in transport. *Transportation Research Procedia*, 69, pp. 440-447.
- Cavallaro F., Bruzzone F. and Nocera S., 2020. Spatial and social equity implications for High-Speed Railway lines in Northern Italy. *Transportation Research Part A: Policy and Practice*, 135, pp. 327-340.
- Cavallaro F., Bruzzone F. and Nocera S., 2023. Effects of high-speed rail on regional accessibility. *Transportation*, 50(5), pp. 1685-1721.

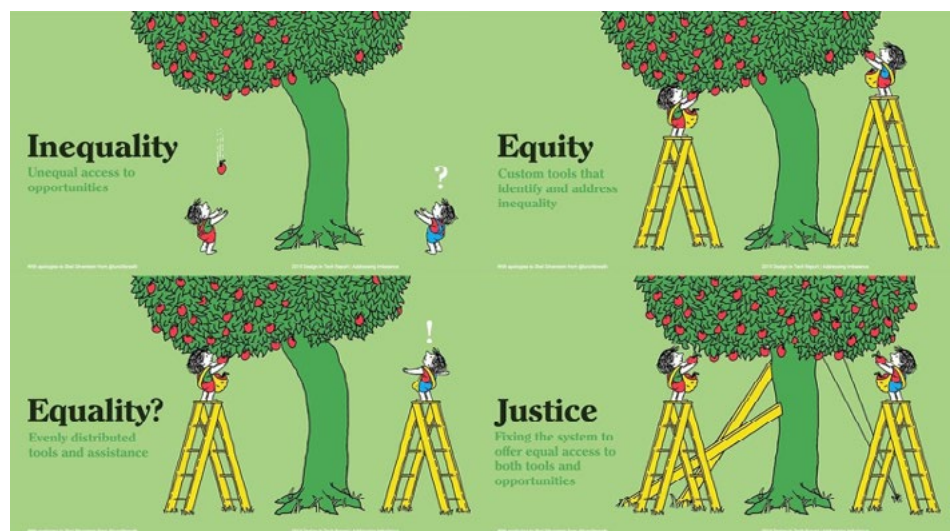
EXTERNAL COLLABORATIONS

- IUAV University of Venice, Department of Architecture and Arts

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The transport sector plays a fundamental role in ensuring the achievement of sustainability goals at global and local level. Mobility, now greatly contributing to the pauperization of resources, can instead be one of the main drivers for global progress towards the greener and more equitable urban world imagined by the United Nations' Sustainable Development Goals. The concept of equity within the transport sector has often been addressed as the study of accessibility and cohesion; however, the study of the link between equity and sustainability in transport still leaves wide open research gaps. In my work, I discuss transport equity, exploring the amplitude of the concept and its practical implications for transport planning and policymaking. The concept of "equity" is vast and comprehends social and spatial aspects, with sociodemographic, market-related and policy factors composing a complex and indented framework with significant impacts on people's quality of life. In its first sections, then, my research investigates social and spatial equity implications of mobility systems, with a specific emphasis on economically suffering territories, discussing the link between transport infrastructure and services, attractiveness and competitiveness at a local level, and the contribution of mobility in sharpening or alleviating societal and distributive inequality. Moving on, I then highlight the link between transport equity and sustainable development, and explore

methods for assessing equity implications of transport projects and plans, in particular within the urban sustainability framework and with a specific focus on large-scale projects such as High-Speed Rail. Finally, through a selection of case studies, I estimate and evaluate equity implications of different mobility projects and plans, as well as possible equity and accessibility enhancement strategies for different types of peripheral areas. The outcomes of the research should be useful to researchers and transport planners to foster the transition towards more sustainable, inclusive and integrated (urban) mobility as required by global, EU and sectorial strategies.



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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE Characters in search of an author.
Unfolding the territorial governance of Italian Metropolitan Cities
TUTOR(S) Giancarlo COTELLA

ACADEMIC CONTEXT

- Crivello S. and Staricco L., 2017. Institutionalizing Metropolitan cities in Italy. Success and limits of a centralistic, simplifying approach. *Urban Research & Practice*, 10(2), pp. 228-238.
- De Donno M., 2019. La riforma del governo locale nella legge Delrio: qualche riflessione cinque anni dopo. *Federalismi.it*, 7/2019.
- Fricke C. and Gualini E., 2018. Metropolitan regions as contested spaces: the discursive construction of metropolitan space in comparative perspective. *Territory, Politics, Governance*, 6(2), pp.199-221.
- Vinci I., 2019. Governing the Metropolitan Dimension: A Critical Perspective on Institutional Reshaping and Planning Innovation in Italy. *European Journal of Spatial Development*, 17(1), pp. 1-21.
- Zimmermann K., Galland D. and Harrison J., 2020. *Metropolitan regions, planning and governance*. Springer.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The exploration of the metropolitan dimension is an exceedingly complex challenge in today's world. The development of territorial policies has always been interpreted through new paradigms in metropolitan areas. This doctoral work focuses on the governance of metropolitan areas in Italy. Specifically, it aims to investigate how the Delrio reform of 2014 has been implemented by local and regional authorities, evaluate its impact, strengths and limitations, and examine the Italian metropolitan cities and their governance structures at the metropolitan level. It's important to note that the Delrio reform was created during a significant historical period. The concept of a metropolis was no longer easily definable and one of the primary goals of the reform was to address the various contradictions that had accumulated over time in Italian cities. The law assigns high and wide-ranging objectives to the metropolitan city. This makes it responsible not only for managing services, infrastructure, and networks but also for promoting economic development, attracting strategic investments and fostering social cohesion. The expected outcomes mainly aim to achieve a comprehensive understanding of territorial governance and planning at the metropolitan level in the Italian context (following the Delrio reform). Through in-depth case studies, the policy approaches, governance systems, and processes that can help to develop more effective metropolitan spatial planning policy will be identified. Comparing the 14 Italian metropolitan cities, the picture that emerges is one of absolute heterogeneity. Heterogeneity in demographic size, economically, socially, territorially and in terms of planning instruments. To adequately investigate three contexts that are different from each other but with elements that are useful to each other, the choice of case studies fell on the Metropolitan City of Turin, the Metropolitan City of Bari and the Metropolitan City of Bologna. The research project is primarily aimed at policymakers and in particular all those who gravitate around metropolitan governance.



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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE Sustainable territorial development. The contribution of heritage to the assignment of spatial development rights
TUTOR(S) Andrea BOCCO

ACADEMIC CONTEXT

- Berisha E., Cotella G., Janin Rivolin U. and Solly A., 2023. Spatial governance and planning systems vis-à-vis land consumption in Europe. *European Planning Studies*, pp. 1-16. <https://doi.org/10.1080/09654313.2023.2207605>.
- Colsaet A., Laurans Y. and Levrel H., 2018. What drives land take and urban land expansion? A systematic review. *Land Use Policy*, pp. 339-349.
- Blanc F., Cabrera J.E., Cotella G., Vecchio G., Santelices N., Casanova R., Saravia M., Blanca M. and Reinheimer B., 2022. Latin American spatial governance and planning systems and the rising judicialisation of planning: Evidence from Argentina, Chile, and Uruguay. *disP - The Planning Review*, 58, pp. 22-39. <https://doi.org/10.1080/02513625.2022.2200654>.
- Leiva F. and Diaz P., 2020. Patrimonialization, Territorial Development and New Governance Models. The Case of the Talca-Constitución Railway Branch in the Maule Region, Chile. *Opera-Colombia*, 26, pp. 37-53.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The present investigation kicked off with a proposed research subject, named “Cultural Heritage for Territorial Development”, framed within the “Technologies, Techniques and Methodologies for Sustainable Development Research Area”, established by the Doctorate School. The proposal aimed to “contribute with vision, technical knowledge, and commitment in designing a future for cultural heritage and local communities who make it alive”. According to it, territories in mature industrial societies as well as in developing countries are living two opposite trends: on one side, extreme urbanisation of certain areas and on the other, abandonment of marginal territories, where population is shrinking and ageing.

The present thesis aims to tackle the reasons for this unharmonious territorial development from a spatial planning perspective, taking Chile as a case study. Consequently, the country’s Spatial Governance and Planning Systems (SGPSs) are introduced and analyzed - particularly, institutional technologies that assign spatial development rights – to study their outcomes in terms of land use and consumption in a context in which regional public institutions struggle to be articulated, and strategies, policies, and investments tend to be centrally defined and fragmented sectorally (Orellana et al., 2020).

Next, some specific examples are presented, where cultural heritage and community participation have propitiated alternative processes and mechanisms of land-use management and transformation that, arising and operating alongside the formal ones, contribute to shaping the nature of SGPSs themselves (Blanc et al., 2022).

The research focuses on the incorporation of heritage functions as strategic resources to construct a renewed territorial model based on the contemporary notion of landscape, where heritage and landscape pairing materializes an operational response to put the concept of sustainability into practice (López Sánchez et al., 2020). This raises the need for a comprehensive look at heritage that, on the one hand, takes charge of the “biocultural” dimension of human activity, that is, the way in which communities interact with their own local ecosystem, and with the combination of landscapes and the biodiversity contained in them, in such a way that the result is a complex and wide range of fine and specific interactions; and, on the other, pay attention to the way in which patrimonialization policies can facilitate and enhance processes of spatial planning and territorial development, seeking to improve the conditions of well-being and quality of life of the communities that have produced and sustained the value by which certain cultural landscapes are recognized (Leiva and Diaz, 2020).

Containing urbanization does not necessarily halt development, which can instead be promoted through backfilling or further densification measures (Berisha et al., 2023). The opportunities presented by a heritage based approach mark out the landscape as a possible new paradigm for new development models, with the aim of harmonious integration of social, economic and environmental factors in space and time (Agnoletti, 2014).



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COURSE	XXXVI cycle - 3 rd year			
RESEARCH TITLE	Social housing urban environments in the post-pandemic: A spatial sustainability assessment approach. Case study: Bogota, Colombia			
TUTOR(S)	Patrizia LOMBARDI, Sara TORABI MOGHADAM			

ACADEMIC CONTEXT

- Escorcia Hernández J.R., Torabi Moghadam S. and Lombardi P., 2023. Sustainability Assessment in Social Housing Environments: An Inclusive Indicators Selection in Colombian Post-Pandemic Cities. *Sustainability*, 15, 2830. <https://doi.org/10.3390/su15032830>.
- Guzman L. A. *et al.*, 2021. COVID-19, activity and mobility patterns in Bogotá. Are we ready for a “15-minute city”? *Travel Behaviour and Society*, 24, pp. 245-256. doi: 10.1016/j.tbs.2021.04.008.
- Sharifi A. and Khavarian-Garmsir A. R., 2020. The COVID-19 pandemic: Impacts on cities and major lessons for urban planning, design, and management. *Science of the Total Environment*. Elsevier B.V., p. 142391. doi: 10.1016/j.scitotenv.2020.142391.
- Torabi Moghadam S. and Lombardi P., 2019. An interactive multi-criteria spatial decision support system for energy retrofitting on building stocks using CommunityVIZ to support urban energy planning. *Building and Environment*, 163.

EXTERNAL COLLABORATIONS

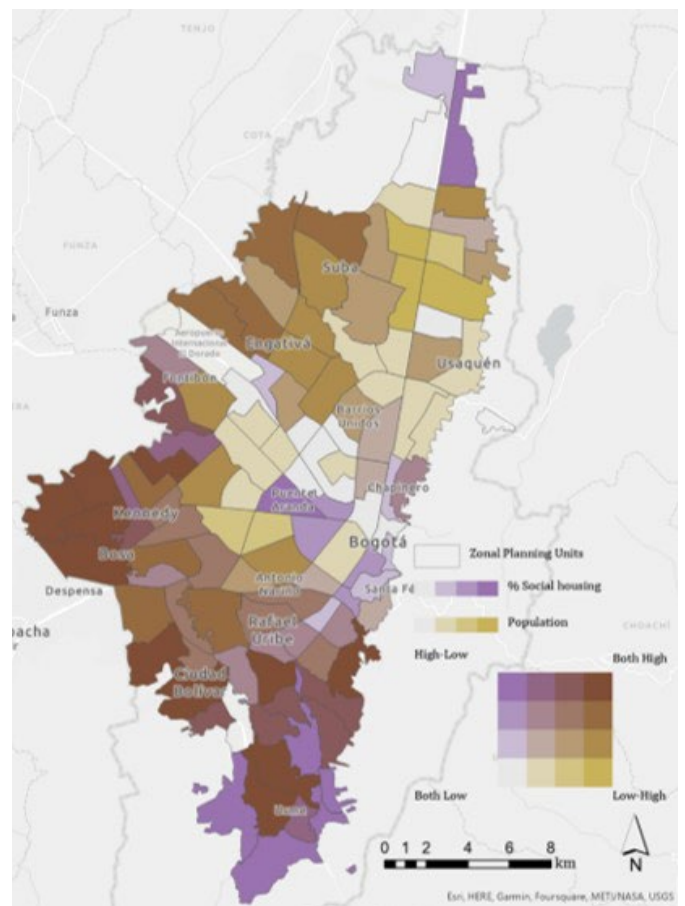
- Graduate School of Innovation and Practice for Smart Society - The IDEC Institute, Hiroshima University – Japan (Host for research visiting period 2023)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In the context of post-pandemic plans for socioeconomic recovery, housing and urban development initiatives play a crucial role. Numerous studies have examined the pandemic’s operational, organizational, and social impacts on cities. It is widely concluded by various scholars that individuals with low incomes, who were already highly vulnerable across multiple dimensions before the pandemic, have been the most adversely affected. They have experienced elevated rates of infection, high mortality rates due to limited access to infrastructure and healthcare services, and various social challenges like unemployment, increased poverty levels within households, and mental health issues. These studies also emphasize that developing countries bear the brunt of pandemic effects and the highest repercussions in the post-pandemic.

These circumstances underscore the significance of countries like Colombia, prioritizing human settlements and housing development in their short- and medium-term post-COVID recovery plans. It is imperative to emphasize that these development pathways for recovery should align with the sustainability agenda, ensuring inclusivity and drawing lessons from cities’ responses during the outbreak. Likewise, strategies should be aligned with the objective of achieving carbon neutrality, spanning their entire life cycle, and ultimately working towards carbon-neutral cities.

In essence, this framework serves as the impetus for this research, which seeks to evaluate the sustainability conditions of social housing environments within future urban development scenarios using a data-driven, multi-dimensional spatial assessment. This research aims to provide a decision-support tool rooted in the systemic nature of cities and social housing environments, striving for both carbon neutrality and urban sustainability.



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COURSE	XXXVI cycle - 3 rd year		
RESEARCH TITLE	When the plan is not enough. Civil Protection emergency planning for effective Disaster Risk Reduction		
TUTOR(S)	Piero BOCCARDO, Mario CERASOLI		

ACADEMIC CONTEXT

- Albris K., Lauta K.C. and Raju E., 2020. Disaster Knowledge Gaps: Exploring the Interface between science and policy for Disaster Risk Reduction in Europe. *International Journal of Disaster Risk Science*, 11, pp. 1-12.
- Alexander D., 2002. *Principles of emergency management and planning*, Edinburgh: Terra Publishing, Dunedin Academic Press Ltd.
- Bertin M., 2018. *Per esser pronti. Ripensare la gestione dell'emergenza in città*. Milano: FrancoAngeli.
- Menoni S., 2020. Risk mitigation and resilience of human settlements. In: A. Balducci et al., *Risk and Resilience*, SpringerBriefs in Applied Science and Technologies, Cham: Springer. pp. 27-47.

EXTERNAL COLLABORATIONS

- National Department of Italian Civil Protection – Fondazione CIMA

HIGHLIGHTS OF THE RESEARCH ACTIVITY

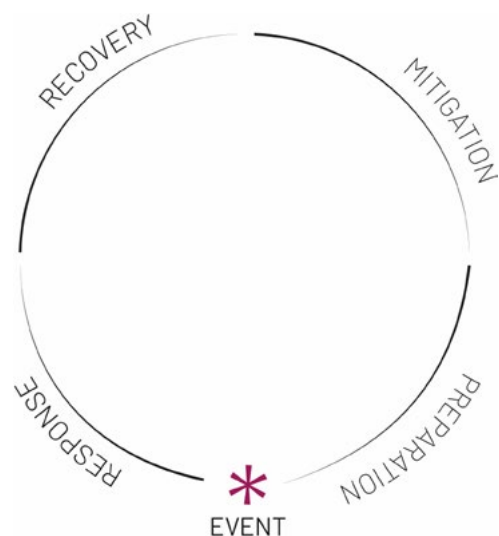
Moving from the early conceptualization of “Disaster as Act of Gods”, the multiplicity of disciplines which address the topic agree on defining the disaster as a socio-natural event with a strong territorial component. Risk is now a holistic concept, integrating environmental, social, economic, political, infrastructural and governance-related issues. In the age of climate change, when disasters are increasing in quantity and intensity, it is necessary to change the paradigm used to approach the subject. It is key to no longer treat disasters as isolated event, but rather as periodic occurrences embedded within a cycle and influenced by human actions.

Mitigation, preparation, response and recovery are the four different phases characterizing the disaster cycle. An effective management of each of these phases helps in the definition of Disaster Risk Reduction action for the social and territorial context hit by the disaster.

It is in this debate that the research work here presented is framed. The objective is to analyse practices of emergency management and planning able to trigger effective Disaster Risk Reduction actions on the territories, in order to successfully integrate them into a more general discourse about risk in spatial planning.

The research adopted a case-study approach, within the Italian Civil Protection system, which embodies one of the main players in the disaster cycle. The specific cases at the centre of the research are two: the execution of a Civil Protection exercise of national relevance – the *EXE Sisma dello Stretto 2022* – and the process of participatory planning for the drafting and updating of the Civil Protection municipal plan of the town of Bagnara Calabria (RC - Italy). Being the field of Civil Protection much more operational-oriented than theoretical, fieldwork plays a central role in the development of this research. Data were collected through participatory observation and semi structured interviews and then organized in a relational database, in order to systemize the process of emergency management and planning observed.

Results of the research show that integrating Disaster Risk Reduction as structural elements in spatial planning requires combined actions at both central and local level. This includes an effective knowledge transfer among governance stakeholders coupled with strong social connection at the local scale.



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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **Beyond marginality: welfare, governance and institutions, spatial imaginaries and policies. Insights from 'Terres Monviso'**
TUTOR(S) **Loris A. SERVILLO, Antonio DE ROSSI**

ACADEMIC CONTEXT

- De Rossi A. and Barbera F., 2018. *Riabitare l'Italia le aree interne tra abbandoni e riconquiste*. Roma: Donzelli.
- Fontana M. and Del Fiore M., 2023. Territori marginali, metromontagna e pianificazione strategica: testimonianze dalle Terre del Monviso. *Atti e Rassegna Tecnica della Società degli Ingegneri e degli Architetti in Torino*, LXXVII(1), pp. 26-33.
- Fontana M., Del Fiore M., Servillo L.A. and Garelli A. (under review). Rivoluzione silenziosa e incompleta: nuove geografie istituzionali, tra CLLD e altre iniziative d'area vasta. *Territorio*.
- Servillo L.A. and Fontana M., 2021. Il welfare in sezione: nuovi ambiti politici, funzionali e istituzionali. In A. De Rossi, F. Barbera, *Metromontagna. Un progetto per riabitare l'Italia*. Roma: Donzelli, pp. 101-125.

EXTERNAL COLLABORATIONS

- *PhD grant*: PhD grant focusing on issues concerning Italian 'inner areas' and marginalised territories. Fund for Development and Cohesion within the framework of the 'Piano Stralcio Ricerca e Innovazione 2015-2017'.
- *Research period*: Municipality of Saluzzo (CN), February 2022 - July 2022.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

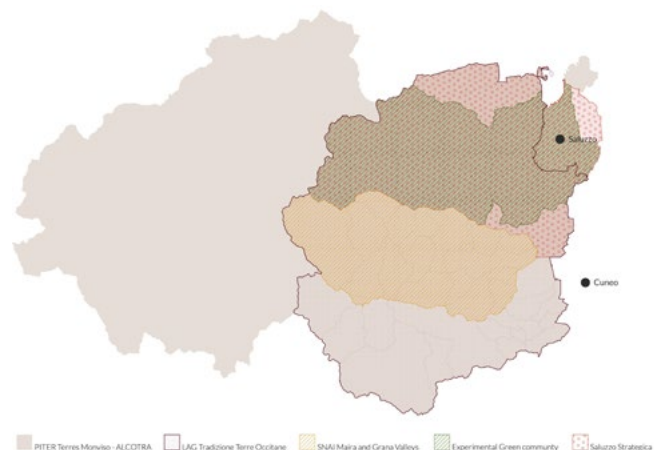
After decades of narratives and imaginaries that, since the post-World War II period, have presented us with the city as the sole engine of development and growth, new narratives which look to the centrality of 'other' places are beginning to arise. Even from the point of view of the cultural approach and public policies, we are witnessing a change of pace that places certain attention on all those territories kept on the margins of the great processes of transformation, such as rural and mountain areas.

In the Italian case, the cultural and political processes focusing on marginal territories were accelerated by the National Strategy for Inner Areas (SNAI in its Italian acronym), a place-based policy launched in 2012. SNAI posed an interpretative paradigm shift for redrawing the geographies of marginality in Italy that overcome the long-standing 'north-south' or 'urban-rural', and stands in contrast to the redistributive and universalist policies that characterised the European states from the Trente Glorieuses until the welfare state crisis in the 1990s.

To answer the research question with wonder about what political, institutional and bottom-up responses are territorial marginality and welfare and services accessibility being tackled, the research discusses territorial marginality from four topics of study and analysis:

- welfare, to frame the issue of socio-spatial inequalities and citizenship rights issues against the need for a renewed territorial welfare;
- institutions and governance, to study the creation attempts of soft spaces, buzzy boundaries and experimental governance, in order to understand how the models of institutional, territorial and governance innovation are working to overcome spatial disparities;
- spatial imaginaries and narratives, to understand their importance to identify effective policy responses and political arenas;
- policy, to analyse the National Strategy for Inner Areas in the context of development and cohesion policies.

The research is based on a single case study identified in the territory of Terre del Monviso, in the province of Cuneo. The research provides a unique interpretation of processes that have taken place in the territory in recent years as a consequence of the perpetuation of socio-spatial marginalisation processes and a response to a gap related to intermediate institutions and governance, as well as to the grounding of various policies and strategic projects.



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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE Data fusion for mobility pattern analysis and APC evaluation protocol definition: A case study
TUTOR(S) Cristina PRONELLO

ACADEMIC CONTEXT

- Lau B.P.L. *et al.*, 2019. A survey of data fusion in smart city applications. *Information Fusion*, 52, pp. 357-374. doi: 10.1016/J.INFFUS.2019.05.004.
- McCarthy C. *et al.*, 2021. A Field Study of Internet of Things-Based Solutions for Automatic Passenger Counting. *IEEE Open Journal of Intelligent Transportation Systems*, 2, pp. 384-401. doi: 10.1109/OJITS.2021.3111052.
- Meng T. *et al.*, 2020. A survey on machine learning for data fusion. *Information Fusion*, 57(2), pp. 115-129. doi: 10.1016/j.inffus.2019.12.001.
- Pronello C. and Garzón Ruiz X.R., 2023. Evaluating the Performance of Video-Based Automated Passenger Counting Systems in Real-World Conditions: A Comparative Study. *Sensors*, 23(18), p. 7719. <https://doi.org/10.3390/s23187719>.

EXTERNAL COLLABORATIONS

- Leonardo S.p.A. – sponsor of the PhD grant

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In the field of studying mobility patterns, there have been various methods for collecting and comprehending data. While traditional techniques, like conducting travel surveys via phone calls, have been widely used, the introduction of intelligent transport systems (ITS) has brought forth innovative ways to collect and process data. For instance, we can mention mobile app applications that automatically collect data, Geographic Information Systems (GIS) for information of the territories, diffusion of IoT devices, inception of 5G mobile network connectivity, etc. When compared to conventional methods, these technologies not only reduce data collection costs but also enhance data quality and quantity.

Therefore, tools like automatic passenger counting (APC) systems have been developed based on the latest technologies and have been offered to transport companies as a way to create indicators to measure their performance. However, there are no protocols or specifications that guide transport companies to choose the right system for them, leading to sub-optimal systems application.

To estimate mobility patterns effectively, it becomes essential to collect a substantial amount of data from different sources, including transport companies, census data and territorial information. Yet, these datasets might be fragmented, and would not provide a full picture of the reality. Thus, new data analysis approaches have been developed to understand the important features from the data lake and to shape its reality in a model. Here is where the big data and learning models in a data fusion context appeared.

This research is aimed to understand how much a fused dataset, composed by territorial variables, environmental data, and passenger count systems

data, can provide a better insight into the intricacies of mobility patterns. Additionally, the research also intends to comprehend and create guidelines to support transport companies in evaluate and choose better suited APC systems for them through a series of real-world transport context experiments.



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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE Understanding hydrological processes at different scales through stable water isotopes: a focus on alpine ecosystems
TUTOR(S) Stefano FERRARIS

ACADEMIC CONTEXT

- Gentile A., Bevilacqua I., Canone D., Ceperley N., Gisolo D., N'Sassila M., Paviati M., Zuecco G., Schaeffli B. and Ferraris S., 2022. Seasonal compartmentalisation of water in a grassland at 2600 m a.s.l. In: *EGU General Assembly 2022*, Vienna, Austria, 23-27 May 2022, <https://doi.org/10.5194/egusphere-egu22-9190>.
- Gentile A., Canone D., Ceperley N., Gisolo D., Paviati M., Zuecco G., Schaeffli B. and Ferraris S., 2023. Towards a conceptualization of the hydrological processes behind changes of young water fraction with elevation: a focus on mountainous alpine catchments. *Hydrology and Earth System Sciences*, 27, pp. 2301-2323, <https://doi.org/10.5194/hess-27-2301-2023>.
- Gentile A., von Freyberg J., Gisolo D., Canone D. and Ferraris S. 2023. Technical Note: two-component Electrical Conductivity-based hydrograph separation employing an EXponential mixing model (EXPECT) provides reliable high temporal resolution young water fraction estimates in three small Swiss catchments. *EGUsphere*, 1-23, <https://doi.org/10.5194/egusphere-2023-1797>.
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EXTERNAL COLLABORATIONS

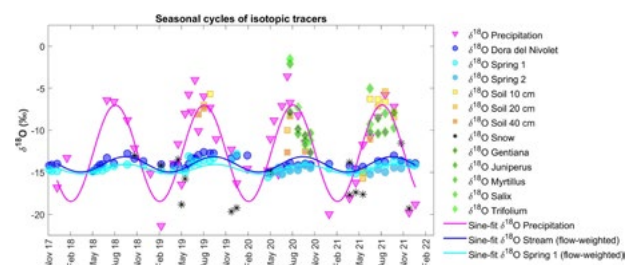
- Institute of Geography, University of Bern, Bern, Switzerland
- School of Architecture, Civil and Environmental Engineering, EPFL, Lausanne, Switzerland
- WATER mixing in the critical ZONE: observations and predictions under environmental changes (WATZON)- PRIN 2017

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The use of tracers in hydrology and ecohydrology allowed giant steps forward for understanding the age, the origin, and pathways of water in natural environments. Among conservative tracers, stable water isotopes have been used for these aims because they are natural constituent of water molecules. Isotope seasonal cycles in precipitation and streamwater can provide key information on ecosystems functioning. The young water fraction, i.e., the fraction of water with transit times of less than roughly 2-3 months, can be estimated from these seasonal cycles. High and steep mountain environments revealed low young water fractions, that is a counterintuitive result since the presence of the exposed bedrock and steep landscapes are expected to promote high water velocity. Accordingly, the hydrological processes hidden behind this result remain basically unclear. By using data of 27 study catchments located in both Switzerland and Italy, we investigate at regional scale the relevance of snowpack persistence, low-flow duration and catchment storage with elevation, thus clarifying this unexpected result.

Isotope seasonal cycles allow to estimate an average value of the young water fraction over the period of isotope sampling. Nevertheless, it is important to investigate the non-stationary behavior of this quantity according to different catchments wetness conditions that are reflected in stream discharge. By coupling the easily obtainable electrical conductivity measurements with stable water isotopes, we developed a method for estimating the young water fraction at the catchment scale with high (daily) temporal resolution. The method has been tested in three small Swiss catchments returning promising results. Soil and xylem water isotope content can be used for answering questions such as "What is the seasonal origin of water that supplies plants and streams?" Our results in a soil profile (plot-scale) of a high-elevation grassland located in the Aosta Valley suggest a seasonal compartmentalization of water: summer rainfall supplies transpiration while winter water (i.e., snowmelt) supplies groundwater recharge and, accordingly, streamflow.

This work improved, at three different scales, the knowledge of water pathways in alpine ecosystems, that is fundamental for studying flood forecasting, pollutant contamination, nutrient loss and water resources management under the current climate change scenario.



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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **From the border to the street: migrants' inhabitation and politics of life in the surroundings of Tiburtina station, Rome**
TUTOR(S) **Marco SANTANGELO, Silvia ARU**

ACADEMIC CONTEXT

- Bourgois P. and Schonberg J., 2009. *Righteous Dopefiend*. Berkeley: University of California Press.
- Dadusc D., Grazioli M. and Martínez M. A., Introduction: citizenship as inhabitation? Migrant housing squats versus institutional accommodation. *Citizenship Studies*, 23(6), pp. 521-539.
- Martin D., Minca C. and Katz I., 2019. Rethinking the camp: On spatial technologies of power and resistance. *Progress in Human Geography*, 44(4), pp. 1-26.
- Tazzioli M., 2020. *The Making of Migration*. London: Sage Publications.

