



# PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 38th cycle

Research Area n. 3 - Systems and Control

**THEMATIC Research Field: SCALABLE AND OPTIMAL CONTROL ARCHITECTURES FOR  
NETWORKED MULTI-ENERGY SYSTEMS**

Monthly net income of PhDscholarship (max 36 months)	
<b>€ 1250.0</b>	
In case of a change of the welfare rates or of changes of the scholarship minimum amount from the Ministry of University and Research, during the three-year period, the amount could be modified.	
Context of the research activity	
<b>Motivation and objectives of the research in this field</b>	The synergetic operation of multi-energy systems, i.e. networked systems interconnecting different energy domains (such as electricity, heating, or hydrogen), is a recognized solution to increase energy system efficiency. Their optimal and integrated control is still an open issue due to the large-scale size of the problem, the modelling complexity, and the different involved timescales. This requires the design of novel scalable control architectures, able to achieve an optimal and prompt coordination of large-scale networked systems.
<b>Methods and techniques that will be developed and used to carry out the research</b>	The research will consist in the development and test of advanced control schemes to efficiently manage the large-scale networked multi-energy systems. The developed solutions will be based on the design of hierarchical and distributed control architectures, exploiting model predictive control algorithms. The research is carried out under the guidance of a supervisor at Politecnico di Milano and in collaboration with RSE - Ricerca sul Sistema Energetico.
<b>Educational objectives</b>	The doctoral program offers advanced training in the research topics currently explored by the scientific community in academy and industry. A period of study in worldwide most recognized research institutions is



	supported by the doctoral school and the supervisor. <a href="http://dottoratoit.deib.polimi.it/">http://dottoratoit.deib.polimi.it/</a>
<b>Job opportunities</b>	The PhD graduates have opportunities both in academy and industry. The intensive collaboration with industrial partners allowed several past PhD graduates to find a satisfactory job position in private companies. Job opportunities abroad are also frequently offered.
<b>Composition of the research group</b>	1 Full Professors 0 Associated Professors 1 Assistant Professors 2 PhD Students
<b>Name of the research directors</b>	Riccardo Scattolini

<b>Contacts</b>	
Prof. Riccardo Scattolini Tel. +39-02-23993539 e-mail: <a href="mailto:riccardo.scattolini@polimi.it">riccardo.scattolini@polimi.it</a> web-page: <a href="http://home.deib.polimi.it/scattoli/indice.html">http://home.deib.polimi.it/scattoli/indice.html</a>	
Dr. Alessio La Bella Assistant Professor (RTD-a) Tel: +39 022399 3436 e-mail: <a href="mailto:alessio.labella@polimi.it">alessio.labella@polimi.it</a>	

<b>Additional support - Financial aid per PhD student per year (gross amount)</b>			
<b>Housing - Foreign Students</b>	<b>1st year</b>	<b>2nd year</b>	<b>3rd year</b>
	1500.0 € per student	1000.0 € per student	1000.0 € per student
	max number of financial aid available: 2, given in order of merit ..		
<b>Housing - Out-of-town residents (more than 80Km out of Milano)</b>	--		

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	625.0 €
<b>By number of months</b>	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>
LIST OF UNIVERSITIES, COMPANIES, AGENCIES AND/OR NATIONAL OR INTERNATIONAL INSTITUTIONS THAT ARE COOPERATING IN THE RESEARCH: RSE - Ricerca sul Sistema Energetico SpA ( <a href="https://www.rse-web.it/">https://www.rse-web.it/</a> ); Carlo Sandroni, Responsabile Gruppo di Ricerca GdR



Reti Attive: Automazione e Controllo (Dipartimento Tecnologie di Generazione e Materiali; *Tel:* +390239925869 - *Mobile:* +393889285228. Ricerca sul Sistema Energetico - RSE S.p.A., Via R. Rubattino 54 - 20134 Milano, [www.rse-web.it](http://www.rse-web.it))

EDUCATIONAL ACTIVITIES (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student

5.095,96 Euro per student

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:

1st year: individual use

2nd year: individual use

3rd year: individual use

DESK AVAILABILITY:

1st year: individual use

2nd year: individual use

3rd year: individual use