# *Exploring urban change through visual and environmental simulations*

**International Workshop** 17 - 18 June 2010

**Milano, Politecnico, Laboratorio di Simulazione Urbana**

**Venue:** **Laboratorio di Simulazione Urbana** | Edificio Sottomarino, via Bonardi, 3
**Spazio Aperto Nave** | Edificio Nave, floor -1, via Bonardi, 9

## Program

- *Day 1, Morning*: **Opening seminar: Work in progress of the Labs of Urban simulation and Environmental modelling**, whereby results of recent research and educational activities carried out at the School of Architecture and Society are presented.

***Thursday, June 17, AM*** | **venue: Spazio Aperto Nave**

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| 09:30 | | **Workshop opening** |
| 09:45 | **PANEL I** | ***Fausto Curti*** *(Polimi)*, Chair of the panel<br>Introduction to the Workshop |
| 10:00 | ***Barbara Piga*** *(Polimi)* | **Research activities and experimentation at the Laboratorio di Simulazione Urbana *(some results of completed work)***<br>*The Urban Simulation Laboratory is a research and didactic facility. The research is developed with students doing their internship at the laboratory. Different kinds of simulations have been used to clarify the cumulative impacts of the various urban projects, at the Garibaldi-Repubblica area in Milan, and the ways to better adapt them to the local context. The completed work carried out during the first three years of the Laboratory will be presented.* |
| 10:30 | ***Valerio Signorelli, Daniele Villa*** *(Polimi)* | **Applications of City Engine and Unity for Urban Simulation**<br>*The aim of this work is to analyze and apply new instruments and techniques to create virtual environments, applicable in different urban contexts for simulating the inter sectoral effect of planning decision and large scale projects implementation. The intention is to analyze and suggest a possible workflow for educational and professional purpose using cartography and other data with* |

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| | | *different software easy to use and integrable together. In this research, a procedural city generator and a game engine has been used.* |
| 10:45 | ***Laura Cibien, Francesco Secchi*** *(Polimi)* | **Three steps toward the Luminous planning table**<br>*One of the research projects carried out within the Urban Simulation Laboratory involves the construction of a tangible table as a tool to support students training and participatory planning. The research is carried out by a graduate student and a degree student in Urban Planning.*<br>*The presentation will briefly introduce the table and will describe some similar tools and their purposes, it will show the research aims and a practical demonstration of what has been produced until today.* |
| 11:00 | | Coffee break |
| 11:15 | **PANEL II** | ***Gianni Scudo*** *(Polimi)*, Chair of the panel<br>Introduction to the Session |
| 11:30 | ***Matteo Clementi*** *(Polimi)* | **Strategies for the energy autonomy of the built environment: a case study in Valtellina**<br>*The research addresses the issue of reducing $CO_2$ emissions of an administrative unit in a mountain area of the Lombardy region. Starting from the fact that the residential sector appears to be the largest local emitter, the study has been focused on understanding the possibilities to meet the energy demand of the local built environment and the local supply of the renewable energy. Geographic Information Systems have been used to understand and represent the local renewable energy potential through thematic maps, and to analyze the geometric and technological factors that influence the energy demand of the existing buildings.* |
| 11:50 | ***Elisabetta Troglio, Matteo Doni*** *(Polimi)* | **Sustainable urban morphology for new quarters and within the existing urban fabric in Europe**<br>*Two contributions are presented. The first introduces the main design aspects that influence the district energy profile from a theoretical and project/management point of view. Different European best practice case studies are analyzed and presented with a particular focus on the link/gap between theory and project. A grid suitable to analyze the characteristics of a district from an energy sustainable point of view is proposed and applied to Hammarby Sjöstad – Stockholm (Sweden).*<br>*The second contribution introduces a methodology to assess the energy consumption of the urban form. The method was developed at the European Institute For Energy Research (EIFER) and applied on 25 portions of Milano using GIS. It is possible to produce an energy map of the city and compare the performance of different urban tissues.* |

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| 12,20 | ***Valentina Dessì*** *(Polimi)* | **Urban Comfort and design tools**<br>*The aim of the presentation is to show how to apply the research results inside the education process by proposing innovative methodologies and tools. In particular, the contribution of the environmental design discipline proposed in the course is based on the methodology implemented for the RUROS research project. The goal is to propose simplified guidelines for the design of comfortable urban spaces, especially for the redevelopment of existing urban spaces. For instance, the research is based on the assessment of microclimatic variables, obtained from both on fields surveys and the use of simulation tools for the computation of thermal comfort conditions. Two master theses that apply this methodology are presented.* |
| 12,40 | ***Gianni Scudo*** *(coordinator) (Polimi)* | **Questions and comments** |
| 13,10 | | Lunch |

- *Day 1, Afternoon:* **European simulation laboratories. Exchange seminar** where purposes, equipments, educational and research experiences implemented in similar European laboratories, research structures and institutions are presented and discussed; the works are illustrated by international speakers and commented together with the invited experts, professors and students of the school.