EXTERNAL COLLABORATIONS

- Baobab Experience, Rome

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In the last decade, the reinforcement of bordering practices across Europe (and beyond) led to the growth of migrants' makeshift encampments across border areas and major urban agglomerations. Despite the border regime, these spatialities became part of an infrastructure supporting people on the move and Rome, as part of the Italian corridor, was fully impacted since 2015. In the surroundings of Tiburtina station specifically, migrants' presence met the support of volunteers and activists, and the emerging spatialities came to be highly visible and politicized during these years. Initially migrants stopped in the Italian capital on their way to northern Europe, but their trajectories changed when people movements became more difficult. Indeed, the governance of migration used borders as political technologies to control the movement of people, which has further resulted in the deterioration of people's living conditions.



Within this framework, the research investigates on the intersection between bordering practices and urban processes, focusing on the point of view of those confined on a life in

the street. In these spaces of marginality, where grey forms of governance are acting, borders are performed across various levels and their negotiations present in several mundane acts. Migrants' give proof of their agency in daily encounters although their room of manoeuvre is constantly endangered, for example when discourses of security and decorum materialise in eviction operation. The study is field based and relies on one year of militant ethnography in Rome joining the infrastructure of solidarity. This involvement allowed to establish meaningful connection with the people met on field, and who made the research possible. On one side, the material collected allowed to reconstruct the spatial processes shaping Tiburtina while, on the other, it helped in understanding how borders came to shape peculiar subjectivities acting across the urban space. The street not only transformed into a socio-material infrastructure sustaining people inhabitation, but it may also represent the space where migrants, in their own ontological frame, can self-determine.

NAME **Beatrice MECCA**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **Fostering value creation in architecture**
TUTOR(S) **Isabella M. LAMI, Alexis TSOUKIAS**

ACADEMIC CONTEXT

- Bouyssou D., Marchant T., Pirlo, M., Tsoukias A. and Vincke P., 2006. *Evaluation and Decision models with multiple criteria. Stepping stones for the analyst.* Springer New York, NY.
- Lami I.M. and Mecca B., 2021. Assessing Social Sustainability for Achieving Sustainable Architecture. *Sustainability*, 13, pp. 1-21.
- Tsoukias A., 2007. On the concept of decision aiding process: An operational perspective. *Annals of Operations Research*, 154, pp. 3-27.
- Mecca B., 2023. Assessing the sustainable development: A review of multi-criteria decision analysis for urban and architectural sustainability. *Journal of Multi-Criteria Decision Analysis*, pp. 1-16.

EXTERNAL COLLABORATIONS

- LAMSADE (Laboratory for Analysis and Modelling of Decision Support Systems) centre at Paris Dauphine University

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In the perspective of a green and sustainable future, architectural choices, together with urban ones, should be made as clearly as possible in order to orient transformations towards environmental, economic and social sustainability. Indeed, these choices prove to be challenging as the architectural and urban context of reference is complex and characterised by multiple dimensions, objectives, interests, and preferences to be considered and managed simultaneously.

Thus, an important issue is to understand how such choices can be supported and oriented to be in favour of an innovative and sustainable future. This point is related to the request of the European Commission, that encourages the development of integrated tools for design and decision-making in the context of developing a sustainable and circular built environment with the aim of taking impacts into account.

This request, in the context of sustainable architecture, could be answered in the development of an evaluation method to support sustainable architectural project evaluation, investigating its potential different characteristics with respect to: the public context of choice among design alternatives; and the private context of project approval and thus to support the design of alternatives.

In this context, the objective of this thesis is to investigate the role of evaluation in the development of sustainable architectural designs and more specifically to understand how it is possible to support the development, measurement, and evaluation of architectural design projects so that they can be considered as sustainable and value creating projects.

In this sense, the research intends to analyse the features and peculiarities of the problem at hand and to reflect on techniques for the architectural project and sustainability appraisal, investigating which assessment method can support the development of sustainable architectural projects able to create value. Therefore, it is envisaged to investigate the logic of value creation of the architectural transformation projects that will be introduced into the market, identifying a methodological evaluation path useful to support in the justified selection of the most appropriate valuation method for the needs of the issue under analysis. This method will be the output of the research and its potential usefulness could be in the selection and approval phase of the project, supporting the Public Administrations in the development of sustainable cities.



NAME **Michele MONDANI**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **Cryosphere processes and hydrogeological systems: analysis and interactions**
TUTOR(S) **Stefano LO RUSSO, Monica PAPINI, Glenda TADDIA**

ACADEMIC CONTEXT

- Gleick P., 1993. *Water in Crisis: A Guide to the World's Fresh Water Resources*, New York: Oxford University Press.
- ISTAT, 2021. *Italia seconda in Europa per il prelievo di acqua potabile per abitante*. Le statistiche dell'ISTAT sull'acqua.
- Leone G. *et al.*, 2021. A hundred years of Caposele spring discharge measurements: trends and statistics for understanding water resource availability under climate change, *Stochastic Environmental Research and Risk Assessment*, 35(2), pp. 345-370. doi: 10.1007/s00477-020-01908-8.

EXTERNAL COLLABORATIONS

- Politecnico di Milano, Lecco (research support and projects collaboration)
- Flinders University, Adelaide (host for visiting research period)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The cryosphere collectively describes all forms of frozen water at the Earth's surface such as sea ice, ice sheets, ice caps, glaciers, snow cover, river and lake ice, permafrost, seasonally frozen ground and solid precipitation. It is an important component in the context of climate change because of its crucial role within the global water balance, in fact, it retains almost 70% of global fresh water (Gleick, P., 1993).

Snow and ice melting in mountain area is very important actor within the hydrogeologic cycle. For instance, in our country high contribute of drinkable water come from cryosphere melting, thanks to which liquid water generated flows out through downstream springs (ISTAT, 2021).

Increasing water exploitation and climate change conditions are affecting water balance, in particular influencing pluviometric regimes and accelerating melting cycles, which lead to widespread drought and instability problems. As reported by (Leone et al., 2021), the trends of the main climate variables, rainfall, snow and temperature, have direct control over groundwater storage conditions as well as spring discharge.

The research topic will range from assessing hydrogeological input such as solid and liquid rainfall to analyzing aquifer characteristics and evolution starting from mountain spring hydrograph. Moreover a particular focus will be put on semi-permeant cryosphere evolution such as glacier and permafrost which are providing water to several hydrogeologic circuits.

This project wants highline the evolution of hydrogeological systems according to the difference of hydric input given by the climate warming up that cause less precipitation, less snowpack in winter and permanent cryosphere melting.

The main goal of this research is to distinguish which aquifers do not perceive contributions from the permanent cryosphere and thus suffer from the new precipitation regimes, and instead the mountain aquifers whose water crisis is hidden by contributions from glacier and permafrost melt. Therefore, hydrogeologic equipment is necessary to establish new relationship between cryosphere melting and the effective water release from this system. Initially a hydrogeological input output analysis has been carried out, among five monitored springs and their weather stations, to understand the compliance of the spring response to rain and snow amounts. After which, an attempt has been made to trace the spring anomalies with the extraordinary melting phenomena in the surrounding environment resulting from glacier and permafrost.



NAME **Richard Lee PERAGINE**
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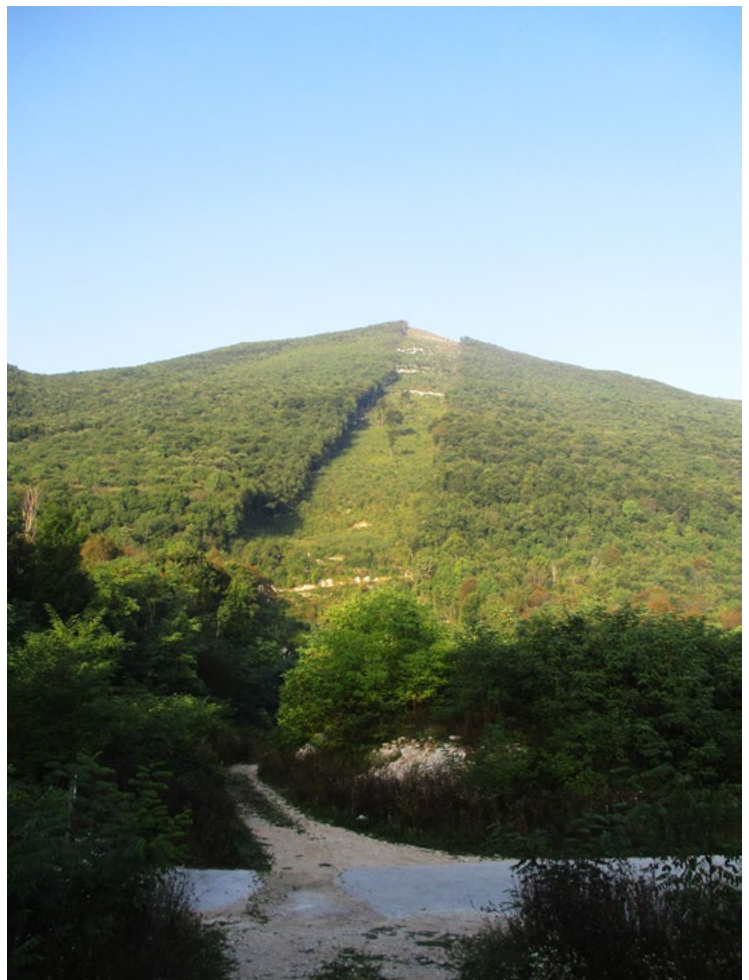
COURSE XXXVI cycle - 3rd year
RESEARCH TITLE The emptiness of sovereignty. Architecture, negativity and weaponization in the Bosnian krajina
TUTOR(S) Camillo BOANO, Angelo SAMPIERI

ACADEMIC CONTEXT

- Henni S., ed., 2022. *Deserts are not Empty*. New York: Columbia University Press.
- Mezzadra S. and Neilson B., 2019. *The Politics of Operations. Excavating Contemporary Capitalism*. Durham and London: Duke University Press.
- Nancy J.L., 1996. *Being Singular Plural*. Stanford: Stanford University Press.
- Povinelli E.A., 2016. *Geontologies. A Requiem to Late Liberalism*. Durham and London: Duke University Press.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This research posits and explores the relationship between the highest form of political power – sovereignty – and the figure of emptiness – a spatial and conceptual coordinate that comprises the architecture of ruins and multifarious forms of spatial ruination. In this sense, the figure of emptiness, I argue, coincides with the spatialization of the concept of negativity. This research will address sovereignty and emptiness, negativity and architecture, by discussing a situated form of state-sovereignty, that of Bosnia and Herzegovina, which consists in an arrangement of sovereign power irreducible to that of the State, or what I call differential sovereignty. Specifically, I focus on the northwesternmost corner of the country, known contentiously as the Bosnian krajina: a territory that straddles over the border with the central counties of Croatia, which has been historically and geographically determined by a frontier logic. In recent years, in the krajina, tens of thousands of migrant and refugee people from Africa, the Middle East and the Indian subcontinent especially have faced violent bordering practices on behalf of EU state and non-state actors that pose a major obstacle to illegal(ised) mobility along the so-called Balkan Route(s). The spatial configuration of migration management overlaps with that of the Transition, an ideological-teleological narrative put in place in post-socialist countries, which has contributed to determine years of hardship and organized abandonment for citizens in the Western Balkans. I thus frame the relationship between sovereignty and emptiness in the krajina through a specific reading of sovereignty in contemporary capitalism. More precisely, borrowing on Continental philosophy and critical theory, I suggest sovereignty is traversed by the nothingness located at its core and operates according to the logics of geontopower. I substantiate these claims by looking at the weaponization of emptiness in migration management and as a constitutive part of the deployment of the Transition in Bosnia and Herzegovina, and how these two forms of governance overlap. Finally, in light of the radical political potential of emptiness in the face of the contingency of classical readings of sovereignty, their relationship opens up to the prospect of an empty ethics of the project of architecture and territory that starts from negativity in order to question the technical solutionism and complicity with power of architecture in contemporary racial capitalism.



NAME	Maria Cristina PINTO		
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COURSE	XXXVI cycle - 3 rd year		
RESEARCH TITLE	Opportunities and challenges of green hydrogen in the energy transition framework: analysis of potential cross-border cooperations through a multi-dimensional approach		
TUTOR(S)	Piero BOCCARDO, Stefano Paolo CORGNATI, Maria GAETA		

ACADEMIC CONTEXT

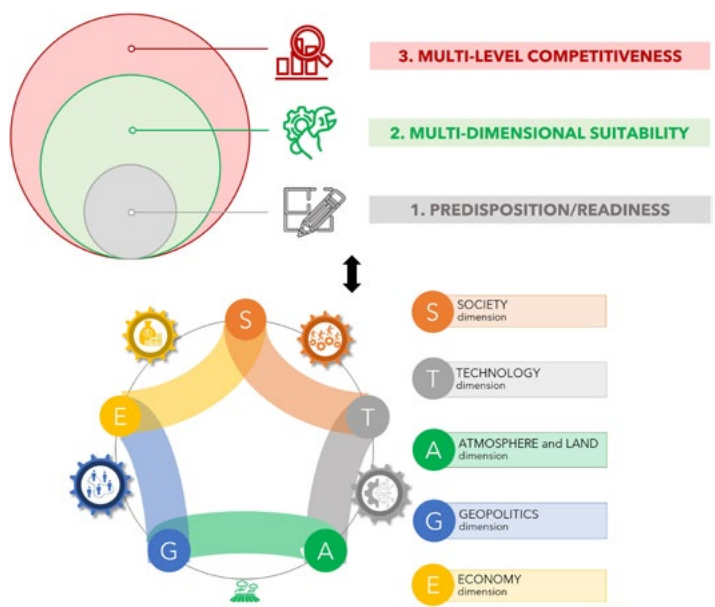
- Caprioli C. and Bottero M., 2021. Addressing complex challenges in transformations and planning: A fuzzy spatial multicriteria analysis for identifying suitable locations for urban infrastructures. *Land Use Policy*, 102.
- Pinto M.C., Boccardo P., Gaeta M. and Gelmini A., 2022. Achieving decarbonization: challenges and opportunities of green hydrogen. *REHVA Journal*, 01/2022, pp. 32-37.
- Vakulchuk R., Overland I. and Scholten D., 2020. Renewable energy and geopolitics: a review. *Renewable and Sustainable Energy Reviews*, 122.
- Zelt O., Kruger C., Blohm M., Bohm S. and Far S., 2019. Long-term electricity scenarios for the MENA region: assessing the preferences of local stakeholders using multi-criteria analysis. *Energies*, 12.

EXTERNAL COLLABORATIONS

- Ricerca sul Sistema Energetico (RSE), co-financer of PhD grant; National Laboratory of Energy and Geology (LNEG) and NOVA School of Science and Technology (FCT NOVA) in Lisbon (Portugal), as hosts for research period.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Even if energy-based, the transition towards climate-neutrality represents an intrinsically multi-disciplinary process that, evolving over time and space, will reshape countries' identities, through the crucial role of policymakers. In this regard, it is required a structured science-based decision making approach, allowing to address the complexity of the transition and paving the way to clean competitive solutions in the long-term. Specifically, by defining a multi-methodological approach, it is studied the role of green hydrogen (i.e. produced through water electrolysis enabled by renewable energy) and its potential import from North Africa, analysing the concepts of (i) predisposition/readiness, (ii) multi-dimensional suitability, (iii) multi-level competitiveness. Firstly, making reference to the required resources, social acceptance, infrastructure availability, environmental issues and geopolitical conditions, the first step exploits the PROMETHEE multi-criteria method; different criteria belonging to Society, Technology, Atmosphere and land, Geopolitics, Economy (i.e. the "STAGE" view) are collected from literature or self-elaborated to rank countries in terms of predisposition to green hydrogen. Secondly, the study of the multi-dimensional suitability deals with the definition of a Multi-criteria Spatial Decision Support System (MC-SDSS) that, through the combination of the Analytic Hierarchy Process (AHP) and Geographic Information System (GIS) environment, allows to assess land suitability in terms of solar and wind hydrogen production. As a result, the majority of the North African areas are classified as moderately or highly suitable, even if the most favourable ones in technical terms are often negatively influenced by the geopolitical or economic assessments. Finally, to adequately investigate the concept of multi-level competitiveness, different energy scenarios are elaborated exploiting TIMES (The Integrated MARKAL-EFOM System) modelling; under specific assumptions, it is possible to assess the competitiveness of green hydrogen according to parameters of uncertainty, with the added value of analysing the complexity of the whole system. This structured science-based decision making approach aims to geographically address the multi-level impacts of the adoption of new clean technologies; specifically applied to green hydrogen, it allows to study if and how it can be multi-dimensionally competitive.



NAME **Caterina POZZOBON**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE Bodies of water: an intersectional geography of waters in rural Tanzania
TUTOR(S) Elisa BIGNANTE, Emanuele FANTINI, Filippo MENGA

ACADEMIC CONTEXT

- Sultana F., 2011. Suffering for water, suffering from water: Emotional geographies of resource access, control and conflict. *Geoforum*, 42, pp. 163-172.
- Thompson J. A., 2016. Intersectionality and water: how social relations intersect with ecological difference. *Gender, Place and Culture*, 23(9), pp. 1286-1301.
- Zwarteveen M. *et al.*, 2017. Engaging with the politics of water governance. *WIREs Water*, 4, e1245. doi: 10.1002/wat2.1245.

EXTERNAL COLLABORATIONS

- I am collaborating with an international NGO called Lay Volunteers International Association (LVIA) who supported my fieldwork in central Tanzania

HIGHLIGHTS OF THE RESEARCH ACTIVITY

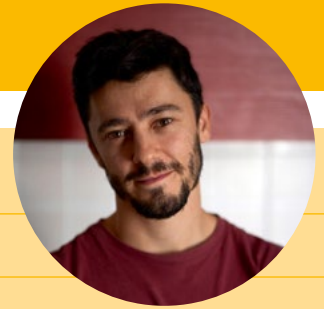
My research aims at reconstructing the complexity of the water geography in central Tanzania adopting a feminist approach focusing on the micro scale of the body, which interacts with other broader scales of community water management. The area under consideration is part of that strip of Sub-Saharan Africa that is facing increasing changes to the climate on whose predictability most of the lives of the farmers and herders living there are based. The pressure of human activity and the changing pattern between the dry and rainy seasons are challenging the local community water management institutions, namely called Community Based Water Supply Organizations (CBWSO). These community entities have been institutionalised over time by the national government, but the number of villages using traditional forms of management is still significant and this creates uneven and fragmented waterscapes.

The issue of water management is addressed from the ground up, starting with those who live, use, and manage water every day and know the effects it has on their bodies, food, clothing, animals, and the crops they tend to. Focusing on, and choosing as a starting point, the lived experiences of Tanzanian women who inhabit more or less remote villages, I reconstruct the waterscapes of two villages in the central region of



Dodoma within which the human and the non-human, nature and society, infrastructure and bodies, institutions designed to regulate water flows, and daily practices that are intermingled with traditions, values, and beliefs. In particular, the focus is on the gendered dimension within the everyday dynamics of water use and management and how this intertwines with other lines of social and ecological difference. The research is being carried out with the support of the NGO Lay Volunteers International Association that has been active in water and sanitation projects in the area for more than 25 years. Semi-structured interviews, photo-elicitation, transect walks, documental analysis, and participant observation are the core methods used during fieldwork.

NAME **Mattia SCALAS**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE Framing the local resilience unit as a post pandemic planning paradigm
TUTOR(S) Angioletta VOGHERA, Grazia BRUNETTA

ACADEMIC CONTEXT

- Brunetta G., Ceravolo R., Barbieri C.A., Borghini A., de Carlo F., Mela A., Beltramo S., Longhi A., De Lucia G., Ferraris S., Pezzoli A., Quagliolo C., Salata S. and Voghera A., 2019. Territorial Resilience: Toward a Proactive Meaning for Spatial Planning. *Sustainability*, 11(8), pp. 11-19.
- Brunetta G., Lombardi P. and Voghera A., 2023. *Post Un-Lock: From Territorial Vulnerabilities to Local Resilience*. Cham: Springer International Publishing.
- Moreno C., Allam Z., Chabaud D., Gall C. and Pralong F., 2021. Introducing the “15-Minute City”: Sustainability, Resilience and Place Identity in Future PostPandemic Cities. *Smart Cities*, 4(1), pp. 93-111.
- Scalas M., 2023. Pedestrian Isochrones Facilities Overlapping with Openrouteservice. An Easy, Fast and Opensource Indicator in Novara, Italy, in: ICCSA - *The International Conference on Computational Science and Its Applications*. Athens, 3-6 July 2023. Cham: Springer Nature Switzerland.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

During the third year, I focused on the finalization of the Post Un-Lock research together with PoliTO's Responsible Risk Resilience Centre (R3C), the outcomes of which converged in a book published by Springer where I directly contributed to three chapters on the topics of climate change-related hydrogeological risk assessment (Pede et al., 2023), tools and data for Geographic Information Systems (GIS)-based land use analysis (Fiermonte et al., 2023), and the resilience unit as a paradigm at the neighborhood scale of planning in post-pandemic perspective (Pede et al., 2023). The latter theme is the focus of my thesis, in which after tracing the theoretical framework of resilience and reviewing theories and models related to proximity, I take an in-depth theoretical and operational look at the local resilience unit and propose a methodology for identifying target areas for its implementation. The Local Resilience Unit, which can be defined as «a 'neighborhood' level operational framework that can develop planning actions along with community empowerment to make cities more responsive, resilient, and able to provide a high level of urban livability and well-being» (Brunetta, 2023) is proposed as



a paradigm for post-pandemic planning, focusing on the nexus between health, well-being, and climate change adaptation by cities. The methodological part of the research involved a large part of this year's thesis activity, with the definition of a GIS procedure based on the use of service area analysis (isochrones) for the identification of walking accessibility basins from a selection of Points of Interest representative of typical facilities of everyday life, in order to generate geometries representative of the sphere of proximity and everyday life of people. The methodology, applied in the thesis on the municipality of Turin, was developed with the help of open-source software and data, in order to enable replicability, and was first proposed with an application on the municipality of Novara (Italy) at The International Conference on Computational Science and Its Applications (ICCSA) in Athens, where it received recognition as the Best paper award at ICCSA2023.

NAME **Agostino STRINA**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **How Food Logistics Is Changing Our Cities. Large-Scale Retail Trade Distribution Centers in Italy**
TUTOR(S) **Angelo SAMPIERI, Francesca GOVERNA**

ACADEMIC CONTEXT

- Bensi N.S. and Marullo F., 2019. The Architecture of Logistics: Trajectories Across the Dismembered Body of the Metropolis. *Footprint*, 12(2), pp. 1-4.
- LeCavalier J., 2016. *The Rule of Logistics. Walmart and the Architecture of Fulfillment*. Minneapolis and London: University of Minnesota Press.
- Lyster C., 2016. *Learning from Logistics. How Networks Change Our Cities*. Basel: Birkhäuser.
- Young L., 2019. Neo-Machine: Architecture without People. *AD Architectural Design. Special Issue: Machine Landscape: Architecture of the Post-Anthropocene*, 89(1), pp. 6-13.

EXTERNAL COLLABORATIONS

- FULL – the Future Urban Legacy Lab (co-financer)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Over the past decade, Large-Scale Retail companies have deeply redefined the structure of food distribution logistics due to increased performativity, food safety and a sustainable supply chain. One of the key spaces within which this transformation has taken place have been the Distribution Centers (DCs), which are large warehouses used to serve the store network. Today, there are more than 450 DCs in Italy.

The literature that has so far dealt with these spaces has highlighted: on the one hand, their functionalist character, describing forms of codification and standardization, as well as the fact that they are pieces of a larger extra-territorial logistical network; on the other hand, that they are permeated by labor-related practices that create specific forms of urbanity marked by negotiations, tensions, and conflicts. The impact on the places where the DCs are located has been observed less, not only in social and environmental terms but also, and especially, in relation to the new forms of urbanization they generate. This research describes the emergence and spread of DCs, highlighting how the implantation of these spaces – alongside the relevant upheavals and imbalances – determines new urban organizations of great relevance for understanding the transformations of the contemporary city, the new hierarchies that organize and regulate it, and the possible actions of a project that tries to govern it. These new urbanizations are constructed by exceptional spaces pervaded by ordinary characters and phenomena, which are so inextricably intertwined with contexts that are ever less confined to the administrative and functional boundaries within which they are located. Indeed, DCs have a strong magnetism toward other economies that extend beyond food logistics.

To do this, since 2020 the research has been conducted – mainly through fieldwork – on the Italian national territory, developing in more detail three selected areas: Santa Palomba (Rome), Aversa Nord (Caserta), and Liscate and Casirate d'Adda (Milan Logistics Region). These areas were selected for their being among the sites with the highest density of food logistics in Italy, and because each of them represents an exemplary case of the different urbanization processes underway.



NAME **Cristina Maria Dorina VIANO**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **Blockchain tools for civic initiatives in the urban space**
TUTOR(S) **Chiara CERTOMÀ, Guido BOELLA**

ACADEMIC CONTEXT

- Ash J., Kitchin R. and Leszczynski A., 2018. Digital turn, digital geographies? *Progress in Human Geography*, 42, pp. 25-43.
- Certomà C., 2021. *Digital Social Innovation: Spatial Imaginaries and Technological Resistances in Urban Governance*. Springer International Publishing, Cham.
- Gloerich I., De Waal M., Ferri G., Cila N. and Karpinski T., 2020. The City as a License. Implications of Blockchain and Distributed Ledgers for Urban Governance. *Frontiers in Sustainable Cities*, 2, Dec. 2020.
- Viano C., Avanzo S., Boella G., Schifanella, C. and Giorgino V., 2023. Civic Blockchain: Making blockchains accessible for social collaborative economies. *Journal of Responsible Technology*, 15, 100066.

EXTERNAL COLLABORATIONS

- University of Turin – Department of Computer Science

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Blockchain technology offers a new paradigm for storing, validating, transferring information and values, and has recently started to be experimented in the social, public services and civic sectors. Many see its features as promising for supporting collaborative and decentralized socio-economic processes (Elsden et al, 2018); others consider it controversial in relation to the unpredictable nature of the social exchanges (Garrod, 2019).

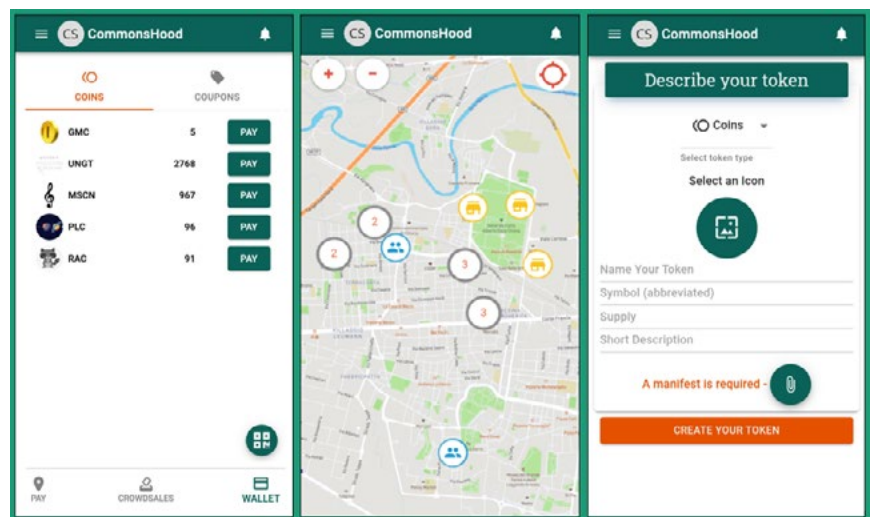
This research focuses on emerging Blockchain initiatives in the civic domain in urban contexts, by adopting a *geography by the digital perspective* (Ash, Kitchin, and Leszczynski, 2016).

The objective of the research is to study how the Blockchain, in civic applications, can reshape and be shaped by the local social and economic spatialities.

The study investigates whether and to which extent the observed app is adapted and adaptable to different local socio-economic contexts, drawing on the concepts of embeddedness (Chiappini 2020, Mello Rose 2021). It also investigates what are the expected effects in terms of opening new spaces of socio-economic exchanges, and who should benefit from this digital (re)production of spaces (Certomà, 2020, 2021).

The study originates from the researcher's work in the Computer Science Department (University of Turin) in some experimentations of civic uses of the Blockchain. Among these, a Blockchain-based wallet app is the main case study; it aims at making the Blockchain functionalities available to citizens, by supporting social and collaborative economies in local communities. Qualitative methods and participant observation are used in pilot experimentations of the app in Turin, in the context of European and local projects. This will also contribute to refining the design and development of the app functionalities, by providing iterative feedback from the urban context addressed.

This work will contribute, from a digital geography perspective, to a mutual enrichment between the two disciplinary domains of Computer Science and Urban Studies. The former misses a geographical and critical analysis of the contextual factors and implications of its technology developments; the latter has not considered in depth newest technologies such as the Blockchain yet, in particular as regards its use in local communities.



