



**POLITECNICO**  
MILANO 1863

## Supervisor Expression of Interest MSCA - Marie Sklodowska Curie Action - (PF) Postdoctoral Fellowship 2022

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Department Name:	DEIB
Research topic:	High Performance Computing / Innovative sensors
MSCA-PF Research Area Panels:	<input type="checkbox"/> CHE_Chemistry <input type="checkbox"/> ECO_Economic Sciences <input checked="" type="checkbox"/> <b>ENG_Information Science and Engineering</b> <input type="checkbox"/> ENV_Environmental and Geosciences <input type="checkbox"/> LIF_Life Sciences <input type="checkbox"/> MAT_Mathematics <input type="checkbox"/> PHY_Physics <input type="checkbox"/> SOC_Social Sciences and Humanities
Politecnico di Milano Areas:	<input type="checkbox"/> Cultural Heritage <input checked="" type="checkbox"/> <b>Smart Cities</b> <input type="checkbox"/> Horizon Europe Missions <input type="checkbox"/> Health <input checked="" type="checkbox"/> <b>Industry 4.0</b>
Brief description of the Department and Research Group (including URL if applicable):	The DEIB was born officially at the Politecnico di Milano in 2013, from the merger of three previous departments: Bioingegneria, Elettronica e Informazione, and Elettrotecnica. Although the Dipartimento di Elettronica e Informazione (DEI) was officially established in 1992, its history dates back to the year 1928, when the Institute of Electrical Engineering was founded at the Politecnico di Milano. The Italian tradition in computer engineering started in 1954 right here, when Prof. Luigi Dadda brought from the U.S. one of the first CRC computers. The pioneering work in numerical computing and in the design of programming languages and hardware originated from these events. Since then, the Department has been recognized as a



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world-class scientific institution that contributes to key achievements in computer engineering, telecommunications, industrial automation, electronics and microelectronics. Research in the field of bioengineering was started by Prof. Biondi, and led in 1991 to the creation of the Dipartimento di Bioingegneria, now again connected with DEI. The historic Dipartimento di Elettrotecnica, founded in 1886, has common roots with the DEI in the principles and theories of electromagnetism, at the base of electrical engineering, electronics, computer science and telecommunications. In the past few decades, the exponential growth of ICT has boosted an impressive expansion of DEIB's researchers and activities. Despite the variety of its interests, however, the Department has been able to preserve a unique scientific identity. Here cross-fertilization is a working reality, and our ICT researchers and specialists are eager to tackle extremely complex and diverse problems in many technical, economic, and social fields. Today our Department counts more than 240 faculty members and about 450 short-term researchers and PhD students. It is organized in six distinct scientific areas: Bioengineering, Computer Science and Engineering, Electrical Engineering, Electronics, Systems and Control, and Telecommunications. DEIB is also a key node of many research networks, and is a widely recognized gateway to a highly qualified know-how and expertise. DEIB's research environment is not bounded within its own walls, as it also includes the industrial consortium CEFRIEL and several spin-offs. With such initiatives, DEIB's activities end up involving nearly 1000 ICT professionals, which makes our Department able to deal with an ever-growing variety of intellectual challenges. DEIB's mission is to:

- Push the boundary of ICT development by fostering groundbreaking technological research, forging innovative ideas, and gaining international recognition;
- Educate young generations of engineers with a solid scientific background, a strong problem-solving mindset, and a truly multi-disciplinary approach.

Courses offered by our faculty cover the full spectrum of ICT within a rich variety of curricula. Undergraduate and graduate degree in Automation Engineering, Biomedical Engineering, Electrical Engineering, Electronic Engineering, Computer Engineering and Telecommunication Engineering, and doctoral programs in Information Technology and Bioengineering are open to national and international students.

<https://www.deib.polimi.it>



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Title	<b>Big Data, Internet of Think and Sensing the World</b>
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**Brief project description:**  
**(max 1 page)**

The project scope is the development of research activities for **Big Data, Internet of Think and Sensing the World, based on ICT technologies.**

More specifically, the research activity can be mainly developed in the following two areas:

- computer science and engineering**
- electronic and electrical engineering**

In this era of huge masses of data, decentralized and distributed in the environment, citizens and organizations produce and manage billions of bytes of data towards exabytes of data through their daily operations. The processing, organization and analysis of data, in order to derive effectively and efficiently the data knowledge, requires methodologies and techniques that span different research areas present at DEIB. In this context, DEIB aims to raise cultural awareness, education and innovation on big data analytics, cyber-physical systems, Internet-of-Think and intelligent technologies and support the use of such innovative research in businesses and create professional skills and promoting the growth of a challenging and competitive job market.

Also research topics on Smart Sensing Technologies are offered, in particular in the following areas: miniaturized sensors for high-resolution medical diagnostics and analytical microsystems; single-photon detectors and fast electronics for automotive applications; high-sensitivity electronics for micro-sensors and nano-bio-medicine; neuromorphic devices for in-memory computing.

The research activity covers a broad range of applications, such as urban mobility in smart cities, in home applications, digitalization of the interactions of the citizen with the institutions, genomics, drug discovery, etc...

These applications will be considered from the perspective of ICT-related technologies.