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DI TORINO



UNIVERSITÀ
DEGLI STUDI
DI TORINO



Dipartimento Interateneo di Scienze, Progetto e Politiche del Territorio





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

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INTRODUCTION

This document contains a series of one-page reports from the students enrolled in the Urban and Regional Development Ph.D. Programme at the Interuniversity Department of Urban and regional studies and planning of Politecnico and Università di Torino.

The programme is designed to train highly-qualified specialists in urban and territorial development, while promoting the appropriate exploitation of their individual talents, to develop a distinctly multidisciplinary figure, a professional able to adapt to a wide variety of scientific knowledge and areas in a flexible and dynamic way.

The offered training will therefore give to PhD students the possibility to exploit specific skills acquired, to effectively interact with other professionals participating in urban and regional planning projects. Based on multi- and inter-disciplinary PhD skills, the programme intends to move fluidly through the conventional boundaries that separate social sciences from applied technical, engineering, physical-natural sciences.

In order to train specialists who are able to effectively navigate in the global context, the doctoral programme should adopt also a strong international nature, both in the sense of attracting young motivated and qualified scholars from abroad, as well as offering to students a training which corresponds to the highest academic and professional standards, also thank to the contribution of foreign scholars and the organisations of internships in highly qualified institutions. To stay coherent with the adopted approach the training activity is also developed entirely in English.

For more info:

dottorato.d.ist@polito.it

<http://dottorato.polito.it/urb/en/overview>



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Pablo Angel RUFFINO
Astrid Coromoto SAFINA ALMEIDA
Francesco SEMERARO





XXX CYCLE - 3rd YEAR STUDENTS



NAME	Emere ARCO
E-MAIL	emere.arco@siti.polito.it
COURSE	XXX cycle - 3 rd year
TOPIC	Geomatics for Mobility Management. A comprehensive database model for Mobility Management
TUTOR(S)	Piero BOCCARDO



ACADEMIC CONTEXT

Boccardo P., Arneodo F., Botta D., 2014. Application of Geomatic techniques in Infomobility and Intelligent Transport Systems (ITS). *European Journal of Remote Sensing AIT*, 21, pp. 95-115, ISSN: 2279-7254.

Arco E., Ajmar A., Arneodo F., Boccardo P., 2017. An operational framework to integrate traffic message channel (TMC) in emergency mapping services (EMS). *European Journal Of Remote Sensing*, 18, pp. 478-495, ISSN: 2279-7254.

EXTERNAL COLLABORATIONS

- ITHACA - Information Technology for Humanitarian Assistance, Cooperation and Action
- 5T - Tecnologie Telematiche Trasporti Traffico Torino

HIGHLIGHTS OF THE RESEARCH ACTIVITY

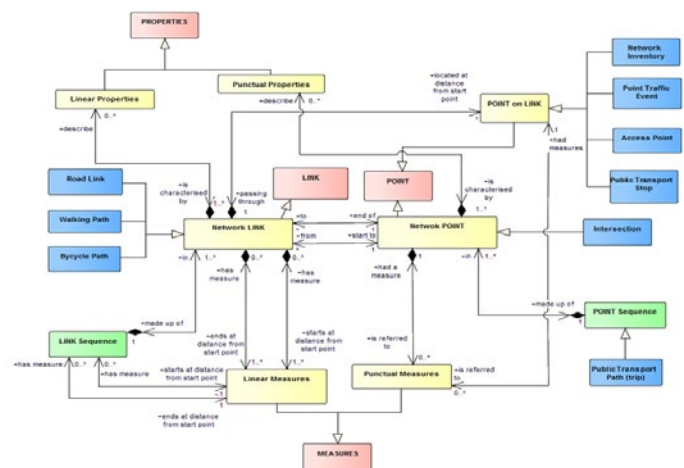
The research activity aims to design a comprehensive and general spatial data model that could allow the visualization of traffic components and measures. The activity is focused on the case study of 5T company in Turin, where the lack of a complete GIS makes difficult the spatial integration between data.

The first phase involves the analysis of available data and standards, in particular looking at their structures, spatial relationships and possible representations. Sensors and road network datasets used for analysis in 5T varies, depending on purposes: several sources, different structures and spatial quality have been observed. Despite spatial overlays between sources, topological and logical consistency between them is low and conflation operations have been developed in order to achieve a unique reference road network and sensors system. Traffic measures, raw or derived from software, have been temporal and spatial aggregated in order to allow their spatial visualization through a GIS.

In the conceptual data modelling phase, attention is given to the definition of the general components and main relationships. Four main components are defined, from which depend a set of child classes and relationships, taking reference also from standards (see Figure). The logical data model deepens the details of the conceptual data model, defining specific objects, attributes and specifying relationships; the model is still quite general to be used also by other Traffic Operation Centers than 5T. Finally, the physical data modelling phase is customized for the use in 5T with ArcGIS Geodatabase. Specific custom scripts have been developed to allow the extraction and the temporal aggregation of traffic measures.

A case study has been deepened in order to evaluate the suitability of the database: a confrontation between damages, detected by Emergency Mapping Services (EMS), and Traffic Message Channel traffic events, has been conducted, evaluating the utility of 5T historical information of traffic events of the Piedmont floods of November 2016 for EMS services. The database has allowed the visualisation of historical datasets, usually available only as table information.

The database developed is also suitable for displaying historical traffic data, properly adapted to be used for network analysis case study.



NAME	Chiara BASILE
E-MAIL	chiara.basile@polito.it
COURSE	XXX cycle - 3 rd year
TOPIC	Making arrival: newcomers' becoming through Brussels
TUTOR(S)	Marco SANTANGELO, Nick SCHUERMANS (Vrije Universiteit Brussel), Bas VAN HEUR (Vrije Universiteit Brussel)



ACADEMIC CONTEXT

Basile C., 2017. Apprendere una città. Uno sguardo sui processi di arrivo e sulle pratiche migranti nello spazio urbano. *Ambiente Società e Territorio*, 2(XVII), pp. 25-29.

Desmond M., 2014. Relational ethnography. *Theory and Society*, 43(5), pp. 547-579.

Simone A.M., 2010. *City Life from Jakarta to Dakar: Movements at the Crossroads*. New York-London: Routledge.

EXTERNAL COLLABORATIONS

- Cosmopolis Centre for Urban Research, Geography Department, Vrije Universiteit Brussel (joint PhD agreement)
- Gran Sasso Science Institute, Social Sciences

HIGHLIGHTS OF THE RESEARCH ACTIVITY

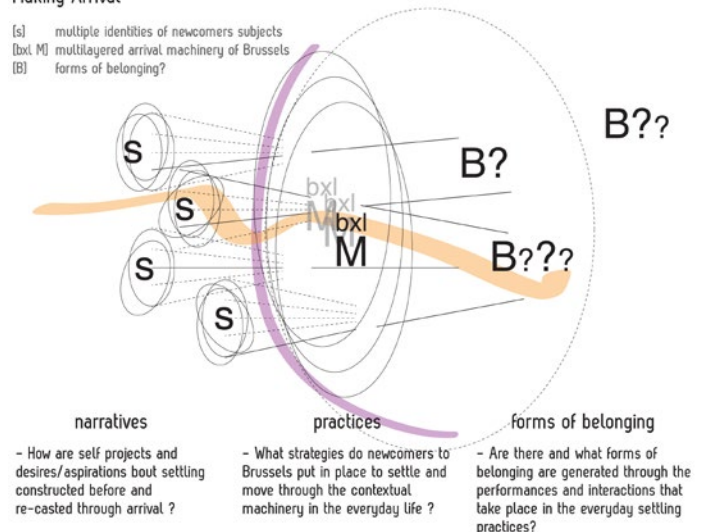
The research is a field enquiry based in Brussels, Belgium's main metropolis and European Union's de facto capital, concerning arrival processes of international migrants to the city. It investigates how newcomers' narratives, practices and forms of belonging are (re)constructed, willingly and/or unwillingly, in the process of settling - both physically and affectively - in the city, by scrutinising the spatial, temporal and power configurations that emerge in the urban context within which arrival is enacted and negotiated.

The study aims to identify the emerging relations for how they contribute both to the recasting of newcomers subjectivities in becoming new dwellers of Brussels and to the changes in the local context in terms of existing/potential forms of belonging. As different individuals are placed in very distinct ways in the same city with respect to these possibilities of interactions and interconnections with the context, the resulting relational configurations play out for them very different settling conditions. One of the key aspects of the research is thus to unlabel migrants from traditional categories, and to study simultaneously very diverse types of mobility, such as the one of asylum seekers and the ones of European free movers, often referred to as "expats", expatriates. So doing, the assumption is that processes of arrival possibly entail similar challenges, and by dismissing a substantive approach to subjects and contexts and instead inquiring the patterns of interactions among people - despite their very different trajectories - and places, it is possible to look for unexpected similarities and particularities and for how different possibilities in the context work out, for different people and through different mechanisms, different ways to structure a relation of belonging in the city.

The research is pursued through qualitative research methods, namely in-depth interviews with newcomers subjects and institutions and ethnographic techniques in meaningful urban sites through which alien dwellers make themselves home, tackling specific research questions (see table). Through this analysis, the research outcome is to make grounded statements about the "mobile" making of a city like Brussels shaped by arrival processes and to gain deeper insights of the urban mechanisms that enable or hinder membership in it.

Making Arrival

- (s) multiple identities of newcomers subjects
- (bxt, M) multilayered arrival machinery of Brussels
- (B) forms of belonging?



NAME **Erblin BERISHA**
E-MAIL erblin.berisha@polito.it



COURSE XXX cycle - 3rd year
TOPIC Evolution of Spatial Planning Systems in the Western Balkan Region
TUTOR(S) Giancarlo COTELLA

ACADEMIC CONTEXT

Dühr S., Colomb C., Nadin V., 2010. *European Spatial Planning and Territorial Cooperation*, London-New York: Routledge.

Janin Rivolin U., 2012. Planning Systems as Institutional Technologies: a Proposed Conceptualization and Implication for Comparison. *Planning Practice and Research*, London.

Adams N., Cotella G., Nunes R., 2011. Territorial Development, *Cohesion and Spatial Planning: knowledge and policy development in an enlarged EU*, Ashgate, Aldershot.

Scharpf F.W., 1997. *Games real actors play: Actor-centered institutionalism in policy research*, Westview Press.

EXTERNAL COLLABORATIONS

- London South Bank University, London, Great Britain
- Catholic University of Leuven, Leuven, Belgium
- Ministry of Urban Development, Tirana, Albania

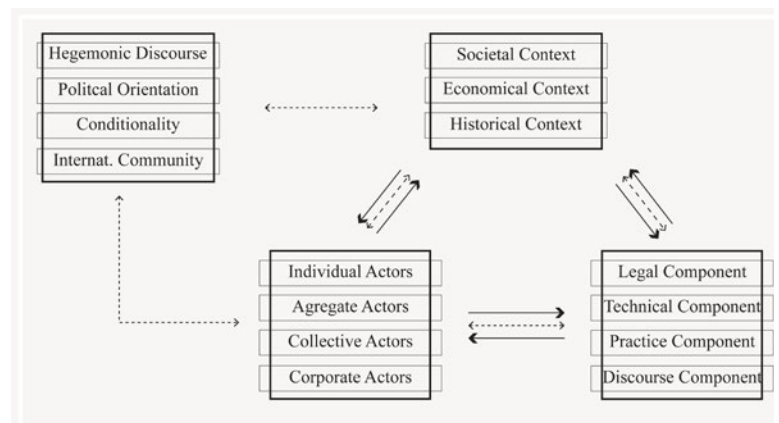
HIGHLIGHTS OF THE RESEARCH ACTIVITY

The research activity focuses at understanding the evolution of spatial planning systems in the Western Balkan Region (above all Croatia, Albania and Bosnia & Herzegovina) and the role played by the international context (among other stimulated by exogenous discourse and actors). For doing that an interpretative model called actor explanatory model has been development. The idea is to bring actors and planning system at the center of the research analyses. According to the topic, the research activities has been subdivided in three parts.

The first focuses on the theoretical and methodological aspects giving more attention to investigate the nature of spatial planning system and its constitutive components (structure, technique, practice and discourse). At this regard, the evolution path of each planning system has been explored by adopting the aforementioned analytical dimensions aiming at identifying the route followed by each country since the collapse of the communist regimes.

The second part scrutinizes the influence of the international context in shaping each domestic planning system. The idea is to shed more light on the importance that external pressures have had in transforming the way through which each country manages the domestic territorial development and to evaluate the attitude of the local actors in receiving or declining external supports (influences).

While the third part adopts a comparative approach through which simultaneously compares the evolution of planning systems of the countries at stake and the influence externally derives. In this stage, the intent is to point out the main spatial planning differences, similarities and uniqueness.



NAME	Amandine DUBOZ
E-MAIL	amandine.duboz@polito.it
COURSE	XXX cycle - 3 rd year
TOPIC	Toward a change of travel behaviour: psychosocial predictors of the use of a real-time multimodal information system
TUTOR(S)	Cristina PRONELLO



ACADEMIC CONTEXT

Pronello C., Duboz A., Rappazzo V., 2017. Towards Smarter Urban Mobility: Willingness to Pay for an Advanced Traveller Information System in Lyon. *Sustainability* 2017, 9(10), 1690; doi:10.3390/su9101690.

EXTERNAL COLLABORATIONS

- OPTICITIES project- Enhancing Smart Mobility (2013-2016)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In 2008, European Commission, has developed an action plan to accelerate and develop the deploying of Intelligent Transport Systems (ITS). In a context where road transport induce many disadvantages as road congestion coast, or negative environmental impacts, ITS is seen as one of the solution to solve transport issues. ITS is a generic expression used to describe the integrated application of information and technologic control, and processing on information transport systems.

Advanced Traveler Information System (ATIS), are a key component of ITS and it is generally believed that they are among the most cost-effective investments that a transportation agency can make. Their aim is to help drivers and commuters to make better choices when initiating a travel, during a travel, or when making a route choice. They contribute to make people more informed about decisions when performing a travel, contribute to the reductions in travel time, delay, fuel consumption, and emissions by inducing a change of behavior.