NAME **Valeria VITULANO**
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COURSE XXXVI cycle - 3rd year
RESEARCH TITLE **Urban Green Infrastructure and spatial planning. A key driver for regenerating the contemporary city?**
TUTOR(S) **Carolina GIAIMO, Carlo GASPARRINI**

ACADEMIC CONTEXT

- Barbieri C.A., Cialdea D. and Cotella G., 2021. I livelli e gli strumenti per la pianificazione integrata del territorio. Polis, *L'ingegnere italiano*, 380, monographic issue.
- European Commission, 2013. *Building a green infrastructure for Europe*. Publications Office of the European Union, Luxembourg. <https://doi.org/10.2779/54125>
- Gasparrini C., 2019. Infrastrutture verdi e blu. Una priorità nazionale per la pianificazione urbanistica e la coesione territoriale nei prossimi anni. *Urbanistica Informazioni*, 282, pp. 45-47.
- Novarina G., 2020. Dalla pianificazione al progetto. La rete verde e blu a Lione. In C. Giaimo, ed., *Tra spazio pubblico e rigenerazione urbana. Il verde come infrastruttura per la città contemporanea. Urbanistica Dossier on line*, 17, pp. 129-133.

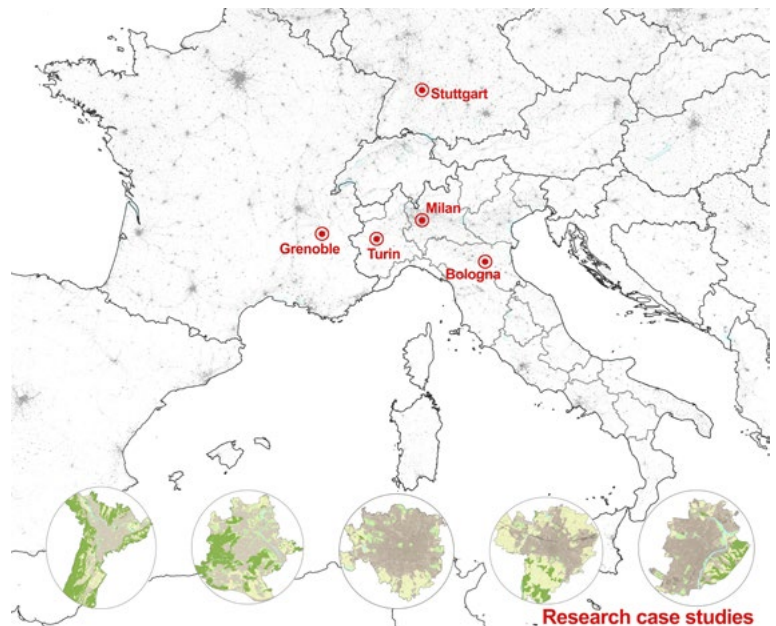
HIGHLIGHTS OF THE RESEARCH ACTIVITY

The first premise of the research is that spatial planning activity still serve today, but requires in Italy to be configured in a different form more suited to current needs. Spatial planning at the municipal level has historically been concerned with regulating land use and the current scenario is characterised by national norms along with a mosaic of different regional dispositions. What transversally distinguishes doing urban planning is the intention to assign to the plan the role of a reference framework for the implementation of land-use and governance policies through actions and projects.

A valid reasons for a change in order for such activity to be even more useful and necessary concern the need to pursue today, for a sustainable governance and government of the territory, the ecological regeneration of the contemporary city. Spatial planning could also be more relevant and effective if concretely interprets the principle of subsidiarity and if it is correlated with socio-economic programming (and thus with the Italian PNRR). Nevertheless, the national planning system is still anchored to the law 1150 of 1942 and new national fundamental principles are required, especially on the profile and nature of a new plan. Among the contents of a innovated urban plan, it is necessary to find new structural ecological-environmental paradigms to be operationalized with the tool: the hypothesis to verify is that Green Infrastructure (GI) is a key driver of the urban plan, useful to meet many requirements because of its multi-functional and multi-scale characteristics and suitable to be a place for vertical and horizontal co-planning.

While an extensive production of EU strategies and scientific literature about GI has been consolidated, urban planning practice still struggles to deal with it in a systemic manner. Integrating GI into the plan requires the shift from a conformative towards a configurative nature.

The research analyses case studies which are common in belonging to metropolitan territories. The choice took place on Italian and European experiences, where to understand how the green component qualifies the urban planning tool. Through a comparative case study analysis, the research explores how differently structured plans design and interpret GI, with the aim of verifying whether they confirm or deny the assumption that green can constitute the new paradigm of the plan and in general the driver of a new planning culture at all scales.



Research case studies



XXXVII CYCLE - 2nd YEAR STUDENTS

NAME **Farzaneh ALIAKBARI**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE Heritage as a resource for Regeneration: A Historical Perspective on the potential of Cultural Natural Heritage in Urban and Rural Development
TUTOR(S) Rosa TAMBORRINO

ACADEMIC CONTEXT

- Alcalá L., Zouros N. and McKeever P.J., 2021. *Global Geoparks: Linking Geological Heritage and Local Development*. Elsevier Science & Technology Books.
- Jones C., 2008. History of Geoparks. *Geological Society, London, Special Publications*, 300(1), pp. 273-277. doi: 10.1144/SP300.21.
- Onley J., 2014. Indian Communities in the Persian Gulf, c. 1500-1947. In: Potter, L.G., ed. *The Persian Gulf in Modern Times*. New York: Palgrave Macmillan, pp. 231-266. https://doi.org/10.1057/9781137485779_10.
- Torabi Farsani N., Celeste C. and Costa C., 2012. *Geoparks and Geotourism: New Approaches to Sustainability for the 21st Century*.

EXTERNAL COLLABORATIONS

- University of Plymouth, UK: host university based on the Erasmus plus programme agreement
- Qeshm Island UNESCO Global Geopark, Iran: Host for the research period

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The establishment of a tool prototype (Web-based tool- Geographic dashboard) for historical and cultural analysis as well as disseminating knowledge about digital history for CNH is the core theme of my PhD thesis. The research investigates how to identify CNH, exploit it as a resource, and use it as a driver for sustainable regeneration in the geopark territories. The methodological framework of this research is implemented into three main phases. The first phase, theoretical phase, is concerned with the state of the art. In this phase, through a systematic literature review, the role of digital tools applications for a better understanding of local history and CNH in the protected heritage landscapes is investigated. The second phase, implementation phase, includes preliminary analysis, assessment, and modelling. During the preliminary analysis, an online survey regarding existing tools, historical and heritage values in the geopark areas is set up. Then, two case studies; an EU and a NON-EU geopark are selected to understand how they protect heritage and help to design tools to protect heritage. Moreover, the policies, and barriers within the EU, and non-EU geoparks regarding the use of digital tools for understanding of local history and heritage are investigated. For the assessment part, the comparative approaches are employed to analyze the areas of interest from a historical perspective. The data modelling is implemented through participatory practices in which the data related to the local history and heritage of selected case studies is collected and mapped. Finally, a digital model/ tool that includes the local history and CNH of areas is prototyped. The research takes advantage of GIS to analyze and map the CNH knowledge from a geographical and thematic perspective. In the last phase, validation phase, the tool/ model with end-users is tested and validated employing surveys. The outcome of this research will bridge the gap between the collective identities and forgotten local values linked to the CNH in the Geopark territories employing digital history approaches. The SDG 11, in particular, target 11.4 which stresses safeguarding and protecting the world's natural and cultural heritage is focused during the entire research framework.



NAME **Arthur BOHN**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE Composition design for load bearing hempcrete and measurement of the territorial impacts
TUTOR(S) Andrea BOCCO

ACADEMIC CONTEXT

- Bohn A., Mazelli R. and Bocco A., 2022. Loadbearing Hempcrete? A preliminary research. In: NOCMAT, 18th International Conference on Non-conventional Materials and Technologies. Online, 7-28 June 2022.
- Mazelli R., Bohn A., Zea Escamilla E., Habert G. and Bocco A., 2023. Comparative Life Cycle Assessment of Two “Vegetarian Architecture” Pavilions. *Bio-Based Building Materials*, 45, pp. 982-999. RILEM. https://doi.org/10.1007/978-3-031-33465-8_76.
- Stanwix W. and Sparrow A. 2014. *The Hempcrete Book: Designing and Building with Hemp-Lime*. Cambridge: Green Books.

EXTERNAL COLLABORATIONS

- ETH of Zurich, Chair of Sustainable Construction (host for visiting)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This study investigates the potentials of an innovative bio-based material and products created from the latter. Today the conventional materials for construction field are represented by concrete, fired masonry and steel. However, their global warming potentials represent a real challenge and raise many issues. Finding alternatives in bio-based materials could decrease the emissions of GHG during the process of production by sinking into the plant the atmospheric carbon dioxide. This research aims to develop a suitable composition for composite and fibre reinforced hempcrete, seeking to increase its mechanical strength, while preserving its low thermal conductivity and density. The objective is to render hempcrete resistant enough to be considered as a load bearing material for some specific situations. The traditional local production of hemp and lime could generate a new local economy for regional companies, empowering the entrepreneurial realities and giving sovereignty back to the population.

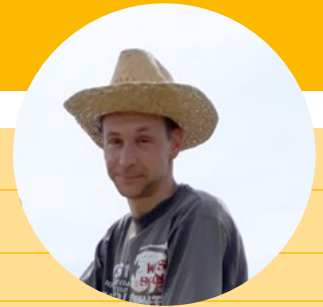
The research of mechanical strength of hempcrete is quite young, and thus, it seems important to avoid too quickly that this product cannot be conceived as a load bearing material. Hempcrete can be used by hand, cast in formworks, sprayed out or even pre cast and transformed in blocks. However, even when changing technique, the issue of structural efficiency remains. The aggregate that are called shivs reduce the mechanical features of the hydraulic binder.

Using cement inside, the setting time is faster, so it combines with the construction time, but its environmental impact rises as concentration concrete grows. The innovation of this research aims to find a suitable mix and composition design of elements that could lead hempcrete to be considered as a support for specific uses.

By processing a life cycle assessment of this new composition of a load bearing hempcrete, it will be the occasion to compare its performance to the conventional materials but also to non-conventional materials like straw bale, and cob constructions.



NAME **Giorgio CAPELLO**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE **Innovation in the management of vineyard soils through the adoption of good practices and tools to support field activities**
TUTOR(S) **Stefano FERRARIS, Marcella BIDDOCCU**

ACADEMIC CONTEXT

- Capello G., Biddoccu M., Ferraris S. and Cavallo E., 2019. Effects of tractor passes on hydrological and soil erosion processes in tilled and grassed vineyards. *Water*, 11(10), 2118. <https://doi.org/10.3390/w11102118>.
- Capello G., Biddoccu M. and Cavallo E., 2019. L'influenza della gestione del suolo e del traffico agricolo sulla conservazione dell'acqua e del suolo: un caso studio in Piemonte. In: F. Ventura, G. M. Poggi, eds., *Atti del XXII Convegno Nazionale di Agrometeorologia - Ricerca ed innovazione per la gestione del rischio meteo-climatico in agricoltura*, pp. 38-43. Bologna: Dipartimento di Scienze Agrarie - Università di Bologna.
- Capello G., Biddoccu M. and Cavallo E., 2020. Permanent cover for soil and water conservation in mechanized vineyards: A study case in Piedmont, NW Italy. *Italian Journal of Agronomy*, 15(4), pp. 323-331. <https://doi.org/10.4081/ija.2020.1763>.
- Dorigo W., Himmelbauer I., Aberer D. *et al.*, 2021. The International Soil Moisture Network: serving Earth system science for over a decade. *Hydrol. Earth Syst. Sci.*, 25, pp. 5749-5804. <https://doi.org/10.5194/hess-25-5749-2021>.

EXTERNAL COLLABORATIONS



- STEMS-CNR (Istituto di Scienze e Tecnologie per l'Energia e la Mobilità Sostenibili, Consiglio Nazionale delle Ricerche): financier of the research and host.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This research aims to investigate the issues associated with soil erosion, a problem prevalent in the sloping regions of Piedmont, particularly in vineyards. Soil degradation phenomena such as the decline of organic matter and soil compaction are closely tied to erosion and pose significant threats to soil conditions in Europe. These phenomena significantly impact the ecosystem services of vineyards, soil quality and fertility, water resource availability, and can negatively influence the quality and quantity of production.

The research's objective is to introduce and promote optimal soil management techniques (good practices) in hilly viticultural environments. These techniques aim to mitigate common soil degradation phenomena like erosion and compaction, thereby improving soil and vine quality. This is achieved through three main innovations: improved best soil management practices; agro-meteorological monitoring for better water and soil management; and ICT tools for managing monitored data and field observations to aid farmers in vineyard management and water-soil conservation. The goal is to understand how innovative soil management practices in hilly vineyards can enhance soil water content, runoff, and erosion response, increase water and nutrient availability for the vine, and comprehend the effect of repeated vehicle passage on soil compaction and hydrological conditions. In five vineyards, different soil management practices have been implemented to compare the effects on soil degradation and soil water content. Each vineyard is equipped with specific systems for continuous monitoring of runoff and erosion; soil water content; meteorological parameters (temperature, air humidity, precipitation). Periodic in-field surveys are conducted to measure soil parameters: bulk density; water content; penetration resistance; hydraulic conductivity. The data collected in two agricultural years showed few differences in runoff and soil erosion results among treatments, due to the little amount of precipitation. This influenced also the soil water content, that showed a decreasing trend, likely enhanced by scarce precipitation in winter and soil compaction in spring.



NAME	Giulio CAVANA		
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COURSE	XXXVII cycle - 2 nd year		
RESEARCH TITLE	Preference Learning approach to evaluate the optimization of the energy renovation of the building stock within the Renewable Energy Communities framework		
TUTOR(S)	Marta BOTTERO		

ACADEMIC CONTEXT

- Gjorgievski V. Z., Cundeva S. and Georghiou G. E., 2021. Social arrangements, technical designs and impacts of energy communities: A review. *Renewable Energy*, 169, pp. 1138-1156. <https://doi.org/10.1016/j.renene.2021.01.078>.
- Hüllermeier E. and Fürnkranz J., eds., 2011. *Preference learning*. Heidelberg: Springer Berlin.
- Lowitzsch J., Hoicka C. E. and van Tulder F. J., 2020. Renewable energy communities under the 2019 European Clean Energy Package—Governance model for the energy clusters of the future?. *Renewable and Sustainable Energy Reviews*, 122, pp. 109489. <https://doi.org/10.1016/j.rser.2019.109489>.
- Suppa A. R., Cavana G. and Binda T., 2022. Supporting the EU Mission “100 Climate-Neutral Cities by 2030”: A Review of Tools to Support Decision-Making for the Built Environment at District or City Scale. In: *International Conference on Computational Science and Its Applications*. Malaga, Spain, 4-7 July 2022. Cham: Springer.

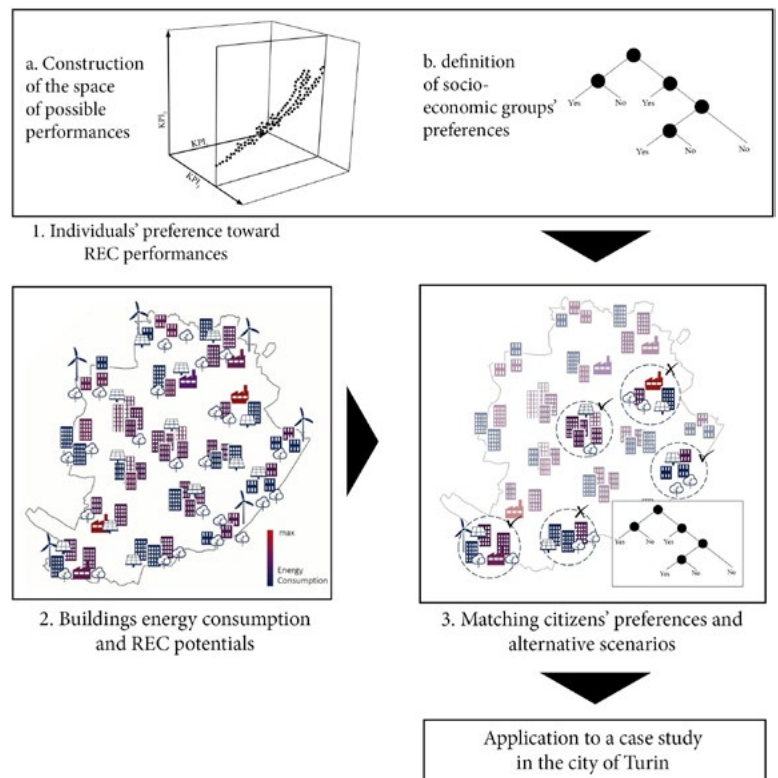
HIGHLIGHTS OF THE RESEARCH ACTIVITY

Responsible of 40% of energy consumption and 36% of energy-related carbon dioxide emissions in Europe, the building sector has been seen as a strategic target by the European Green Deal and the subsequent “Fit for 55” package in the effort to reduce its environmental impacts.

It has already been demonstrated that the adoption of cooperative behaviors at different scales of the urban context in terms of technological adoption and energy sharing can generate further benefits compared to considering each building independently.

The evaluation of the combined effect of the reduction in energy consumption due to energy efficiency measures and the implementation of Renewable Energy Communities (RECs) at the urban level is still scarce and the behavioral rules of the stakeholders involved or not in such projects have yet to be analysed. Aim of the research is to evaluate citizens’ willingness to participate in RECs, and the potential synergistic benefits that could arise if combined with a deep retrofit of the urban fabric. Methodologically, a meta-analysis of the literature on the topic was performed in order to extract REC performance against a set of Key Performance Indicators (KPIs). The resulting dataset was used to construct a questionnaire distributed to the population. Using Machine Learning methods, specifically belonging to the Preference Learning sub-field, the compromises between the KPIs that constitute the behavioral rules for joining a REC will be evaluated. In a second phase of the analysis, these preferences will be used to analyse the potential penetration of RECs in the urban context according to the socio-economic characteristics of the inhabitants, together with the performances obtainable from these configurations.

The research will lead to the estimation of the potential for reducing greenhouse gas emissions by combining district-scale retrofit and RECs solutions. Furthermore, the analysis of the socio-economic discriminating factors between participating or not in such schemes will highlight the critical areas of adoption and potential mitigation strategies, together with possibilities for partnership models.



NAME **Marco DEL NIBLETTO**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE Valuing the presence of retailers in the housing market evidence from Turin
TUTOR(S) Giulio ZOTTERI, Luigi BUZZACCHI

ACADEMIC CONTEXT

- Jang M. and Kang C. D., 2015. Retail accessibility and proximity effects on housing prices in Seoul, Korea: A retail type and housing submarket approach. *Habitat International*, 49, pp. 516-528.
- Wu C., Ye X., Du Q. and Luo P., 2017. Spatial effects of accessibility to parks on housing prices in Shenzhen, China. *Habitat International*, 63, pp. 45-54.
- Zhang L., Zhou J. and Hui E. C. M., 2020. Which types of shopping malls affect housing values? From the perspective of spatial accessibility. *Habitat International*, 96, 102118.

EXTERNAL COLLABORATIONS

- FULL – the Future Urban Legacy Lab (co-financer)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

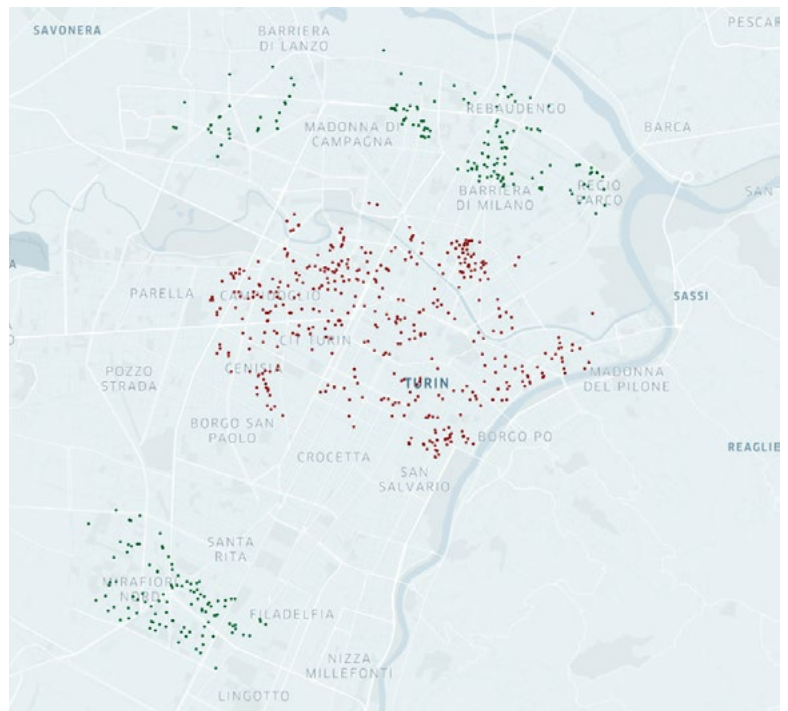
Retailers represent one of the most valuable amenities offered by urban spaces, as they contribute to the local economy, and enhance the vibrancy of the neighborhood and safety of streets. In the urban context, brick-and-mortar retailers play a role that goes beyond what they sell: they contribute to building that 'sense of place' that forms enjoyable neighborhoods, allowing people to meet, create social connections, and exchange information (Baker, 2010). Also in the urban context, retailers assume a role that goes beyond what they sell. These elements contribute to fostering the urban vibrancy of streets and enhance their 'vitality', generating value for the inhabitants and homeowners of streets.

The research aims to offer empirical support for the impact of amenities, namely the presence of retailers, on real estate values (Wu, 2017) and how different types of retailers influence the value of apartments in the context of Turin. Retailers are classified into 4 groups according to Copeland (1923) to explore how different retail typologies are valued and explore the positive and possibly negative externalities generated.

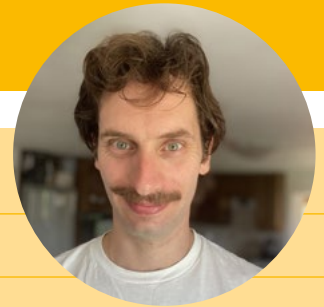
Analyses are carried out using statistical tools, the hedonic price model and Geographically Weighted Regression model to explore the relationship between accessibility to retailers and housing values in different areas of Turin.

Results show that accessibility to shopping, supermarket, and food&drink retailers positively relates to real estate values, while accessibility to convenience retailers is negatively related to real estate values. Accessibility to shopping retailers has a positive impact on real estate values in the city center, while the same area is negatively impacted by convenience retailers. The relationship is mirror-like in the periphery. The relationship between real estate and accessibility to supermarkets is consistent in most of the areas of study. On the other part, accessibility to food&drink retailers is valued more in a specific area around the city center.

The research offers insights into how safeguarding the presence of brick-and-mortar retailers can propose economic policies at the urban level. The study can offer suggestions for dealing with the phenomenon of retail deserts (Schuetz, 2012), quantifying how the absence/closure of different types of businesses generates a loss of value for homeowners and residents.



NAME **Juri Igor FARDIN**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE **Figures of a Play Aesthetics: Skateboarding, Ugo La Pietra and Playtime**
TUTOR(S) **Camillo BOANO**

ACADEMIC CONTEXT

- Agamben G., 2005. *Profanazioni*. Roma: Nottetempo.
- Fardin J. I., 2023. The Politics of Play, Ugo La Pietra's Design without Ends. *Design lusses*, 39(3), pp. 19-29.
- Marmont G., 2022. Another Use, Another Sociality: Some Reflections on Giorgio Agamben's Radicalization of Use. *Design and Culture*, 14(2), pp. 185-203.
- Rancière J., 2013. *The Politics of Aesthetics: The Distribution of the Sensible*. London: Bloomsbury.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In contemporary society, play is everywhere. Everything is made to look like play, though often in the interests of the production of value for capital as well as individualistic self-expression and creativity. This emphasis on play has important consequences for the way in which we perceive and relate to space – the aesthetics of space. The space of play becomes a space to appropriate in the name of self-expression and individuality and play becomes a proper or more authentic use of space, against which “inappropriate” uses are inevitably produced. Operating within this mechanism of separation, play masks the generalized impossibility of a use that is not consumption or exhibition which, following certain political philosophers, characterizes contemporary life.

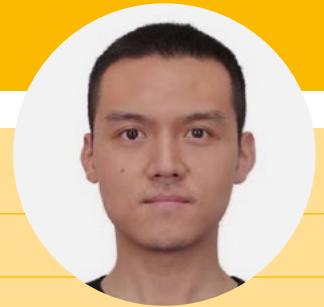
My project aims at bringing to the fore an(other) play – one that instead of masking today's impossibility of use would be capable of using this very impossibility, one that is repetitive, profaning, and inappropriate. More specifically my project focuses on certain spatial practices and their potential, often obscured, to open onto (other) ways of perceiving and relating to the built environment, ways that do not pass through appropriation and creation but rather through inappropriate uses and suspension. The project asks: What is the unexhausted radical potential of play? And, more specifically, what spatial aesthetics does it open onto?

In order to address these questions, I will build a dialogue between an(other) theory of play grounded on critical theory, continental philosophy and psychoanalysis, and a study of three spatial practices of play – namely skateboarding, Ugo La Pietra's art and architecture practice and Jacques Tati's film *Playtime*. These three spatial

practices and their discourses offer the possibility for a reading against the grain that brings to the fore an(other) play and its aesthetics. The figures these practices create become the figures of a play aesthetics, or the vantage point from which to observe the possibility of spatial uses of our present impossibility of use.



NAME **Feiran HUANG**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE Digitalisation of the Agriculture and Its implication on Rural Landscape
TUTOR(S) Claudia CASSATELLA

ACADEMIC CONTEXT

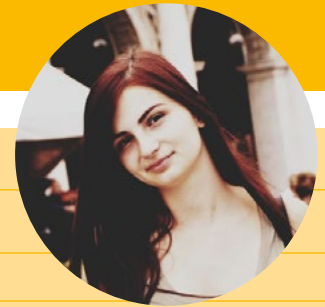
- Klerkx L., Jakku E. and Labarthe P. 2019. A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda. *NJAS-Wageningen Journal of Life Sciences*, 90, 100315.
- Legun K. and Burch K. 2021. Robot-ready: How apple producers are assembling in anticipation of new AI robotics. *Journal of Rural Studies*, 82, pp. 380-390.
- Primdahl J. and Swaffield S. 2010. *Globalisation and agricultural landscapes: change patterns and policy trends in developed countries*. Cambridge: Cambridge University Press.
- Swanwick C. 2002. *Landscape Character Assessment: Guidance for England and Scotland*. Countryside Agency.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The information and communication technologies (ICT) has changed significantly the way of production and agriculture is no exception. Variety of digital technologies have been integrated with the farming process to increase the resource/labour efficiency and reduce the negative impact on the environment. Such practices have been labelled as 'digital agriculture' or 'smart farming' and different countries and regions have been developing policies to facilitate the digitalisation of agriculture. Numerous research has focused on the socio-economic and environmental impact of digital agriculture, while few has studied this issue from a landscape perspective even though landscape is an essential part of human being's surround playing a significant role in sustainability. As an essential driving force for landscape change, technology has contributed greatly to reshape the rural landscape particularly during the period of industrialisation when agriculture has been through a dramatic mechanisation process. Therefore, it raises the question on whether new generation technologies characterised by information technology and digitalisation also have the similar effects on rural landscape. On this account, this research intends to examine the influence of digital agriculture on rural landscape, focusing on three key questions: (1) how digital agriculture has been integrated with farming process and how they affect landscape management; (2) which dimension of landscape (natural, cultural/social and perceptual/aesthetic) has been influenced due to the implementation of the digital agriculture. Different methods including systematic literature review, expert survey/interview and review of practical cases have been used to answer these questions. The answers to these questions will help to inform policy makers and planners to develop landscape policies and planning, which is able to protect and enhance landscape values in the digital era.



NAME **Redina MAZELLI**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE Non-conventional materials: opportunities for a paradigm shift in the construction sector
TUTOR(S) Andrea BOCCO

ACADEMIC CONTEXT

- Bocco Guarneri A., 2020. *Vegetarian Architecture: Case Studies on Building and Nature*. Jovis Verlag GmbH.
- Bohn A., Mazelli R. and Bocco A., 2022. Loadbearing Hempcrete? A preliminary research. In: *NOCMAT, 18th International Conference on Non-conventional Materials and Technologies*. Online, 7-28 June 2022.
- Mazelli R., Bohn A., Zea Escamilla E., Habert G. and Bocco A., 2023. Comparative Life Cycle Assessment of Two “Vegetarian Architecture” Pavilions. In: Amziane S., Merta I. and Page J., eds., *Bio-Based Building Materials*. ICBBM 2023. RILEM Bookseries, vol 45. Cham: Springer. https://doi.org/10.1007/978-3-031-33465-8_76.
- Mazelli R., Bocci M., Bohn A., Zea Escamilla E., Habert G. and Bocco A., 2023. Fair Play: Why Reliable Data for Low-Tech Construction and Non-conventional Materials Are Needed. In: Arbizzani E., Cangelli E., Clemente C., Cumo F., Giofrè F., Giovenale A. M., Palme M. and Paris S., eds., *Technological Imagination in the Green and Digital Transition*. Geneva: Springer International Publishing, pp. 367-379. https://doi.org/10.1007/978-3-031-29515-7_33.

