PhD in URBAN PLANNING, DESIGN, AND POLICY -
36th cycle

Research Field: CYBER-CAPITAL AND IMPACT ON THE URBAN RENT

<table>
<thead>
<tr>
<th>Monthly net income of PhD scholarship (max 36 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>€ 1180.0</td>
</tr>
</tbody>
</table>

In case of a change of the welfare rates during the three-year period, the amount could be modified.

**Context of the research activity**

- Interdisciplinary PhD Grant
  The PhD research will be carried out in collaboration with research groups of the PhD programme in "Data Analytics and Decision Sciences".

Cyber-capital is the name given to the cluster of General Purpose Technologies (GPTs) driving the accelerated digitalisation of the economy since the early years of the current century. One of the key features of this process is that cyber-capital is today an increasingly significant component in the capital endowment of advanced as well as emerging economies. Like previous GPTs in economic history, it has a deeply transformative impact and entails a radical reorganisation of societal and economic processes, disrupting conceptual frameworks and societal forms adapted to an economy based on the production and sale of tangible goods and physically delivered services.

Among them, 1) a key actual and potential influence of Cyber-capital on economic structures is due to its in-depth and multiple impacts on urban form, flows, values and cultures. These impacts relate to disruption in the traditional organisation of physical space and establishment of virtual functions. 2) a second actual and potential influence of Cyber-capital is related to value creation and capture: Digital platforms provide an
illustration of how cyber-capital changes the nature of value creation and capture. By accumulating data and processing power, some platform providers have achieved a dominating position and command oligopoly rents in virtual space, often at the expense of physical spatial rents linked to more traditional forms of production and distribution. This induces a spatial reorganisation, where virtual cyberspace provides services and functionalities in parallel to the physical one (which continues to exist), disrupting traditional channels, flows and pricing mechanisms.

The main objective of this research project is to explore these dynamics: in order to do this, the PhD Candidate shall develop a consistent analytical and conceptual proposal, based on a high interdisciplinary work.

The research project shall develop an interdisciplinary approach, building on highly advanced and experimental theoretical assumptions, in order to generate relevant contributions on the methodological dimensions.

From the urban studies fields, in fact, there is large and solid discussion about the fact that the "Urban restructuring" is accelerating (Brenner, 2019) under the restructuring of capitalism. Yet, we are still lacking sound methodological contribution to developing new analytical tools and techniques to detect and explore - quantitatively and qualitatively - what is happening to the restructuring of the capitalist urban fabric. At the same time, urban studies have started taking into consideration how to map those cyber-age processes which remain invisible compared to the material flows that we have traditionally seen as embodying economic and social functions in cities through physical networks (Batty, 2018).

On the other side, Artificial intelligence driven data analysis and geographical modelling could help in, on
the one hand dealing with innovative datasets, working on data analysis models and algorithms, based on non-Euclidean exploration and understanding of this non-physical space. In the statistical field, this problem of framing the correct geometry where complex data could be naturally analysed without unrealistic Euclidean constraints is referred as Object-Oriented Data Analysis (OODA, Wang and Marron, 2007). OODA approach basically questions the Euclidean setting as a "give for granted setting" and opens a discussion about which geometrical framework should be used. This approach enables a thorough statistical analysis of a variety of complex objects, such as relational trees, networks, curves, shapes, texts, etc. that are often encountered in the fields of new technologies.

Educational objectives

This research project is based on an interdisciplinary dialogue between the two PHD programs supporting it, UPDP and DADS and it aims at contributing to the aims of the Data@ter Interdisciplinary nucleus promoted two years ago by colleagues from different disciplinary fields and departments at Polimi, members of different PhD Programs, in order to generate innovative and transdisciplinary approaches to contemporary social challenges and research enterprises.

In this respect, it opens to a new field of research, which is barely uncovered by traditional disciplinary approaches and highly experimental, needing a thick collaboration between research fields. So far, DATA@TER has promoted an interdisciplinary bourse 2 years ago, between Maths and Planning studies, now we would like to extend to the Data Science field a more intensive and open collaboration, which is needed to address this new research field.

The research project will also count on the collaboration with the European Investment Bank / Mandate Management Department (Luxembourg), which is
interested in supporting the activities of the research candidate.

| Job opportunities | The UPDP program intends to train highly qualified researchers and professionals in spatial planning, design and management of urban projects and policy, urban studies and urban governance. Doctors with such profile could be employed by Italian and International academic institutions, public bodies and research centres, public and private development agencies. The DADS program aims at breeding the next generation of data scientists who will tackle the challenges and the opportunities created by the increasingly availability of massive amount of data. These data scientists will be able to capture the relevant aspects of phenomena at play, develop adequate models, supervise the development of analytic pipelines, critically analyze the results, and support the technological transfer. |
| Composition of the research group | 12 Full Professors  
11 Associated Professors  
1 Assistant Professors  
25 PhD Students |
| Name of the research directors | Valeria Fedeli, Simone Vantini |

| Contacts |
| PhD Coordinator:  
prof. Luca Gaeta  
e-mail: luca.gaeta@polimi.it  
phone +39/02/2399.5426 |
| PhD Vice coordinators:  
prof. Valeria Fedeli  
e-mail: valeria.fedeli@polimi.it  
phone +39/02/2399.5531 |
| prof. Carolina Pacchi  
e-mail: carolina.pacchi@polimi.it |
Additional support - Financial aid per PhD student per year (gross amount)

<table>
<thead>
<tr>
<th>Housing - Foreign Students</th>
<th>--</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing - Out-of-town residents</td>
<td>--</td>
</tr>
<tr>
<td>(more than 80Km out of Milano)</td>
<td></td>
</tr>
</tbody>
</table>

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

List of 5 Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research:

1. Katholieke Universiteit Leuven
2. HafenCity Universitaet Hamburg
3. Bartlett School of Planning, UCL
5. Sciences Po, Paris

**Educational activities** (purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student per year (“DOTE”):

1st year: max 0 euros
2nd year: max 1,534,33 euro
3rd year: max 1,534,33 euro
Computer availability:
In the PhD room workstations are available for shared use, connected with a printer. All PhD students can use their own laptop with the wireless connection. Workstations and other equipments are also available in the laboratories linked with the doctoral programme.