



PhD in INGEGNERIA ELETTRICA / ELECTRICAL ENGINEERING - 40th cycle

**PNRR 630 Research Field: SISTEMI MODELLISTICI PER LA SIMULAZIONE DELLA
MOBILITÀ IN ORGANIZZAZIONI COMPLESSE**

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| Monthly net income of PhDscholarship (max 36 months) |
| € 1500.0 |
| In case of a change of the welfare rates during the three-year period, the amount could be modified. |

| Context of the research activity | |
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| <p>Motivation and objectives of the research in this field</p> | <p>Modelling systems for the simulation of mobility in complex organisations:</p> <p>International policies in many countries today are strongly oriented toward the process of decarbonizing the transportation sector. The emissions produced can affect both air quality, especially in urban areas, and climate change. From a quantitative point of view, the transport sector is second only to electricity production and heating in terms of emissions. The acquisition and analysis of large amounts of data enables the development of methodologies and approaches that can make strategic decisions for public transport companies.</p> <p>The focus will be on the simulation of mobility, proposing feasible and applicable models and technical solutions in complex organisations. In particular, there will be more attention about:</p> <ul style="list-style-type: none"> - Defining the extension of urban areas under the TEN-T regulation according to actual mobility interactions using cell phone movement databases - Construction of SUMP planning guidelines in order to facilitate the last-mile enpass-through function of urban areas |
| <p>Methods and techniques that will be developed and used to carry out the research</p> | <p>System modelling through modern methods based on probabilistic procedures (Montecarlo-based), fuzzy logic, neural networks, artificial intelligence, genetic algorithms, chaos theory, game theory and other theory system analysis, together with traditional mathematical tools and</p> |



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| | analysis, together with traditional mathematical tools and programming, big data analysis, order reduction techniques. |
| Educational objectives | Prepare researchers with high scientific qualification, autonomous research ability in the Power System area: this includes specific skills in modelling of both technical and economic issues, simulations, critical analysis and validation of results. |
| Job opportunities | The main opportunities are offered, typically, by R&D departments of both small and large innovative companies and manufacturers, research centres, Transmission and Distribution Operators, Regulating authorities, Generation Companies. Finally, the academia is also an option. |
| Composition of the research group | 5 Full Professors 5 Associated Professors 5 Assistant Professors 20 PhD Students |
| Name of the research directors | Prof. Michela Longo |

| Contacts | |
|--------------------------------|--|
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| Additional support - Financial aid per PhD student per year (gross amount) | |
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| Housing - Foreign Students | -- |
| Housing - Out-of-town residents (more than 80Km out of Milano) | -- |

| Scholarship Increase for a period abroad | |
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| Amount monthly | 750.0 € |
| By number of months | 6 |

| National Operational Program for Research and Innovation | |
|---|--------------------------------------|
| Company where the candidate will attend the stage (name and brief description) | Ferrovie dello Stato Italiane S.p.A. |
| By number of months at the company | 6 |
| Institution or company where the candidate will spend the period abroad (name and brief description) | To be defined |



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| By number of months abroad | 6 |
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Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Educational activities:

Financial aid per PhD student is available for purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences, instrumentations and computer, etc. This amount is equal to 10% of the annual gross amount, for 3 years.

Teaching assistantship:

Availability of funding in recognition of supporting teaching activities by the PhD student. There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.

Computer availability: *individual use*.

Desk availability: *individual use*.