EXTERNAL COLLABORATIONS

- Chair of Sustainable Construction, ETHz (host for visiting period)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The urgent need to reduce carbon emissions and achieve carbon neutrality in the built environment has become a global challenge and requires significant and radical changes in the construction industry.

The research project “Experimental Pavilions of Vegetarian Architecture” (November 2020 – ongoing) aims to the construction of full-scale buildings on which to experiment the application of advanced building techniques and the use of natural materials, capable of achieving high environmental performance. It includes the design, construction, and monitoring of three pavilions, namely in loadbearing straw bales, timber framed light earth construction and loadbearing hemp lime.

The first results of the life cycle analysis of the first two pavilions for the life cycle stage module A, cradle to handover, show that the use of Vegetarian Architecture principles (Bocco Guarneri, 2020), and of low processed, local materials has allowed to produce near zero carbon buildings. Moreover, the calculations of the stored biogenic CO₂ show that the studied pavilions can store around 20 tCO₂eq each. This amount is around ten times the CO₂ emitted by the production of construction materials and their transport to the construction site and is to be attributed to the high use of fast-growing bio-based materials. Further research will include the assessment of the hygrothermal performance, durability, and indoor air quality of the studied pavilions. Current results show that the studied techniques and related construction materials present a radical solution to the challenge of achieving a net-zero built environment and withhold a significant regenerative potential.



NAME **Alessandra MOSSA**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE **Post-asylum geographies of madness. Finding space for getting mad**
TUTOR(S) **Michele LANCIONE**

ACADEMIC CONTEXT

- Basaglia F., Lovell A. and Scheper-Hughes N., 1987. *Psychiatry inside out : selected writings of Franco Basaglia*. New York; Guildford: Columbia University Press.
- Butler R. and Parr H., 1999. *Mind and body spaces : geographies of illness, impairment and disability*. London: Routledge.
- Crooks A., Andrews G. and Pearce J., 2018. *Routledge Handbook of Health Geography*. London and New York: Routledge.
- Philo C., 2005. The geography of mental health: An established field? *Current Opinion in Psychiatry*, 18, pp. 585-591.

EXTERNAL COLLABORATIONS

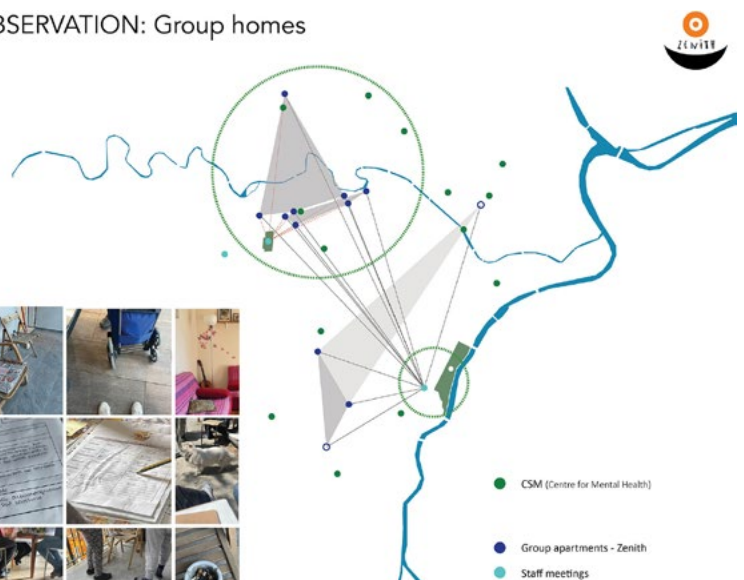
- University of Glasgow - School of Geographical & Earth Sciences (host for visiting period in September 2024).

HIGHLIGHTS OF THE RESEARCH ACTIVITY

My research sits within the literature that looks at the process of deinstitutionalization of the mental health system through the lived geographies placed outside the walls of the asylum (Philo, 1997; Philo, 2005). It addresses mental health geographers' call for a practiced and situated knowledge about mental health and aims to provide an examination of different geographies of mental care at the local scale (Butler & Parr, 1999; Parr & Philo, 2003; Conradson, 2003; Parr, 2000). By monitoring a series of mental care practices that go from drop-in centres to supported accommodation, my study intends to assess the current and future implications of these spatial and relational practices in terms of belonging, self-determination and resistance. Through an analysis of benefits and detriments that users recognise in each of these practices, and their impact at the urban level, I will get a more specific understanding of how different spatial arrangements, and their associated narratives contribute to dynamics of power and exclusion. This study aims to identify pros and cons that different settings imply for chronically ill patients and will offer a fine-grained analysis of how different spatial arrangements act at the individual and collective level (Söderström et al., 2017). The main ethnographic analysis has been carried out, via participant observation and life-story interviews, in a series of group homes run by a cooperative operating in the city called Zenith. A focus on spatiality and embodied experiences has allowed to explore to what extent space, and its relational traits affect the psyche and how psychosis transform individuals' perception and use of space (Söderström et al., 2017; Söderström, 2019). Personal stories and spatial biographies have provided insight on where madness is created, how it is perceived, when it is instead a mere product of cultural or direct violence (Galtung 1990). Therefore, as part of its main investigation, this study on post-asylum geographies of mental health care will go beyond mapping the shift that, in relation to political, economic and social drivers has led to the current set of settings and practices, to include the intimate and everyday response of individuals. This with the aim to build up a micro-geography of mental health care that, by putting the human and its everyday life at the centre of its inquiry, will make individuals' "embodied and contested subjectivities to emerge more clearly" (Parr, 2000: 226).

PARTICIPANT OBSERVATION: Group homes

Turin



NAME **Simone PERSICO**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE **Disinformation flows in the Social Media ecosystem. Nuclear between energy, waste and atomic conflict narratives in Europe**
TUTOR(S) Sara MONACI

ACADEMIC CONTEXT

- Monaci S. and Persico S., 2022. The COVID-19 Vaccination Campaign and Disinformation on Twitter: The Role of Opinion Leaders and Political Social Media Influencers in the Italian Debate on Green Pass. *International Journal of Communication*, 16.
- Monaci S., Morreale D. and Persico S., 2023. The Eurabia Conspiracy Theory: Twitter's Political Influencers, Narratives, and Information Sources. *Media and Communication*, 11(4).
- Monaci S. and Persico S., 2023. La disinformazione in tempo di guerra. Il ruolo delle piattaforme sottotraccia nell'ecosistema dei social network. *Comunicazione politica*, 24(2), pp. 271-296.
- Rogers R., 2019. *Doing digital methods*. Los Angeles: Sage.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Digital phenomena pose unique challenges to social science researchers studying the impact of new and changing technologies. In part, this challenge stems from the constant evolution of practices, actors, and geographies that are inscribed in the digital. The effects are related to daily life and how people spend their time in various activities and places, so we can assume that offline time is affected by the time people spend online.

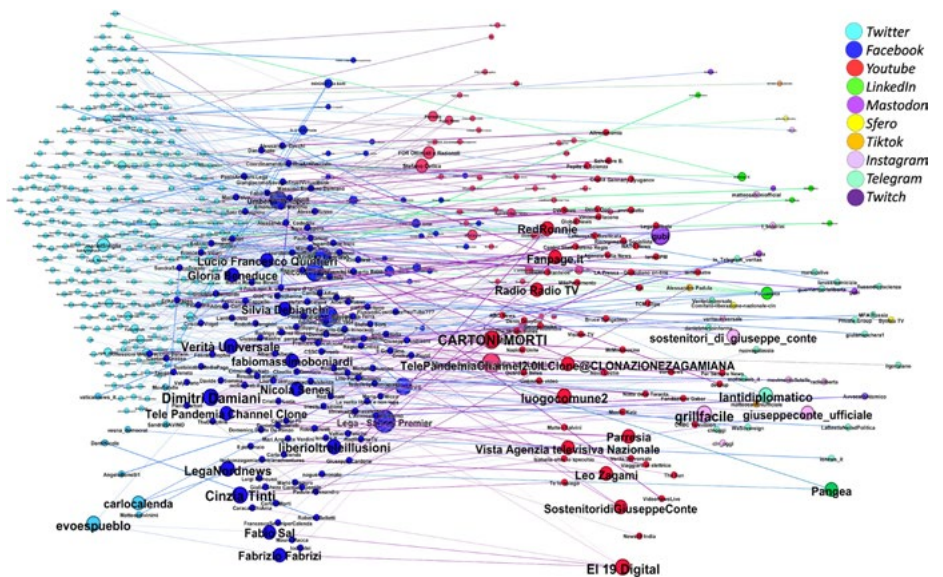
In the digital age, poor public communication catalyzes the spread of misinformation and information in public opinion, and anyone can produce political content that can reach a global audience. Everyday citizens play a crucial role in the information ecosystem, where a key aspect is that social media has become a key tool for conveying information (Tucker, Guess, Barberà, 2018).

This research focuses on nuclear debate by considering both the energy perspective (since the inclusion of nuclear energy in the European taxonomy for sustainable activities) and the atomic conflict narrative (which has grown along with the escalation of the conflict in Ukraine).

The idea of this doctoral research is to conduct a cross-platform exploration by examining the connections of social media platforms that we call Bridges. Bridge is a concept from Transmedia Theory (Hayes, 2006), where the term is used to describe the movement of audiences across different media platforms. We will use it to describe the connection between different social media platforms, with the goal of not only considering the digital object itself (e.g., a hyperlink), but also including the narrative built around the object that drives people to other platforms.

The quanti-qualitative methodological approach was designed with an explanatory sequential design. The quantitative phase relies on digital methods (Rogers, 2019) to identify bridges between social media platforms. This is followed by a qualitative digital ethnography - to explore a highly dynamic social media ecosystem - aimed at describing the roles of different actors and the narratives at play.

As the effectiveness of social media plays an increasingly important role in a country's democratic dynamics, this research contributes to the scholarly debate on the role of social media platforms in the information ecosystem by offering a multidisciplinary perspective on the topic.



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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE An interactive Spatial Decision Support System to co-recovery sustainable villages and marginal areas
TUTOR(S) Patrizia LOMBARDI, Sara Torabi MOGHADAM

ACADEMIC CONTEXT

- Caselli B., Ventura P. and Zazzi M., 2020. Performance-based spatial monitoring. An interpretative model for long-term shrinking medium-small Italian towns. *Sustainable Cities and Society*, 53(February 2020), p. 101924. doi: 10.1016/j.scs.2019.101924.
- Pignatelli M. et al., 2023. Spatial clustering-based method for Italian marginal areas toward the sustainable regeneration. *Valori e Valutazioni*, 32, pp. 77-89. doi: 10.48264/VVSIEV-20233207.
- Pignatelli M. et al., 2023. Spatial decision support system for low-carbon sustainable cities development: An interactive storytelling dashboard for the city of Turin. *Sustainable Cities and Society*, 89(February 2023). doi: 10.1016/j.scs.2022.104310.
- Torabi Moghadam S., Genta C., Pignatelli M. and Lombardi P., 2020. Supporting sustainable urban planning process based on scenarios development. *IOP Conference Series: Earth and Environmental Science*, 588. doi: 10.1088/1755-1315/588/4/042022.

EXTERNAL COLLABORATIONS

- Osservatorio per lo Sviluppo dei Territori (Istituto EURISPES e Ragioneria Generale dello Stato)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

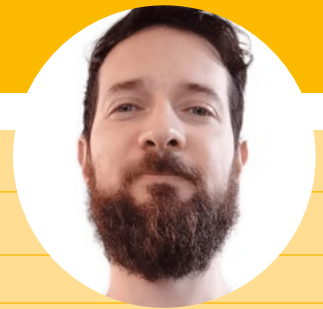
Territorial marginality is a challenging topic that characterizes numerous studies, especially in the discipline of human geography (Caselli, 2020). This issue is in the foreground in Italy because of the history and settlement evolution of municipalities and cities. The urban shrinkage of marginal areas is widely debated because it has acquired a strong connotation of the territorial transformation processes and socio-economic dynamics that took place after World War II (Barca, F., Casavola, P. and Lucatelli, 2014).

As a result, in Italy there is now a clear disparity between cities and villages located in marginal areas. The progressive depopulation of inland areas and the urban polarization represent consolidated dynamics difficult to adapt to the new paradigm of sustainable development. The post-Covid-19 pandemic scenario offers the opportunity to redefine new parameters of intervention and new visions for the regeneration of villages in accord with the new challenges of decentralization and physical distancing.

This research aims to create the conditions to repopulate and rebalance shrinking territories by establishing new centres of attractiveness. The study envisages the active involvement of municipalities in implementing multi-sectoral analysis and spatial assessment approaches in planning processes. It intends to develop an interactive web dashboard for local authorities and spatial planners to create both a learning environment and a participative spatial decision support system for future local policy actions toward sustainable local development. In this way, it is proposed a functional method with a place-based approach to managing the existing territorial complexity through innovative models of territorial governance and policymaking, among them the effective implementation of participatory and multi-actor visions of territorial development. The selection of proper indicators in the decision-making processes is crucial for evaluation, measurement and reporting purposes (Hiremath et al., 2013). Therefore, the proposed doctoral research is closely linked to the contemporary Italian necessities and priorities set by the PNRR (Piano Nazionale di Ripresa e Resilienza). Its inclusion within a national research project "Renaissance of villages for the revitalization of marginal areas" approved by Eurispes observatory, enriches the methodological framework with many multidisciplinary aspects. The interdisciplinary approach of this research contributes to advancing the theoretical discourses to understand the dynamics of the new spatial participatory city planning but also expands the empirical implementation to the urban context.



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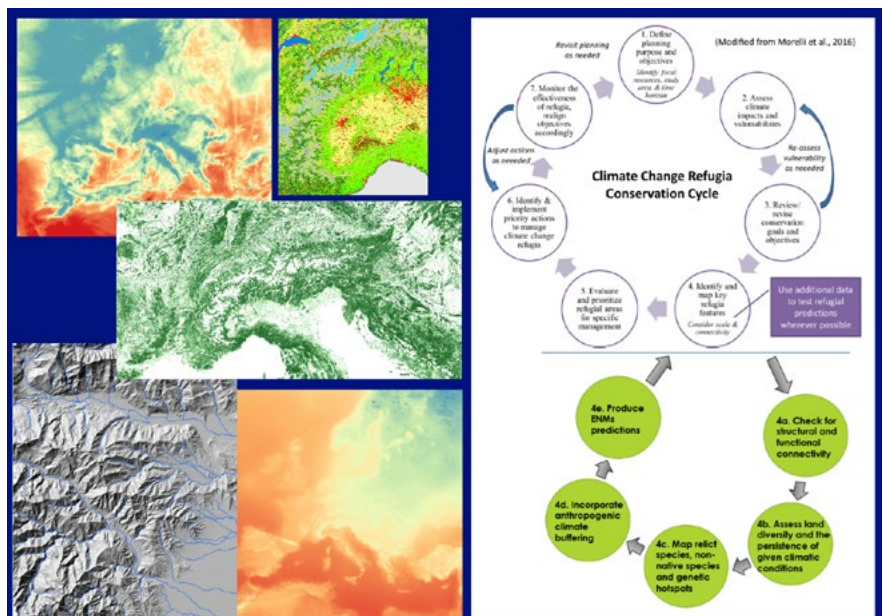
COURSE XXXVII cycle - 2nd year
RESEARCH TITLE Geocosystem tipping points and biogeomorphological assessment for “anthropocenic refugia”
TUTOR(S) Angelo BESANA

ACADEMIC CONTEXT

- Barnosky A.D., Hadly E.A., Bascompt, J., Berlow E.L., Brown J.H., Fortelius M., Getz W.M., Harte J., Hastings A., Marquet P.A., Martinez N.D., Mooers A., Roopnarine P., Vermeij G., Williams J.W., Gillespie R., Kitzes J., Marshall C., Matzke N., Mindell D.P., Revilla. E. and Smith A.B., 2012. Approaching a state shift in Earth's biosphere. *Nature*, 486, pp. 52-58.
- Baumgartner J. B., Esperòn-Rodríguez M. and Beaumont L. J., 2018. Identifying in situ climate refugia for plant species. *Ecography*, 41, pp. 1850-1863.
- Morelli T.L., Daly C., Dobrowski S.Z., Dulen D.M., Ebersole J.L., Jackson S.T., Lundquis, J.D., Millar C.I., Maher S.P., Monahan W.B., Nydick K.R., Redmond K.T., Sawyer S.C., Stock S. and Beissinger S.R., 2016. Managing Climate Change Refugia for Climate Adaptation. *PLoS ONE*, 11(8), p. e0159909.
- Waltari E., Hijmans R. J., Townsend Peterson A., Nyàri A. S., Perkins S. L. and Guralnick R. P., 2007. Locating Pleistocene refugia: comparing phylogeographic and ecological niche model predictions. *PLoS ONE*, 2(7), e563.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Facing the accelerating pace of climate change that the Italian peninsula is experiencing, any attempt to define long-term strategies for habitat integrity conservation seems doomed to excessively high levels of uncertainty. Besides, anthropic disturbance on bio-geomorphological systems occurs not only indirectly (with climate change) but also directly, with massive land use conversion which entails complex, non-linear effects in terrestrial ecosystems. These forcings are expected to keep on increasing exponentially in the next decades, eventually attaining unknown thresholds beyond which the entirety the Earth's surface can be considered virtually affected by human presence (Barnosky et al., 2012). The conflict between human settlements and the biosphere seems to be unavoidable, however Earth observation techniques and geostatistics can give a detailed and quantitative overview on the critical boundary along which this conflict manifest itself. They can produce not only a definite asset of territorial data and their synthetic interpretation, but also, through cartography, their combination with complementary information, allowing retrospective, present-day and prospective analyses, thus merging the outputs offered by different disciplines, such as atmospheric physics, field biology and remote sensing. Ecology, in its turn, provides the basic principles founding the theory of ecological corridors and their operative setting, given by both structural and functional landscape connectivity, which should ensure that territorial contiguity is maintained to help mobile species in their forced upslope altitudinal and poleward latitudinal migration. Within this framework, the so-called climate change refugia (Morelli et al., 2016), i.e., those geographical areas exhibiting a delayed response to the global trends of climate change, may become a key factor to dampen the effects of anthropic disturbance on ecosystems, allowing a locally smoothed transition to higher temperature scenarios (Waltari et al., 2007). With my research I am testing a workflow to locate those strategic areas across Italian ecoregions, and to produce a subsequent series of cartographic products endowed with sufficient reliability to be a useful reference point for subsequent conservative management initiatives (Baumgartner et al., 2018), through which the attainment of SDG 15 (protection of terrestrial ecosystems), and in particular SDG Target n. 15.5 (natural habitat integrity) could be more easily evaluated and fostered at the local level.



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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE “Culture will fix that place!”: Locating the role of new philanthropy in a spatialized analysis of social innovation
TUTOR(S) Carlo SALONE

ACADEMIC CONTEXT

- Bertacchini E.E., Pazzola G. and Puletti F., 2022. Urban alternative cultural production in Turin: An ecological community approach. *European Urban and Regional Studies*, 29(3), pp. 350-368.
- Jessop B., Moolaert F., Hulgård L. and Hamdouch A., 2013. Social Innovation Research: A New Stage in Innovation Analysis. In: F. Moolaert, D. MacCallum, A. Mehmood, A. Hamdouch, eds. *The international handbook on social innovation: Collective action, social learning and transdisciplinary research*. Cheltenham: Edward Elgar Publishing Limited, pp. 110-30.
- Rogers R., 2011. Why philanthro-policy matters. *Society*, 48(5), pp. 376-381.
- Uitermark J. 2014. Integration and Control: The Governing of Urban Marginality in Western Europe: Governing urban marginality in Western Europe. *International Journal of Urban and Regional Research*, 38(4), pp. 1418-1436.

EXTERNAL COLLABORATIONS

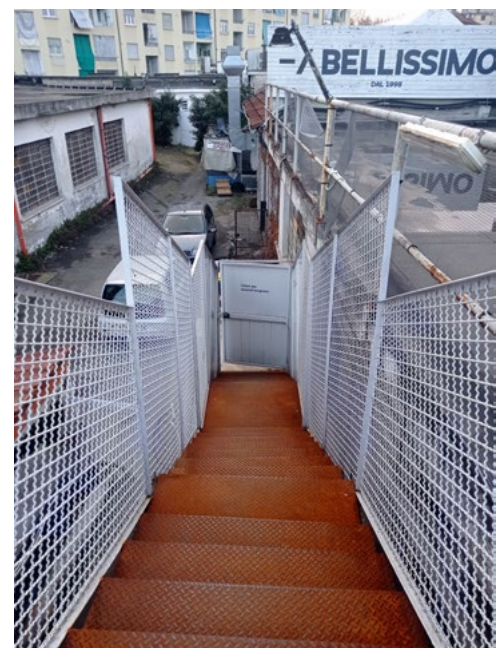
- Fondazione Santagata for the Economics of Culture

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The emergence of the urban as a site of governance is always a negotiated political process, and one that gets established through prevailing discourses and associated power geometries (Massey 1993). Taking this as a starting point, the general aim of my work is to contribute to the development of an understanding of the relationship between the spatial patterns of urbanisation and the institutionalisation of public authority outside the realm of government institutions. Instead of assuming the existence of bounded and coherent local authorities responsible for urban governance, therefore, I’m interested in the power-laden processes through which institutional decision-making contexts are produced through the relationship between different actors. More specifically, I’m concerned with the association between uneven urban development and the emergence of governance expectations about the autonomous responsabilization of citizens for the provision of socially innovative localized solutions to wider societal problems; and on how these effects have been captured by different third sector organisations for political gain.

As philanthropic organisations are gaining increasing prominence as institutional formations responsible for policymaking and agenda setting (Arrigoni 2021; Barman 2016; Frumkin 2008; Ravazzi 2016; Rogers 2011; Skocpol 2016), my research specifically addresses their role within the power geometries associated to the emergence of an order of discourse supporting entrepreneurial forms of social innovation as solutions against social exclusion and urban marginality. Provided that a central element in the role of these actors is to greatly influence the definition of local development agenda by defining and spatially situating problems, as well as foregrounding and foreclosing selected solutions through their financial support to specific projects, I will also focus on the impact that the institutionalisation of social innovation has on the social construction of space both at the level of representations and of their enactment.

These questions are examined through the case study of some call for grants designed to support socially innovative cultural and community spaces in the city of Turin (Italy) during and after the pandemic crisis. The case study is analysed qualitatively through the Critical Discourse Analysis of semi-structured interviews to relevant members of the donor and recipient organisations and supported by the analysis of the projects submitted to the call and of other relevant public documents.



NAME **Alice RE**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE **Assessment of coastal vulnerability in semi-enclosed sea basins: focus on a spatially explicit analysis of exposure**
TUTOR(S) **Alessandro PEZZOLI, Lorenzo MINOLA**

ACADEMIC CONTEXT

- IPCC, 2019. Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities. In: Pörtner H.-O. et al., *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*.
- Re A., Minola, L. and Pezzoli, A., 2023. Climate scenarios for coastal flood vulnerability assessments: a case study for the Ligurian coastal region. *Climate*, 11(3), p. 56. <https://doi.org/10.3390/cli11030056>.
- Woznicki S.A., Baynes J., Panlasigui S., Mehaffey M. and Neale A., 2019. Development of a spatially complete floodplain map of the conterminous United States using random forest. *Science of the Total Environment*, 647, pp. 942-953. <https://doi.org/10.1016/j.scitotenv.2018.07.353>.

EXTERNAL COLLABORATIONS

- University of Valencia (host for visiting or research period)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

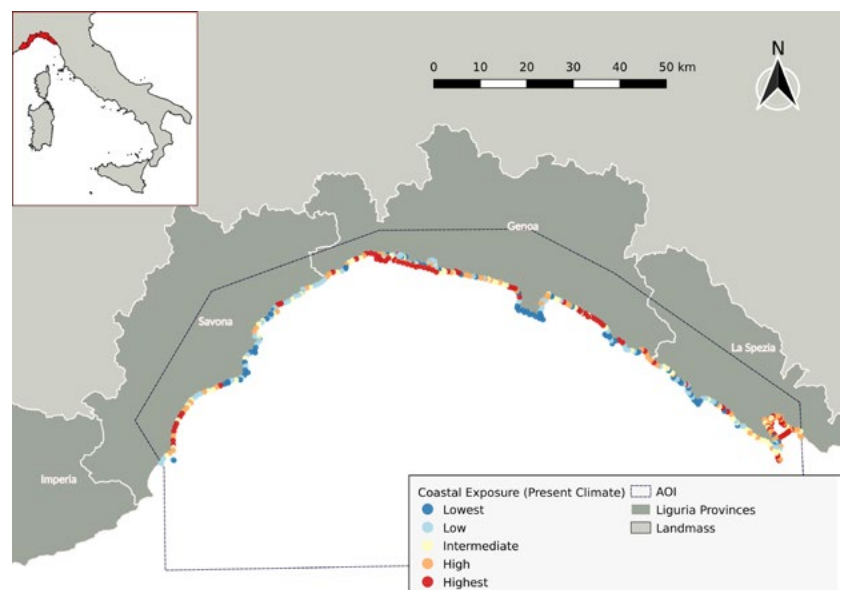
Assessing vulnerability to climate-related hazards is crucial for climate change adaptation. Coastal communities are among those who will likely be affected the most by relevant climate change-related outcomes such as sea level rise and floods. Projections of future urban population trends point towards coastal cities growing in the next years, and to more people being consequently exposed to such hazards. The aim of this PhD research is to advance the knowledge in this field, with a specific focus on assessing physical exposure to coastal inundation and wind-driven extreme sea level changes in semi-enclosed sea basins, specifically the Mediterranean Sea basin.

The first year of the PhD research has been devoted to developing a case study for the assessment of exposure to inundation and erosion for a large shoreline stretch in Liguria. This Italian region is renowned for extreme weather events having particularly dire consequences due to the region's geomorphology and relatively high population density.

The vulnerability of the area was analysed by computing a qualitative Coastal Vulnerability Index of relative exposure in a spatially explicit manner along the region's coastline. The index is obtained as combination of several bio-geophysical variables determining local exposure to storm events. The results of the analysis can be used to identify which coastline portions are of most concern, in order to orient more in-depth studies.

Though, this index-based approach had significant limitations in terms of the type of spatial output, index construction and output validation possibilities. The shortcomings of this approach have been used to orient the following phases of the PhD research.

The research objective is currently being approached as a machine learning-based supervised classification task aimed at the production of a susceptibility map of coastal inundation for the area of interest. Flood inundation maps produced by regional administrations in the context of the EU Floods Directive 2007/60/EC will be used as ground truth data for both training and validation of the model. Data on local hydromorphological, geographical, meteorological-climatic and land use factors will be used as predictor variables.



NAME **Andrea RICCI**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE How Do Cities Learn? Instrumental approach to migration governance in Italian Cities
TUTOR(S) Fabrizio DI MASCIIO, Tiziana CAPONIO

ACADEMIC CONTEXT

- Caponio T., 2019. City Networks and the Multilevel Governance of Migration: Towards a Research Agenda. In: Caponio T., Scholten P. and Zapata-Barrero R., eds., *The Routledge Handbook of the Governance of Migration and Diversity in Cities*. New York: Routledge, pp. 182-192.
- Lescoumes P. and Le Galès P., 2004. *Gouverner par les Instruments*. Paris: Presses de la Fondation Nationale de Sciences Politiques.
- Rose R., 1991. What is Lesson Drawing?. *Journal of Public Policy*, 11(1), pp. 3-30.
- Zapata-Barrero R., Caponio T. and Scholten P., 2017. Theorizing the 'Local Turn' in a Multi-level Governance Framework of Analysis: A Case Study in Immigrant Policies. *International Review of Administrative Sciences*, 83(2), pp. 241-246. <https://doi.org/10.1177/0020852316688426>.

EXTERNAL COLLABORATIONS

- IMISCOE (International Migration Research Network), as a PhD Representative in the Migration Politics and Governance (MigPoG) Standing Committee

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The project investigates the processes Italian municipalities enact to gather and introduce new policy knowledge into local migration governance. Specific attention is devoted to transnational municipal networks – political arenas where cities can voluntarily convene for economic, political, symbolic or educational purposes - to foster knowledge exchange and share best practices and capacity-building activities among European municipalities. The project takes the moves from the work of Lescoumes and Le Galès (2004), “Gouverner per les Instruments”, identifying an instrumental approach to delve into decision and policymaking processes unfolding at the municipal level. The theory posits that resonance between the finalities of public actions and the instruments – where instruments are “technical and social dispositif organising specific social relationships between public authorities and their addressees, as a function of representations and meanings which is bearer thereof” (Lascoumes and Le Galès 2009: 3)- through which they are enacted can be identified. In this framework, instruments can not be reduced to mere technical objects but are indissociable from users who use and transform them. The research posits that local migration governance is an instrument that results from two different but interconnected processes of instrumental policy learning and ‘lesson drawing’ (Rose 1991, 1993, 2005). On the one hand, the long-lasting evolution of the European Union’s urban policy (Urban Pilot Projects, URBAN Initiative, URBACT, EU Urban Agenda) has yielded specific instruments (Transnational Municipal Networks) and relative tools (peer-to-peer knowledge exchange, best practice sharing and capacity-building activities, EU-funded projects) to improve policies and practices in the urban realm. Network participation represents an alternative (among others) modality through which cities can update their policies and practices. On the other hand, local governance arrangements have evolved along with a process of instrumental learning, more and more collaborative, in which several public and private actors have contributed to its development and current structuration. Embracing an urban perspective, I propose a comparative study of 4 Italian cities (Turin, Bologna, Settimo Torinese, Capaci) and two transnational municipal networks (Eurocities and CEMR). Investigating the municipal migration governance constitutive relations, also in a diachronic way, unfolds how cities of different sizes can learn from their past practices and European policy evolution to foster policy change locally.