It is often argued that the provision of suitable traveler information would help to overcome habits that affects the elaborateness of decision making concerning travel mode use. Habits are challenged by the information provision by changing the cognitive foundation of intentions, although evidences showed that individuals with strong travel mode habits are less likely to be affected by information about alternative options and travel mode choices conditions compared to individuals with weak habit.

The scope of this research is to define psychosocial constructs and socioeconomics characteristics, as well as travel habits, explaining the willingness to use multimodal information systems to change of modal behaviour. More precisely, understanding the influence of intention, attitudes and expectations of a sample of people living in Turin, Italy. To this aim, a real-time multimodal information system, TUEtO, has been developed through the project Opticities, a European project. TUEtO provides information about all the transport modes (car-sharing, public transport, bike-sharing, trains) as well as of traffic (congestion, accidents).



NAME **Benedetta GIUDICE**
E-MAIL benedetta.giudice@polito.it



COURSE XXX cycle - 3rd year
TOPIC Ecological planning strategies for a qualitative land take
TUTOR(S) Angioletta VOGHERA, Gilles NOVARINA (Université Grenoble Alpes)

ACADEMIC CONTEXT

Giudice B., 2017. Caratteri e criticità delle misure sul consumo di suolo in Piemonte. In Arcidiacono A., Di Simine D., Oliva F., Ronchi S., Salata S. (edited by), *La dimensione europea del consumo di suolo e le politiche nazionali. Rapporto CRCS 2017*, pp. 144-148.

Giudice B., 2015, Green Belts e sviluppo urbano. *Urbanistica Informazioni*, 263, pp. 76-78.

EXTERNAL COLLABORATIONS

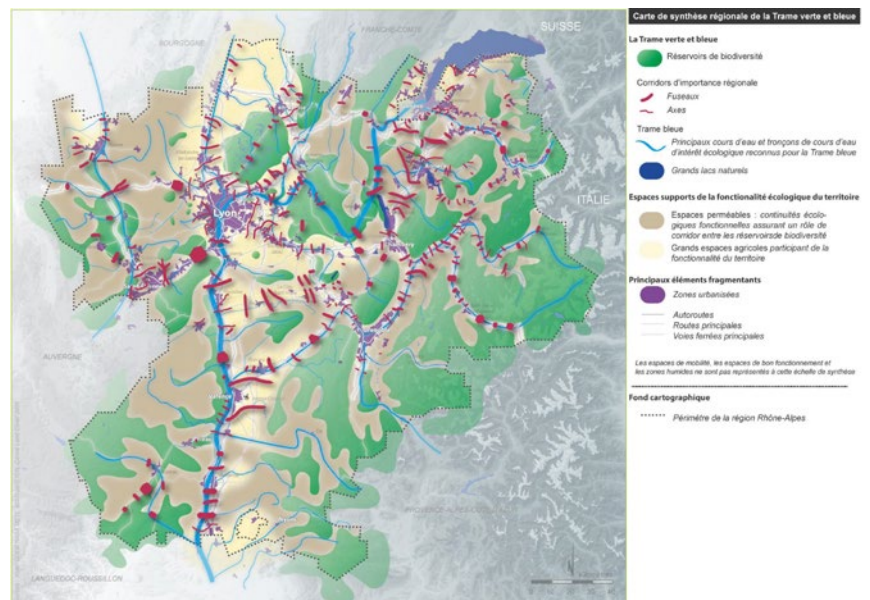
- Institut d'Urbanisme de Grenoble


HIGHLIGHTS OF THE RESEARCH ACTIVITY

Starting from a deep literature review, the research aims at redefining the Italian planning process which still lacks some important elements. Incoming new necessities and challenges of the last years require indeed to urban and regional planning a change of paradigm and approach. The starting point of the research was the understanding of the link between land take and urban planning, with the aim of overcoming a merely quantitative approach in favor of a qualitative one.

By focusing on issues as land take, ecological networks and project quality, the research compares Italian planning system and tools (in particular the ones of Piedmont region) with the French ones (the case study is represented by Auvergne-Rhône-Alpes region). French context shares some important elements with the Italian one (for example, high communal fragmentation) but it also represents a relevant context of comparison due to its innovative elements developed at all institutional levels in the latest years. Despite high communal fragmentation, French municipalities tend to cooperate into inter-municipalities for decision-making process, including the planning one, while Italian municipalities have less propensity to cooperate. The two countries give great importance to environmental and ecological issues (in my research I have focused on the limitation of land take and the role of green and blue infrastructures) but they have a different approach in dealing with them. With reference to land take, Italy has a normative approach even though in Piedmont some experiences are trying to have a qualitative approach, as for example the SAM4CP project. France, instead, with the introduction of the concept of "inverser le regard", starts from natural and agricultural environment to arrive to the urban project and development. For what concerns G&B infrastructures, in Italy they are often separated from planning tools while in France they have been integrated into all the scales of the planning process: at a national level, some general orientations are addressed to develop the regional plan of ecological coherence (see figure) which can be taken into account by SCoT and PLU.

These elements represent the main core of the operative guide for planning in Italy. This guide will be composed by some possible scenarios based on the elements suggested by French case studies.



NAME	Nives GRASSO	
E-MAIL	nives.grasso@polito.it	
COURSE	XXX cycle - 3 rd year	
TOPIC	A low-cost multi-sensor approach for 3D urban model updating	
TUTOR(S)	Marco PIRAS	

ACADEMIC CONTEXT

Bassani M., Grasso N., Piras M., 2015. 3D GIS based evaluation of the available sight distance to assess safety of urban roads. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XL-3/W3, 137-143, <https://doi.org/10.5194/isprsarchives-XL-3-W3-137-2015>.

Abdul Jabbar A., Aicardi I., Grasso N., Piras M., 2017. Urban data collection using a bike mobile system with a FOSS architecture. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLII-4/W2, 3-9, <https://doi.org/10.5194/isprs-archives-XLII-4-W2-3-2017>.

EXTERNAL COLLABORATIONS

- Delft University of Technology

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The research work is focused on the updating of existing 3D models of urban environment with low-cost solutions through the integration of different data source. Through these interactive and dynamics models at large and medium scale, operations of simulation can be carried out to use them as decision support systems. The activity would be applied for important research on road safety and visibility analysis in a urban context.

The extraction of features in urban environment (such as street furniture, vegetation, fences, including those that can be relocated over time like bins and the parked cars) and of geometric characteristics of the infrastructures (as built) can be performed through the use of mass market and off the shelf instruments such as cameras, webcam, action-cam, IMU and GNSS mounted on a Mobile Mapping System (car or bicycle).

The first step of the research was dedicated to the evaluation of the characteristics of the imaging sensors and their intrinsic parameters. To this purpose many calibration tools were tested and many analyses on the chosen sensors were performed.

The input data used for the analysis were video captured by webcam and action-cam mounted on car, bicycle and a bike cargo. Some tests were performed to evaluate the possibility to integrate these data with data acquired by a laser sensor and a panoramic camera. These devices allow, also to non-expert users, to acquire a great amount of data in a fast and easy way.

The resulting data were processed through photogrammetric and Structure From Motion (Sfm) techniques, in order to reach the final objective.

The second part of the thesis was aimed at the integration and updating of a 3D city model with point cloud data and the development of an automatic procedure to perform visibility analysis on the road infrastructures.

The research focused on the segmentation of the point clouds of urban environments for the automatic reconstruction of road sections and detection of permanent and temporary objects which could obstruct the visibility along the roadside or which may represent a danger to the categories of the most disadvantaged users such as people with disabilities and pedestrians, at entrances of pedestrian paths or intersections between road and pedestrian routes, or for cyclists, along the cycle paths. After an evaluation of the existing approaches, the visibility analyses were performed directly on the point cloud through a Matlab routine using the Line of sight approach, and considering the dynamicity of the movement.

In the last section, was evaluated the possibility to extend the visibility analyses to the indoor environment for the evaluation of the safety inside the public buildings. A procedure for the calculation of the less complex path to follow in emergency cases inside of buildings was then proposed.



NAME **Gian Gavino PAZZOLA**
E-MAIL gian.pazzola@polito.it



COURSE XXX cycle - 3rd year
TOPIC The socio-spatial relations for innovative artistic production in Piedmont and Liguria
TUTOR(S) Carlo SALONE, Giovanna SEGRE

ACADEMIC CONTEXT

Salone C., Bonini Baraldi S., Pazzola G., 2017. Cultural production in peripheral urban spaces: lessons from Barriera, Turin (Italy). *European Planning Studies*, pp.1-21.

Bathelt H., Glückler J., 2003. Toward a relational economic geography. *Journal of economic geography*, 3.2, pp. 117-144.

Scott A.J., 2014. Beyond the Creative City: Cognitive-Cultural Capitalism and the New Urbanism. *Regional Studies*, 48.4, pp. 565-578.

EXTERNAL COLLABORATIONS

- University of Birmingham - School of Geography, Earth and Environmental sciences
- CSS EBLA - Centro Studi Silvia Santagata sull'Economia della Cultura

HIGHLIGHTS OF THE RESEARCH ACTIVITY

During this year of activities, I worked in three main lines of research in order to investigate the research topic from different side.

The first line of research focused the exploration of different kinds of spatiality exists in contemporary innovative cultural production and the pathways in which, through individual networks, workers can exchange knowledge and information in order to generate new solution for cultural offers. My exploration analyzed the relations in new businesses formation and the impact of cultural practices in cities or, in other words, behaviors oriented to develop ideas – that are the main resources in cultural works – in innovative artistic designed project. Creation process can involve individuals, cultural organizations and other actors in productive systems but now several aspects are unknowns.

The second line of research dealt several aspects of creative economy in a critical perspective. Cultural economy focused the potentialities of culture as a driver for urban and local sustainable development and this conception often offers an empty rhetoric inscribed in a capitalistic way of development – offers an interesting interpretation about mobility of workers and jobs, flows of information and opportunities across the contemporary world. My research discusses the myths and realities surrounding the clustering of creative networks through a critical analysis of innovative artistic production in the field of visual and performing arts; and its clustering tendencies in Piedmont and Liguria. My interests was in how the clustering of networks is structured according cognitive and physical aspects of proximity and, in order to understand the specificity of aesthetic practices, I stressed the role played by networks in sharing different resources at the different scales.

The third line of research is related to the specific environment in which research developed: independent cultural producers. While the study of the cultural economy of cities has often focused on more institutionalized actors and sectors, such as museums, cultural foundations and private art galleries, independent cultural producers are still rarely studied, also if they emerges as new forms of entrepreneurship, creativity and local culture. My work try to clarify the disconnection between the young artistic communities and the markets or cultural institutions, witnessing - however - the existence of fervent underground movements.

Dimension of socio-spatial relations	Principle of socio-Spatial structuration	Associated configurations of socio-spatial relations	Socio-Spatial Tensions and Dilemmas
TERRITORY	Bordering, bounding, parcellization, enclosure	Construction of inside/ outside divides, Constitutive role of outside	Bordered vs Cross-border relations (eg "hermit state" vs "free state")
PLACE	Proximity, spatial embedding, areal differentiation	Construction of spatial divisions of labor; Differentiation of social relations horizontally among "core" vs. "peripheral" places	Container vs Connector (eg particularism vs cosmopolitanism)
SCALE	Hierarchization, Vertical differentiation	Construction of scalar divisions of labor; differentiation of social relations vertically among "dominant", "nodal" and "marginal" scales	Single Scale vs Multi-scalarity (eg unitary city-state vs multi-scalar meta-governance regime)
NETWORKS/ RETICULATION	Interconnectivity, interdependence, transversal or "rhizomatic" differentiation	Building networks of nodal connectivity; differentiation of social relations among nodal points within topological networks	Enclosed network vs networks of networks (eg "functional region" or "formal region" vs "unbounded region" or "virtual region")

NAME **Anna Paola QUAGLIA**
E-MAIL **annapaola.quaglia@polito.it**



COURSE XXX cycle - 3rd year
TOPIC The politics of innovation, entrepreneurship and community as a discursive practice. Researching a startup incubator in Milan
TUTOR(S) Ugo ROSSI

ACADEMIC CONTEXT

Foucault M., 2007. What is Critique?. In: S. Lotringer, (ed.) *The Politics of Truth*. New York: Semiotext(e), pp. 41-81.

Quaglia A.P., 2017. Innovazione, imprenditorialità, tecnologia: la promessa di una nuova urbanità. *Ambiente, Società e Territorio*, 2, pp. 20-23.

Thrift N., 2005. *Knowing capitalism*. London: SAGE Publications.

EXTERNAL COLLABORATIONS

- School of Public Engagement, The New School
- Departement Architectuur, KU Leuven

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The research has aimed to explore the social fact “innovation” as a discursive practice that is simultaneously ideal and objective, but also contingent to material processes and subjective.

Drawing upon a consistent multi-disciplinary literature, the inquiry has moved from a basic consideration that acknowledged as meaningful the tie between “innovation”, the city and the urban space. Rather than taking the bundle “city/innovation” as given, the study has firstly attempted to investigate some of its epistemological and ontological properties. Alongside tracing the general “virtual” features of such a discourse, its “eventualization” in the city of Milan has been explored with reference to urban policies and initiatives endorsed and promoted at the local and national governmental levels, since 2012 onwards.

Secondly, moving from the assumption that a discourse happens somewhere, it materially looks like something and it is embodied by someone, an ethnographic observation has been conducted in a relevant hybrid organization located in Milan, mainly operating as a startup incubator and a co-working space. Hosting a variety of entrepreneurial selves, from startup entrepreneurs to freelancers, the organization has emerged as a space of citizenship wherein the conditions to be a “good citizen” were laid and taught. The organizational spatial rhetorics and pedagogy has been explored to make visible the material conditions of the discourse’s appearance. Moreover, the experience of being an “innovative” subject has been investigated to account for the situated, contested and nuanced signification that this social fact gained “in the ground”.