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| 14:30 | **PANEL III** | ***Lidia Diappi*** *(Polimi)*, Chair of the panel<br>Introduction to the session |
| 14:45 | ***Martijn Stellingwerff*** *(TUDelft)* | **New Urban / Architectural Envisioning experiments at the Delft Faculty of Architecture**<br>*After loosing our faculty building in a fire in May 2008, we had to reconsider and build up our facilities for research and education. In this presentation we will briefly describe the laboratories and experiments from the past and then we will outline our view on new approaches towards a set of combined digital and physical techniques.*<br>*We will also introduce the term "envisioning" as a general new theme and replacement of the word "endoscopy" in the European Architectural Endoscopy Association. The next EAEA conference will be held in Delft in autumn 2011.*<br>Questions |

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| 15:25 | ***Dominik Lengyel, Catherine Toulouse*** *(Brandenburg University of Technology)* | **Physical and Virtual Urban Models for Cologne**<br>*The use of physical and virtual models in the city of Cologne is presented, highlighting their role in the communication and understanding of urban projects. The physical urban city model is an important tool of the urban design council that advises the town administration on architectural and urban projects that have a substantial impact on the city scape. The city model is an installation used internally and publically, inviting Cologne's citizens and visitors to experience the city in an unusual yet tempting way.*<br>*Different purposes demand different approaches. This is presented in a series of projects illustrating the city of Cologne virtually yet in close relationship to the physical urban model: an illustration of building block heights and their distribution within the city centre, a development of a business district area between fast train station and trade fair area and finally the construction phases of Cologne Cathedral during the last two thousand years, recently installed as permanent installation between the Cathedral towers' basements, an example of temporal developments of a model.*<br>Questions |
| 16:10 | ***Margherita Cavallo*** *(Glasgow City Council)* | **The Glasgow Urban Model: accessibility, participation and improved communication within the planning system**<br>*The aim, construction, use and maintenance of the digital urban models adopted by the City Council in 2008 are presented. In particular, the focus is on the accessibility and usability of this type of data in the planning process and how the models can affect the process and the relationship of the different actors involved (city council, developers, designers).*<br>Questions |
| 16:50 | ***Cynthia Echave*** *(Agència d'Ecologia Urbana de Barcelona)* | **Simulation tools in urban transformation planning**<br>*The Urban Ecology Agency of Barcelona bases his experience in the development of methodologies and simulation tools in order to analyze urban ecosystems. The main objective of this effort is be able to evaluate and establish the adequate strategies for a more sustainable urban design and management of resources. The aim of this session is to expose the simulation tools used at the Agency specially focused on mobility, improvement of habitability levels on public spaces, waste and water management and energy consumptions.*<br>Questions |

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| 17:30 | ***Alessandro Rogora*** *(coordinator)* | **Open discussion**<br>Invited speakers: ***Paola Caputo*** *(Polimi),* ***Eckart Lange*** *(University of Sheffield),* ***Steve Tiesdell*** *(University of Glasgow)* |
| 18:15 | | Conclusion of the session |
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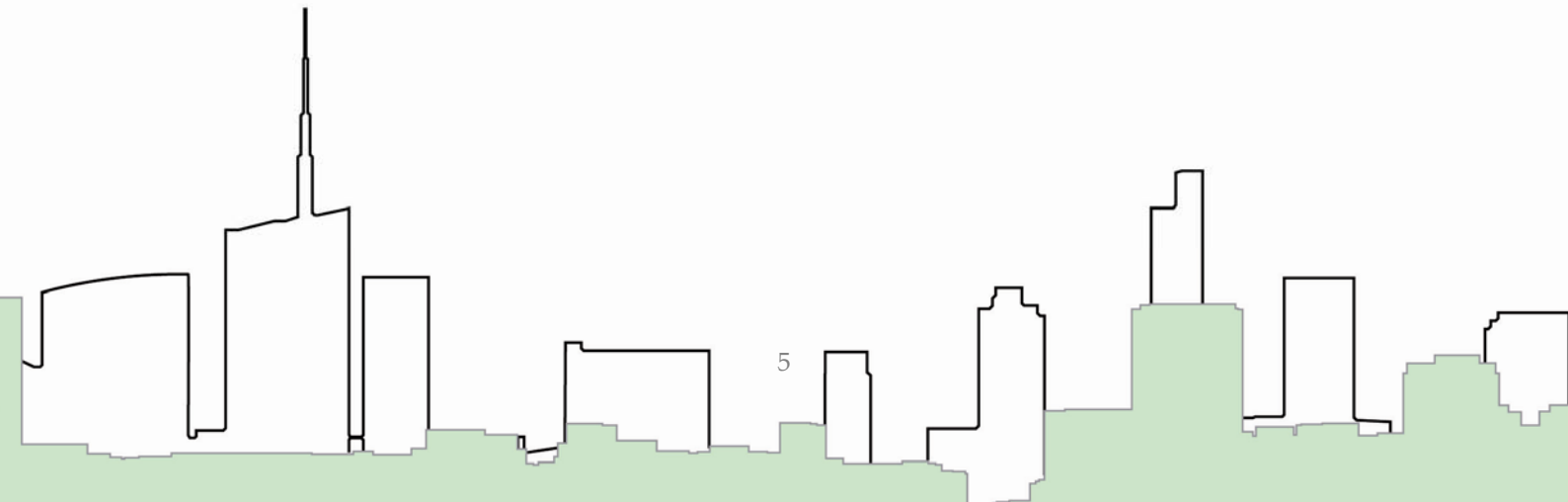
| 20:00 | | Social Dinner |