NAME **Sofía Beatriz RIVERA GARCÍA**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE Beyond fear: a communitarian feminist approach to urban violence from socio-spatial practices of care
TUTOR(S) Camillo BOANO

ACADEMIC CONTEXT

- Hume M. and Wilding P., 2007. Beyond agency and passivity: Situating a gendered articulation of urban violence in Brazil and El Salvador. *Urban Studies*, 57(2), 249-266.
- Rivera-García S., 2023. The caregivers' strike: a tale of violence and care in the entrails of San Salvador. *Lo Squaderno*, 65, pp. 49-53.
- Rivera-García S., 2023. Bodily Infrastructures of Care. *Roadsides*, 9, pp. 17-22.
- Truelove Y. and Ruszczuk H., 2022. Bodies as urban infrastructure: Gender, intimate infrastructures and slow infrastructural violence. *Political Geography*, 92, pp. 1-10.

EXTERNAL COLLABORATIONS

- Universidad Centroamericana José Simeón Cañas (UCA), El Salvador

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The Latin American region had been characterized in the past decades by its high levels of multiple forms of layered structural, infrastructural, cultural, and direct violence. One of the concepts that has sought to capture the complexity of this phenomenon is urban violence. Although urban violence has been mainly studied in this region, there are certain dimensions that have not received the attention they deserve. Echoing the call of Kristally and Schulz (2022) to take love and care seriously while researching violence (and not focusing only on its devastating effects), this research aims to contribute to this breach by reflecting on socio-spatial practices of care that emerge in contexts of extreme and chronic violence, and on how do caregivers' bodies and practices shape urban contexts of extreme and chronic violence, as caring practices continue to be provided, sustaining and weaving the complex web that sustains life (Soto-Villagrán, 2022). This research is framed in a communitarian feminist approach by placing at the centre the concepts *cuero-territorio* and *acuerpamiento*, addressed not only theoretically but also methodologically; it's developed in the city of San Salvador, El Salvador, where the effects of the Exception Regime established since March 2022 have resulted in new socio-spatial practices of care and resistance, which need to be remarked on. During the stage of fieldwork (Nov/2022 – Jul/2023) we engaged with (1) a group of women that have been inhabiting the surroundings of *El Penalito*, an old cinema located within the limits of the Historic Centre of San Salvador, which became a temporary jail where almost every prisoner passes prior permanent confinement, and (2) Azoro Cultural Association (ACA) and La Cachada Teatro, a group of female street vendors who funded a theater company, and started the Nave Cine Metro project, a space dedicated to performing arts where street vendors can rest and practice self-care, where their children can play and take part in various workshops while their mothers are selling on the streets.



NAME **Daniela SANTANA TOVAR**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE Definition of a standard framework for ESG assessment of private companies: a focus in the construction sector
TUTOR(S) Patrizia LOMBARDI, Sara TORABI MOGHADAM

ACADEMIC CONTEXT

- Billio M., Costola M., Hristova I., Latino C. and Pelizzon L., 2021. Inside the ESG ratings: (Dis)agreement and performance. *Corporate Social Responsibility and Environmental Management*, 28(5), pp. 1426-1445. doi: 10.1002/csr.2177.
- Gillan S.L., Koch A. and Starks L.T., 2021. Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*. Elsevier B.V., 66(June 2020), p. 101889. doi: 10.1016/j.jcorpfin.2021.101889.
- Khan M.A., 2022. ESG disclosure and Firm performance: A bibliometric and meta analysis. *Research in International Business and Finance*, 61(February), p. 101668. <https://doi.org/10.1016/j.ribaf.2022.101668>.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The private sector is crucial in delivering practical, innovative solutions that will eventually lead to a zero-carbon economy. In addition, encouraging businesses to make decisions based on climate change is the best approach to developing and building more equitable and healthy societies. While there is a global trend toward mandated sustainability disclosure, acknowledging that it provides stakeholders and investors with significant company information, there is skepticism about the value that businesses place on reporting when sustainability criteria are not in line with corporate goals. Establishing a strategic and standard evaluation framework is required to raise the level of openness and accountability in environmental, social, and governance (ESG) and lower the expenses it entails. This is particularly true in construction, where there is a lack of standardized criteria for ensuring sustainability in the built environment. This framework should allow for the comparison of the sustainability metrics between construction companies, the reporting of progress toward the realization of the 2030 targets in the built environment, and the benefits in business.

By aligning the values of companies with sustainability goals, the cost of sustainability reporting could be oriented towards the development of efficient measurements. Economies are reshaping into sustainable practices, conducting businesses into the consideration of ESG issues in decision-making, and using reporting as a key initiative to achieve the value creation of the sector with the SDGs. Also the potential is such that the Global Sustainable Investment Review (2018) stated that the global sustainable investing assets accounts for 30 million dollars and is continuing to increase.

There is a need for a standard sustainability reporting tool that can compare sustainability report measurements between companies, to report progress in climate change mitigation and advancement in the achieving of the 2030 agenda, while also being of benefit to the companies' financial objectives.

An examination of present policies, tools, and disclosures is then conducted to support the findings of the literature review, which contrasts the gap between theories and practices. The results show that the treatment of ESG practices has to be holistic, starting from policymaking to the standardization of assessment and disclosure frameworks and ending with the development of sustainability strategies in each company. The overview indicates that actions are being made toward the adaptation of ESG strategies but is urgent to be critical of the homogenization of standards.

This review is expected to contribute to current advancements in the crucial goal of achieving standardization of assessment ESG frameworks in the construction sector, disclosures, and benchmarks, and as support to future policymaking.



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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE **Negotiating Spatial Inequality: Caste and Gender Dynamics among Women Street Vendors in Mumbai, India**
TUTOR(S) **Michele LANCIONE**

ACADEMIC CONTEXT

- Anjaria J.S., 2006. Street Hawkers and Public Space in Mumbai. *Economic and Political Weekly*, 41(8).
- Bandyopadhyay R., 2009. Archiving from Below: The Case of the Mobilised Hawkers in Calcutta. *Sociological Research Online*, 14(5), pp. 27-37.
- Chakravarti U., 2018. *Gendering caste through a feminist lens*. New Delhi: SAGE Publications Stree.
- Sundaresan J., 2019. Urban planning in vernacular governance: Land use planning and violations in Bangalore, India. *Progress in Planning*, 127, pp. 1-23.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Street vendors in Mumbai are targeted on various fronts: by the forces of neoliberalism that term vendors as ‘encroachments’ over property; a state that views them as an obstacle to an ordered urban life; “bourgeois environmentalists” that consider street vendors as ‘eyesores’ and sources of ‘filth’; as well as xenophobic, regionalist political parties that protest against the ‘influx’ of migrant workers in the city. How does the intersection of gender and caste influence these multiple axes of oppression faced by street vendors?

For Indian women, the decision to work outside the home involves crossing boundaries – both social and material – that are based on the traditional perception of where a woman’s domain should lie. It is this very tension between the workplace and home, the public and private that gives birth to a spatiality shaped by the intersections of gender, caste, and class. Women street vendors in Mumbai are, thus, uniquely vulnerable to urban policies that encourage segregation of the commercial from the residential, create rigid “no-hawking” zones, rely on technocratic solutions, and focus on formalising rather than supporting street vendors. Knowledge produced about and with women street vendors will be key to addressing this gap.

Thus, I carried out a 9 month multi-sited ethnography grounded in the social and historical geography of the city in order to understand the experiences of women street vendors in Mumbai. My findings have the potential to critique the current urban planning paradigm in India, interrogate how the intersection of gender, caste, and class has produced urban space, and shift attention to the policy-based, political, and epistemological exclusion of women and caste minorities in India. To do this, I built upon three main conceptual frameworks in my research – decolonial Southern urbanism, feminist geography, and anti-caste geography.

Therefore, the broad research aim of my project is to expand our understanding of the intersection of caste, gender, and space in Indian cities, and how this relation has produced urban space, through the experiences of women street vendors in Mumbai. This included understanding the everyday experiences of women street vendors through an ethnographic approach, focusing on the impact of contemporary urban planning policies on them, and finally, analysing, through a historical lens, how street vending has been viewed by the colonial and postcolonial state.



NAME **Elia SILVESTRO**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE **The geography of italian logistics' renaissance: private rationalities and public prophecies between sprawl and special economic zones**
TUTOR(S) **Carlo SALONE**

ACADEMIC CONTEXT

- Brenner N. and Katsikis N., 2020. Operational Landscapes: Hinterlands of the Capitalocene. *Architectural Design*, 90(1), pp. 22-31. <https://doi.org/10.1002/ad.2521>.
- Dablanc L. and Ross C., 2012. Atlanta: A Mega Logistics Center in the Piedmont Atlantic Megaregion (PAM). *Journal of Transport Geography*, 24(C), pp. 432-42. <https://doi.org/10.1016/j.jtrangeo.2012.05.001>.
- Molotch H., 1976. The City as a Growth Machine: Toward a Political Economy of Place. *American Journal of Sociology*, 82(2), pp. 309-32.
- Raimbault N., 2022. Outer-Suburban Politics and the Financialisation of the Logistics Real Estate Industry: The Emergence of Financialised Coalitions in the Paris Region. *Urban Studies*, 59(7), pp. 1481-98. <https://doi.org/10.1177/00420980211014452>.

EXTERNAL COLLABORATIONS

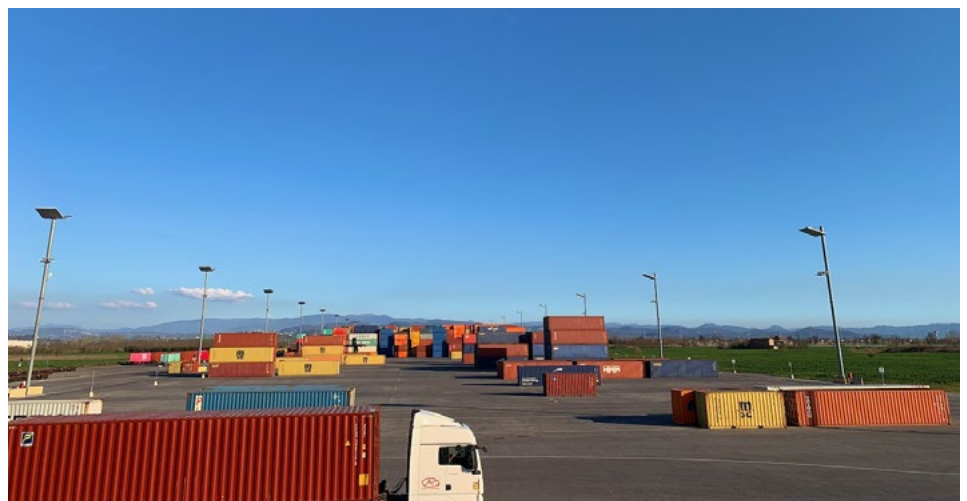
- Laboratoire Ville Mobilité Transport (LVMT), Université Gustave Eiffel, Paris (visiting period)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Logistics facilities development has surged to satisfy the demand of globalized production and trade. Warehouses, distribution centres, courier facilities and intermodal hubs are built alongside industrial parks and in other strategic locations such as highway interchanges. This is especially prevalent in the sprawling hinterlands of global city-regions, where cheap undeveloped land plots along transport infrastructure can be found (Dablanc and Ross 2014). I approach this logistics urbanization as a local economic strategy based on real estate development and investigate the actors behind its materialisation. First, I perform a quantitative (GIS) survey of Northern Italian logistics facilities to identify case studies. The resulting fieldwork stretches across the Italian provinces of Alessandria and Piacenza, a poorly industrialised but strategic area for goods flows from and to the port of Genoa and the rich manufacturing sector of Northern Italy as well as a gateway to the Northern European markets. I investigate the processes behind logistics real estate development through semi-structured interviews with key experts (logistics operators, government officers and real estate firms).

Building on my fieldwork, I reconstruct these processes as growth coalitions (Molotch 1976), constellations of governmental and non-governmental (market) actors interested in land-based growth. This exposes a network stretching across scales from the global to the local, as the financial strategies of global investment funds are channelled down to suburban municipalities through the advanced services of global city-regions – in this study, Milan-based real estate agencies – resulting in a financialized growth machine for logistics. Second, I posit that, like in other cases (Raimbault 2022), regional governance is weak and is ultimately in the hands of revenue-seeking municipalities trying to logistics facilities with little regard for planning. Finally, I argue that my case study shows how extended urbanization is fuelled through global finance as the 'operational landscapes' of Global North hinterlands (Brenner and Katsikis 2020) are built through global capital.

My research explores an uninvestigated aspect of Northern Italian urbanization from the perspective of urban geography. It also informs urban planning and territorial governance in a region where land consumption is rampant.



NAME **Anthony SUPPA**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE **Towards a climate-neutral Turin: evaluating district-scale retrofit scenarios for the built environment using urban building energy modeling (UBEM) and stakeholder collaboration**
TUTOR(S) **Marta Carla BOTTERO , Vincenzo CORRADO**

ACADEMIC CONTEXT

- Becchio C., Bottero M.C., Corgnati S.P. and Dell’Anna F., 2018. Decision making for sustainable urban energy planning: an integrated evaluation framework of alternative solutions for a NZED (Net Zero-Energy District) in Turin. *Land Use Policy*, 78, pp. 803-817.
- Suppa A.R. and Corrado V., in press. Supporting the EU mission “100 climate-neutral cities”: using urban building energy modeling for zero-emission building retrofit scenarios at district scale. In: *Building Simulation Conference Proceedings*, Vol.18.
- Suppa A.R. and Ballarini I., 2023. Supporting climate-neutral cities with urban energy modeling: a review of building retrofit scenarios, focused on decision-making, energy and environmental performance, and cost. *Sustainable Cities and Society*, 98 (2023), 104832.
- Zivkovic M., Pereverza K., Pasichnyi O., Madzarevic A., Ivezić D. and Kordas O., 2016. Exploring scenarios for more sustainable heating: the case of Niš, Serbia. *Energy*, 115, pp. 1758-1770.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Climate deadlines are fast approaching. As a participant in the EU mission “100 climate-neutral cities by 2030”, the City of Turin must eliminate all Scope 1 & 2 CO₂ emissions in a district of 50,000 people within the next 7 years. Keys to Turin’s decarbonization are retrofit strategies to reduce energy demand in the buildings sector, which accounts for 40% of energy consumption and 36% of energy-related CO₂ emissions in the EU.

Reviewing the climate-neutral cities concept, Huovila et al. (2022) note that “cities need support to develop and assess action plans, come up with creative and innovative ideas, and increase stakeholder collaboration”. One tool providing such support is urban building energy modeling (UBEM), which can create models at district or city scale, ranging from dozens to thousands of buildings, providing baseline and post-retrofit energy and CO₂ performance.

The PhD candidate’s research shall unfold over three academic journal articles, as follows:

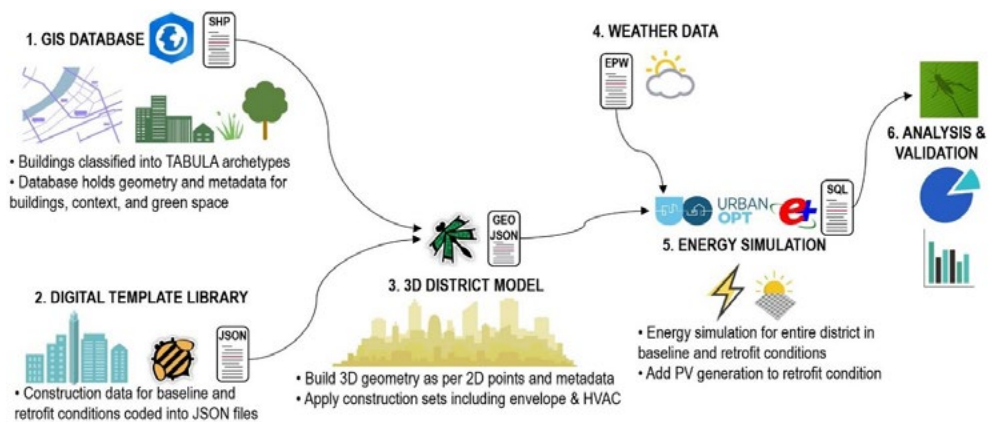
Article 1, a literature review, shows how UBEM studies use divergent quantification approaches, hindering their comparability for policymakers. The findings also indicate challenges with renewable energy production and heating via heat pumps, including increased peak electrical loads and seasonal mismatches in generation and consumption, which are mitigated by measures reducing overall building energy demand, demand-response measures to curtail peaks, and district sources of endogenous energy. The decision-making analysis signals pathways to innovation and stakeholder collaboration, highlighting approaches using context analysis to generate and share energy in districts, economic criteria to mirror real-world conditions, and stakeholder engagement to meet local priorities.

Article 2 uses UBEM to model the effect of retrofitting 1,761 residential buildings in Turin’s Barriera di Milano district. The approach targets retrofits using the zero-emissions building concept while emphasizing decision-making toward efficiency and constructability of retrofits. The results show a reduction of overall primary energy use of 56% to 71% in retrofit scenarios including envelope and mechanical system measures, and adding onsite PV energy generation reduces carbon emissions by 90% compared to baseline.

Article 3 shall use stakeholder collaboration and multi-criteria decision-making (MCDM) tools to determine local preferences and priorities for climate-neutral retrofits for the Turin district in the EU mission.

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NAME **Giorgio TOSATO**
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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE Urban development through Complex Networks and Mathematical Dynamic Modelling
TUTOR(S) Marta Carla BOTTERO, Elena DE ANGELIS, Giancarlo COTELLA

ACADEMIC CONTEXT

- Assuma V., Bottero M., De Angelis E., Lourenço J.L., Monaco R. and Soares A.J., 2021. A decision support system for territorial resilience assessment and planning: an application to the Douro Valley (Portugal). *Science of the Total Environment*, 756, p. 143806.
- Bettencourt L.M.A., 2021. *Introduction to Urban Science*, Cambridge: MIT Press.
- Della Marca R., Groppi M. and Soares A.J., 2022. Human-induced oscillations in a network landscape model, *Communication in Nonlinear Science and Numerical Simulation*, 115:106722.

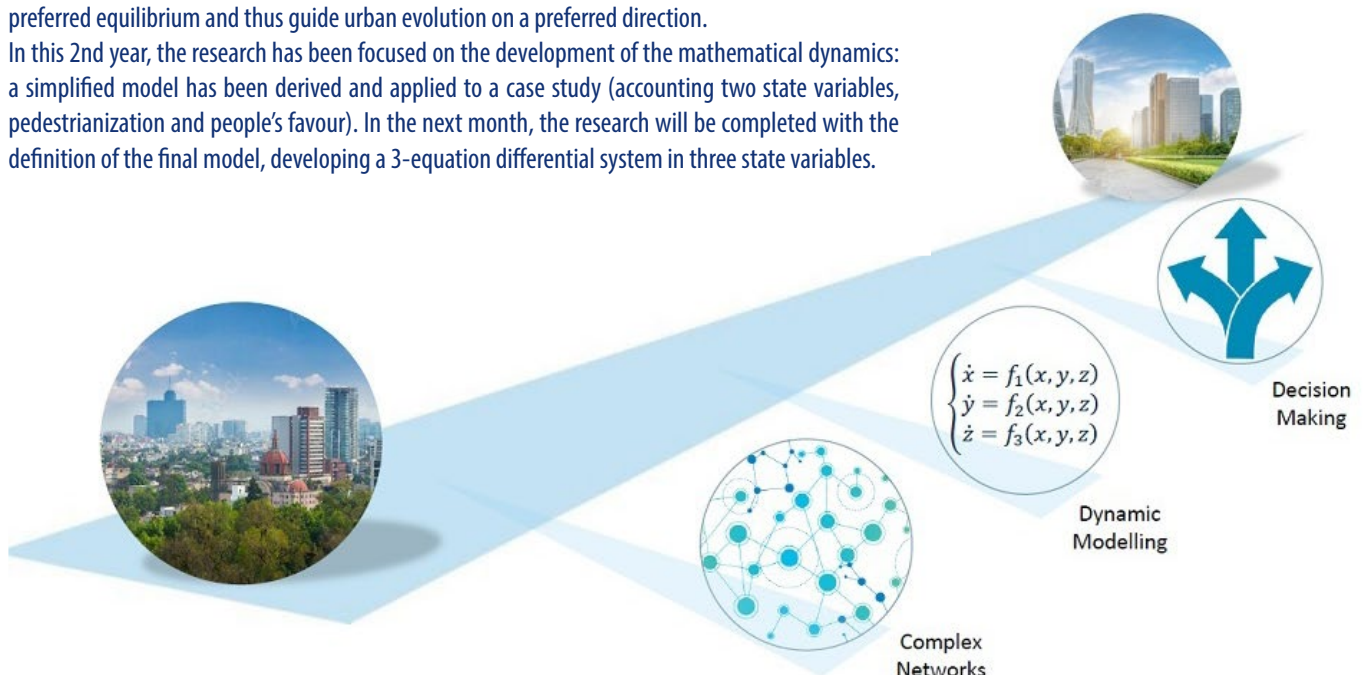
HIGHLIGHTS OF THE RESEARCH ACTIVITY

Since the middle of the XX century, the world's population has experienced a sharp increase due to a general improvement in living conditions and in the last 35 years urban population had a leap of 2.3 billion people. The analyses show a consolidated trend, which will bring 68% of people to live in cities by 2050. The control of urban processes and which tools are to be used to achieve this result have, thus, become a central issue for managing such complex realities, in constant economic, social and building development, not to mention the environmental fall-outs.

The research aims to address the specific topic of urban evolution using Science of Complex Networks and Mathematical Dynamic Modelling to predict possible scenarios in the growth of metropolitan areas and to provide further elements to support decision makers, in order to guide cities' future development.

From this background, the research proceeds with an analysis of the evolution of the urban configuration (from central to polycentric city and recently to city of cities) and the basic features of a network reading and modelling. This path leads to the development of a mathematical model of urban evolution accounting for several components: urban growth, environmental sustainability and the human factor, joint together in a multi-dimensional dynamics represented by a set of differential equations. Such a dynamics may allow to gather the urban future growth trends and support the decision making process, identifying the stable equilibriums, because they represent a stable evolution path and, therefore, lead to predictable scenarios. The second target is the introduction in the dynamics of proper parameters, which make the system move towards a preferred equilibrium and thus guide urban evolution on a preferred direction.

In this 2nd year, the research has been focused on the development of the mathematical dynamics: a simplified model has been derived and applied to a case study (accounting two state variables, pedestrianization and people's favour). In the next month, the research will be completed with the definition of the final model, developing a 3-equation differential system in three state variables.



NAME	Matteo TRANE	 	
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COURSE	XXXVII cycle - 2 nd year		
RESEARCH TITLE	<i>shapURbe</i> . SHAPing the green transition in the EU for sustainable URBan Environment in light of the European Green Deal and the 2030 Agenda		
TUTOR(S)	Patrizia LOMBARDI, Riccardo POLLO, Luisa MARELLI, Alice SIRAGUSA		

ACADEMIC CONTEXT

- Brandon P.S. and Lombardi P., 2011. *Evaluating Sustainable Development in the Built Environment*. 2nd ed. Oxford: Wiley-Blackwell.
- Sala S., Farioli F. and Zamagni A., 2013. Progress in sustainability science: Lessons learnt from current methodologies for sustainability assessment: Part 1. *International Journal of Life Cycle Assessment*, 18(9), pp. 1653-1672. <https://doi.org/10.1007/s11367-012-0508-6>.
- Trane M., Marelli L., Siragusa A., Pollo R. and Lombardi P., 2023. Progress by Research to Achieve the Sustainable Development Goals in the EU: A Systematic Literature Review. *Sustainability*, 15, 7055. <https://doi.org/10.3390/su15097055>.
- Trane M., Genta C. and Siragusa A., 2024. The 2030 Agenda in European Urban Contexts. Procedures and tools to support the localization of the SDGs. *Working Papers - Urban@it*. In press.

EXTERNAL COLLABORATIONS

- European Commission's Joint Research Centre (JRC)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This Doctoral Research is meant to provide support to policy-makers in operationalizing and mainstreaming the SDGs at local level, given the current and upcoming EU policy framework and the need for Absolute Sustainability (i.e., staying within the Planetary Boundaries). As such, this study is framed by the 2030 Agenda of the United Nations and European Green Deal (EGD) policies designed by the current European Commission (EC). Indeed, the EGD is a cornerstone to implement the SDGs in the EU, while advancing the regulatory EGD targets implies the achievement of most 2030 Agenda targets, which are pursued by national, regional, and urban governments on a voluntary basis. On the other side, the SDGs are highly interconnected by nature and the assessment of interlinkages might provide a holistic and integrated perspective on policies. Given this context, this Ph.D. Program is articulated in three main Building Blocks:

- Systematic Literature Review (SLR) of approaches developed or most used by scholars to operationalize the SDGs and measure progress against them, to finally highlight literature gaps to be addressed, as well as recent trends from research to further investigate on (I Ph.D. Year at Politecnico di Torino)
- Critical analysis of major Actors, Barriers, Challenges and Drivers that might support or prevent the Urban Sustainability Transition in light of EGD urban-relevant policies and related SDG targets (II Ph.D. Year at JRC)
- Integrated evaluation via Consumption Footprint of prioritized and urban-relevant targets from the EGD policy and 2030 Agenda frameworks to finally assess current gaps and future perspectives in achieving those targets in EU cities, while contributing to inform the next EC about the sustainability ambitiousness of designed policies (III Ph.D. Year at JRC).

After having highlighted a growing interest by scholars in operationalizing the SDGs at urban level in the SLR, the most relevant EGD targets have been derived from a policy analysis process with a further refinement via EU local-level stakeholder consultation (on-site survey at the European Week of Regions and Cities and online consultation in October-November 2023). This will make it possible to prioritize policy targets and related SDGs, as well as unveil potential synergies and trade-offs among them, which, in turn, is a vital process to really operationalize the 2030 Agenda at urban level and assess the role of EU cities in achieving the EGD policies while staying within the Planetary Boundaries.



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COURSE XXXVII cycle - 2nd year
RESEARCH TITLE **A spatial dynamic integrated approach for beavers management as Nature-based Solution for freshwater ecosystem restoration**
TUTOR(S) **Elena COMINO**

ACADEMIC CONTEXT

- Siemer W.F., Hall B., Jonker S.A., Decher D.J. and Organ J.F., 2013. Toward an understanding of beaver management as human and beaver densities increase. *Human-Wildlife Interactions*, 7(1), pp.114-131.
- Treves A., Bottero M., Caprioli C. and Comino E., 2020. The reintroduction of Castor fiber in Piedmont (Italy): An integrated SWOT-spatial multicriteria based approach for the analysis of suitability scenarios. *Ecol. Indic.*, 118.
- Treves A., Terenziani A., Angst C. and Comino E., 2022. Predicting habitat suitability for Castor fiber reintroduction: MaxEnt vs SWOT-Spatial multicriteria approach. *Ecological Informatics*, 72.
- Viviano A., Auster R.E., Mazza G., Lagrotteria A., Pucci C., Senserini D., Campbell-Palmer R., Needham R., Curci D. and Mori E., 2023. Eurasian beavers in Central Italy: perceptions in the local community. *The Science of Nature*, 110.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Human activities directly and indirectly affect the environment by changing land uses, breaking off river continuity, altering flow regime, polluting environmental matrices and affecting biodiversity. Freshwater ecosystem are one of the most threatened ecosystems at global scale.

In this context, beavers represent a Nature-based solution to increase the resilience of freshwater ecosystem to drivers of change. These animals are known as ecosystem engineers because they deeply modify the environment offering several ecosystem services. However, although beavers represent a sustainable solution, they as other species are often identified as pest where the proximity to human is strong. Human-wildlife interactions and the extent of related conflicts are strictly linked to human vision of World. Currently, the management of species is a hotly debated topic given the involvement of social community and the different interpretation of the concepts of acceptance, tolerance and coexistence. The challenge is to find a balance between needs and behaviour of species involved implementing management strategies that consider ecosystem approach and socio-economic theories.

To response to this challenge, this PhD research proposed a multi-species management approach which considers beavers and biodiversity as a resource, evaluating socio-ecological dynamics linked to human-wildlife interactions. This approach is implemented from a local point of view in the territory of Piedmont region. Starting from five areas, the most suitable case study area is selected based on several socio-ecological criteria. The criteria consider ecological connectivity, habitat suitability obtained using Species Distribution Models (SDMs), human-beaver conflicts, local community response. Subsequently, a beaver management model is simulated using System Dynamics (SD) and used as discussion tool in the designed area to involve community in species management. The resulting multi-species management approach is innovative in the field of human-wildlife conflicts because it combines SDMs and SD. SDMs are often applied for conservation purposes, while SD are used for modelling complex systems in engineering and management. The expected results (i.e. a cartographic support and a discussion tool) will permit to define several guidelines for the management of human-wildlife relationship and a participatory management approach that considers the beaver as a resource and not a problem to be solved.