Theoretically and methodologically, the study has importantly drawn from critical social theory (i.e. Michel Foucault and psychoanalysis) and places itself at the intersection between urban studies, human and economic geography.



NAME **Alys SOLLY**
E-MAIL alys.solly@polito.it



COURSE XXX cycle - 3rd year
TOPIC Spatial planning and well-being: a survey on the Swiss case
TUTOR(S) Umberto JANIN RIVOLIN

ACADEMIC CONTEXT

Barton H., 2017. *City of Well-Being. A Radical Guide to Planning*. London-New York: Routledge.

Carmona M., Sieh L., 2004. *Measuring Quality in Planning, Managing the Performance Process*, London, Spon Press.

Gleeson B., 2002. *The Difference that Planning Makes: Towards a Framework for Analysis*, Issues Paper 12, Sydney: Urban Frontiers Program, University of Western Sydney.

Walker P., John M. (eds.), 2012. *From Public Health to Wellbeing. The New Driver for Policy and Action*, Basingstoke-New York: Palgrave Macmillan.

EXTERNAL COLLABORATIONS

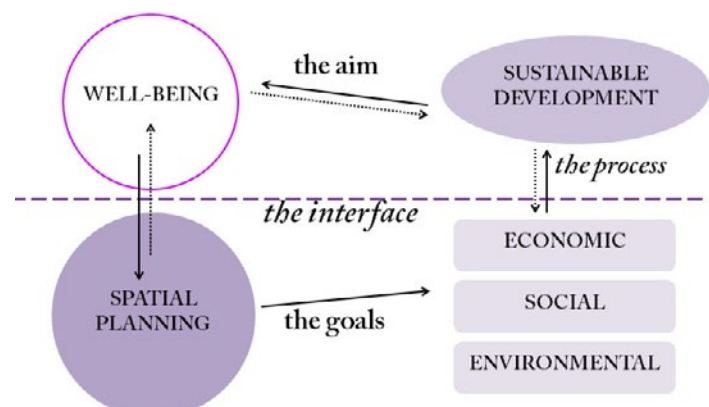
- ESPON COMPASS project - Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe (2016-2018)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This research starts from the premise that it is important to understand the relationship between urban and territorial development patterns, which depend largely on the function of spatial planning systems and policies defined within specific institutional contexts, and life satisfaction, and to identify what dimensions of spatial planning are affecting well-being. It therefore brings together two concepts often considered separately, or not adequately connected, in the literature: spatial planning and well-being. This separation, although perhaps convenient from a disciplinary viewpoint, is somewhat unnatural, since the promotion of citizens' well-being through the achievement of a wide range of economic, social and environmental objectives traditionally lies at the heart of spatial planning.

One of the aims of the research is to try to develop an analytical framework which will enable us to better understand the connection between efficient and sustainable spatial development and well-being. In order to do this, the study explores and frames the relationship between a spatial governance and planning system and its performance from a place-based perspective, taking into consideration recent trends and innovations. Switzerland, the country chosen for the survey, has a number of specific historical, geographical, social and political features, such as its strong tradition of direct democracy and its positioning in the centre of Europe, but outside the EU. However, it also faces various spatial planning challenges, which can affect the present and future well-being of its citizens, such as urban sprawl and other land-use issues.

In relation to spatial planning, indicators measuring the outcomes of a policy or the performance of planning processes may help to provide information on whether the process is getting better, worse or staying more or less the same, therefore supplying data that can be used to evaluate its efficiency. However, choosing indicators useful for policy-making is extremely complex. The research examines this issue in depth as regards the Swiss case, in terms of spatial planning and governance, and focusing on the three dimensions of economic, environmental and social well-being. The study therefore provides a state of the art overview of the Swiss system, shedding light on the factors underpinning the planning system and its functioning; and likewise on the extent to which the quality of life of the country is intertwined with the efficiency and effectiveness of its planning system. Among its findings, the research demonstrates that effective measurements on well-being can be extremely useful for policy-making.



NAME	Sara TORABI MOGHADAM
E-MAIL	sara.torabi@polito.it
COURSE	XXX cycle - 3 rd year
TOPIC	Multi-Criteria Spatial Decision Support System for Urban Energy Planning in the Built Environment
TUTOR(S)	Patrizia LOMBARDI, Guglielmina MUTANI



ACADEMIC CONTEXT

Lombardi P., Ferretti V., 2015. New Spatial Urban Decision Support Systems for Sustainable Urban and Regional Development. *Smart and Sustainable Built Environment*, 4, pp. 45-66.

Torabi Moghadam S., Delmastro C., Corgnati S.P., Lombardi P., 2017. Urban energy planning procedure for sustainable development in the built environment: a review of available spatial approaches. *Journal of Cleaner Production*, 165, pp. 811-827, doi: 10.1016/j.jclepro.2017.07.142.

EXTERNAL COLLABORATIONS

- École Polytechnique Fédérale de Lausanne (EPFL)
- Telecom Italia
- CSI Piemonte

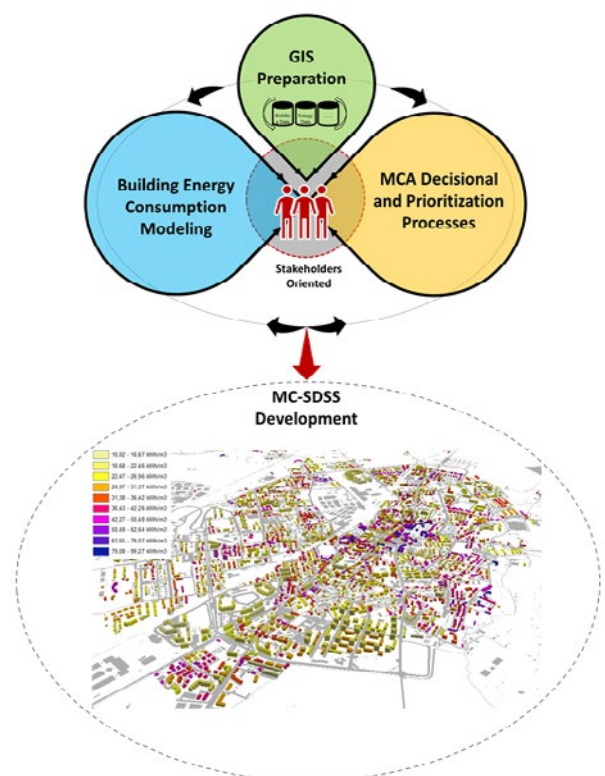
HIGHLIGHTS OF THE RESEARCH ACTIVITY

Urban and Regional Integrated Energy Planning (UR-IEP) is crucial to define transition strategies toward sustainable development and post-carbon cities; particularly, in the built environment sector which is one of the main responsible for energy consumption and carbon emissions.

The research focuses on the problem of energy consumption of the building stock in the urban environment, using Geographic Information System (GIS) to map energy consumption. The aim of the project is to model energy consumption patterns based on bottom-up statistical-engineering combination methods within energy efficient cities to provide a methodology for evaluating different energy saving scenarios to promote effective and sustainable urban planning. However, the choice among urban energy planning scenarios is extensively based on multi-actors and multi-criteria aspects. Hence in this research, the stakeholders-oriented approach plays a key role in implementing the effective strategies for regional adaptation. The thesis, therefore, is also dealing with the integration of participative decisional processes of urban energy planning by forming different workshops and focus groups involving real stakeholders. This fact can help to assess, over a mid to long term period, the mix of measures by analyzing meaningful scenarios focused on energy consumptions/environmental impacts/ economic and social aspects.

The result is a development of an energy plug-in on GIS, which is able to be used to visualize interactively by stakeholders and explore a range of possible futures for assisting urban planners, policy makers and built environment stakeholders in their efforts to plan, design and manage low carbon cities.

This work is a part of a national Smart City & Communities project, named "EEB- Zero Energy Buildings in Smart Urban Districts". The methodology can be further applied to other contexts due to its generic nature.



NAME	Francesca Maria UGLIOTTI	
E-MAIL	francesca.ugliotti@polito.it	
COURSE	XXX cycle - 3 rd year	
TOPIC	BIM and FACILITY MANAGEMENT for smart data management and visualization	
TUTOR(S)	Anna OSELLO	

ACADEMIC CONTEXT

IFMA, & IFMA Foundation, 2013. *BIM for Facility Managers*. United States of America: Paul Teicholz.

Talamo C., Bonanomi M., 2015. *Knowledge Management and Information Tools for Building Maintenance and Facility Management*. London: Springer.

EXTERNAL COLLABORATIONS

- Universiti Kuala Lumpur
- Telekom Malaysia
- City of Turin
- BFORMS Srl

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The research is focused on the exploitation of BIM methodology for Facility Management (FM) to overcome the fragmentation of the building process as well as to make effective the use of BIM models for the entire asset lifecycle. The availability and the updating of data constitute the most widespread issues for the built-up environment management. In this scenario, BIM can provide a structured framework to improve asset handover and maintenance, by introducing Lean production thinking in the construction industry and establishing collaborative processes.

The study gives a great contribution to understand how to realize a FM BIM model depending on its purpose and the stage of the process in which it is made, working on the synergy of three main aspects: Data Organization, Data Usage, Data Visualization.

The initial stage is often underestimated but is the key to make modeling successful not only in terms of worksharing but of information sharing during the building process. For this purpose, the use of interoperable systems and standards is crucial for data continuity across the lifecycle. Direct use of BIM data, as well as systems integration across CAFM and CMMS platforms or simulations software, are tested to ensure connection with facility activities. On the other side, reporting tools, 3D printing and Virtual and Augmented Reality applications are explored to test new ways to communicate both technical and dissemination data. According to my results, the highest level of graphical detail is not the only possibility for FM but also a simplified representation of objects with associated metadata can be useful to create added value services. According to this approach, the research promote the definition of BIM Management, understood not only as an integrated process leading to management, but as a process that suffers from management experience to set a practice for the building lifecycle. In this way, quality, speed and efficiency involve a reduction in knowledge-related process costs as well as the optimization of management solutions.

The issue of sustainability is pursued in economic terms: a better management and control of a building allows to obtain considerable savings that can be reinvested in order to generate more benefits for companies, users and for the environment.





XXXI CYCLE - 2nd YEAR STUDENTS



NAME **Samantha CENERE**
E-MAIL samantha.cenere@polito.it



COURSE XXXI cycle - 2nd year
TOPIC Performing Maker subjectivities.
Investigating new spaces, cultures, and subjects of production in Turin.
TUTOR(S) Ugo ROSSI, Alberto VANOLO

ACADEMIC CONTEXT

Benkler Y., 2006. *The wealth of networks: How social production transforms markets and freedom*. Yale University Press.
Richardson L., 2016. Feminist geographies of digital work. *Progress in Human Geography*, 0309132516677177.

EXTERNAL COLLABORATIONS

- Catholic University of Leuven
- Durham University, Department of Geography

HIGHLIGHTS OF THE RESEARCH ACTIVITY


Networking, peering, sharing, and collaborating are considered the pillars of a new form of economy, a 'Wikinomics' (Tapscott & Williams, 2006) enabled by the potential of digital technologies to enhance the 'wealth of networks' (Benkler, 2006) by empowering individuals to have a more active role in the realm of production. Some of these productive communities present also a physical counterpart, being involved in shared community-driven local organizations devoted to experiment, produce, and hack both software and artefacts. In fact, the so-called commons-based peer production has been experiencing its 'second wave', characterised by its merging with the realm of manufacturing; indeed, 'the emergence of networked "makerspaces" seems to distribute the means of making (Kohtala & Hyysalo, 2015; Niaros, 2016). Such spaces can either be hackerspaces, micro-factories, fab labs or other co-working spaces which are equipped with desktop and benchtop manufacturing technologies' (Kostakis, Latoufis, Liarakapis, & Bauwens, 2016).

However, the embedded nature of peer production (Kohtala & Bosqué, 2014) within Fablabs calls for a contextual investigation of the narratives, practices, and material outcomes of the communities revolving around the various shared personal fabrication workshops.

The present work situates itself within the line of research looking at Maker subjectivities and understanding Maker culture(s) as a sociotechnical practice; in so doing, it reflects an interest in 'the exploration of the process of becoming a "maker", the expression of that subjectivity through interaction with materials and participation in a situated maker community' (Toombs, Bardzell, & Bardzell, 2015: n.p.).

Drawing on the economic geography tradition that looks at cultural processes within economy, the research aims at investigating how individuals constitute themselves as Makers through the socio-spatial relation with the urban contexts they inhabit and perform. The focus is on how new forms of productive subjectivity raise through the intersection of spaces, narratives, and practices of Making by conducting an empirical ethnographic investigation of the situated and social construction of a specific community of Makers in Turin (Italy), that is, the community of Fablab Torino.



NAME	Merve DEMIRÖZ	
E-MAIL	merve.demiroz@polito.it	
COURSE	XXXI cycle - 2 nd year	
TOPIC	Reflecting the integrated conservation planning of the historic towns in Turkey. Smyrna as an Exemplary Case Study	
TUTOR(S)	Giuseppe CINÀ	

ACADEMIC CONTEXT

- Bandarin F., Van Oers R., eds., 2014. *Reconnecting the city: the historic urban landscape approach and the future of urban heritage*. John Wiley and Sons.
- Pendlebury J., 2008. *Conservation in the Age of Consensus*. Routledge.
- Demiroz M., 2017. *The Potential of Self-Organized Communities in the Urban Renewal: Izmir Historic Centre*. Conference Proceedings: Human Cities and AESOP Urban Culture Thematic Group Joint Seminar: Public Spaces For Local Life.
- Demiroz M., 2017. *Unveiling the Urban Transformation Processes in the Historical Centre of Ankara: The Case Study of Hacâ±-Bayram Quarter*. ISUF 2017 XXIV International Conference: City and Territory In the Globalization Age, Valencia, Spain.