- *Day 2, Morning*: **Learning by trial and error: the use of the Lab as a didactic setting. Simulation workshop**, whereby physical and virtual models realized by the students in different courses are tested using some tools developed and applied at the laboratories.

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| 09:30 | **PANEL IV** | ***Rossella Salerno*** *(Polimi)*, Chair of the panel<br>Introduction to the session |
| 09:45 | ***Barbara Piga***<br>*(Polimi)* | **Ongoing research activities: works with students, research topics, future directions**<br>*Work in progress and the future research directions of the Urban Simulation Laboratory will be presented. The activities will be addressed to university education and scientific researches to be developed in collaboration with other research laboratories.* |
| 10:00 | ***Eugenio Morello***<br>*(Polimi)* | **Energy, climate and urban form *(research works and works with students)***<br>*The shape of the urban fabric can highly affect the energy consumption and the environmental performance of the city. Today, the use of largely available 3D digital models enables to investigate these aspects. By adding more information to the simple geometry of the urban fabric, such as materials and vegetation, a series of innovative analyses and tools have been implemented. Ongoing research works and applications tested with students are presented.* |
| 10:20 | ***Andrea Arcidiacono***<br>*(Polimi)* | **Open spaces and urban livability in Milan *(results of master theses and internship works)***<br>*Livability and vitality of open spaces are essential features of the urban quality. Research results of recent master degree theses are presented. The aim is to reflect on different analysis and direct observation methodologies to assess the features and potentialities of public spaces (pedestrian paths, green areas and streets). The considered case studies are different urban contexts in Milano (the historical district and transformation areas) where possible design guidelines are proposed.* |
| 10:40 | ***Rossella Salerno, Daniele Villa*** *(Polimi)* | **Models for landscape representation: didactic experiences**<br>*The presentation consists of three didactic case studies focused on the representation of ex-urban and urban landscapes to explore and design a territorial context. Some points are recurring in three different experiences: building a model to know the context; using physical and digital models as substitute of maps; comparing the potentialities* |

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| | | *of 2D and 3D images – built up at different scales, still or moving – from a communication point of view. The experimentation about large scale models is first of all proposed as a tool to explore, and get a synthetic frame of the natural and elements of the territorial context.* |
| 11:00 | | Coffee break |
| 11:15 | **PANEL V** | ***Andrea Arcidiacono*** *(Polimi)*, Chair of the panel<br>Introduction to the session |
| 11:20 | ***Giulio Podestà***<br>*(BetaNit)* | **Live presentation of the use of the microcar and the gantry for endoscopic recording inside physical models** |
| 11:45 | ***LabSimUrb***<br>*(Polimi)* | **Live Simulations using physical and digital models** realized at the Laboratorio di Simulazione Urbana and by students in the following design studios at the Polimi: *Luigi Chiara, Joseph Di Pasquale, Nicola Gallino; Raffaele Pugliese, Laura Pogliani, Giulia Pesaro; Giampiero Spinelli; Andrea Arcidiacono.* |
| 13:00 | | **Questions and comments** |
| 13:10 | | Lunch |

- *Day 2, Afternoon*: **Approaches and tools for improving urban design education and projects evaluation. Round table closing session**, open to the invited speakers, experts and professors aiming at discussing the presented works and delineate future research collaborations and seminars.

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| 14:30 | **ROUND TABLE** | ***Patrizia Gabellini*** *(Polimi)*, Chair |
| | | Invited speakers: ***Eckart Lange*** *(University of Sheffield)*, ***Dominik Lengyel and Catherine Toulouse*** *(Brandenburg University of Technology)*, ***Martijn Stellingwerff*** *(TUDelft)*, ***Steve Tiesdell*** *(University of Glasgow)*, ***Paola Caputo*** *(Polimi)*, ***Fausto Curti*** *(Polimi)*, ***Remo Dorigati*** *(Polimi)*, ***Gianni Scudo*** *(Polimi)*. |
| | | **Questions and comments** |
| 17:00 | | Conclusion of the workshop |

**Map of the Campus | Architecture School, Politecnico Di Milano**