XXXVIII CYCLE - 1st YEAR STUDENTS

NAME **Niccolò AIMO**
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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **Climate Change Response and the Reshaping of Urban Governance**
TUTOR(S) **Fabrizio DI MASCIO, Ekaterina DOMORENOK**

ACADEMIC CONTEXT

- Adelle C. and Russel D., 2013. Climate Policy Integration: A Case of Déjà Vu? *Environmental Policy and Governance*, 23(1), pp. 1-12. <https://doi.org/10.1002/eet.1601>.
- Di Mascio F. and Natalini A., 2022. *Pubbliche amministrazioni. Tradizioni, paradigmi e percorsi di ricerca*. Bologna: il Mulino.
- Domorenok E., 2019. Voluntary instruments for ambitious objectives? The experience of the EU Covenant of Mayors, *Environmental Politics*, 28(2), pp. 293-314. <https://doi.org/10.1080/09644016.2019.1549777>.
- Tosun J. and Lang A., 2017. Policy integration: Mapping the different concepts. *Policy Studies*, 38(6), pp. 553-570. <https://doi.org/10.1080/01442872.2017.1339239>.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

As the title suggests, the research project is dedicated to the study of public responses to climate change at the municipal level, with a particular attention to the issue of policy integration.

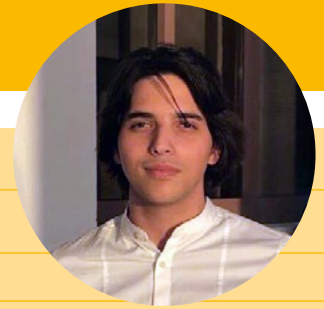
Cities are nowadays recognized as a fundamental level of government for climate change response. Cities, in fact, are an active player in climate policymaking for a variety of reasons. On the one hand, the effects of climate change are particularly evident at the local level. Cities are ever more frequently interested by climate hazards, making the adverse effects of climate-change more obvious to citizens and policymakers. As a consequence, the issue of climate change has emerged in the local political agenda and is growing in importance. On the other hand, cities are also key players in the ideation and experimentation of solutions for the mitigation of and adaptation to climate change. Under the labels of mitigation and adaptation, we generally indicate all the technical solutions to climate change. As the effects of climate change manifest themselves locally, the available tools (mitigation and adaptation) are also heavily related to local implementation. Despite the richness of such technical solutions, this research identifies a gap in literature related to the procedural aspect of policymaking, focusing on the issue of administrative fragmentation.

The traditional model of public policymaking is characterized by the bureaucratic fragmentation by multiple domains. This approach, however, has proved to be scarcely effective when dealing with cross-boundary issues like climate change.

This problem appears particularly relevant in the case of Southern European cities, which are currently tasked with the implementation of sustainable development projects funded by the European Recovery Fund. Adopting the theoretical framework of policy integration, this research will investigate the institutional solutions adopted by municipalities to overcome fragmentation in the implementation of NRPP projects. The research will empirically study two local cases in Southern Europe: Genoa and Lisbon.



NAME **Hashem ALSIBAI**
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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE Post Carbon Cities and Renewable Energy Communities: Energy and comfort controls towards sustainable uni-campuses using USBEM
TUTOR(S) Egidio DANSERO

ACADEMIC CONTEXT

- Belpoliti V., Altan H., Alsibai H. and Melahfci O., 2020. Shaping the microclimate: CFD-assisted design optimization to enhance the outdoor comfort of a recreational complex in the UAE. *Procedia Manufacturing*, 44, pp. 84-91.
- Mutani G., Santantonio S., Usta Y., Beltramino S., Alsibai H., Alehasin M. and Giraudo E., 2022. La Comunità energetica rinnovabile del pinerolese. Un esempio di best practice. In: *Contenuti e strumenti della pianificazione urbana e territoriale. Dalla lezione di Giampiero Vigliano alle prospettive del Green New Deal. Urbanistica Dossier*, 27, pp. 117-119.
- Oke T.R., 2017. *Urban climates*. Cambridge: Cambridge University Press.
- Perera A.T.D., Nik V.M., Chen D., Scartezzini J.-L. and Hong T., 2020. Quantifying the impacts of climate change and extreme climate events on energy systems. *Nature Energy*, 5(2), pp.150-159. doi:<https://doi.org/10.1038/s41560-020-0558-0>.

EXTERNAL COLLABORATIONS

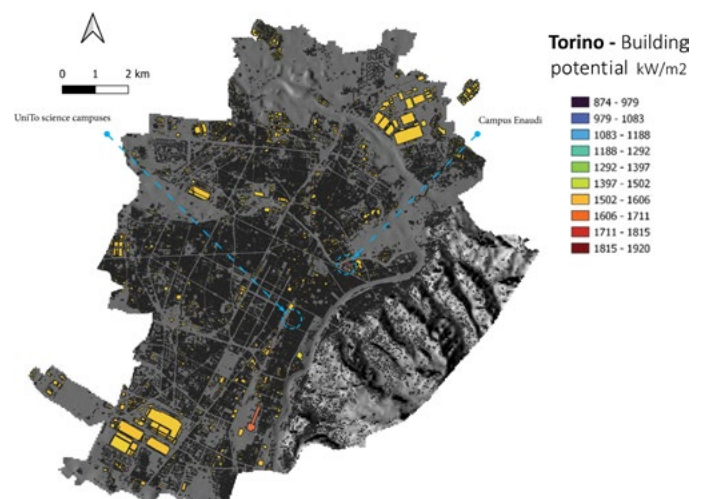
- Unito green office - Member of the energy sector and research group
- International Forum on urbanism (IFoU)- young ambassador
- TUdelf university: - Undergoing process of the research abroad period

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Climate change has fundamentally reshaped the way we approach the development of our world. Our communities can no longer afford to be solely driven by economic interests that disregard clean energy production. Correcting our current course of action is imperative for securing a prosperous future. The research is focused on the creation of energy communities, with a particular emphasis on sustainable campuses. By exploring the urban landscape as a new frontier, we can carefully manage the relationship between built environments and the natural world.

In a by paper Perera (Perera et al., 2020) which discusses the impact of climate change on cities and urban areas, as well as the potential consequences of failing to address climate change mitigation and adaptation. It emphasizes the importance of a sustainable energy supply in the face of increasing extreme climate events. many sources show the same opinion, including the IPCC's Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (IPCC 2012), The Global Risks Report 2016 by the World Economic Forum 10, and World Urbanization Prospects: The 2018 Revision by the United Nations 10. Furthermore two particular articles from the journal Nature Energy supports the outcomes, one of which discusses the potential for renewable energy integration in Swedish cities (Perera et al., 2017), while the other explores the impact of climate change on the energy performance of buildings in Stockholm 10. Overall, the papers highlight the need for urgent action to mitigate and adapt to the impacts of climate change on urban areas.

As the fraction of people living in urban areas is expected to reach almost 70% by 2050, the energy consumption in cities is likely to follow the same upward trend. In the coming decades, urban planners and stakeholders will face significant challenges related to energy, traffic, and resource flows. Their primary concern will undoubtedly be finding suitable ways to plan sustainable energy generation, distribution, and storage. Additionally, they will focus on increasing energy efficiency and reducing dependency on non-renewable energy sources. A crucial aspect of achieving these goals lies in minimizing the energy demand of buildings in urban areas, which holds significant energy-saving potential (Santamouris, 2001).



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **Urban Energy Modelling for the feasibility analysis of Renewable Energy Communities. An application on the City of Turin**
TUTOR(S) **Piero BOCCARDO, Stefano Paolo CORGNATI**

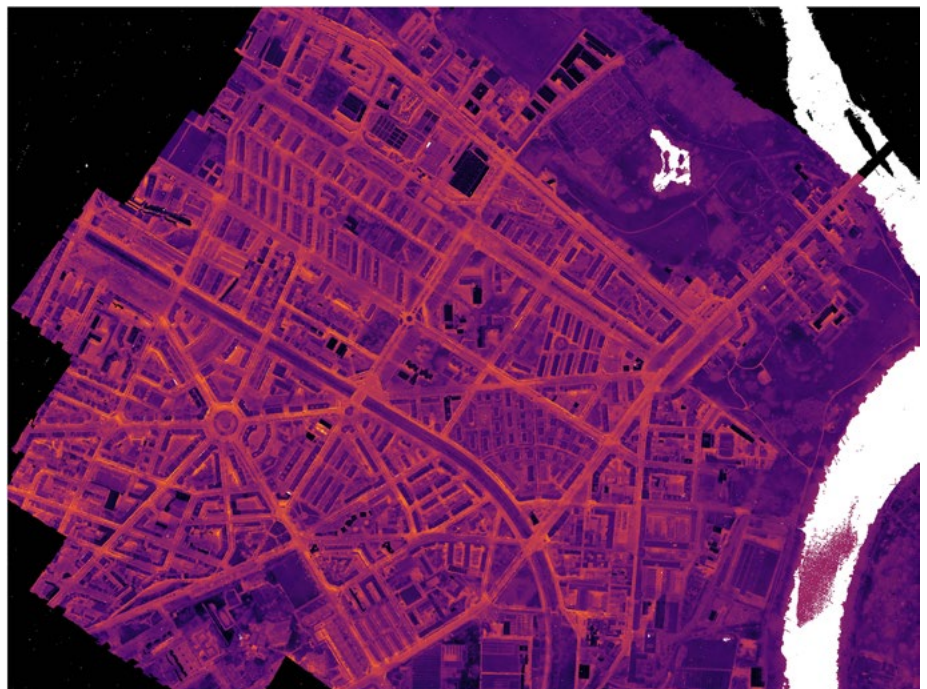
ACADEMIC CONTEXT

- Anselmo S., Ferrara M., Corgnati S., Boccardo P., 2023. Aerial urban observation to enhance energy assessment and planning towards climate-neutrality: a pilot application to the city of Turin. *Sustainable Cities and Society*, [e-journal] in publication, <https://doi.org/10.1016/j.scs.2023.104938>.
- Johari F., Shadram F. and Widén J., 2023. Urban building energy modeling from geo-referenced energy performance certificate data: Development, calibration, and validation. *Sustainable Cities and Society*, [e-journal] 96, p. 104664. <https://doi.org/10.1016/j.scs.2023.104664>.
- Martin M., Chong A., Biljecki F. and Miller C., 2022. Infrared thermography in the built environment: A multi-scale review. *Renewable and Sustainable Energy Reviews*, [e-journal] 165, p. 112540, <https://doi.org/10.1016/j.rser.2022.112540>.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Urban areas are crucial to achieve decarbonisation objectives stated at international level, as recognised by the UN 2030 Agenda for Sustainable Development – with SDG11 identifying cities as key areas of intervention in the path towards a post-carbon society – and the fit for 55 package – elaborated at European level. The latter included the revision of Energy Performance of Buildings Directive, which targeted the achievement of minimum performance objectives for all existing buildings, certified by Energy Performance Certificates. Therefore, it emerged the need for an extensive survey on the conditions of the building stock. It is possible to perform such large-scale analyses taking advantage of remotely sensed thermographic pictures and GIS technology.

The principal task of my research consists in the correlation between the surface temperature and the EPCs to model the energy classification of the building stock. It learns its moves from the assumption that – given a constant internal temperature as stated by law – the outer surface temperature returns the thermal loss of the building and therefore the energy performance. A three-dimensional model will be used to semantically enrich the buildings with thermal data, as well as to effectively visualise the produced information. EPC data – such as the energy class and performance – are used as training dataset to input known values in the model. The adoption of standard parameters enables the calculation of the thermal energy demand. On the other hand, the photovoltaic potential is assessed with 2.5D and 3D methods, estimating the solar radiation and calculating performance values. By intersecting the previous calculations, it is possible to assess the feasibility of Renewable Energy Communities, which partially self-produce their energy needs. The final goal is to develop – in accordance to the framework agreement between the City of Turin and the Polytechnic for the realisation of a Digital Twin – an energy Digital Twin supporting policymaking. This platform is being implemented starting from District 6, to be then scaled up. As for the technology, the aim is to automate as much as possible the calculation model, so as to improve the algorithm with the addition of new thermographic pictures and EPCs.



NAME **Elisa BIOLCHINI**
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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **Towards the Healthy City. Modelling UHI mitigation**
TUTOR(S) **Riccardo POLLO, Giuseppe MANDRONE**

ACADEMIC CONTEXT

- Ellena M., Melis G., Zengarini N., Di Gangi E., Ricciardi G. K., Mercogliano P. and Costa G., 2023. Micro-scale UHI risk assessment on the heat-health nexus within cities by looking at socio-economic factors and built environment characteristics: The Turin case study (Italy). *Urban Climate*, 49, 101514.
- Erell E., Pearlmutter D. and Williamson T., 2011. *Urban Microclimate: designing the spaces between buildings*. London - Washington, DC: Earthscan.
- Pollo R., Biolchini E., Squillacioti G. and Bono R., 2020. Designing the healthy city: an interdisciplinary approach. *SMC*, 12, 150-55.

EXTERNAL COLLABORATIONS

- Fondazione CRT Cassa di Risparmio di Torino, Turin, Italy (co-financer of the PhD grant)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The strong drive for urbanisation that has been characterising the last decades led to a fast and disorganised cities' development. This has caused a worsening of the environmental and microclimatic conditions and today one of the biggest challenges to be faced, to improve the quality of urban life, is the phenomenon of Urban Heat Island (UHI). The expression UHI refers to the thermal anomaly for which in urban areas temperatures are significantly higher than in surrounding rural areas (Oke, 1982). UHIs are clear representations of how climate change has direct consequences on the quality of life, especially when it also becomes a risk factor for physical and mental health. Building design and urban planning can help mitigate the effects of these phenomena.

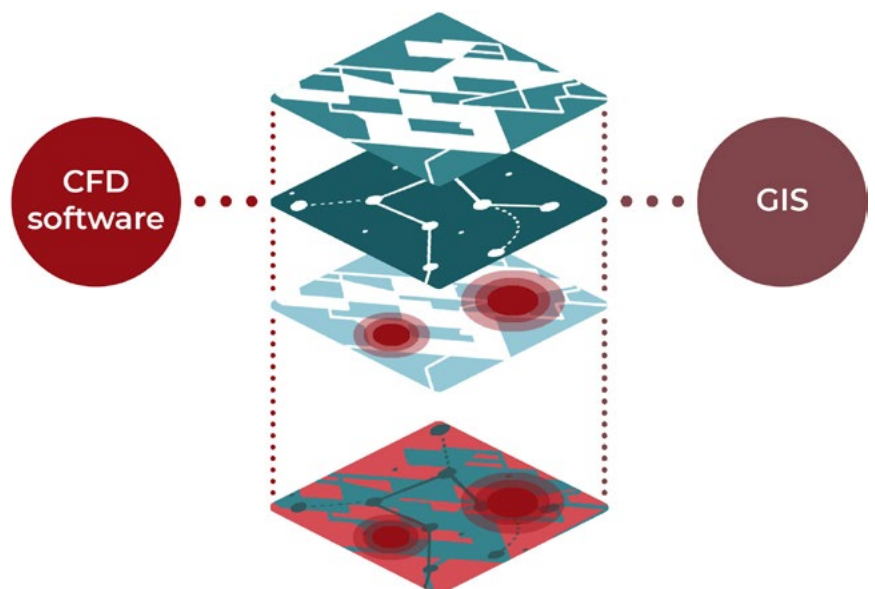
The research proposed in this PhD program concerns the planning of outdoor urban spaces for the mitigation of Urban Heat Islands' effects. The focus of the research will be oriented towards UHI mitigation strategies, at the neighbourhood scale, that can promote the health and well-being of people with a specific attention to the current inequalities.

It is believed that, in this context, the use of digital tools to support the planning processes can guide the choice of the best project scenario. The aim is to understand how results from Computational Fluid Dynamics (CFD) software microclimate simulations can be cross-referenced with data available in GIS to obtain risk maps that consider not only the physical factors but also the socio-economic ones. The CFD

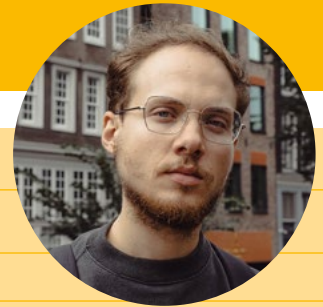
offers the possibility to evaluate environmental dynamics both in the current situation and in possible project scenarios by modelling and simulating, in a precise way, the spaces and buildings; the GIS allows for in-depth spatial analysis, through demographic, social and economic data.

The first year focused on a Systematic Literature Review, selecting, reading and analysing publications to have an overall view of the research done on the correlation between health, microclimate conditions and vulnerability factors. This review is useful to understand background and gaps of the research topic and will be the starting point for the next PhD year's work.

This research must be inserted, to improve the quality of life of people in the outdoor urban spaces, in a complex mechanism that connects the physical and environmental variables to the social ones to bridge the gap between the urban planning processes and the conditions of specific neighbourhoods.



NAME **Riccardo Giovanni BRUNO**
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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE Of regions and food systems.
Territorializing food policies in a City-Region Food System perspective
TUTOR(S) Egidio DANSERO

ACADEMIC CONTEXT

- Battisti L., Bruno R., Cuomo F., Dansero E. and Pettenati G., 2022. Politiche locali del cibo: verso una Food Policy a Torino. *Politiche Piemonte*, 78(6), pp. 30-35.
- Bruno R., Tesfay K. and Dansero E., 2022. Processi di costituzione di Urban Food Policy: il caso di Addis Abeba. *Semestrale di Studi e Ricerche di Geografia*, XXXIV(2), pp. 7-22.

EXTERNAL COLLABORATIONS

- Municipality of Turin, MAB UNESCO Collina Po Biosphere Reserve projecting

HIGHLIGHTS OF THE RESEARCH ACTIVITY

My research centers on the City-Region Food Systems (CRFS) approach within the MAB UNESCO Collina Po Biosphere Reserve. Established in 2016, this reserve comprises important natural areas, large portions of agricultural lands and a mix of small, rural, and urban municipalities, contributing to the broader regional food system. The study aims to understand how urban food policies, assessed relying on CRFS indicators, align with MAB UNESCO's conservation goals. This intersection of urban food governance and environmental preservation sets the coordinates to build resilient, equitable, and sustainable food systems.


The aim of this study is to comprehend how urban food policies, if set on systemic knowledge produced by adopting CRFS indicators, may align with conservation targets set forth by MAB UNESCO, meaning to foster sustainable interactions between humans and their natural environment. In recent times, this critical intersection of urban food governance and environmental preservation has emerged as a focal point in the quest for resilient, equitable, and sustainable food systems.

Methodologically, I employ a multifaceted approach that encompasses both qualitative and quantitative methodologies. This includes a systematic literature review, focused desk research, semi-structured interviews, and geospatial analysis.

Among the contributions of this research, I mention its theoretical part. By scrutinizing the themes of regional perspectives and territorialism as geographical basis for CRFS, this study aims to advance the discourses regarding urban food systems extension. Moreover, methodological contributions are given by the innovative assessment of CRFS by relying on new groups of indicators. Finally, this research intends to provide data that is evidence-based, to decision-making in policy arenas, particularly concerning food policies development.



"Alternative" Chinese restaurant, Turin

NAME	Ilaria CAZZOLA	
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COURSE	XXXVIII cycle - 1 st year	
RESEARCH TITLE	Planning and Design Resilience Actions for overcoming territorial risks. Experimentations in Living Labs	
TUTOR(S)	Angioletta VOGHERA, Grazia BRUNETTA	

ACADEMIC CONTEXT

- Brunetta G., Ceravolo R., Barbieri C.A., Borghini A., de Carlo F., Mela A., Beltramo S., Longhi A., De Lucia G., Ferraris S., Pezzoli A., Quagliolo C., Salata S. and Voghera A., 2019. Territorial Resilience: Toward a Proactive Meaning for Spatial Planning. *Sustainability*, 11(8), pp. 11-19.
- Meerow S., Newell, J.P. and Stults M., 2016. Defining urban resilience: A review. *Landscape and Urban Planning*, 147, pp. 38-49.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In recent years, resilience has been widely discussed in many different contexts. However, the concept of resilience can be somewhat nebulous and challenging to put into practical use. Despite its complexity, resilience is considered crucial in addressing the challenges we face today, especially in the context of climate change and urban development (Brunetta et al., 2021). Resilience is a complex concept. It encompasses the capacity of systems, communities, or individuals not only to withstand and adapt to external shocks and stresses but also to recover and thrive in the face of adversity.

One of the most difficult aspects of operationalizing resilience lies in effectively measuring and comprehending its current state within a given context. The research will support the need to evaluate and predict the present and future impacts of climate-related events on the built environment, urban settlements and cultural heritage. Research aims to develop models and systems of indicators that can monitor and measure the effectiveness of climate adaptation and carbon-neutral strategies and actions. This involves creating tools identify areas that need improvement and to assess progress. Given the complexity of the urban system and the relationships within it, measuring resilience must be considered from a holistic perspective, rather than in terms of specific risks (Brunetta et al., 2019).

The evaluation activity will converge in the definition of place-based planning and design guidelines for urban resilience implementations. The identified strategies will be tested in living labs, with the involvement of relevant stakeholders and active participation of territorial institutions. This participatory and inclusive approach is useful for developing a shared vision and integrating guidelines into risk management governance. Working with local actors ensures that the strategies are tailored to the specific context (UNISDR, 2017).

Collaborative approaches in living labs offer a promising path toward more resilient communities and systems, ultimately contributing to a sustainable and resilient future.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE The political ecology of post-wildfire spatial development:
The case of the Greek island of Evia
TUTOR(S) Marco SANTANGELO, Elia APOSTOLOPOULOU

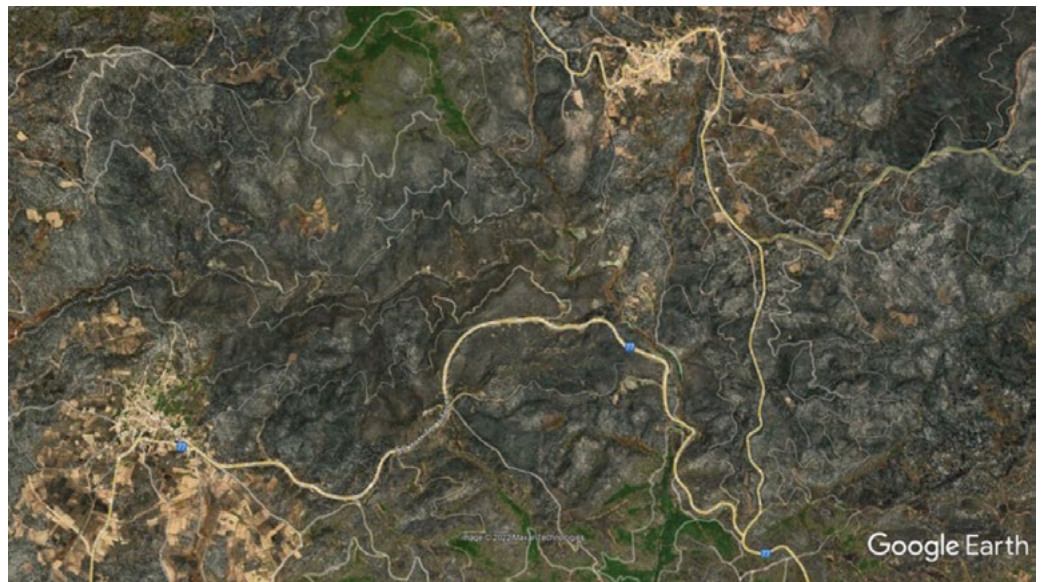
ACADEMIC CONTEXT

- Apostolopoulou E. and Adams W. M., 2015. Neoliberal capitalism and conservation in the post-crisis era: The dialectics of “Green” and “Un-green” Grabbing in Greece and the UK. *Antipode*, 47(1), pp. 15-35.
- Castree N., 2008. Neoliberalising nature: Processes, effects, and evaluations. *Environment and Planning A*, 40(1), pp. 153-173.
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HIGHLIGHTS OF THE RESEARCH ACTIVITY

As wildfires in the Mediterranean area and elsewhere in the globe are more and more frequent and severe, they often become the vehicle for broader land policy transformations. An indicative case is the one of North Evia island (Greece) regeneration plan which was formed in the aftermath of extensive wildfires that took place there in the summer of 2021. The plan aspires to create a new development narrative for North Evia, structured around tourism, forest use ‘optimization’ and boosting cultural and natural resources for the promotion of the area. Through the lens of political ecology this thesis will study the post-wildfire planning processes in North Evia and their implications. Its main aim is to trace their impact on forest and land re-appropriation and the socio-economic transformations

local communities and the forest producers are undergoing as a result of these developments. This will further entail the exploration of worldviews, discourses and conflicts arising by different stakeholders, in the wake of environmental regeneration and new development plans for the area. A qualitative methods approach was chosen for this research development. A long stay in North Evia is foreseen in order to study the everyday assemblages and nuances of social interactions and productive activities in the area. Empirical observation will allow for a thick description of the



regeneration plan’s impacts in local society and the changing human-forest interactions and modes of land appropriation. Hence, participant observation combined with in-depth interviews and text-based research on archives and environmental legislation will set the methodological framework of this research. This dissertation is positioned within the political ecology of wildfires literature, studying fire as an agent of socio-natural transformation. It will interrogate the politics of post-disaster planning and its implications for rural livelihoods from a Southeastern European perspective. Thus, it aims to contribute to the better understanding of the different dimensions of forest and land re- appropriation after the fire.

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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE Air pollution impacts on health and their economic consequences in Central and Eastern Europe countries
TUTOR(S) Alessandro PEZZOLI, Claudio BELIS, Lorenzo MINOLA

ACADEMIC CONTEXT

- Belis C. A., Djatkov D., Lettieri T., Jones A., Wojda P., Banja M., Muntean M., Paunović, M., Niegowska M., Marinov D., Poznanović G., Pozzoli L., Dobricic S., Zdruli P. and Vandyck T., 2022. *Status of environment and climate in the Western Balkans*, EUR 31077 EN, Publications Office of the European Union. <https://doi.org/10.2760/294516>.
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- Frontuto V., Dalmazzone S., Salcuni F. and Pezzoli A., 2020. Risk Aversion, Inequality and Economic Evaluation of Flood Damages: A Case Study in Ecuador. *Sustainability*, 12. <https://doi.org/10.3390/su122310068>.
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EXTERNAL COLLABORATIONS

- Visiting scientist at JRC (Joint Research Centre) – Ispra

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Although significant efforts have been made worldwide to improve air quality and promote human health, there is still scientific evidence indicating persistent negative health consequences, which may range from minor subclinical diseases to premature death. According to “The cost of air pollution Report” (World Bank and Institute for Health Metrics and Evaluation, 2016), air pollution is the fourth leading fatal health risk worldwide. Moreover, air pollution is of increasing concern in many low- and middle-income nations, including the ones selected for my research, which often lack strict air quality regulations and where the majority of people continue to depend on burning solid fuels in their homes for cooking and heating. Consequently, it has become increasingly crucial to obtain quantitative assessments of the health effects caused by air pollution, enabling policy makers and other stakeholders to better allocate their resources and to shift priorities towards investment in clean air, through the creation and implementation of more effective policies.

A preliminary study on the climatic conditions that are more likely to increase the concentration of pollutants will be carried out, in order to understand under which meteorological conditions air quality is worse. After the climatic analysis, econometric models will be developed to estimate the Value of Statistical Life (VSL) and Value Of a Life Year (VOLY) that can be applied globally. These values will be obtained through a meta-analysis of existing literature and outlined in a database specifically created for this purpose. The aim of this step is to determine the economic impact of air pollution on mortality in Central and Eastern Europe countries. This will be achieved conducting a health impact assessment and applying the unit costs (VSL, VOLY) obtained with the previously mentioned econometric methodology. In order to tailor the theoretical framework to the studied countries, a function transfer will be carried out.



NAME **Jessica COMINO**
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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **Urban Goes Digital: visual tools exploration in the investigation of perception of space**
TUTOR(S) Piero BOCCARDO

ACADEMIC CONTEXT

- Baratto R., 2021. Psychoanalysing the space: Ila Beka and Louise Lemoine discuss the ordinary aspects of urban life. *Arch-Daily* [online]. <https://www.archdaily.com/961269/we-make-a-psychoanalysis-of-the-space-an-interview-with-ila-beka-and-louise-lemoine>.
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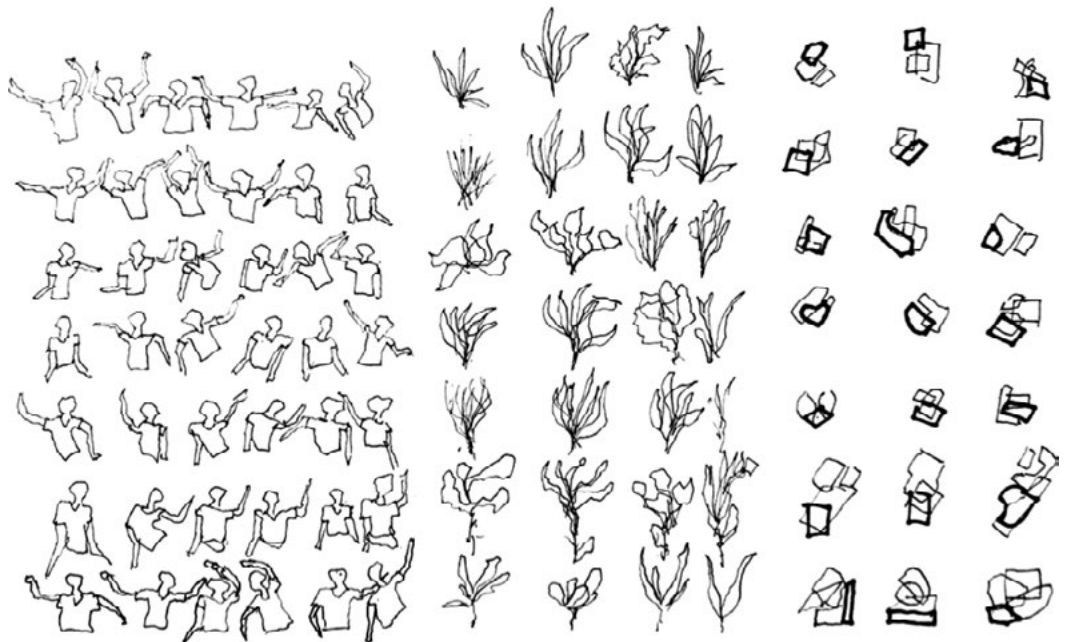
HIGHLIGHTS OF THE RESEARCH ACTIVITY

Architecture and urban planning are some of the main visual arts and techniques dealing with the representation of space. In the last years, these disciplines saw the coming of the Digital Twin model, a 3D virtual copy of the built environment, whose implementation can help creating a digital ecosystem capable of containing a consistent amount of fundamental information relating not only to the built environment, but also to geomorphological features,

climate hazards, potentially anticipating thus preventing the emergence of critical issues. Although the great potentialities of this innovative tool are relatively well known, there is very little investigation on its capability of actually represent the behaviour of the real city, hence monitoring its process and evolution. As a matter of facts, there is a consistent gap between the actual way of living the city and the way in which it is virtually represented.