EXTERNAL COLLABORATIONS

- Newcastle University - Global Urban Research Unit

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The central objective of this research is to discern how changes in urban governance and planning are impacting the conservation of cultural heritage; to identify the consequences for the identity of place and investigate how practice can respond most adequately to build up the sustainable policies for the urban heritage. For this reason, it will discover utmost different practices and gain knowledge from the good or bad experiences and grasp the transferable concepts. This study will investigate Smyrna (Izmir) Historic Urban Landscape which is located in the western region of Turkey as an exemplary case study to understand the dynamics of urban change linking to the changing urban governance and planning system in the context of Turkey. Currently, the Izmir Metropolitan Municipality has launched the Izmir History Project in 2013; it aims to connect the city's multi- coloured and multicultural history with the experiences of Izmir's residents. Another major goal of the new project has been claimed as preparation of the Smyrna Historic Centre to meet sustainable development goals.

The organization scheme of this project, the type of regulatory tools used in the historic district can be considered as one of the leading examples within the recent experiences in Turkey about the intersection of urban planning and conservation of cultural heritage. Although, the project has not used the approach of Historic Urban Landscape in its discourse or tools, it has given some clues to follow the recommendation indicated by the report by UNESCO in 2011. During the field survey, conducting interviews with the municipality's technical staff and with related stakeholders in the project, the author has encountered widespread under-use of holistic spatial information about the urban past/changes such as building ages, land-use patterns, urban and socio-economic fabric, and their cause and effect relations with the regulatory system, urban planning and conservation policies. The aim of this study is to scrutinise in the use of urban morphological-typological analysis to explore urban pasts through the regulatory and planning histories of Smyrna Historic Urban Landscape.

This analysis will indicate the cause and effect relations of the changing urban governance and planning with conservation/regeneration of the urban heritage. It will seek to answer how to re-conceptualize of the planning with the urban conservation field in the sustainable development age by illustrating its spatial reflections.



NAME	Vincenzo DI PIETRA
E-MAIL	vincenzo.dipietra@polito.it
COURSE	XXXI cycle - 2 nd year
TOPIC	Seamless positioning and navigation in urban environment
TUTOR(S)	Andrea M. LINGUA, Marco PIRAS



ACADEMIC CONTEXT

Chiabrando F., Di Pietra V., Lingua A.M., Jeon J., Cho Y., 2016. *Solid Image Generation for Indoor Image Based Positioning. The Bangbae Metro Station in Seoul*. Proceeding of IPIN 2016.

Chiabrando F., Di Pietra V., Lingua A.M., Cho Y., Jeon J., 2017. An Original Application of Image Recognition Based Location in Complex Indoor Environments. *ISPRS Int. J. Geo-Inf.*, 6(2), 56; doi:10.3390/ijgi6020056.

EXTERNAL COLLABORATIONS

- Electronic and Telecommunication Research Institute E.T.R.I. - Republic of South Korea

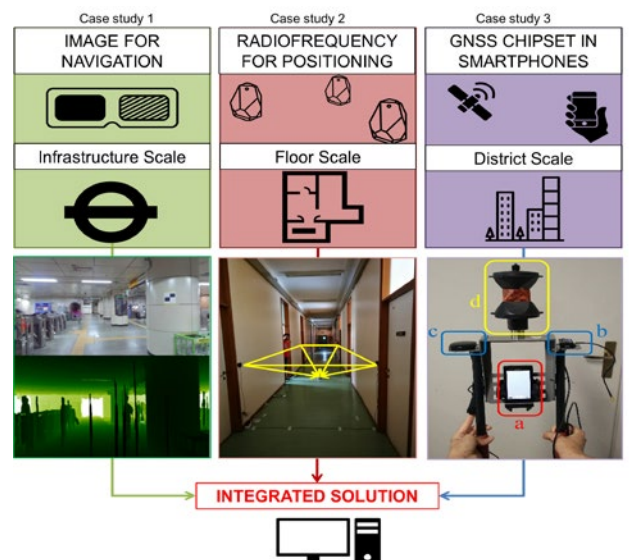
HIGHLIGHTS OF THE RESEARCH ACTIVITY

The Urban Environment is composed by outdoor spaces, indoor spaces and interface urban spaces where people lives, performs everyday tasks and interact with each other or with the context. In the era of Internet of Things (IoT) every citizen holding a portable smart technology, every sensor installed in public infrastructure, every kind of communication network spread all over the living spaces is able to collect an huge amount of heterogeneous information useful for different purpose. Among the many, the spatial related information are one of the most important data to collect and analyze as it can be used from different stakeholders (policy makers, first responders, market analyst, social expert) in different spatial-related applications (urban planning, location-based services, autonomous navigation and more). The main problem in this panorama is how to provide the location in every situation. Nowadays, the well-known global navigation satellite system (GNSS) technology is able to provide accurate positioning in outdoor space but when this functionality is transposed in an indoor environment, the data signal is loss and the position is no longer available. For this reason, in the recent years has increased the interest in indoor positioning systems, a field of investigation that exploiting different technologies for localization in closed spaces. At the state of research does not exist an unique solution able to solve the positioning issues in all environment and for all applications. In my research I'm focusing on a particular aspect of the positioning problem: the navigation in seamless condition, where the continuity of the data have to be guaranteed into the transition from the inside to the outside. I have started to analyze three main technologies:

- Image based navigation
- GNSS positioning with smartphone
- UWB positioning

The firsts solutions are approaches where a smartphone camera is the only or the primary main sensor. All camera-based system architectures use photogrammetry principle and computer vision techniques to define the position of the camera sensor. The seconds solution, permit to define position with smartphone embedded GNSS low-cost chipsets. The UWB systems are based on radio frequencies to estimate distances and use it in trilateration algorithm for positioning.

The integration of these three very different systems could be the solution for the seamlessness in positioning and navigation in urban environment.



NAME	Camilla GUADALUPI	
E-MAIL	camilla.guadalupi@polito.it	
COURSE	XXXI cycle - 2 nd year	
TOPIC	Undisciplined. Assembling a new urban expertise	
TUTOR(S)	Carlo SALONE, Paolo GIACCARIA	

ACADEMIC CONTEXT

Nishat A., Schneider T., Till J., 2011. *Spatial Agency: Other Ways of Doing Architecture*. Abingdon, Oxon-New York: Routledge.

Mould, Oli. 2014. Tactical Urbanism: The New Vernacular of the Creative City. *Geography Compass* 8, 8, pp. 529-39, doi:10.1111/gec3.12146.

EXTERNAL COLLABORATIONS

- Catholic University of Leuven

HIGHLIGHTS OF THE RESEARCH ACTIVITY


In recent years, through a fast and pervasive urban policy transfer (McCann and Ward 2011), there has been an increasing interest in urban tactics. While a precise definition of the banner urban tactics is problematic (Mould 2014), the generally recognized common features of such practices are the short time horizon, the small spatial scale, the mobilization of the locally available resources and a kind of open-endedness (Brenner 2015).

This trend is the result of the overlapping of very different agendas: it fits with the withdrawal of public resources invested in urban transformation, it offers a niche to practitioners after the effects of the economic crisis in architecture and it reflects the epistemological turn which has been recently crossing urban studies and planning theories.

The focus of this research is on the category of actors mainly enacting such practices: a growing body of new professional realities, who are stepping out disciplinary boundaries and engaging with complex spatial processes. This new generation of subversive, socially minded and politically-motivated groups are experimenting self-initiated projects, new forms of financing and alternative organizational structures, mostly in the form of multidisciplinary - and precarious - collectives. It is an ambiguous phenomenon both in its theorization and in its impact on public policies.

In the academic literature, the same practices have been alternatively framed as an opportunity for a more livable and dynamic city or as an expression of the neoliberal character of contemporary urban policies. This research aims to give a non-romantic overview of this emerging profession and on the variegated ways in which such expert authority is being constructed. Although the phenomenon could be considered marginal in relation to the scale of its impacts, this research argues that these new urban actors are especially emblematic of the contemporary trends in urban transformation and urban studies and their investigation could help to question central issues of the planning theory.



NAME	Luca LAZZARINI	
E-MAIL	luca.lazzarini@polito.it	
COURSE	XXXI cycle - 2 nd year	
TOPIC	Planning for the better countryside. Local cooperation and rural development in Italy and England	
TUTOR(S)	Giuseppe CINÀ, Matthew REED (University of Gloucestershire)	

ACADEMIC CONTEXT

Lazzarini L., 2017. Soft Cooperation and Rural Development in Aso Valley in Italy. *Journal of International Scientific Publications Agriculture and Food*, 5, pp. 238-251.

Lazzarini L., Chiarini C., 2017. The reorganization of development rights at inter-municipal level: different scenarios for an alternative land-use forecast in Seriana Valley in Italy. In Breccia C.A., Galiano-Garrigos A., (eds.), *Urban regeneration & Sustainability*. Southampton: WIT Press, pp. 50-59.

EXTERNAL COLLABORATIONS

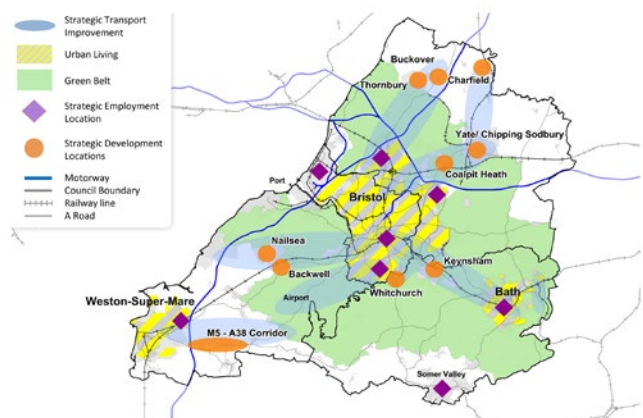
- Countryside and Community Research Institute (CCRI), University of Gloucestershire
- Istituto di Ricerca Sociale (IRS)
- Politecnico di Milano

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The PhD thesis aims at studying the relationship between intermunicipal cooperation (IMC) and planning policies, looking at rural areas as a ground to observe the impacts of this relationship. During the past year, two case studies have been explored with the aim of investigating how planning can proactively support rural development with regard to two different geographical contexts and planning frameworks.

The first one is the Aso Valley, a predominant rural territory in the Marche region characterized by high institutional fragmentation at the local level. In recent years the valley has served as a ground for experimenting some policy tools whose innovation was given by the fruitful cooperation between public and private actors in addressing the needs of rural areas. The research work has critically analyzed contents and aims of the spaces of cooperation in Aso Valley, demonstrating to which extent they have influenced policy-making processes and reassembling the fragmented institutional panorama of the local level. Emphasis was placed on the role that planning practice could play in supporting rural policies. It was demonstrated that a better integration of rural policies into territorial planning could better sustain local farmers' activity, empower agricultural enterprises and reduce the conflicts between urban and rural land uses.

The second case investigated is Bristol City Region in England, which was explored during the six months abroad as a visiting PhD at the CCRI, University of Gloucestershire. Bristol is a relevant context where observing the consequences brought in planning by the recent processes of devolution and studying the ways in which local authorities can shape an innovative idea of urban/rural relationships through cooperative patterns among local public and private actors. In particular, the research has analyzed the planning policies at local and city-regional level dealing with and affecting rural areas in the context of Bristol City Region. It has demonstrated that most of the failings of planning in supporting the development of rural areas relate to the rigidity of its policies and to the poor attitude towards the innovation of its tools. The work has argued the need for a more proactive and integrated approach for planning to re-build stronger agri-food relations and to achieve a more sustainable land use management at city regional level.



NAME	Davide LONGHI	
E-MAIL	davide.longhi@polito.it; longhi.d@extrato.it	
COURSE	XXXI cycle - 2 nd year	
TOPIC	Mobility as a Service (MaaS) in suburban and rural areas: concept design and challenges	
TUTOR(S)	Cristina PRONELLO	

ACADEMIC CONTEXT

Pronello C. , Longhi D., 2017. *Analysis of mobility patterns and transport supply through the validation data of smart cards*. HKSTS 2017 - proceedings of the 22nd Hong Kong Society for Transportation Studies.

EXTERNAL COLLABORATIONS

- Department of Regional and Urban Studies and Planning (DIST), Politecnico di Torino
- Extra.To s.c.a.r.l.
- Regione Piemonte

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The research aims at defining new mobility services for less densely inhabited areas, notably suburban and rural zones. To this end, an in depth analysis of the transport demand and supply in the case study area has carried out following a two-step methodology.

The first step aims at estimating the Origin-Destination matrices of public transport through the analysis of smartcard validations to better understand how transport demand matches existing supply. The method enables to define the most frequent lines and stops as the peak and off-peaks hours. Both transport operators and transport authorities can use the proposed methodology to estimate origin-destination matrix using smart-card validations. Such data can be used also for quantifying passengers' flows for those systems where validation is mandatory only during boarding.

The second step is the design of a Mobility as a Service (MaaS) in rural and suburban areas thanks to the information obtained in the first step. To this end, an analysis of both transport demand and supply was conducted to identify those areas where the supply cannot entirely satisfy transport demand and, therefore, more investment or alternative modes of transport are needed.

A mixed method is used, adopting together a quantitative and qualitative approach to investigate in depth the users' needs. A web-questionnaire has been designed to understand users' mobility habits and their attitudes toward a MaaS; then, focus groups with both travellers and transport operators are organised to support the definition of a new concept of mobility.



NAME	Valerio OPERTI	
E-MAIL	valerio.operti@polito.it; v.operti@rfi.it	
COURSE	XXXI cycle - 2 nd year	
TOPIC	Travellers' Preferences and Attitudes to understand Travel Behaviour and define Market Segmentation	
TUTOR(S)	Cristina PRONELLO, Emmanuele VAGHI (Rete Ferroviaria Italiana Spa)	

ACADEMIC CONTEXT

Pronello C., Camusso C., 2011. Travellers' profiles definition using statistical multivariate analysis of attitudinal variables. *Journal of Transport Geography*.

Gaborieau J. B., 2016. *Evaluation of the potential modal shift induced by the use of a real time multimodal navigator: psycho-social study of travel behaviour and attitudes*. PhD thesis.

