



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

Research Area n. 4 - Telecommunications

**PARTENARIATO PNRR Research Field: INDUSTRIAL IOT TRAFFIC MANAGEMENT AND
PROTOCOL OPTIMIZATION**

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.

Context of the research activity

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

This research project is in the framework of
MICS (3A-ITALY)
PARTENARIATO ESTESO MADE IN ITALY CIRCOLARE
E SOSTENIBILE
CUP D43C22003120001
Decreto di Concessione D.D. 1551 del 11/10/2022

Information and data coming from field industrial processes and machineries are central to support multifold services within Industry 4.0 paradigm. Field data is commonly retrieved by leveraging multiple heterogeneous communication technologies which often need to coexist within the industrial environment. In this context, the main objectives of the present research proposal can be briefly summarized as follows:-
development of a self-contained tools and architectures to monitor industrial IoT traffic across multiple communication technologies-development of effective tools/solutions to orchestrate, aggregate and polish data generated by field networks within industrial environment-study and development of algorithms to design and optimize industrial IoT connectivity solutions.

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

The research will resort to different methodologies and



research	technical tools including system level simulation, algorithm design and prototyping of the proposed solutions on embedded hardware
Educational objectives	The research project will allow the candidate to improve her/his skills within the following areas:- comprehension/knowledge of industrial IoT communication technologies-design/optimization of communication architectures-design of machine learning solution for IoT traffic analysis-skill development in the field of simulation, emulation and prototyping of networking hardware
Job opportunities	IT leader in industrial environments Digital transition expert Research positions in research departments IT Consultancy
Composition of the research group	2 Full Professors 4 Associated Professors 0 Assistant Professors 7 PhD Students
Name of the research directors	Matteo Cesana

Contacts
Matteo.cesana@polimi.it 0223993695

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	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
The research proposal will be carried out at the Advanced Network Technologies Lab, within the Electronics, Information and Bioengineering Department (@PoliMI). According to the rules of the PhD Programme in Information Engineering at Politecnico di Milano, the candidate will be



required to attend at least five 5 credits courses to complement her/his background. Moreover, the candidate may also be required to supervise MS students developing their thesis and perform TA-ing duties within curricular courses at Politecnico di Milano.

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
5.707,13 Euro

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

D.D. 341 del 15/03/2022 Avviso pubblico per la presentazione di Proposte di intervento per la creazione di "Partenariati estesi alle università, ai centri di ricerca, alle aziende per il finanziamento di progetti di ricerca di base" - nell'ambito del Piano Nazionale di Ripresa e Resilienza, Missione 4 "Istruzione e ricerca" - Componente 2 "Dalla ricerca all'impresa" - Investimento 1.3, finanziato dall'Unione europea - NextGenerationEU