

PhD In Information Technology

Research Area n. 3 Title: Systems and Control

Research Field:

**“Methodologies for the Estimation and Monitoring from
Data of Electric Systems”**

Scholarships and Financial support	
Monthly net income of PhD scholarship (max 36 months)	€. 1.200 (In case of a change of the welfare rates during the three-year period, the amount could be slightly modified)
Number of scholarships	1
Beginning of PhD	1/5/2017
Deadline for application	13/03/2017
Context of the research activity	
Motivations and objectives of the research in this field	Electricity distribution systems are seeing a constant increase of devices and services able to collect, elaborate and transmit data – typically current and voltage – pertaining to many measurement points and with a relatively fast sampling frequency. The data can be employed to achieve advanced or “smart” functionalities to improve the reliability, safety, and efficiency of the network. Crucial ingredients required to realize these advanced functionalities are methodologies and algorithms, able to exploit the available data for system estimation and monitoring purposes. The main goal of the proposed research will be to investigate such methodologies, from theory to implementation and real-world demonstration.
Methods and techniques that will be developed and used to carry out the research	<ul style="list-style-type: none">• Model-based and data-driven identification approaches with emphasis on electric networks and electric systems/subsystems;• Model-based and data-driven observer design;• Machine learning techniques;

	<ul style="list-style-type: none"> Numerical optimization techniques, centralized and distributed; Condition monitoring and fault detection techniques.
Educational objectives	<ul style="list-style-type: none"> Grid automation and smart grid technologies and operational concepts; Advanced and nonlinear identification and filtering methods; Machine learning methods; Numerical optimization methods.
Job opportunities	Professional career opportunities will be available across all the stakeholders and value chain of modern and future power distribution systems, from original equipment manufacturers to utilities and system operators.
Composition of the research group	Control Systems research line: http://www.deib.polimi.it/eng/research-lines/details/87 Faculty involved: 2 Full professors 2 Associate professors 1 PhD researcher
Names of the research directors	Prof. Sergio Bittanti Prof. Lorenzo Mario Fagiano
E-mail address, phone number and web-page	lorenzo.fagiano@polimi.it 02.2399.9609 http://www.deib.polimi.it/eng/people/details/1190542 http://lorenzofagiano.altervista.org/
Companies that are cooperating in the research	ABB SpA ABB Schweiz
Additional support	
<u>Educational activities</u> (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences): financial aid per PhD student per year	2nd year: 1.370 euro per student 3rd year: 1.370 euro per student
<u>Teaching assistantship:</u> availability of funding in recognition of support to 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.
<u>Computer availability:</u>	1 st year: <i>individual use</i> 2 nd year: <i>individual use</i> 3 rd year: <i>individual use</i>
<u>Desk availability:</u>	1 st year: <i>individual use</i> 2 nd year: <i>individual use</i> 3 rd year: <i>individual use</i>