On these basis, the current research intends to investigate a variety of different visual tools and performative practices, more specifically short film and documentary, as powerful tools capable of grasping human, and sometimes non-human, perception of space.

These tools could not only be integrated into a more sensitive planning approach, instead they could fulfil the gap in between technical conception of space, the making of a place, its communication and its overall quality.



NAME **Marco DEL FIORE**
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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE Integrated territorial development in lagging behind regions, the case study of the inner area "Maira e Grana valleys"
TUTOR(S) Loris A. SERVILLO

ACADEMIC CONTEXT

- Dühr S., Colomb C., and Nadin V., 2010. *European Spatial Planning and Territorial Cooperation*. Oxon: Routledge.
- Del Fiore M. and Fontana M., 2023. Territori marginali, metromontagna e pianificazione strategica: testimonianze dalle Terre del Monviso. *Atti e Rassegna Tecnica della Società degli Ingegneri e degli Architetti in Torino*, LXXVII-1, pp. 26-33.
- De Rossi A., Del Fiore M., Servillo L. and Fontana M., 2023. *Terre del Monviso. Scenari strategici per un territorio metromontano*. Torino: Politecnico di Torino.
- Salet W., ed., 2019. *The Routledge Handbook of Institutions and Planning in Action*. New York: Routledge.

EXTERNAL COLLABORATIONS

- Agenzia per la coesione territoriale (co-financer)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The research focuses on the topic of local development policies and instruments capable of reversing the marginalisation processes of lagging behind areas. The investigation intends to place the issue of lagging behind regions within a broader cultural and academic context, posing it as an institutional and political spatial problem. The aim of the proposed research is to examine the political and instrumental issue on the one hand, and the methodological and political philosophy issue on the other, investigating its effectiveness within a multi-level view. Starting from the European level to the local level, the investigation will cover the challenges, issues and perspectives related to the topic of local development in lagging behind regions.

The study will focus on the Italian case and will conduct a detailed operational analysis of the "Maira and Grana Valleys", recognised as part of the National Strategy for Inner Areas (NSIA). The case study is proposed in order to reason about a complex and representative territorial portion of the lagging regions. Given the co-presence of several ongoing projects, the area is ideal for analysing and evaluating national and local policies implemented in recent years, to understand possible complementarities or divergences. On the same area, coexist different instrument and policies related to local development, such as: NSIA area, ITI (Integrated Territorial Investment) LAG (Local Action Group) "Tradizione Terre Occitane" and the cross-border program INTERREG ALCOTRA, in particular with the PITER "Terres Monviso".

The aim of this study is to examine the reorganisation and adoption of broader territorial strategies to face the challenges present in the area of interest, which is characterised by high levels of fragility and long-lasting marginalisation processes. The peculiarity of the area of analysis lies in the use of the experience gained through the National Strategy for Inner Areas as a starting point for a more complex reflection on the socio-spatial and strategic dynamics affecting the territory, in order to analyse the effectiveness and promote the adoption of integrated strategies and policies for a new model of local development.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **Community Participation and Asset-Based Community Development in inner areas: a Participatory research in Aosta Valley**
TUTOR(S) Paolo GIACCARIA

ACADEMIC CONTEXT

- De Rossi A. and Barbera F., 2018. *Riabitare l'Italia le aree interne tra abbandoni e riconquiste*. Roma: Donzelli.
- García I., 2020. Asset-Based Community Development (ABCD): core principles. In: Phillips R., Trevan E. and Kraeger P., eds., *Research Handbook on Community Development*. Edward Elgar Publishing. <https://doi.org/10.4337/9781788118477.00010>.
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EXTERNAL COLLABORATIONS

- Unité des Communes valdôtaines Grand-Paradis

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This research focuses on marginalised territories, classified as inner areas within the context of the Italian National Strategy for Inner Areas (SNAI), namely Espace Grand Paradis, a total of 13 small municipalities in the North-Western region of Aosta Valley. Inner areas are characterised by demographic decline, abandonment and the lack of public essential services such as health, education and transport. As a policy, SNAI aims to foster sustainable development by focusing on four key goals: improving connectivity and infrastructures, enhancing the quality of life and services, promoting economic growth and innovation, and protecting and enhancing cultural and natural heritage. Recent research on inner areas in the Italian territories is undertaking action research and activating participatory processes that highlight the need to strengthen the role of bottom-up participation and citizen engagement. Community participation can provide learning opportunities, increasing awareness of the territory and strengthening the sense of belonging and connection with places. So, it seems that bottom-up and community-based solutions represent opportunities to tackle issues in these territories. To do so, Asset-based Community Development (ABCD), elaborated in the 1990s in the US as an alternative to the need-based approach, identifies and mobilises assets and capacities in and with communities and emphasises participatory methods to promote development in the territory, starting from citizens and stakeholders in dialogue with municipalities. This path focuses on exploring new opportunities, individuals' and communities' capabilities and assets, possibly to design policies and activities. Assets cluster six categories: individuals, associations, institutions, land and physical environment, exchange or local economy, culture and stories, as they represent assets that could be strengthened by locals.

How can local capabilities and participation of local communities foster local development and the design of a local development strategy using the ABCD approach? What are the enablers and barriers to implementing community solutions for development? To what extent participatory work be achieved in places with low or inexistent participatory processes?

This participatory research employs the so-called ABCD as a view and approach for development to enhance the territorial complexity and to highlight the pros and cons of implementing such an approach in territories categorised as inner areas.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE Urban regeneration: institution, agency, and tools
TUTOR(S) Loris Antonio SERVILLO

ACADEMIC CONTEXT

- Furbey R., 1999. Urban “regeneration”: reflections on a metaphor. *Critical Social Policy*, 19(4), pp. 419-445.
- Lovering J., 2007. The Relationship Between Urban Regeneration and Neoliberalism: Two Presumptuous Theories and a Research Agenda. *International Planning Studies*, 12(4), pp. 343-366.
- Moulaert F., Jessop B. and Mehmood A., 2016. Agency, structure, institutions, discourse (ASID) in urban and regional development. *International Journal of Urban Sciences*, 20(2), pp. 167-187.
- Porter L. and Shaw K., eds., 2009. *Whose urban renaissance? an international comparison of urban regeneration strategies*. London - New York: Routledge (Routledge studies in human geography, 27).

EXTERNAL COLLABORATIONS

- FULL – the Future Urban Legacy Lab (co-financer)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

As discussed in Porter and Shaw’s “Whose Urban Renaissance?” (2009), government policies often succeed in attracting investment and the middle class to inner cities. Regeneration, though producing ‘winners and losers’, rarely undergoes in-depth examination of the policies employed. According to them, regeneration has a darker side, primarily concerning the potential exclusion of certain social groups. The current situation, seemingly on the verge of a new upswing given the new national and European support (e.g., PNRR, Next Generation EU), needs to be understood within the trend of growing inequalities and imbalances. A predominantly nationally oriented urban system shaped by modernist planning principles has always been the realm of action for planners and geographers. For these reasons, emphasizing urban transformations and changes is crucial when discussing urban regeneration, aiming to overcome the stigma and trivialization associated with this fragmented, vague, and undefined topic. My research project aims to critically examine the issue of urban policy and urban regeneration in Italy, using the European context as a reference. It offers a critical analysis of the concept, highlighting its complexity and questioning the urgency and ambiguity of the term through a qualitative methods approach. The performative dimension of regeneration is discussed, exploring the use of the biomedical metaphor in urban planning, comparing the city to a sick body in need of healing. The research questions focus on how urban regeneration processes affect economic, social, and environmental outcomes in different urban contexts and how these outcomes differ depending on the design and implementation of the respective urban policies and strategies. In particular, I question the relationship between urban change and public action. I intend to use an intersectional approach that combines the relational approach and new institutionalism to analyze the dynamics of social stratification and the visibility of different identities in urban space. The challenge lies in configuring these approaches with different interpretative matrices and making them dialogue with each other. Within this framework, I intend to adopt a critical discursive analysis that embraces an evolutionary perspective to study the variation, selection, and maintenance of particular discourses.



NAME	Enrico FEDELI		
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COURSE	XXXVIII cycle - 1 st year		
RESEARCH TITLE	Exploration of new enhanced methodologies of policy design in mobility and infrastructure planning		
TUTOR(S)	Cristina PRONELLO		

ACADEMIC CONTEXT

- Bardach E. and Patashnik E. M., 2019. *A practical guide for policy analysis: The eightfold path to more effective problem-solving*. Washington, DC: CQ Press.
- DeLeon P., ed., 2016. *Handbook of public policy analysis: Theory, politics, and methods*. Boca Raton, FL: CRC Press.
- Siddiki S. and Curley C., 2022. Conceptualising policy design in the policy process. *Policy & Politics*, 50(1), pp. 117-135. DOI: 10.1332/030557321X16346727541396.

EXTERNAL COLLABORATIONS

- ENS-PLS Paris – Visiting period

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The expected policy planning and design should normally follow the steps of issue identification, policy formulation, decision making, implementation and evaluation. This theoretical expectation, however, crumbles in the face of practice. In the case of infrastructure and mobility policies, the main problem is prospective visual impairments. This includes diachronic, synchronic, functional, scalar, and normative difficulties of vision. The first ones are about considering the effects of policies in the context of feedbacks that amplify or reduce the impact of choices. The second ones are about evaluating and comparing a plurality of solutions. The third ones refer to the comprehensive examination of technological, economic, and managerial constraints. The fourth ones are about consistency among policy goals at multiple scales. Finally, the fifth ones refer to the very function of policy, that is, whether it should have an adaptive or conversely normative approach to reality. The aim of this research is to explore enhanced methodologies of policy design that can respond to the above problems.

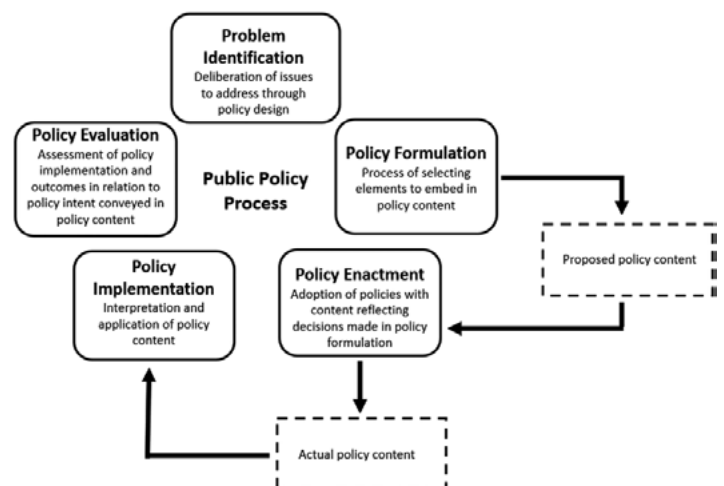
The research is built on successive steps that allow for the progressive construction of an advancement of knowledge of the world as it is (descriptive stage) and an advancement of possibilities for action on the world (prescriptive stage). Each step has its own aim, and each goal achieved allows one to continue with the rest of the research, which is still fruitful even as the first steps are completed. In this sense it is possible to list:

The descriptive stage:

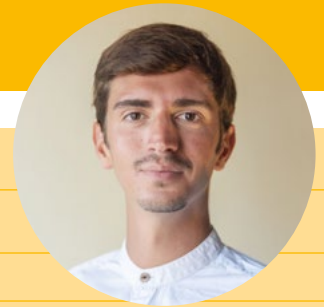
- Identify, through exemplary cases and representative benchmarks, the critical issues that exist in adopted policies and understand what proportion of error is attributable to the design process.
- visualize prospective errors in policy construction.
- qualitatively measure the discrepancy between theory and practice in policy construction.
- clearly distinguish the adaptive aspect and the normative aspect of public policies and verify the possible coexistence of the two aspects.

The prescriptive stage:

- propose policy design methods that go as far as possible to supply tools to address the issues mentioned above.
- devise ex-ante evaluation models that frame policy in its ideological (adaptive or normative) components and derive the best application strategies in policy communication and execution.
- apply these methods to case studies to solve in vitro issues that require policy creation.
- evaluate the outcomes of such policies in compliance with superordinate social, environmental and climate goals.



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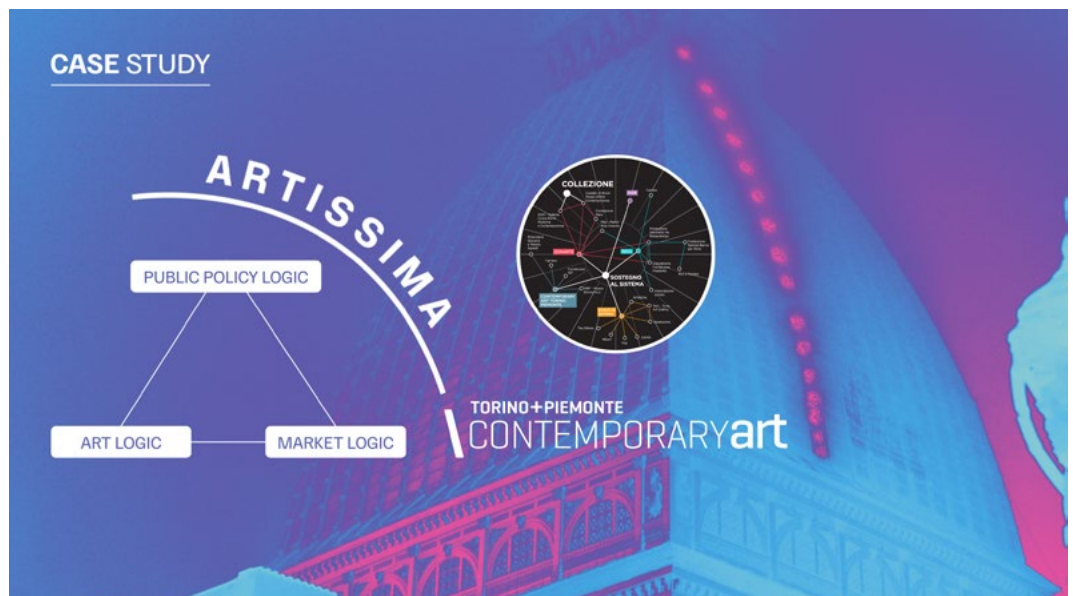
COURSE XXXVIII cycle - 1st year
RESEARCH TITLE International Contemporary Art Fairs as Hybrid Organisations: Between Multiple Institutional Logics and Cultural Policy Implications
TUTOR(S) Sara BONINI BARALDI, Carlo SALONE

ACADEMIC CONTEXT

- Bourdieu P., 1985. The Market of Symbolic Goods. *Poetics*, 14 (1-2), pp. 13-44.
- Lindqvist K., 2017. Art Ventures as Hybrid Organisations: Tensions and Conflicts Relating to Organisational Identity. *International Journal of Entrepreneurial Venturing*, 9(3), pp. 242-259.
- Pache A. C. and Santos F., 2013. Inside the Hybrid Organization: Selective Coupling as a Response to Competing Institutional Logics. *Academy of Management Journal*, 56(4), 972-1001.
- Schuster J. M., 1998. Neither Public nor Private: The Hybridization of Museums. *Journal of Cultural Economics*, 22, pp. 127-150.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

International contemporary art fairs (ICAFs), parallel art fairs, and the dense urban programme of cultural initiatives surrounding them (“art weeks”) have steadily increased from the 1990s onwards. Though this trend was certainly put on hold by the pandemic, it is well on track to regain its former pace. Alongside their commercial nature, this research considers ICAFs’ role as gatekeepers of the art market for galleries and artists, as “agents of consecration” (Bourdieu, 1985) often embracing a curatorial attitude to exhibiting contemporary art and developing temporary art-related initiatives on an urban scale. As market-driven cultural organisations, ICAFs operate within a hybrid environment and must relate to multiple institutional logics pertaining to the domains of art, the market and the public sector. By adopting the framework of hybrid organisations, the study intends to shed light on the benefits of this organizational asset to meet demands from several stakeholders, the tensions and conflicts arising from the coexistence of different institutional logics, and the managerial and strategic responses put in place to contrast them. While the literature on cultural hybrid organisations has mainly insisted on their mixed ownership and the competition for and dependency on public resources, the thesis turns the tables on this consideration to investigate ICAFs’ influence on public cultural policy and how the latter, in turn, impact cultural and creative ecosystems. Through the qualitative analysis of multiple case studies, the study will focus on the issues arising from competing demands over organizational identity and how similarly or differently these challenges are faced compared to hybrid organizations in other fields. One of the cases will be centred around Artissima in Turin, the most important contemporary art fair in Italy, organized by a publicly owned limited company and approaching its thirtieth edition.



While the literature on cultural hybrid organisations has mainly insisted on their mixed ownership and the competition for and dependency on public resources, the thesis turns the tables on this consideration to investigate ICAFs’ influence on public cultural policy and how the latter, in turn, impact cultural and creative ecosystems. Through the qualitative analysis of multiple case studies, the study will focus on the issues arising from competing demands over organizational identity and how similarly or differently these challenges are faced compared to hybrid organizations in other fields. One of the cases will be centred around Artissima in Turin, the most important contemporary art fair in Italy, organized by a publicly owned limited company and approaching its thirtieth edition.

NAME **Angelina GRELLE**
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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE (Looking for) Radical democracies 'abroad': the experience of the Kurdish diaspora in Western countries
TUTOR(S) Silvia ARU

ACADEMIC CONTEXT

- Cemgil C., 2021. The Geopolitics of Democratic Confederalism in Syria: Geopolitics as the Interplay of Multiple Strategies of Spatialisation. *Geopolitics*, 26(4), pp.1046-1074.
- Purcell M., 2022. Theorizing democratic space with and beyond Henri Lefebvre. *Urban Studies*, 59(15), pp. 3041-3059.
- Veysi D., 2023. Self-governing from below: Kurdish refugees on the periphery of European societies. *Journal of Ethnic and Migration Studies*, 49(15), pp. 3920-3939.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This research aims to discuss the radical democratic system called democratic confederalism in the context of the Kurdish diaspora in Western countries. Democratic confederalism is a non-state social paradigm that proposes a social, economic, and political change in the current society to build alternative institutions for people's self-determination. This paradigm has been practiced in Rojava since 2011 (Kurdistan region of north-east Syria) as a social contract form.

Literature, mainly in the social and political fields, broadly discusses the political statements of democratic confederalism. However, almost all research focuses on the Rojava region and its social model, while democratic confederalism has not been sufficiently addressed in the context of the Kurdish diaspora.

The existing literature on the Kurdish diaspora mainly investigates the role of the diasporic community in media entrepreneurship, political mobilization, social movements, solidarity networks, stateless conditions, identity, national and transnational coalitions, networks, and the role of women.

This research aims to fill this gap by focusing on the role of democratic confederalism in diasporas. Asking: How does the ideology of democratic confederalism shape the connections and power structures of the Kurdish diaspora community at local and global levels? To what extent do the spatialization processes of the Kurdish diaspora abroad reflect the principles and practices of democratic confederalism? Are there any unique forms of collective action within the Kurdish diaspora community in relation to democratic confederalism?

To reply to these research questions, this work is based on an ethnography carried out in two different contexts. First, the thesis involves extensive fieldwork on the Kurdish diaspora of Rome through participant observation, semi-structured interviews, and life history methods. Secondly, it includes an online ethnography of the Academy of Democratic Modernity movement. The participant observation in Rome will take place working as a volunteer in the Kurdish socio-cultural center of Ararat. The online observation, along with the collection and analysis of documents and visual materials produced by the movement, will focus on the interactions on the online posts on social media and interactions in meetings, seminars, and conferences. The research focuses on the internal diaspora's mechanism, everyday life practices, the connection with local and transnational networks, and the spatial organization within the city.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE Emerging Taobao Villages: Forms of Platform-Urbanism in Rural China
TUTOR(S) Antonio DI CAMPLI

ACADEMIC CONTEXT

- Bedir M., 2019. The global village: building a future countryside. *Architectural Review*. [online] <https://www.architectural-review.com/essays/the-global-village-building-a-future-countryside>.
- Li A.H.F., 2017. E-commerce and Taobao Villages. *China Perspectives*, 2017(3), pp. 57–62. doi:<https://doi.org/10.4000/chinaperspectives.7423>.
- Cuppini N. and Peano I., 2019. *Un mondo logistico*. Milano: Ledizioni.
- Tsing, A., 2015. *The Mushroom At The End Of The World: On The Possibility Of Life In Capitalist Ruins*. Princeton: Princeton University Press.
- Wei Y.D., Lin J. and Zhang L., 2019. E-Commerce, Taobao Villages and Regional Development in China. *Geographical Review*, (110), pp.1-26. doi:<https://doi.org/10.1111/gere.12367>.
- Young L., 2019. *Machine Landscapes: Architectures of the Post Anthropocene*. London: Wiley.

EXTERNAL COLLABORATIONS

- China Room Research Group (Scholarship CSP/DIST - Frontier Urbanism. A Chinese Perspective)

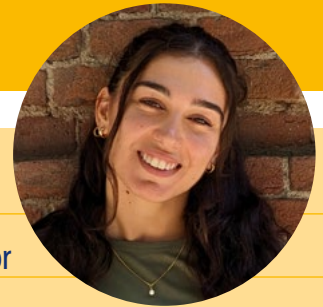
HIGHLIGHTS OF THE RESEARCH ACTIVITY

In recent years, China's e-commerce sector has grown exponentially, establishing the country as a global leader in the online marketplace. Especially in late 2014, Alibaba launched the 'Rural Taobao' initiative in collaboration with regional governments to provide e-commerce outposts in rural areas. Through this initiative, Alibaba committed to invest 10 billion yuan over three to five years to establish 1000 county-level operation centers and 100,000 village-level service stations in rural areas. The primary objective of this operation is to utilize one of the leading online customer-to-customer (C2C) marketplace platforms (Taobao) as a catalyst for rural development and sustainability.

The common catch-all term for these rural supply-chain extensions is 'Taobao villages', where entire rural villages have become de facto factories by leveraging their craft skills, global shipping, and e-commerce realities. Each factory space within these villages contributes to a novel urban environment where commercial, productive, and residential activities might converge, overlap, and interact. By critically examining the interplay between logistics as a rational framework and the platform as a practical tool, the aim is to delve into a thoughtful exploration of the diverse array of phenomena, relationships, and conflicts that characterize the emergence of these spatialities. While new economies intersect the "existing villages," their spaces are notably characterized by three key facets: the flow of goods, organizational structures, and, most importantly, socio-spatial control. By investigating these distinctive spaces situated at the crossroads of production and consumption, the sustained hypothesis is that Taobao Villages hold a crucial position in reforming the neoliberal organizational structure of the e-commerce ecosystem. Despite advancements in technology and growing market expectations for product quality, deep-rooted inflexibilities endure. Large e-commerce platforms seem open to adaptation and reimagine buildings and environments as open and expandable. The study aims to elucidate challenges within the current system, formulate hypotheses regarding e-commerce's impact on the urban landscape, and identify possible design strategies. Focusing on specific cases along the South-Eastern Chinese Coast, the research views Taobao Villages as spatial instruments to comprehend territory functionality. Investigation spans various scales, encompassing the macro scale of relations and flows in large-scale distribution and the micro scale of living-working space intricacies within logistics platforms and production-consumption spaces facilitated by logistics activities. In essence, the work seeks to highlight the transformative effects brought about by the reinforcement of platform-based systems and the concurrent amplification of the logistical dimension within the domains of contemporary production processes.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **The Sustainability of Nonprofit Organizations in the Arts and Cultural Sector**
TUTOR(S) **Sara BONINI BARALDI**

ACADEMIC CONTEXT

- Baumol W.J. and Bowen W.G., 1965. On the Performing Arts: The Anatomy of Their Economic Problems. *American Economic Review*, 55(1/2), pp. 495-502.
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HIGHLIGHTS OF THE RESEARCH ACTIVITY

Nonprofit organizations (NPOs) in the arts and cultural sector serve a variety of purposes, ranging from granting access to culture, developing artistic practices and preserving our cultural heritage to fostering civic engagement and promoting integration, through a diversified set of activities.

From an organizational point of view, this type of NPOs vary in terms of size, degree of professionalism, and the way they attract and engage audiences. Nonetheless, most of NPOs in arts and culture share a common struggle related to their financial health, which is constantly threatened by external factors (as economic crises and decreasing audience attendance) and internal factors, sometimes determined by the very nature and structure of the NPOs working in arts and culture themselves (Baumol and Bowen 1965).

To study this phenomenon, scholars have adopted and reframed the broader concept of sustainability of NPOs, by associating the issue of financial health of NPOs in arts and culture with social, cultural, and environmental aspects (Throsby 1997).

Given the heterogeneity of NPOs in arts and culture, the concept of sustainability and its practical applications present different characteristics that give rise to various challenges and opportunities. Most of the existing literature on this topic explores large, canon-focused arts organizations, which are usually clearly structured, well established and associated with high culture (Ostrower 2020).

In my research, I will focus instead on smaller, more flexible, and experimental NPOs in the arts and cultural sector, which can however generate a

high impact at the local level. These organizations operate mainly within their community and their goals go far beyond the artistic ones, embracing social purposes. My objective is to understand what it means for this type of organizations to be sustainable, which are the main financial challenges they face and what are the opportunities and strategies that allow them to carry on their activities and meet their purposes.

This study will involve a qualitative analysis based on a selection of case studies of small arts and cultural NPOs operating at the community level within the Italian context. Qualitative data about the activities, organizational structure, and sustainability aspects of the different NPOs will be gathered and analyzed together with quantitative data referring to their economic and financial position.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE TODness and underground and ground spatial development in station areas of urban TOD
TUTOR(S) Luca STARICCO

ACADEMIC CONTEXT

- Cervero R. and Kockelman K., 1997. Travel demand and the 3Ds: Density, diversity, and design. *Transportation Research Part D: Transport and Environment*, 2(3), pp. 199-219. [https://doi.org/10.1016/S1361-9209\(97\)00009-6](https://doi.org/10.1016/S1361-9209(97)00009-6).
- Singh Y.J. *et al.*, 2017. Measuring TOD around transit nodes - Towards TOD policy. *Transport Policy*, 56, pp. 96-111. <https://doi.org/10.1016/j.tranpol.2017.03.013>.
- Zhou J. *et al.*, 2019. Can TODness improve (expected) performances of TODs? An exploration facilitated by non-traditional data. *Transportation Research Part D: Transport and Environment*, 74, pp. 28-47. <https://doi.org/10.1016/j.trd.2019.07.008>.

EXTERNAL COLLABORATIONS

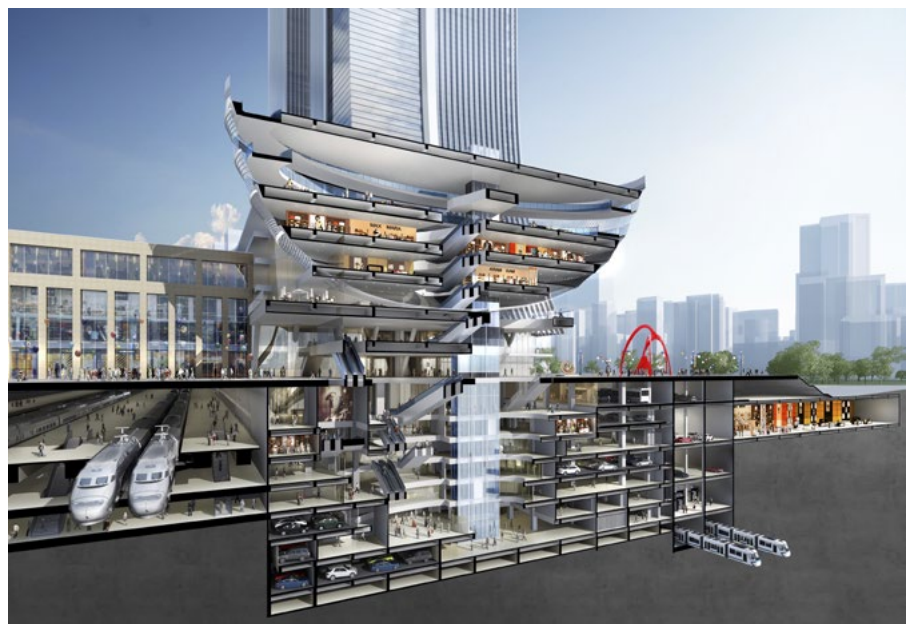
- Supported by China Scholarship Council

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In China, urban growth has converted from incremental development into stock development. For full land resources utilization and redevelopment, urban planning theories such as Transit Oriented Development (TOD) are proposed, and TOD planning put forward new requirements for the coherent development in the underground and ground space of station impacted areas. A good underground plan in TODs hinges on the benefits of enlarging the density, enriching the diversity, and improving the design. Thus, the underground development in station areas becomes pinpoints to satisfy this new demand.

