



PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 37th cycle

Research Area n. 4 - Telecommunications

**THEMATIC Research Field: NOVEL OPTIMIZATION TECHNIQUES FOR THE DESIGN AND
MANAGEMENT OF RADIO AND OPTICAL NETWORKS**

Monthly net income of PhDscholarship (max 36 months)

€ 1250.0

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

Context of the research activity

**Motivation and objectives of the research
in this field**

Modern telecom networks leverages the growing availability of monitoring data to improve the network manageability in terms of optimization of physical resources, and in terms of prevention and management of malfunctions. To leverage such availability of data, the proposed research has the ambition to develop management and design tools in the field of radio networks and in optical networks using algorithmic techniques in the field of machine learning and optimization.

**Methods and techniques that will be
developed and used to carry out the
research**

Methodologies to develop such management and design tools in radio networks and in optical networks will come from the fields of machine learning (neural network, deep learning) and optimization (integer linear programming, heuristics). The research will be carried on at Politecnico di Milano, in collaboration with SIAE Microelectronics and SmOptics.

Educational objectives

The PhD student will learn how to apply optimization and machine learning techniques to optimize management of telecom networks and will develop an understanding of physical layer effects that characterize signal propagation in optical and radio networks.



Job opportunities	There is a very strong request of PhD students with a specific background knowledge in in the field of network optimization. Recently, some of our former PhD students have been hired in top high-tech companies as Google, Nokia or Facebook.
Composition of the research group	1 Full Professors 4 Associated Professors 2 Assistant Professors 4 PhD Students
Name of the research directors	Massimo Tornatore, Francesco Musumeci

Contacts
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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	564.01 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p>LIST OF UNIVERSITIES, COMPANIES, AGENCIES AND/OR NATIONAL OR INTERNATIONAL INSTITUTIONS THAT ARE COOPERATING IN THE RESEARCH: Politecnico di Milano; 2. Siae Microelettronica; 3. SMOptics</p> <p>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 per year 2nd year: euros per student (1534)</p>



3rd year: euros per student (1534)

TEACHING ASSISTANSHIP: (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