EXTERNAL COLLABORATIONS

- Rete Ferroviaria Italiana Spa
- Piemonte Region

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Research context

Our modern world has to face several global problems, one of these is the Global Warming. To handle this problem, the international community adopted some protocols: Kyoto Protocol (1997) and Paris Agreement (2015). To achieve their targets the European Commission is focused on the human activities that produce a large quantity of greenhouse gases, as transport sector. The mobility, in particular road transport, represents approximately a quarter of Europe's greenhouse emissions.

Therefore, huge investments are being undertaken on infrastructure and new vehicles, by European Organizations and by transport companies. Nevertheless this efforts are not immediately effective and they are not sufficient without other complementary actions. The optimization of actual infrastructures and transport services is a key point to fit transport demand. One way can be developing the integrated mobility: thinking all transport means as a connected and integrated system.

Objectives

To promote and support the integrated mobility, it is needed to know:


- how travellers' attitudes towards transport influence behaviour and transport mode choice;
- what are the main barriers which restrain integrated mobility.

The aim of the PhD is to give a original contribute to this research effort, so the first objective is to understand the role of attitudes in the transport mode choice. The second is to find the most relevant obstacles which causes a gap between intention to perform an intermodal trip and real behaviour. Therefore, it can be possible to suggest some guidelines to overcome the barriers, based on the study of pilot site, but the same actions could be generalised where there are similar conditions.

Methodology

To reach this goals, the methodology is composed by these phases: survey design, sample selection, survey administration and data analysis. The pilot site will be the Torino and Milano metropolitan areas. For this PhD research a mixed approach, using a qualitative-quantitative method (focus group and questionnaires) has been chosen. This will allow to get both a quantitative data base and qualitative detailed and in depth information related to the opinions, intentions, attitudes, lifestyles, preferences. The complementary nature of the two approaches is the strength of the data collection methodology.



NAME	Constantin SANDU	
E-MAIL	constantin.sandu@ithaca.polito.it	
COURSE	XXXI cycle - 2 nd year	
TOPIC	Algorithms and Procedures for Information Extraction from Remote-Sensed Images for Emergency Management or Environmental Analysis	
TUTOR(S)	Piero BOCCARDO	

ACADEMIC CONTEXT

Sandu C., Tonolo F.G., Cotrufo S., Boccardo P., 2017. *Building damage scale proposal from VHR satellite image*. European Geosciences Union General Assembly 2017, 23-28 April 2017.

Sandu C., Vassileva M.S., Boccardo P., Disabato F., 2017. *Sentinel-1 and Sentinel-2 imaging for reference water extraction and monitoring*. European Geosciences Union General Assembly 2017, Vienna, 23-28 April 2017.

EXTERNAL COLLABORATIONS

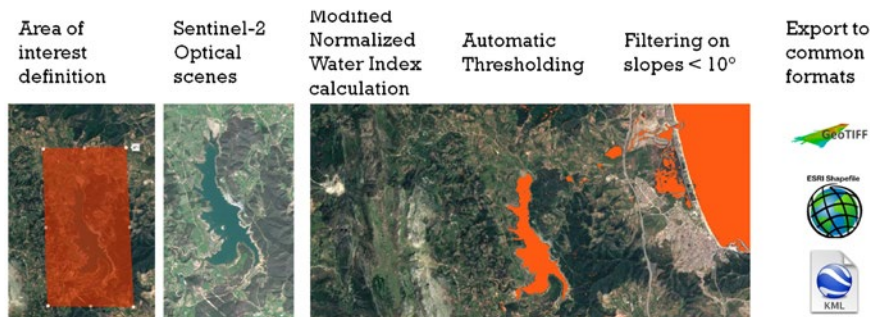
- ITHACA - Information Technology for Humanitarian Assistance, Cooperation and Action

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Damage grading of buildings, and surface water extraction from remote sensed satellite images are the two main research activities pursued during the past two years.

The aim of the first study is to develop a building damage scale tailored for analyses based on very high resolution (VHR) vertical imagery and to propose a standard for the related interpretation guidelines. The task is carried out by comparing current scales used for damage assessment by the main satellite based emergency mapping services. The study is based on the Ecuador earthquake (April 2016) and the Central Italy earthquake (August and October 2016). The results suggest that by using VHR remotely sensed images it is not possible to directly use damage classification scales addressing structural damages. Therefore, a new damage scale is proposed.

The aim of the second study is to propose and operational semi-automatic methodology for surface water extraction at a synoptic scale, based on free satellite data. The proposed methodology takes advantage of the availability of free and frequent microwave and multi-spectral information acquired by the recently operational Sentinel-1 and Sentinel-2 ESA's missions. The proposed method showed encouraging results with an accuracy greater than 75% using the Sentinel-2 optical imagery.



NAME	Diego VITELLO
E-MAIL	diego.vitello@polito.it
COURSE	XXXI cycle - 2 nd year
TOPIC	Re-thinking the relationship between city & production in a post-industrial era: the role of land use planning
TUTOR(S)	Marco SANTANGELO



ACADEMIC CONTEXT

Chapple K., 2014. The Highest and Best Use? Urban Industrial Land and Job Creation. *Economic, Development Quarterly*, 28(4), DOI: 10.1177/0891242413517134.

Reynolds E. B., 2017. Innovation and Production: Advanced Manufacturing Technologies, Trends and Implications for US Cities and Regions. *Built Environment*, 43(1), 25-43.

EXTERNAL COLLABORATIONS

- IRES PIEMONTE
- DePaul University (Chicago)

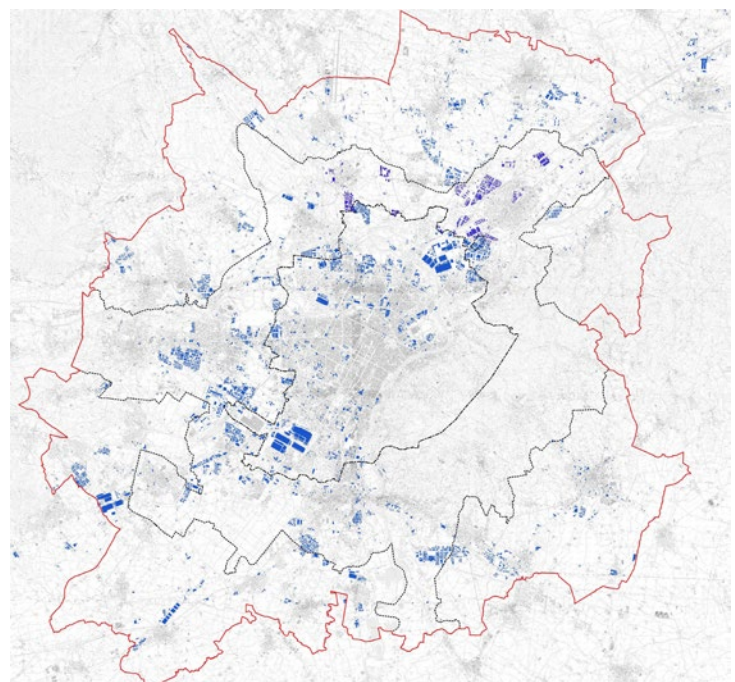
HIGHLIGHTS OF THE RESEARCH ACTIVITY

This research focuses on the role that manufacturing could play within the urban restructuring processes by assuming land use planning as a practice targeted to support the spatial organization of urban restructuring.

According to different scholars, a fourth industrial revolution is the great metamorphosis of 21st that is once again interesting the production system by generating “new opportunities for the location and spatial configuration of production” (Reynolds, 2017). This new innovation wave is prompting two phenomena that potentially could shape a new urban restructuring process for those cities that are going to adopt a re-industrialization trajectory based on advanced manufacturing: a global changing of the geography of labor and a new wave of urban manufacturing. Investigating on the entity of these emerging manufacturing technologies – in terms of economic and spatial effects – is one of the goals of this research in attempting to understand how land use planning can maximize this new technologies potential. Reason why this work assumes land use planning as a critical practice in supporting the spatial needs of this new wave of manufacturing innovation through policies and manufacturing zoning pattern oriented to review the traditional approach based on the separation between manufacturing uses and non-manufacturing uses.

In light of the influence that potential spatial impacts of advanced manufacturing technologies could generate on urban and metropolitan development, this research investigates on the behavioural dynamics that orient the localization choice of advanced manufacturing firms in order to define an innovative land use planning model in supporting to spatial needs of these new wave of manufacturing innovation.


The Turin and Chicago’s areas are observed in attempting to understand how both cities are supposing their future relationship with manufacturing, both from an economic and planning point of view.





XXXII CYCLE - 3rd YEAR STUDENTS



NAME	László CSEKE	
E-MAIL	laszlo.cseke@polito.it	
COURSE	XXXII cycle - 1 st year	
TOPIC	Garbage animals at the foot of the volcano: changing human-animal relations at the urban margins	
TUTOR(S)	Ugo ROSSI	

ACADEMIC CONTEXT

Cseke L., Marvin S., Luque-Ayal A., McFarlane C., (eds.), 2016. Smart Urbanism: Utopian Vision or False Dawn?. *Hungarian Geographical Bulletin*, 65(4), pp. 444-446.

Gillespie K., Collard R.C., 2015. *Critical Animal Geographies*. Abingdon: Routledge.

Hamilton L., Taylor N., 2017. *Ethnography after Humanism*. London: Palgrave Macmillan.

EXTERNAL COLLABORATIONS

- University of Naples Federico II, Department of Architecture

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Research interests

- Urban political ecology
- Multispecies ethnographies
- 'More-than-human' political ecology
- The geographies of waste

Over the last few years, my research has focused on the political ecology of urban waste. In my master's dissertation I dealt with the changing politics of waste in postsocialist Hungary. This project analyzed the technologization of the waste sector (e.g. development of incinerator facilities and changing ways of recycling household waste) and related socio-environmental struggles, including the post-politicization of environmental issues in postsocialist Budapest and Eastern Europe.

My current PhD research project aims at exploring the potential of urban political ecology as an analytical tool in investigating non-human vulnerability in socio-environmental conflicts such as the toxic waste crisis in Campania, Italy. Urban political ecology as a radical concept has been very effective in analyzing how environmental risks and unequal power relations affect marginalized human groups. However, the approach has had an almost exclusive human focus, the interests of animals and other non-human entities have rarely been represented. This thesis focuses on the changing human-animal relations and animal vulnerability in the toxic wastelands in Campania. In pursuit of that, the study develops a 'more-than-human' urban political ecology, that mobilizes concepts from urban political ecology, critical animal geographies and 'discard studies' as well. My 'more-than-human' ethnographic approach attempts to engage with the emerging methodological field of multispecies ethnographies. While doing research this way still does not allow us to "hear" the voices of animals, it appoints them as central figures in those investigations where they have previously been neglected or silenced.



NAME **Federico DELL'ANNA**
E-MAIL federico.dellanna@polito.it



COURSE XXXII cycle - 1st year
TOPIC Energy and Economic Evaluations to Design Urban Transformation and Requalification Programs
TUTOR(S) Marta C. BOTTERO, Stefano P. CORGNATI (Politecnico di Torino)

ACADEMIC CONTEXT

Becchio C., Bottero M., Corgnati S., Dell'Anna F., 2016. A MCDA-based approach for evaluating alternative requalification strategies for a Net-Zero Energy District (NZED). In Zopounidis C., Doumpos M., *Multiple Criteria Decision Making*. Cham: Springer. pp.189-211.

Buso T., Dell'Anna F., Becchio C., Bottero M., Corgnati S., 2017. Of comfort and cost: Examining indoor comfort conditions and guests' valuations in Italian hotel rooms. *Energy Research & Social Science*, 32, pp.94-111.

EXTERNAL COLLABORATIONS

- National University of Singapore

HIGHLIGHTS OF THE RESEARCH ACTIVITY

According to the European Roadmap 2050, the low carbon transition of cities can play an important role for responding efficiently to the threat of climate change. To reach the stated environment targets on urban scale, the government should employ significant financial resources to develop innovative and modernized technologies which are more expensive compared to conventional ones. To facilitate the public acceptance, more recent attention has focused on the incorporation of co-benefits (co-impacts) into decision-making frameworks to take in consideration the full range of stakeholders involved in the energy projects.

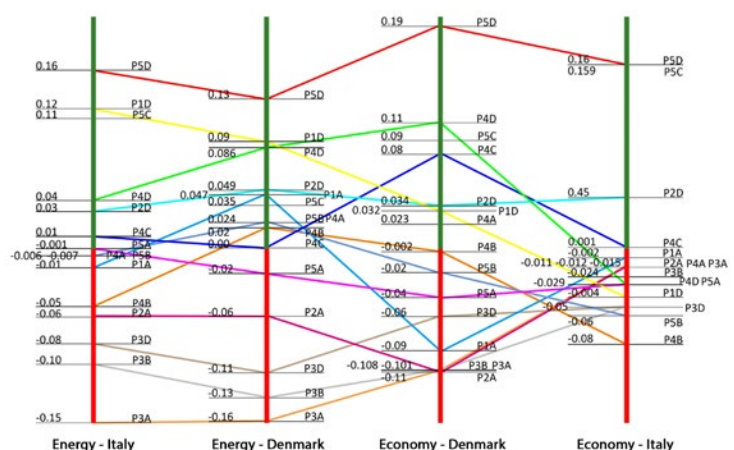
My thesis aims to create a structured approach for estimating costs and benefits in energy-efficient urban design in order to define a standardized evaluation procedure to support decision process in the context of post-carbon city.


The first part of the research provides a detailed study of virtuous existing cases which aim to achieve a large-scale renewable energy target. The research will collect multiple sources of evidence from four different case studies, located in different climate zones. Existing projects will be analysed by energy models to investigate the used technology, and to verify achievable/achieved environmental objectives.

The second section of the research deals with the identification of the co-benefits generated by the project and the involved beneficiaries, in order to find linkages between the analysed case study and the outcomes on society. Estimating benefits requires a first collection of data to identify and obtain information about the identified benefits. The negative or positive externalities raised in terms of non-marketed goods will require the use of estimating techniques that refer to approaches based on surrogate markets or surveys (revealed and stated preferences approaches).