However, many studies only consider the urban underground space as an auxiliary extension of the urban ground space in TODs. It is few to formulate and concentrate on the role of underground development in TOD planning and how the underground space affects TODs. Furthermore, the underground space is usually overlooked in TOD performance assessments. Thus, this study endeavours to clarify the relationships between the underground and ground spatial development in TODs and offer a new TOD evaluation including underground space.

In the beginning, this thesis illustrated the importance of researching underground space in the TOD areas and recalled the development of the relative theories. Then, the meaning of TOD to develop underground space coherently was explained. Taking the TOD cases which had well-established underground systems as an example, the relationships between underground development and TOD were revealed. Afterward, combining the criteria of TOD performance and underground built environment, a new evaluation system for both ground and underground space of TOD was established. Furthermore, to verify the new evaluation system, the database of TODs in Chengdu was constructed with two categories: TODs without coherent underground development and TODs with complete underground systems. To conclude, it was found that the coherent underground development in TOD areas can improve TODness through the new assessment system.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE Pentecostalism in Italian cities: insights on negotiations over places of worship
TUTOR(S) Francesco CHIODELLI

ACADEMIC CONTEXT

- Allievi S., 2010. Immigration and Cultural Pluralism in Italy: Multiculturalism as a Missing Model. *Italian Culture*, 28(2), 85-103.
- Buttici A. and Pace E., 2010. *Le religioni pentecostali*. Roma: Carocci editore.
- Gale R. and Naylor S., 2002. Religion, planning and the city: the spatial politics of ethnic minority expression in British cities and towns. *Ethnicities*, 2, pp. 387-4.
- Vertovec S., 2007. Super-diversity and Its Implications. *Ethnic and Racial Studies*, 30 (6):1024-1054.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Today “new, small and scattered, multiple-origin, transnationally connected, socio-economically differentiated, and legally stratified immigrants” (Vertovec, 2007, p. 1024) are reaching new countries for multiple reasons. This qualitative transformation in the understanding of the migratory processes, conceptualized by the author with the term “super-diversity” (Vertovec, 2007), had made the topic gain new salience worldwide. Dealing with its consequences in Western countries means trying to provide some updated answers to the question of how to co-exist close to one another. To start accomplishing that, Italy has to first comprehend itself as a plural society, according to Allievi (2010). Italy’s peculiar historical trajectory especially regarding migratory processes and the cultural hegemony of the Catholic church on its territory have been among the obstacles to such comprehension. Despite the constellation of ethno-religious groups inhabiting cities, researchers agreed that multiculturalist policies and practices have not permeated yet into Italian institutions and social bodies. To contribute to this evaluation, the research proposed seeks to provide insights into the multi-group urban governance and negotiations surrounding everyday practices and interactions concerning religious super-diversity.



It is intended to follow the strand of literature that dealt with micro-interactions during struggles upon places of worship, phrased around the complex legal framework, planning system, and street-level bureaucracy. This literature had great fortune in Britain, where authors such as Gale and Naylor (2002) explored the public debate surrounding the establishment of religious minorities’ places of worship in the country, unfolding both questions of discrimination disguised as planning bottlenecks and episodes of coexistence due to local actor’s strategic agendas. Pentecostalism, conceptualized as a repertoire of recognizable spiritual affinities rather than a church of any kind characterized by splits, re-compositions and high mobility, will be the object of the inquiry as it is the most relevant religious movement regarding statistical forecast and socio-political preeminence worldwide (Buttici & Pace, 2010). Finally, in Italy, the peculiarities of this cult – Christianity from one side and migratory background from the other – position this movement at the crossroads between acceptance and suspicion, guaranteeing an intriguing option for the present work.

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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **Transforming the Resilient City: Assessment and Visions of Inclusive Nature-based Solutions in European Cities**
TUTOR(S) **Sara TORABI MOGHADAM, Giancarlo COTELLA, Patrizia LOMBARDI**

ACADEMIC CONTEXT

- Amorim-Maia A. T., Anguelovski I., Chu E. and Connolly J., 2022. Intersectional climate justice: A conceptual pathway for bridging adaptation planning, transformative action, and social equity. *Urban Climate*, 41, 101053.
- Anguelovski I. and Connolly J. J., 2021. *The green city and social injustice: 21 tales from North America and Europe*. London: Routledge.
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EXTERNAL COLLABORATIONS

- GREEN-INC consortium (University of Amsterdam, Vrije Universiteit Brussel, Université libre de Bruxelles, University of Bucharest, Luleå University of Technology)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Climate change exposes cities and citizens to unprecedented threats and exacerbates existent inequalities. The resilience approach is often proposed as a framework for facing changing climate conditions, but it is also criticized for ignoring the inherently power-related connotations of vulnerability to climate change. Therefore, developing a comprehensive framework that integrates environmental justice and climate resilience is crucial.

Nature-based Solutions (NbS) are recognised as an important strategy for achieving climate resilience by acting as mitigation and adaptation measures for climate change. However, citizens and ecosystems benefit differently from the wider functions that NbS can provide, and NbS can even exacerbate existing inequalities between communities or create new ones. To address this, Inclusive Climate Actions (ICAs) are proposed as tools that enable a structural and systemic implementation of NbS, thus fitting within a comprehensive just resilience framework.

This research project proposes an innovative interdisciplinary approach to complement the study of climate resilience in the urban context with a focus on justice and inclusivity. Specifically, the research aims to study the efficiency of ICAs on NbS for the achievement of justice and climate resilience in the urban context. This systematic and holistic analysis will result in the identification of planning principles under which ICAs can flourish, helping the uptake of NbS, and promoting transitions towards inclusive and resilient future cities.

The research project is subdivided in three phases: (i) a systematic literature review for the identification of research gaps and future research trajectories, (ii) an empirical analysis which combines quantitative, qualitative and spatial methodologies for assessing the efficiency of NbS as ICAs in enhancing climate resilience as well as social inclusion and well-being, and (iii) the co-development, digital visualization and assessment of future scenarios for the implementation of ICAs in future cities.

This PhD research falls within the European project GREEN-INC: GRowing Effective & Equitable Nature-based Solutions through INCLUSIVE Climate Actions, funded by the European Driving Urban Transition Partnership (DUT). The project aims to assess the performance of ICAs in European cities and to define institutional conditions and design principles under which ICAs can flourish to deliver the full potential of NbS.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **Dwellers on the Move: Digital Nomadism's Transformative Implications for the Urban Infrastructure of Living**
TUTOR(S) Francesca GOVERNA

ACADEMIC CONTEXT

- Hannonen O., 2020. In search of a digital nomad: defining the phenomenon. *Information Technology & Tourism*, 22, pp. 335-353.
- Holleran M., 2022. Pandemics and georbitrage: digital nomadism before and after COVID-19. *City*, 26(5-6), pp. 831-847.
- Müller A., 2016. The digital nomad: Buzzword or research category?. *Transnational Social Review*, 6(3), pp. 344-348.
- Thompson B. Y., 2018. Digital nomads: Employment in the online gig economy. *Glocalism: Journal of Culture, Politics and Innovation*, 1, pp. 1-26.

EXTERNAL COLLABORATIONS

- Visiting Research at University College London (UCL)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This thesis conducts an extensive exploration of digital nomadism, offering a comprehensive analysis of its impact on urban living infrastructures and the broader societal and economic implications. The study is structured around four key thematic dimensions. Firstly, it critically examines how digital nomads are categorized within contemporary paradigms, aiming to move beyond simplified perceptions and delve into the diverse range of individuals encompassed by the "Digital Nomad" label. This nuanced examination seeks to unravel the complex motivations, demographics, and economic roles of digital nomads in contemporary paradigms. Secondly, the research delves into the intricate interplay between digital nomadism and urban housing markets, with a particular focus on understanding the transformative effects on housing dynamics within urban environments. This encompasses a thorough exploration of the evolving housing preferences of digital nomads and the broader implications for urban real estate markets. Furthermore, the study evaluates governmental institutions and market responses to the increasing prevalence of digital nomadism, encompassing the analysis of the strategies adopted by governments, including regulatory adaptations, urban planning initiatives, and incentive structures designed to attract and accommodate digital nomads. Concurrently, it investigates how market dynamics adapt in order to cater to the demands of this mobile workforce. Finally, the research ventures into the socio-economic consequences arising from the growing presence of digital nomadism within urban scenarios. It navigates the intricate web of effects, including well-known issues such as gentrification, the dynamics of local population displacement, and the emergence of diverse housing solutions designed to meet the diverse needs of digital nomads and the communities they interact with. The thesis will focus on the Southern European region, with Lisbon and Athens as chosen case studies as these cities have experienced a substantial influx of digital nomads over the past five years, leading to significant implications and challenges for the governance and management of their urban infrastructures.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **The Multi-Level Meta-Governance of Just Green Transitions of the European Union**
TUTOR(S) Giancarlo COTELLA, Carlos TAPIA, Zora ŽIVANOVIĆ

ACADEMIC CONTEXT

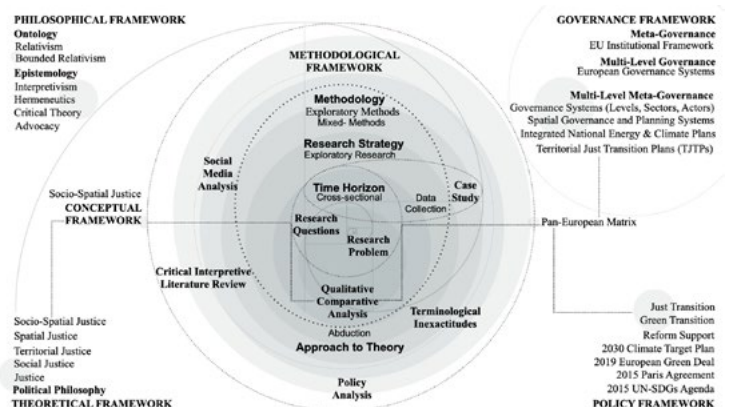
- Jessop B., 2004. Multi-level Governance and Multi-level Metagovernance: Changes in the European Union as Integral Moments in the Transformation and Reorientation of Contemporary Statehood. In: Bache I. and Flinders M., eds., *Multi-level Governance* (Oxford, 2004; online edn, Oxford Academic, 7 Apr. 2004). <https://doi.org/10.1093/0199259259.003.0004>.
- European Commission, 2021. *Commission Staff Working Document on the Territorial Just Transition Plans*. Brussels, 23.9.2021 SWD (2021) 275 final. https://ec.europa.eu/regional_policy/sources/funding/just-transition-fund/swd_territ_just_trans_plan_en.pdf.
- Cedergren E., Tapia C., Gassen N. S. and Lundgren A., 2022. *Just Green Transition – key concepts and implications in the Nordic Region*. Nordregio discussion paper 2022:2. Stockholm: Nordregio. <http://doi.org/10.6027/WP2022:2.1403-2511>.
- Tavares M., 2022. A Just Green Transition: concepts and practice so far. *UN DESA Policy Brief*, 141. https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB_141.pdf.

EXTERNAL COLLABORATIONS

- European HORIZON- WIDERA-2021-ACCESS-02-01 - GreenFORCE Western Balkans Twinning - Foster Research Excellence for Green Transition in the Western Balkans.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In perspective to the European Green Deal and contributing to the growing debate on the EU “Green Transition” and “Just Transition” dimensions (European Commission, 2020c), this research is scrutinizing the Multi-level Meta-Governance (ML-MG) of the compound concept “Just Green Transitions” (JGT); investigating how the JGT are conceptualized (Shields and Whetsell, 2017) and operationalized (Bali, et al., 2021) both at the EU level and that of the Member States of the European Union (MS); across levels, actors, sectors, policies and levels of decision-making. This interdisciplinary exploratory research recognizes JGT as context-dependent and socially constructed realities, exposed to high level of geopolitical and economic uncertainties, that are subject to ideological, political, philosophical, societal, environmental interpretations; meaning that, what is considered just is relative and arguable according to different geographies, cultures, and institutions. Based on the nature of this research, JGT are viewed from a bounded relativism ontological perspective (Moon & Blackman, 2014). The research design strategy is based on multimethodology and explorative methods (Kosow & Gaßner, 2008; Melnikovas, 2019) including discourse analysis, case studies, qualitative comparative analysis (QCA), policy analysis, interviews, network analysis, and social media analysis. As a reason of the uncertainty and plurality regarding JGT, abductive reasoning has been found suitable for this research. A critical interpretative literature review is to shape the research conceptual framework; a Twofold Analytical Grid aimed at investigating the conceptualization and operationalization of JGT from the theoretical conceptions of social and spatial justice. The Grid will then be applied to both the EU and the MS levels, to highlight the JGT governance systems, objectives, the actual state of the progress, the implementation of JGT, the introduced policies, actors involved, levels of decision-making. This Grid will be used to explore three MS case studies and a qualitative comparative analysis (QCA) will be used to understand how the interplay between the ML-MG and the implementation of the JGT in three different contexts. The thesis is directed mainly to policy-makers active at the EU and the Member States levels, the main domains of interest are political and social. This research is expected to contribute to the development of governance and policy recommendations aimed at advancing JGT in the EU.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **Toward a redefinition of territorial accessibility**
TUTOR(S) **Luca STARICCO, Federico CAVALLARO**

ACADEMIC CONTEXT

- Hull A., Silva C. and Bertolini L., 2012. *Accessibility Instruments for Planning Practice*. COST Action TU1002.
- Staricco L., 2022. 15-, 10- or 5-minute city? A focus on accessibility to services in Turin, Italy. *Journal of Urban Mobility*, 2, 100030.
- Steg L., 2005. Car use: lust and must. Instrumental, symbolic and affective motives for car use. *Transportation Research Part A*, 39, pp. 147-162.
- Vitale Brovarone E., 2010, *Città in movimento. Relazione e dipendenza tra i caratteri degli insediamenti e la domanda di mobilità*. Brienza: Edizioni Le Pensur.

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The concept of the 15-minute city is receiving increasing attention, both in planning practices and in the academic literature, especially with the COVID-19 pandemic that has made evident the need for a minimum set of proximity-based services accessible by active travel. Many planning concepts has preceded this theory, for example, the plan of Cerda in Barcelona with its city blocks has in common the equitable distribution of services; proximity to services can be observed in the garden city model of Howard; Perry's neighbourhood unit concept for the scale, as well as the centrality of pedestrian friendliness, high density, mixed land use in the more recent Transit Oriented Development, but many others share similarities with this concept. However, the \pm 15-minute city is often being reduced to a mere political slogan and employed as a city branding device with little measurability or benchmarks.



I am currently involved in research that focuses on deconstructing the concept of the \pm 15 minute city, with the aim of demonstrating how behavioural variables influence the mobility decisions of individuals by limiting the role of the built environment and marginalising the importance of proximity, and thus how spatial planning must focus on the real needs of the context in which it operates in order to avoid failures in the application of a theory. The first phases of the research have been devoted to answer to the following question through the literature review: Is there a body of research that recognises the importance of the socio-cultural dimension in modal choice, which can be at the expense of accessibility by proximity, so that the \pm 15 minute city is likely to have little impact because it neglects this aspect in its indicators, guidelines and policy instruments? Further research is projected to focus also on understanding if it is enough to act on the dimension of physical proximity to influence the choice of active mobility or if it is necessary to work on the socio-cultural dimension as well.

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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE Resilience Model of large-scale Hydropower System
TUTOR(S) Anna OSELLO

ACADEMIC CONTEXT

- Barbera F. and De Rossi A., eds., 2021. *Metromontagna. Un progetto per riabitare l'Italia*. Roma: Donzelli.
- Mehvar S., Wijnberg K., Borsje B., Kerle N., Schraagen J. M., Vinke-de Kruijf J., Geurs K., Hartmann A., Hogeboom R. and Hulscher S., 2021. Review article: Towards resilient vital infrastructure systems – challenges, opportunities, and future research agenda, *Nat. Hazards Earth Syst. Sci.*, 21, pp. 1383-1407. <https://doi.org/10.5194/nhess-21-1383-2021>.
- Osello A., Fonsati A., Semeraro F. and Rapetti N., 2019. *InfraBIM: Il BIM per le infrastrutture*. Roma: Gangemi Editore.
- Ruggeri G. and Adami S., 2011. Lo sviluppo dell'energia idroelettrica in Italia. *L'acqua*, 6, pp. 69-78.

EXTERNAL COLLABORATIONS

- SIED, Calcinere Hydropower Plant

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Against the backdrop of the growth of renewables, the research proposal is geared towards the study of resilience models for large hydroelectric generation plants. The history and characteristics of this type of plant, mainly built in the early 1900s, and their management concerning climate change requires specific attention to the potential and feasibility of revamping interventions, as well as the complex regulatory framework. The challenge is to achieve production, energy and environmental efficiency objectives through an integrated approach aimed not only at modernisation interventions with a green perspective but also at promoting resilient development of the local territory with social and economic spin-offs. The redevelopment strategy of the Italian power plant park therefore requires the evaluation of a systemic approach to the reference ecosystem to activate actions that can generate a value chain oriented towards sustainable development. The increasingly complex management of networks will also have to exploit the possibilities offered by digital technologies through digitisation, interconnectivity, and interconnection.

With these ambitions, one would like to test advanced methods and tools to support the digitizing Calcinere hydropower plant located in the western Piedmont Pre-Alps in the homonymous fraction of the municipality of Paesana (CN) and deepening innovative solutions to support the creation of a resilience model that aims to aspire to become a virtuous example scalable to other similar contexts.

In the first year, the pilot case BIM-GIS model is being implemented in Facility Management operations and as a digital basis for the next steps. In the second year, the main local actors will be involved in a participatory design to establish possible development strategies from environmental and social perspectives. In the last year, the proposed methodology will be used to develop guidelines and best practices for improving the hydropower system resilience to achieve sustainable implications for the mountain territory, its permanent and temporary hosts.



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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE Integrated evaluation for supporting Climate Positive Circular Communities
TUTOR(S) Marta Carla BOTTERO, Adriano BISELLO

ACADEMIC CONTEXT

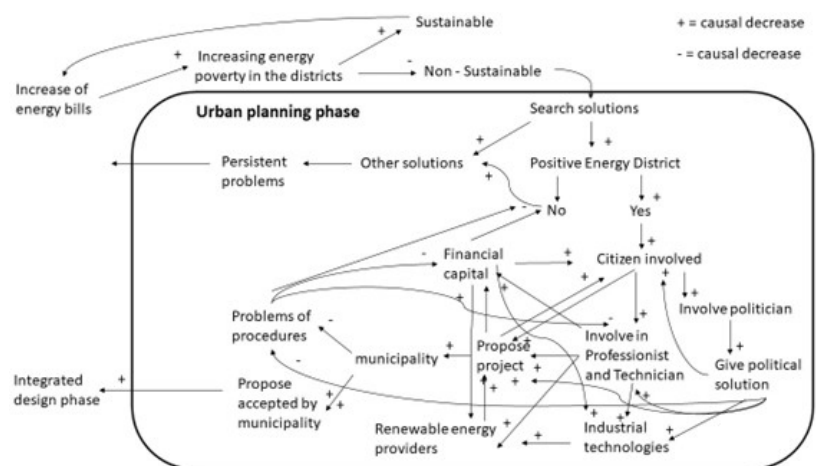
- Bisello A., 2020. Assessing Multiple Benefits of Housing Regeneration and Smart City Development: The European Project SINFONIA. *Sustainability*, 12(19). <https://doi.org/10.3390/su12198038>.
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- Bottero M., Mondini G. and Oppio A., 2016. Decision Support Systems for Evaluating Urban Regeneration. *Procedia - Social and Behavioral Sciences*, 223, pp. 923-928. <https://doi.org/10.1016/j.sbspro.2016.05.319>.
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EXTERNAL COLLABORATIONS

- EURAC research, Bolzano

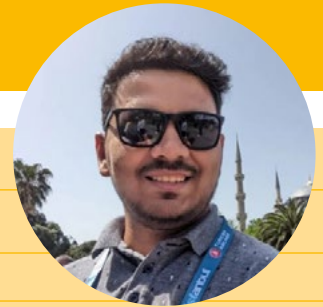
HIGHLIGHTS OF THE RESEARCH ACTIVITY

The research work presented here focuses on integrated assessments of the urban district, which represents the smallest form of community, but at the same time the most complex due to the multitude of components that characterize it. We know that by 2050 more than 70 % of the world's population will live in cities, resulting in a massive growth in demand for urban energy infrastructure (European Commission, 2021). To support the urban energy transition, the concept becomes even more ambitious, moving from highly efficient buildings to zero-emission buildings. Subsequently, by including energy sharing, waste heat recovery, electric mobility, and energy storage, the scope has been broadened to include the implementation of zero-emission neighbourhoods or better still PEDs (Guarino et al., 2022). PEDs represent a new approach towards a sustainable and efficient, positive-energy city and urbanization model combining the built environment, mobility, sustainable production and consumption to increase energy efficiency reduce greenhouse gas emissions and create added value for citizens. Although the transformation of a district is beneficial for many stakeholders, points of agreement are not always found that make all projects sustainable and feasible. My research is part of a European project called ARV. ARV is a H2020 EU-funded project aiming at creating Climate Positive Circular Communities in Europe and increasing the building renovation rate in the continent. In this sense, my research project aims to identify decision support systems that can evaluate as well as define common strengths to identify shared lines of development and be able to implement the energy transition in the best possible way. The research has opened 2 strategies that run together but with a single objective, which are:



1. Multiple benefits analysis applied to the European ARV project and the 6 case studies in collaboration with the different living labs of each demo case, and to the PEDs in the International Energy Agency ANNEX 83 research group in order to address and evaluate the urban district development proposals shared with all stakeholders involved.
2. A proposal for a new certification protocol for PEDs and CPCCs to promote their sustainable development.

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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **Landscape goes Digital: 3D model production and implementation of Digital Twins for innovative Landscape Management**
TUTOR(S) **Piero BOCCARDO, Sisi ZLATANOVA**

ACADEMIC CONTEXT

- Dembski F., Wössner U., Letzgus M., Ruddat M. and Yamu C., 2020. Urban Digital Twins for Smart Cities and Citizens: The Case Study of Herrenberg, Germany. *Sustainability*, 12(6). <https://doi.org/10.3390/su12062307>.
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- Yan J., Zlatanova S., Aleksandrov M., Diakite A. A. and Pettit C., 2019. Integration of 3D Objects and Terrain for 3D Modelling Supporting the Digital Twin. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, IV-4/W8, pp. 147-154. <https://doi.org/10.5194/isprs-annals-IV-4-W8-147-2019>.

EXTERNAL COLLABORATIONS

- University of New South Wales (UNSW), Sydney, Australia (Visiting Researcher)
- Indian Institute of Technology, Roorkee, India (Research Internship)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The ability of the Digital Twins (DT) to provide value-added information simplistically has paved a completely new and broader path of opportunities in the field of Remote Sensing (RS) and digital 3D modeling. The presence of state-of-the-art RS techniques like LiDAR, SLAM, close-range photogrammetry, aerial photogrammetry, and their possible integration have even broadened the horizons and scopes for the creation and update of DT. In addition to 3D modelling, DT features the fourth dimension, time, which itself alters the data and the associated semantic information. DT enables the end users with a simplistic browsable and interactive web environment to analyse the past, present, and future of urban dynamics. Urban DT represents the virtual picture of a complex and dynamic physical world with a variety of applications in mobility, planning, energy, and many others. In this doctoral research, we focus on the ongoing progress and initiative in the project of creating the DT for the city of Torino, its update with respect to time and deriving products from it. This DT research is also aimed at the extraction of the built environment features, land use data, road network, and signs along with the update of the model with time.



There are several challenges associated with this research, related to the technical aspects. such as the processing of larger datasets, their cost-efficiency factor, and other influencing factors like the rapid rate of growth and development of the city, and the complexity of the solutions, which support the need for further research in this area. The major challenge is to model the whole city or a bigger region with the problem in the processing and reconstruction of the small details. In fact, although there are many solutions that exist for the integration of 3D models from different sources for a DT, the key problem is still to have an operational and simplistic product that can be understood and implemented by the direct stakeholders. Another key challenge to be addressed in this research is the update of Digital Twins with respect to the time. The proposed outcome of this doctoral research is an easily accessible and browsable digital ecosystem that describes the behaviour of the real world and its evolution over time and an environment simulating the effects of future urban developments on the digital copy of reality.

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COURSE XXXVIII cycle - 1st year
RESEARCH TITLE **New strategies for Building Information Modelling (BIM) to Facility Management (FM) training and integration in public administration**
TUTOR(S) **Anna OSELLO**

ACADEMIC CONTEXT

- Pinti L., Codinhoto R. and Bonelli S., 2022. A Review of Building Information Modelling (BIM) for Facility Management (FM): Implementation in Public Organisations. *Applied Sciences*, 12(3), <https://doi.org/10.3390/app12031540>.
- Salman A. and Ahmad W., 2023. Implementation of augmented reality and mixed reality applications for smart facilities management: a systematic review. *Smart and sustainable built environment*. <https://doi.org/10.1108/SASBE-11-2022-0254>.
- Salzano A., Parisi C. M., Acampa G. and Nicoletta M., 2023. Existing assets maintenance management: Optimizing maintenance procedures and costs through BIM tools. *Automation in Construction*, 149. <https://doi.org/10.1016/j.autcon.2023.104788>.
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HIGHLIGHTS OF THE RESEARCH ACTIVITY

Society 5.0 is an anthropocentric societal paradigm that emphasizes the use of Information-Technology systems such as the Internet of Things (IoT), Artificial Intelligence (AI), and Virtual and Augmented Reality (VAR) to improve human living circumstances.

Research, innovation, and technology are critical for achieving a Smart-city that is sustainable, adaptive, and human-centered. Building Information Modelling (BIM) methodology offers significant advantages in building operation and maintenance (O&M), but its implementation at the building scale has mainly focused on the design and construction phases. Innovative approaches and technologies for building maintenance research can assist public administrations in transitioning to the BIM-world and digitizing data for the establishment of the Digital Twin. Italy is one of the countries that has adopted BIM for public projects. The application of this methodology in public building management activities is currently in an embryonic state due to the absence of reference standards and operational research at this stage of the management process.

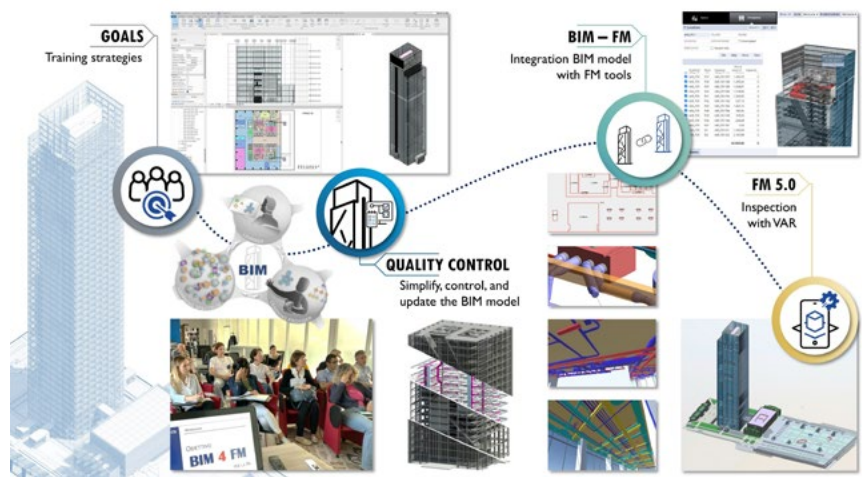
This research aims to explore the use of Building Information Modelling (BIM) in Italian public administration. But also develop operational and training strategies for digitizing real estate assets, specifically Palazzo Unico Regionale. For this purpose, 3D BIM-based models integrated with facility management and Virtual Augmented Reality tools are used.

In particular, the research focuses on:

- Develop and carry out training activities with public officials to generate a Record Model BIM-based for FM activities;
- Visualize, extract and implement information from the BIM Model to the Integrated Workplace Management System software;
- Inspect the BIM model with VAR for FM activities and define Guidelines for the BIM use in public administration.

By comparing the traditional approach with innovative tools, new BIM-FM integration standards can be defined for transferring data from the construction phase to the operational phase. This process creates a digital model of a building,

including: equipment, facilities, systems, maintenance, and operational requirements. The research combines expertise from various disciplines in digital modelling, plant engineering, and management to streamline operations and maintenance administration tasks. The main result is the development of guidelines for controlling, simplifying, updating, and managing maintenance information.





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