POLITECNICO DI MILANO

PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 37th cycle

Research Area n. 3 - Engineering Design and Manufacturing for the Industry of the Future

THEMATIC Research Field: NEW SENSING STRATEGIES FOR THE NEW FACTORIES

Monthly net income of PhDscholarship (max 36 months)
€ 1325.0 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	Despite the growing interest towards the digitization of industrial processes, no widespread examples exist today about real applications, in which dense sensing can help improving maintenance strategies. The main difficulty resides in the need to merge many different technical skills and cultures in the same professional; at the same time Academia is not yet able to train new specialists having such a wide transversal knowledge. The project aims at getting over the mentioned limitations, as specified in the INPS call financing it: https://www.inps.it/news/dottorati-di-ricerca-2021-2022-pubblicato-il-bando
Methods and techniques that will be developed and used to carry out the research	The research will deal with sensor fusion approaches relying on the use of MEMS and microcontrollers, the main interest being the possibility to perform data analysis at the peripheral units, i.e. at the sensor level (edge computing). The idea is not to design new hardware, rather to foster its the best use for industrial applications. The project plan has been designed in agreement with STMicroelectronics, a worldwide renowned semiconductor company: within a long lasting cooperation, the experimentation of cross contamination among different researchers has already produced relevant results. A secondment is also foreseen in ETH, in a research group having an outstanding reputation under the guidance of

	Prof. Luca Benini and already cooperating with both Polimi and STMicroelectronics (ing. Diego Melpignano). Activities will be mainly carried out at Polimi and STMIcroelectronics premises.
Educational objectives	The Researcher is expected to develop at the same time sensitivity to the specific application and to the implementation of the best mix of hardware and software tools for the adoption of new control strategies of an industrial process.
Job opportunities	The PhD is perfectly aligned to the industrial need for new professional skills having a wide transversal education. Opportunities can be everywhere, from academia, to big industries, to service companies.
Composition of the research group	2 Full Professors 3 Associated Professors 0 Assistant Professors 3 PhD Students
Name of the research directors	Prof. Alfredo Cigada

Contacts
Prof Alfredo Cigada, Dept Mechanical Engineering, Via La Masa 1, 20156 Milano; alfredo.cigada@polimi.it

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	566.36 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Funding for educational activities (purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences); funding per PhD student per year: 2nd year: euros 1.534 3rd year: euros 1.534. Teaching assistantship: 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. **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