The results of the analyses will be integrated in a Multi Criteria Analysis that provides a standardized framework able to evaluate alternative solutions according to a defined group of criteria, and considering the stakeholders' preferences.

Multi-actors analysis for supporting the choice of strategy for the energy requalification of an urban district.



NAME	Massimiliano GRANCERI	
E-MAIL	massimiliano.granceri@polito.it	
COURSE	XXXII cycle - 1 st year	
TOPIC	Mainstreaming climate change adaptation in warm temperate cities. Challenges and opportunities towards an urban planning system revision	
TUTOR(S)	Maurizio TIEPOLO, Lorenzo CHELLERI (Universitat Internacional de Catalunya)	

ACADEMIC CONTEXT

Tiepolo M., Ponte E., Cristofori E., 2016. *Planning to cope with tropical and subtropical climate change*. De Gruyter Open Editions.

Uittenbroek C., Janssen-Jansen L.B., Runhaar H.A.C., 2013. Mainstreaming climate adaptation into urban planning: overcoming barriers, seizing opportunities and evaluating the results in two {Dutch} case studies. *Reg Environ Chang*, 13, pp. 399-411.

EXTERNAL COLLABORATIONS

- UIC, Universitat Internacional de Catalunya

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This PhD thesis aims to investigate on the multiple ways cities are adapting to Climate Change (CC) using urban planning and management tools. CC has been affecting cities for many years and will continue to do so for decades to come. Urban areas house the majority of the world's population and cities are vital economic and political entities in today's society, regionally and internationally. Thus, urban areas are an important driver for accomplishing climate-related risks reduction. Climate Change Adaptation (CCA) is a way to tackle this issue and IPCC defines it as "the adjustment of human and city systems in response to actual or expected climatic changes or their effects to reduce and/or moderate the negative impacts of them". CCA in recent years increased in terms of importance and audience, globally speaking. Some cities already have created ad-hoc plans for CCA, but still the quality of these planning tools is still low and many times they lack in integration with the other plans and in operability.

In the last decade, international institutions (e.g. UN-Habitat, EU-EC, OECD, UNISDR) have increasingly used the term MAINSTREAMING in international agreements or guidelines when referring to the integration of climate-proof actions into several administrative levels. Mainstreaming, integrating, operationalization and institutionalization of CCA are notions, approaches and processes that are very topical nowadays. In particular, the mainstreaming notion is increasingly taking audience in both the scientific and decision-making dimensions.

Three are the issues where this PhD research aim to deal with. These issues focus on the integration of CCA at urban local level through:

- CCA ad-hoc plans
- Adaptation and Mitigation plans
- CCA actions (plan-free)

The CCA integration process into the urban planning and management systems could deal with different types of challenges:

- Synergies among several plans and actions
- Stimuli or barriers in the operationalization of plans and actions
- Synergies and trade-offs between Adaptation and Mitigation objectives

As an academic work, it aims mostly to identify and fulfil the knowledge gaps in the CCA operationalization and institutionalization. From an operative point of view, this work is done with the purpose of finding best practices of ways of adaptation, whether local government are able to take CC as an opportunity and, if not, whether they meet barriers in the Adaptation process and how they can overcome them.



NAME	Fabio IAPAOLLO	
E-MAIL	fabio.iapaolo@polito.it	
COURSE	XXXII cycle - 1 st year	
TOPIC	Becoming user: the post-human citizen	
TUTOR(S)	Marco SANTANGELO	

ACADEMIC CONTEXT

Braidotti R., 2013. *Posthumanism*. Cambridge: Polity Press.

Bratton B.H., 2015. *The Stack. On Software and Sovereignty*. Cambridge and London: MIT Press.

Rose G., 2017. Posthuman Agency in the Digitally Mediated City: Exteriorization, Individuation, Reinvention. *Annals of the American Association of Geographers*, 107 (4), pp. 779-793.

EXTERNAL COLLABORATIONS

- University of Lisbon, Institute of Social Sciences
- KABUL Magazine

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In recent years, discussions on the relationship between technology and urban development have insistently revolved around Smart Cities and ICTs as drivers of economic growth, environmental sustainability, and social and political innovation.

This notwithstanding, it seems now that technology is lesser providing solutions to urban problems, than posing issues and questions that out-scale the urban dimension.

To explain further, in light of recent technological advances in robotics, Artificial Intelligence, nanotechnology and prosthetics, the very notion of 'Man' (and what it means to be Human) is being questioned and reformulated. At the same time, the emergence of autonomous forms of non-human agency is challenging the centrality of 'Man' in the process of world-sensing and making (see Fig.1).

Diverse post-anthropocentric and posthumanist geopolitical accounts, drawing on different philosophical traditions, have been developed to address this process of decentering of the Human, and investigate the agency of non-human actors. In general, these theories (1) reject the idea of a Man-centred universe, with all the other beings treated as objects of cognition or exploitation, and (2) abolish the dualistic distinction between subjects and objects, assuming that all entities in the world live in a nature-culture continuum.

This project, drawing on Bratton's geopolitical model of the Stack, intended both as an emerging planetary-scale computational architecture and geographical order, intends to elaborate on the concepts of 'citizenship' and 'subjectivity' from a post-anthropocentric and posthumanist perspective.

The main research activities carried out during the first year of the PhD program are summarized as follows: (a) review of existing literature on the subject of investigation, ranging from technical discussions of Artificial Intelligence, nanotechnology, and robotics, to philosophical and geopolitical approaches developed to account for such technological advances; (b) development of the theoretical framework; (c) drafting of the research question and methodology; (d) planning of activities for the 2nd and 3rd years.

As for (d), in particular, I intend to spend a research period abroad during the second half of the a.y. 2017-18. In light of the theoretical linkage between his work and the research project I'm setting out to develop, I'm establishing contacts with Bratton, who is the Director of the Center for Design and Geopolitics at the University of California, San Diego.

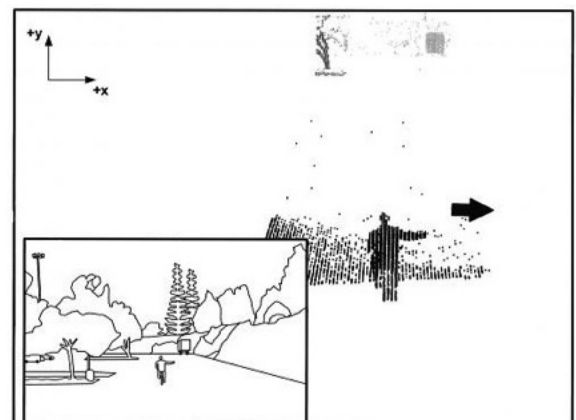


Fig.1 How Google's driverless cars see a signaling cyclist

NAME	Lucia LUPI	
E-MAIL	lucia.lupi@polito.it	
COURSE	XXXII cycle - 1 st year	
TOPIC	Web Technologies for collaborative planning in urban management	
TUTOR(S)	Marta C. BOTTERO, Guido BOELLA (Università di Torino)	

ACADEMIC CONTEXT

Foth M., Forlano L., Satchell C., Gibbs M., Donath J., 2011. *From social butterfly to engaged citizen: urban informatics, social media, ubiquitous computing, and mobile technology to support citizen engagement*. MIT Press.

Innes J.E., Booher D. E., 2010. *Planning with complexity: An introduction to collaborative rationality for public policy*. Routledge.

Silva C.N. (ed.), 2010. *Handbook of Research on E-Planning: ICTs for Urban Development and Monitoring*. IGI Global.

EXTERNAL COLLABORATIONS

- Department of Computer Science, University of Turin

HIGHLIGHTS OF THE RESEARCH ACTIVITY


The pervasiveness of ICTs to support urban management activities does not result in substantial changes in local governance, supported by an improvement of coordinative and collaborative practices among different stakeholders providing formal and informal city services. The disconnection between offline and online interactions in an inter-organizational setting for public and private actors, in addition to the distance of knowledge representation in web platforms from the logics of sectorial projects and internal organizational protocols, can be identified as the main causes of the low effectiveness of many smart city solutions.

This research project is aimed to document, analyse and evaluate the implementation process of a multipurpose urban platform intended as a shared virtual workspace for public and private initiatives, designed by following a participatory process in an agile development framework. The approach is based on hybridising consolidated design methods of computer supported collaborative systems with urban planning theories and analytical frameworks to deal with the complexity of urban dynamics, socio-technical constraints and technological limits/opportunities.

This year I focused my effort on the data collection in the three case studies used for the design research: FirstLife, WeGovNow and Co-City, three projects aimed to support a collaborative urban management. Considering the rapid evolution of web technologies and the relatively slow time for developing and testing a functioning prototype, the focus on the evaluation methods will be mostly oriented to study the decision-making process in the platform development and the early assessment of preliminary results by the stakeholders involved so far. The analysis of the design artifacts (probes, prototypes, projects results) and the socio-technical system to address leads to the formulation of specific interpretative models about:

- general framework and scope for an urban platform
- the representation of spatial actions on interactive maps
- the stratification of information in a temporal perspective and implications on documentation, planning and knowledge sharing about urban activities and entities.
- the model of actors, networks, and relations implemented in common urban activities involving multiple stakeholders.
- the descriptive framework of cooperation, coordination and collaborative practices at urban level that can be traced on a digital platform through digital contents.



NAME	Andrea MORA	
E-MAIL	andrea.mora@polito.it	
COURSE	XXXII cycle - 1 st year	
TOPIC	Praxeology and knowledge. An exploration of collective practices of construction in low income built environment	
TUTOR(S)	Francesca GOVERNA	

ACADEMIC CONTEXT

Gilbert A., 2007. The Return of the Slum: Does Language Matter?: The return of the slum: does language matter? *International Journal of Urban and Regional Research*, 31(4), pp. 697-713.

McFarlane C., 2006. Knowledge, learning and development: a post-rationalist approach. *Progress in Development Studies*, 6(4), pp. 287-305.

Nicolini D., 2012. *Practice theory, work, and organization: An introduction* (1. ed). Oxford: Oxford University Press.

EXTERNAL COLLABORATIONS

- Centro de Investigación de la Arquitectura y la Ciudad (CIAC), PUCP: Pontificia Universidad Católica del Perú, TECHO | Perú
- Urban@it, Centro nazionale di studi per le politiche urbane

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The research proposal addresses the broader debates of Urbanization in the Global South, with special reference to the SLUM discourse and the status of building construction activities in real time.

Until now the investigation has been divided into three main parts. One part regards the ordinary set of actions performed, by which low income settlements are assembled. Investigation of Knowledge accumulation and translation into the production process of built environment has been chosen as second part. Whereas, the last section attempts to dismantle great narratives of urban development, such SLUMs and Urban Informality, by which cities are conceived.

The current work examines the previous three parts through the lens of the practice-based approach. An approach chose due its capacity to unveil social world and linked phenomena from the ground. Following its assumption, a specific methodological toolbox has been composed, including: Interviews; non-participant observation and genealogical inquiry.

Selected areas are located in Lima –Peru- were local professionals in construction and planning fields will be engaged as reference communities. Actual objects of inquiry therefore concern:

- The production of human action: artifacts
- The process of production: practices
- The means by which the action is given: bodies and tools



NAME	Qi MU	
E-MAIL	qi.mu@polito.it	
COURSE	XXXII cycle - 1 st year	
TOPIC	Built Heritage Conservation in Perspective of Local Development	
TUTOR(S)	Giuseppe CINÀ	

ACADEMIC CONTEXT

Cinà G., Mu Q., Forthcoming. *Ju Er Hutong project: a rehabilitation model or an unaccomplished attempt?*

Cinà G., Demiroz M., Mu Q., 2017. *Participation and Conflict between local community and Institutions in the conservation and regeneration processes: The Case of Novara Old Town*. ICOMOS Scientific Symposium, India.

EXTERNAL COLLABORATIONS

- Huazhong University of Science and Technology

HIGHLIGHTS OF THE RESEARCH ACTIVITY

Different disciplines including cultural, economic, historical, tourism, and geography have also focused on issues such as heritage planning, the effects of tourism, identity and representation, and the regeneration of built heritages and their relationship with the renaissance of local society.

In recent years, the transformation of the conceptualization on the theme of heritage preservation has been quiet relevant for its extension to a more comprehensive (or less restrictive) concept at international level. And the concept of heritage inclined to include an increasing amount of heritage/ legacy among the objects to be protected and enhanced, including both the tangible and intangible ones.

Actually, the research has been started with representative case studies, through the interventions applied on the physical spaces of the built heritages trying to capture the more in deepen issues/matters hind behind and the relative relationship between the transformation of the built heritage and local society (such as Ju Er Hu Tong and Kashgar cases, see the Image). Moreover, the research activity is developing following and 'two tracks' approach, one is the doctoral thesis, another is the planning activities from which the candidate can achieve a realistic view and make reflections on the issues appeared in the research-planning-implementation activities. The research is an interdisciplinary and trans-disciplinary research which does not only remain to deal with the conservation of physical spaces such as a group of buildings or more largely to study the transformation of urban texture of a built area. The study will go far beyond this limitation trying to find out how the heritage conservation or in some certain cases the re-functionalization of heritage can stimulate benefit/support local sustainable development through various of modes and perspectives. The following question have been always exposed from a variety of the literatures/practices, and they are also the main challenges that will be deepening faced during the research. However, on the contrary, from various of best cases/experiences, probably we need to redefine or re-interpret the position of the built heritage. In this sense, built heritage should be conceived as the subject of the conservation, thus the questions as

"what can we do for the Heritage?"

"what can we do to find a better operational solution for built heritage conservation?" will be posed and naturally the built heritage will not be something that we plan to take advantage of.



NAME **Maurizio PIOLETTI**
E-MAIL maurizio.pioletti@polito.it



COURSE XXXII cycle - 1st year
TOPIC The bi-univocal relation between urban governance and democratization
A survey on Latin American and Caribbean countries
TUTOR(S) Umberto JANIN RIVOLIN

ACADEMIC CONTEXT

Marconi G., Pioletti M., 2015. Agenda di riforma urbana in Brasile: il ruolo politico delle città. In *Urban@it Background Papers, Rapporto sulle città 2015. metropoli attraverso la crisi ottobre 2015*. Rivista online di *Urban@it*, 1/2015, ISSN 2465-2059.

