

PhD in INGEGNERIA ELETTRICA / ELECTRICAL ENGINEERING - 37th cycle

THEMATIC Research Field: OPTIMIZATION ALGORITHMS FOR CHARGING STATIONS APPLIED TO TRANSPORT SECTOR

Monthly net income of PhDscholarship (max 36 months)

€ 1400.0

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

Con	text of the research activity
Motivation and objectives of the research in this field	The international policies of many countries are now strongly focused on the decarbonization process in the transport sector: the emissions produced can affect both air quality, especially in urban areas, but also climate change. From a quantitative point of view, the transport sector is second only to electricity production and heating in terms of CO_2 emissions. The real-time acquisition and analysis of large amounts of data allows the development of predictive and optimization algorithms for decision support system, both operational and strategic, for the development and management of diffusion charging stations for transport systems. In particular, the focus will be on the diffusion of green mobility (e.g. Electric Vehicles, E-scooter, E-buses, E-bike) proposing a possible mathematical model and defining different scenarios in order to verify, predict and optimize the performance of their model focusing on electric, economic and environmental aspects.
Methods and techniques that will be developed and used to carry out the research	In view of the fact that green mobility management is increasingly conditioned by the factor of many, the planned methods and techniques to be used will cover: - optimization methods for the planning and management of Charging Stations (CSs) considering also wireless charging; - techniques for modeling electrical systems in the presence of renewable sources and loads for electric



	mobility; - techniques for the prediction for the installation of storage for the diffusion of CSs.
Educational objectives	Prepare researchers with high scientific qualification, autonomous research ability in the Electric Transportation 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, EV charging systems Operators. Finally, the academia is also an option.
Composition of the research group	3 Full Professors 4 Associated Professors 4 Assistant Professors 15 PhD Students
Name of the research directors	Michela Longo

Contacts

Email: michela.longo@polimi.it Tel: +39 02 2399 3759

https://www.energia.polimi.it/en/energy-department/research/research-groups/electric-powersystems-group/#c1812 https://www.energia.polimi.it/en/energy-department/research/research-groups/electrical-systemsfor-transportation-group/#c1810

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

Scholarship Increase for a period abroad		
Amount monthly	566.36 €	
By number of months	6	

POLITECNICO DI MILANO



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. The amount is about Euro 3.000,00.

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.

Awards:

Awards will be recognized to the PhD candidate up to Euro 1.500,00 (gross amount, after completion of the 3rd year). More details about this program will be provided by PhD Program Steering Committee.