Pioletti M., 2017. Using institutional and media communication analysis as a tool to shape the multifaceted urban security in Porto Alegre (Brazil). In AA. VV., *Reducing Boundaries. Understanding exclusion through security defensive systems in wealthy urban areas: Porto Alegre (BR), Brussels (BE), Venice (IT)*. Mimesis international.

EXTERNAL COLLABORATIONS

- Universidad de La Habana (Cuba)
- Associazione Nazionale di Amicizia Italia-Cuba (Italia)
- Universidade Federal do Rio de Janeiro (Brasil)
- Università IUAV di Venezia (Italia)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The accomplishment of citizenship is considered by numerous scholars, as the crucial condition to perform democracy. Throughout the daily exercise of citizenship, democratic relationships are played in the urban space and the shapes of the social, economic and spatial urban relationships are themselves the matter of the 'urban governance'.

This research project focuses on Latin American and Caribbean countries, using as case studies a range of metropolitan areas, where it is possible to recognize different situations, in terms of economic and democratic development. In those areas, in the last decades, urbanization and urban growth have been increasingly relevant, and wide urban transformations have been taking place, in parallel to democratization strengthening, neoliberal economic development, globalization influence and governance reorganization at national level. Particular subjects of the proposed research are the definition of the relationship among local community participation, neoliberal development, and institutional action, and the social, economic and spatial impact assessment of large urban redevelopment intervention, in terms of the 'right to the city'.

Dealing with such a complex notion as the 'right to the city', implies to consider at the same time the land and house tenure, the right to housing and to access to all the urban services. Because of that, the financial and material actions of the urban developers, the political orientation of local governments, the active involvement of local stakeholders, and the juridical and financial frameworks are analyzed.

This program is carried out according to a comparative approach and a direct observation of the cases, which are Rio de Janeiro (Brazil), La Habana (Cuba), and Bogotá (Colombia). In each of them dynamics characterizing the urban redevelopment of historical urban centers are taken into consideration, since they are the physical destination of global touristic flows in the city and inner-city residential areas, where the 'urban developers' are often interested to invest. New buildings for the middle class would be profitable. In particular, the interaction among the 'urban developers', the institutions and the civil society, is shaped using the frame of the 'urban contract'.



NAME	Federico PIOVESAN
E-MAIL	federico.piovesan@polito.it
COURSE	XXXII cycle - 1 st year
TOPIC	The Impact of ICT in Participatory Urban Reactivation
TUTOR(S)	Giancarlo COTELLA, Grazia BRUNETTA



ACADEMIC CONTEXT

Kelty C.M., 2016. Too Much Democracy in All the Wrong Places: Toward a Grammar of Participation. *Current Anthropology* 5000–5000. Doi:10.1086/688705.

Day D., 1997. Citizen Participation in the Planning Process: An Essentially Contested Concept? *Journal of Planning Literature*. 11, pp. 421-434. doi:10.1177/088541229701100309.

Hess C., Ostrom E. (Eds.), 2007. *Understanding knowledge as a commons: from theory to practice*. MIT Press, Cambridge, Mass.

Mangialardo A., Micelli E., 2017. From sources of financial value to commons: Emerging policies for enhancing public real-estate assets in Italy: Emerging policies for public real-estate assets. *Papers in Regional Science*. doi:10.1111/pirs.12310.

Simon J., Bass, T., Boelman V., Mulgan G., 2017. *Digital Democracy: The Tools Transforming Political Engagement*. Nesta.

Shaw J., Graham M. , (Eds.), 2017. *Our digital rights to the city*. Meatspacepress.

Shelton T., 2017. The urban geographical imagination in the age of Big Data. *Big Data & Society*, 4, 205395171666512. doi:10.1177/2053951716665129.

EXTERNAL COLLABORATIONS

- Avanzi - Sostenibilità per Azioni

HIGHLIGHTS OF THE RESEARCH ACTIVITY

I study the impact that information and communication technologies are having on participatory processes. My goal is to investigate the relation between communities and urban spaces in emerging digital societies.

While participatory activities can be used for a variety of purposes, I specifically focus on projects where stakeholders are involved in deciding how urban vacants (buildings and/or spaces) can be given back to their local communities.

I will closely follow a group of external facilitators who are managing a set of participatory processes in Chieri (a municipality 30 km from Turin). These include the re-qualification of an urban vacant (a former textile factory), the co-management of public spaces that the municipality provides to local citizen associations, and the organization of 2018 edition of the AREA festival, an event to promote the commons.

Using action research as methodology, I will propose a number of digital tools (preferably based on free-libre open source software) that may help to collect knowledge from different stakeholders (like public administration employees, formal and informal citizen groups, and private firms); coordinate efforts; facilitate decision-making; and other activities that may emerge throughout the process.

My theoretical framework stands on three pillars. The first builds on literature about participatory planning and deliberative democracy, to define the role that knowledge plays within participatory processes. The second pillar uses research on the commons to analyze novel management strategies of urban spaces. Finally, the pillar on the digital right to the city attempts to frame the participatory process within the context of how pervasive use of technology, and the data that results from it, are impacting our cities.



NAME **Giulia RAFFELLI**
E-MAIL **giulia.raffelli@polito.it**



COURSE XXXII cycle - 1st year
TOPIC Modelling evapotranspiration, irrigation, snowmelt and drainage at plot and regional scale
TUTOR(S) Stefano FERRARIS, Davide CANONE

ACADEMIC CONTEXT

Raffelli G., Previati M., Canone D., Gisolo D., Bevilacqua I., Capello G., Biddoccu M., Cavallo E., Deiana R., Cassiani G., Ferraris S., 2017. Local- and Plot-Scale Measurements of Soil Moisture: Time and Spatially Resolved Field Techniques in Plain, Hill and Mountain Sites. *Water*, 9, 706.

Allen R.G., Pereira L.S., Raes D., Smith M., 1998. Crop evapotranspiration-Guidelines for computing crop water requirements. *FAO Irrigation and drainage paper 56*. FAO, Rome, 300(9), D05109.

Hargreaves G.H., Samani Z.A., 1982. Estimating potential evapotranspiration. *Journal of the Irrigation and Drainage Division*, 108(3), 225-230.

EXTERNAL COLLABORATIONS

- SMAT - Società Metropolitana Acque Torino

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The main goal is to quantify of the role of soil, plants, irrigation and snow in the recharge of drinking water reservoirs in the Città Metropolitana of Torino, both now and with future climate change scenarios.

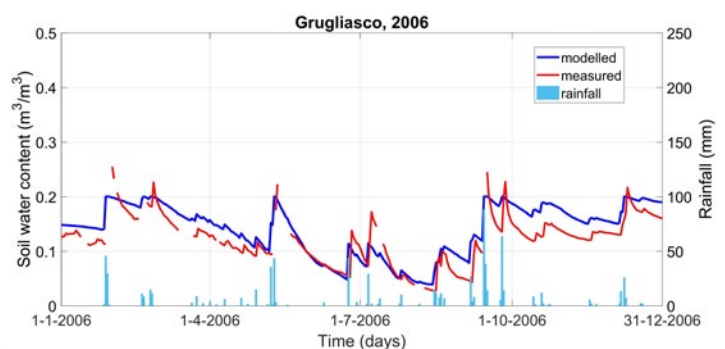
Monitoring (of existing and new datasets) and laboratory tests are combined with modelling. Specifically, monitoring and laboratory tests are fundamental for models calibration and validation. Modelling phase is done at plot and regional scale, and includes: (1) models development and application (now and with future climate scenarios); (2) models comparison and evaluation of possible integrations.

Up to now, a soil bucket model based on FAO's 56 (Allen et al., 1998) has been developed and validated in different conditions of land use, land cover and altitude, without any calibration parameters.

In this model, soil is considered as a box made of different layers. For each layer, the model evaluates a daily mass water balance. Inputs are represented by: (1) meteorological data; (2) the digital elevation modl; (3) soil texture and soil depth; (4) soil hydrological properties and (5) irrigated surfaces. Model outputs are: (1) actual evapotranspiration (AET), i.e. the real water consumption due to plants action obtained as a fraction of PET (Allen et al., 1998); (2) irrigation and irrigation volumes, obtained as a function of crop needs: if a water stress situation occurs, the model "irrigates" the cell with a fixed water quantity, based on real farmers' behaviour.

With this work we highlighted the importance of irrigation estimates in a region with high water consumption but with lack of data. We observed that both soil water content variations (therefore, AET volumes) and irrigation (volumes and dates) are well estimated by the model on average.

Future work will include the extension to the Regione Piemonte, both now and with future climate change scenarios. Moreover, other models will be developed and tested, with the aim of comparison and with a focus on increased complexity. The aim is to evaluate potential complementarity among soil hydrological models of different complexity.



NAME **Leonardo RAMONDETTI**
E-MAIL leonardo.ramondetti@polito.it



COURSE XXXII cycle - 1st year
TOPIC Building The Inland Metropolis. The Case Of Zhengzhou, Henan
TUTOR(S) Angelo SAMPIERI, Francesca GOVERNA

ACADEMIC CONTEXT

Ramondetti L., Safina A., Carota F., 2017. Yanzhou Island, a well being reserve inside the Zhaoqing New Area. In *Urban Design*, ongoing publication. CeNTO (Chinese New Towns) research, ongoing.

EXTERNAL COLLABORATIONS

- Tsinghua University of Beijing
- South China University of Technology of Guangzhou

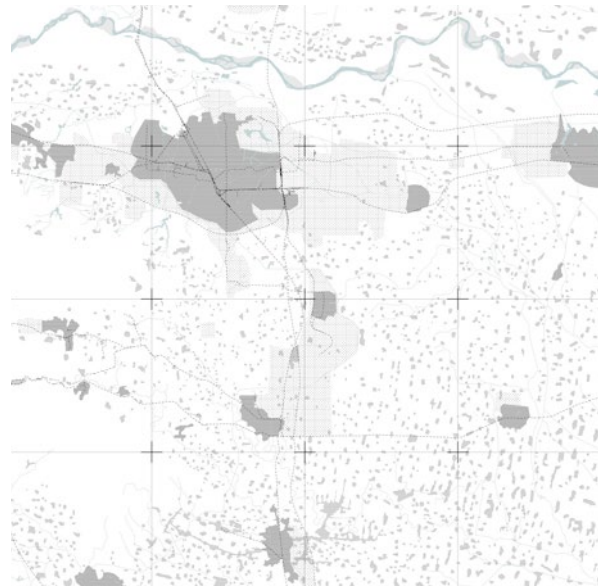
HIGHLIGHTS OF THE RESEARCH ACTIVITY

The proposal aims to investigate contemporary Chinese urban transformations focusing on the inland territories. The inner plains of China has been shaped through the centuries in order to be a huge agricultural reserve, composed by small infrastructures and characterized by a widespread urbanization. Since the last decades, these spaces has been affected by a great urban expansion mostly driven by new infrastructure policies. Zhengzhou, in Henan, could be considered one of the most interesting place where it is possible to inquire this phenomenon.

However Zhengzhou urban expansion is related to the creation of the railways infrastructures in 1906 the city has mostly grown in the last decades. In line with Chinese urban expansion, in 2010 Zhengzhou become a center of 4.28 millions of inhabitants in an administrative area of nine millions of people. However the city maintains the characteristics of a compact urban nucleus. In Zhengzhou the apotheosis of this 'centripetal process' was the promotion of Zhengdong New District: an urban area of 150 sq km, bigger than the existing city.

Although Zhengdong New District is still under construction, nowadays it is possible to see another shift in urban policies. Since 2004 the national government is investing in the 'Central Rise Strategy', promoting several urban agglomerations in order to create different regional growth poles. The 'Central Plans' (in which Zhengzhou is the major center) should be one of the main growth pole of the inland. For this reason since 2006 the city of Zhengzhou is promoting the creation of Zhengbian New District, a 'composite city' of 400 sq km developed in a vast area of more than 2.100 sq km between Zhengzhou and the city of Kaifeng. Nowadays this area is facing an industrial restructuring and a spatial reconstruction in order to become a demonstrative area for coordinated urban and rural development in the central regions.

At present in Zhengzhou several multi-scale projects are acting in a punctual or diffuse way, re-articulating functions, relationships and hierarchies. If in the past decades the debate regarding Chinese great urban transformations mostly focus on coastal regions, nowadays seems to be interesting give more attention to the inner areas. Inquiring the spatial characteristics of Zhengzhou metropolitan agglomeration, the policies and the economies, could provide a critical description on how China is rethinking and rebuilding its inland.



NAME	Niccolò RAPETTI	
E-MAIL	niccolo.rapetti@polito.it	
COURSE	XXXII cycle - 1 st year	
TOPIC	BIM implementation for infrastructure projects: Methods and tools for information modeling and management	
TUTOR(S)	Anna OSELLO	

ACADEMIC CONTEXT

Succar B., Sher W., Williams A., 2012. Measuring BIM performance: Five metrics. *Archit. Eng. Des. Manag.*, 8 (2), pp. 120-142.

Clevenger C., Ozbek M., Mahmoud H., Fanning B., 2014. Impacts and Benefits of Implementing Building Information Modeling on Bridge Infrastructure Projects. *Mt. Consort.*

Ciribini A.L.C., 2013. Level of Detail e Level of Development: i processi di committenza e l'Information Modelling. *Techne*, 6, pp. 90-99.

EXTERNAL COLLABORATIONS

- ANAS S.p.a

HIGHLIGHTS OF THE RESEARCH ACTIVITY

In the first year of activity, my research was focused on the investigation of the main research topics, clarifying the research objectives towards the definition of main research questions and the definition of a wide literature review.

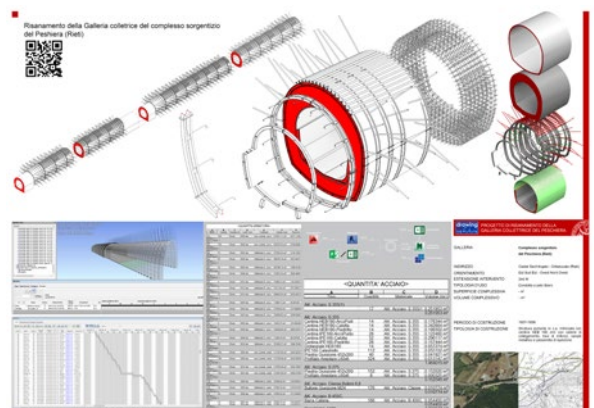
Starting from the macro concept to introduce the BIM methodology into a Contracting Authority, like ANAS S.p.a, the research aims to realize a framework of processes and methodology useful to facilitate the BIM adoption for infrastructure projects. In order to obtain this goal, the early steps of research were dedicated to the study of international literature, the mapping of internal process to assess and to promote the change management, phase from a CAD based to a BIM based approach and then the selection of project pilot to test the applicability of BIM in the infrastructure projects

The preliminary findings of the first year were the realization of a framework of initiatives to provide a gradual adoption of BIM methodology for public works. Especially, the initiatives purposed aim to reach from one hand to provide contractual instrument, such as the Employer's Information Requirement (EIR), useful to manage the procurement phase. On the other hand, the research was focused on the coordination and validation of BIM models' contents and then the realization of first BIM library, dedicated for infrastructure project. In the next stages, the research activity will continue to the development of a one or more case studies to define the right information workflow, testing interoperability process, using main exchange formats (IFC, LandXML, IMX, DGN, DWG). The aim is to estimate the integrity of data during the process.

Furthermore, another part of research activities will dedicate to investigate the concept of Definition of Level of Development (LOD), that plays a key role to determine what information should pass between different discipline for each work stage. Especially, for an infrastructure project, where model with information must interact with geological, hydraulic, environmental parameters and many others information at different scale and work stages. All these factors are challenges to overcome to promote the BIM adoption, especially in civil infrastructure.

A second part of research activity will dedicate to define the appropriate metrics to evaluate the standardization of BIM working practices, processes and methodologies. It is a key issue for the industry, and as consequence it is essential to assess the productivity improvements, that these implementations should promise. In this way, it will be possible to measure the BIM maturity of organization and to assess the competencies, potentially, and to benchmark their progresses.

The last part of activities will aim to standardize BIM working best practices, processes and methodologies for downstream users of the digital asset. In order to ensure the right information useful for the facility management of the infrastructure during the entire life cycle.



NAME **Pablo Angel RUFFINO**
E-MAIL **pablo.ruffino@polito.it**



COURSE XXXII cycle - 1st year
TOPIC BIM, GIS and VR for Smart Buildings and Smart Cities
TUTOR(S) Anna OSELLO

ACADEMIC CONTEXT

Nam T., Pardo T., 2011. *Conceptualizing smart city with dimensions of technology, people, and institutions*. Proceedings of the 12th annual international digital government research conference: digital government innovation in challenging times. pp. 282-291. ACM.

Macdonald J.A., 2012. *A framework for collaborative BIM education across the AEC disciplines*. 37th Annual Conference of Australasian. University Building Educators Association (AUBEA). 4, pp. 4-6.

Deng Y., Cheng J.C., Anumba C., 2016. Mapping between BIM and 3D GIS in different levels of detail using schema mediation and instance comparison. *Automation in Construction*. 67, pp. 1-21.

EXTERNAL COLLABORATIONS

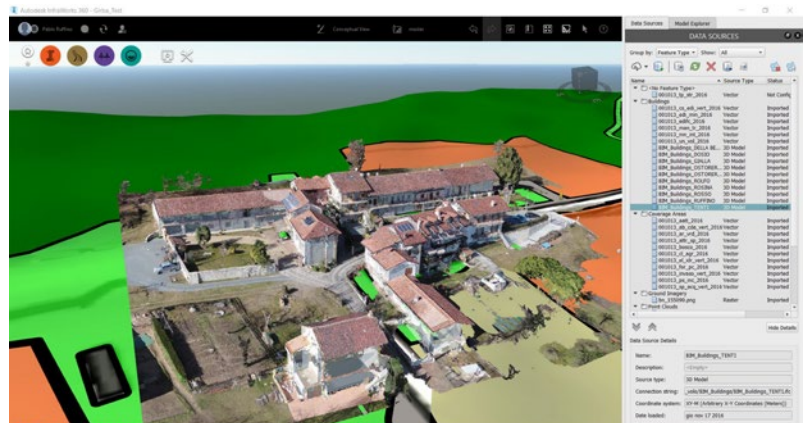
- MMU – Multimedia University of Malaysia
- IIS Sella Aalto Lagrange
- Associazione per il patrimonio dei paesaggi vitivinicoli di Langhe-Roero e Monferrato

HIGHLIGHTS OF THE RESEARCH ACTIVITY

The research topic focus on the digitalization of the built environment as important contribution for the Smart Cities. The thesis is going to give attention to the main consolidated and innovative tools usable in the work world and in the training and educational environment in order to facilitate the realization of Smart Cities. More specifically, the research is committed to consider several technologies already existing and to understand potentialities and limitations. The technologies considered are: BIM (Building Information Modelling), GIS (Geographic Information System), VR (Virtual Reality) and AR (Augmented Reality). Essentially, the thesis aims to do a critical study about the possible interaction between Building Information Models and Geographical Information Systems to store and manage the real estate information [Fig. 1] and how VR and AR visualization tools can be used to interact with the data and the three-dimensional models.

The basic hypothesis is that 3D models of buildings and cities, besides the digitalization of the built environment, allow to get new kind of innovative solutions during the construction life cycle in order to store, manage and visualize the building data but it is not limited to this. For example, taking the advantages of the 3D models and the VR/AR tools, it is possible to develop interesting solutions such as fire evacuation simulators, virtual environments to acquire specific skills in training activities, virtual tours applied to museums or cultural heritage sites for distant tourists or to support the occupation therapies. In conclusion, this research tries to get answer at following questions:

- Can BIM methodology contribute for achieving Smart Cities objectives?
- What are the interactions between BIM and GIS?
- How can BIM education be introduced in AEC (Architecture, Engineering and Construction) curricula?
- What is solution are achieving using AR and VR technology in AEC industry?
- Is it possible to apply AR and VR tools at BIM models in training, tourism and health fields?



NAME **Astrid Coromoto SAFINA ALMEIDA**
E-MAIL **astrid.safina@polito.it**



COURSE XXXII cycle - 1st year
TOPIC **The role of small cities in large-scale processes of urbanization.
An emphasis on the construction of global city-regions**
TUTOR(S) **Francesca GOVERNA, Angelo SAMPIERI**

ACADEMIC CONTEXT

Han S.S., 2010. Urban expansion in contemporary China: What can we learn from a small town?. *Land Use Policy*, 27, pp. 780787.
Kendall P., 2015. Between big city and authentic village: Branding the small Chinese city. *City*, 19(5), pp. 665-680.
Ramondetti L., Safina A., Carota F., 2017. Yanzhou Island, a well being reserve inside the Zhaoqing New Area. *Urban Design*, 13(5), pp. 54-61
Wu F. (2016). China's Emergent City-Region Governance: A New Form of State Spatial Selectivity through State-orchestrated Rescaling. *International Journal of Urban and Regional Research*, 40(6), pp. 1134-1151.

EXTERNAL COLLABORATIONS

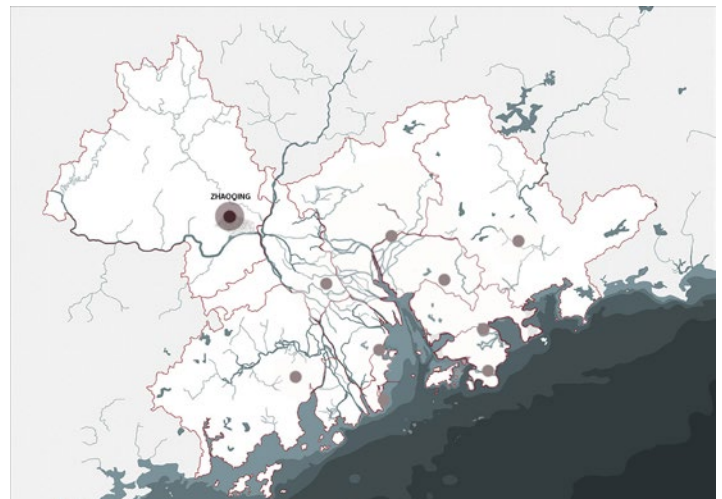
- CenTo Research on Chinese New Town - South China - Torino Collaboration Lab
- Yanzhou Island Concept Planning - South China - Torino Collaboration Lab

HIGHLIGHTS OF THE RESEARCH ACTIVITY

This research project aims at understanding the role of small cities within particular large-scale processes of urbanization.

The research focuses on studying the formation of global city regions and its implications in different but not contradictory contexts, from the point of view of the small and peripheral city that without been at the centre of the large-scale process, belongs to the centrality that the process represents. This approach puts small cities at the centre of the discussion and challenges the mostly non-European tendency of studying big cities for producing generalizable representations of urbanity.

The research proposes to study how small cities have embraced the figure of urban entrepreneurship in order to attract national and international investments, attain support from central governments and achieve urban expansion, while mediating with the complicated relationship between the big city, the small city and the rural village. The research also proposes to understand how this urban entrepreneurship contributes or impedes to the creation of a truly polycentricism within regional urbanization processes and how small cities enter in the competitive regional arena and create networks with other urban development nodes. In order to do so, initially the study will focus on Zhaoqing City, in Guangdong Province, in the Pearl River Delta (PRD). This first case study illustrates how a small peripheral city has undergone a process of urban expansion through the construction of a new town. Encourage by the decentralization policies of the central state, the implicit branding of "been part of the PRD" and the impulse of the regional government fomenting urban entrepreneurialism and competitiveness, the city of Zhaoqing is expecting to be fully integrated into the region and become an important new node in the very complicated urban system thanks to the creation of this new area and the densification of the "free" agricultural territory that surrounds it. Successively, a second case study (to be decided) will be introduced as a counterpart to the Chinese case. This second case will be introduced with the goal of analysing in a comparative approach the reality of small cities within a bigger process of urbanization and to propose a thesis that supports that in the case of the role of small cities, the Chinese case is not an incomparable phenomenon, and is in fact relevant to confront if there is a global tendency for the role of small cities regardless of their difference of scale.



NAME	Francesco SEMERARO
E-MAIL	francesco.semeraro@polito.it
COURSE	XXXII cycle - 1 st year
TOPIC	Building Information Modelling methodology for infrastructure projects
TUTOR(S)	Anna OSELLO



ACADEMIC CONTEXT

Eastman C., Teicholz P., Sacks R., Liston K., 2011. *BIM Handbook A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors* (2nd ed.). Hoboken, New Jersey: Jhon Wiley & Sons, Inc.

He Q., Wang G., Luo L., Shi Q., Xie J., Meng X., 2017. Mapping the managerial areas of Building Information Modeling (BIM) using scientometric analysis. *International Journal of Project Management*, 35(4), pp. 670-685.

Succar B., 2009. Building information modelling framework: A research and delivery foundation for industry stakeholders. *Automation in construction*, 18(3), pp. 357-375.

EXTERNAL COLLABORATIONS

- ANAS S.p.A., Design Coordination department, Rome (IT)

HIGHLIGHTS OF THE RESEARCH ACTIVITY

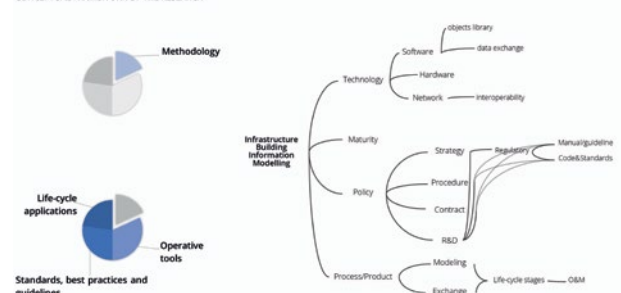
The EU strategy for the medium to long-term period in order to enhance performances of the Construction sector is related to research and innovation activities mainly focused on technology-oriented activities. These activities cover a broad range, such as ICTs. The Directive 2014/24/EU on public procurement is an operative measurement related to this objective and states that for public work contracts and design contests, Member States may require the use of specific electronic tools, such as of building information electronic modelling tools (BIM). D.Lgs. 50/2016 implemented the EU directive for the Italian context. The general objective of the research is focused on the BIM methodology application to infrastructure projects, mainly transportation infrastructures. The framework of the research is focused on three main areas:

- Technology. In terms of implementations concerning software, hardware and network applications. In particular, interoperability for open formats and infrastructure objects library will be analyzed.
- Policy. In terms of production of series of code and standards, and manuals and guidelines in order to help professionals in their daily work activities, and public authorities (or bodies governed by public law) to provide a code of practices able to re-assess the company organization. In particular, a series of contract document for significant applications in the public sector will be developed.
- Process/Product. In terms of managing a BIM model of an infrastructure. Investigations are needed concerning the modelling techniques and data exchange formats in order to produce the best fitting models for each stage of the life-cycle. In particular, a focus on the Operations&Maintenance (O&M) phase will be developed.

ANAS is a public industrial company, leader into the Italian market of design, construction and maintenance of transportation infrastructures. ANAS represents the main case study of the research, due to its plan of BIM implementation, and also the source of all the case studies that will be analyzed. Preliminary tests of procurement management have been carried out during the first year of research, developing a set of contract documents for public contract of design services and works.

Further investigations will involve the realization of infrastructure object libraries and the anticipation of O&M information at the Design phase in order to define standards of model management for construction and maintenance.

CONCEPTUAL FRAMEWORK OF THE RESEARCH







FOR MORE INFO:

dottorato.d.ist@polito.it

<http://dottorato.polito.it/urb/en/overview>

