



PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 39th cycle

**THEMATIC Research Field: DESIGN, DEVELOPMENT AND QUALIFICATION OF ADVANCED
MEASUREMENT SYSTEMS**

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**

Nowadays the role of measurements is no longer limited to the estimation of physical quantities, but it also involves the smart processing of huge amounts of data in real time, to enable a full interaction with the surrounding environment and support the decision makers. The monitoring of mechanical and thermal quantities is quickly evolving, thanks to the possibility to share the data in real time in the cloud and to the availability of efficient processing approaches for big data manipulation. Applications of this approach are diverse, and can involve many fields, like structural health monitoring, industrial processes monitoring, biomedical parameters sensing, cultural heritage monitoring. Industrial sensing benefits from the huge innovations in space research and consumer electronics, that continuously push for a strong development of sensors. In these scenarios, the availability of reliable and accurate data plays a crucial role. This project is aimed at the development and metrological qualification of measuring solutions for networked sensors and big data manipulation, for industrial and scientific applications. The main goals of the research include the optimization of the measuring approaches and data analysis to obtain a reliable representation of the monitored system or process. The joint analysis and optimization of the data acquisition and data processing for a network measurement will be a key point of the research.



Methods and techniques that will be developed and used to carry out the research	Development of new sensing solutions based on modern low-cost and low-power hardware, to obtain efficient and reliable measuring nodes. Development of data processing strategies to obtain information on the monitored system by synergic analysis of data from a number of sensors.
Educational objectives	We provide doctoral candidates with high-level scientific training, fostering and refining research and problem solving abilities by focusing on both theoretical and experimental skills. The candidate will develop horizontal competences on data collection and management, as well as on experimental and analytical approaches, to be used in any field of engineering in the future step of the career. Indeed, a PhD in Mechanical Engineering will be able to layout, draft and carry on original research, by leading a research group or working in a team.
Job opportunities	Our last survey on MeccPhD Doctorates highlighted a 100% employment rate within the first year and a 35% higher salary , compared to Master of Science holders in the same field.
Composition of the research group	3 Full Professors 5 Associated Professors 2 Assistant Professors 10 PhD Students
Name of the research directors	Proff. Saccomandi, Cigada, Saggin, Zappa

Contacts

Prof. Paola Saccomandi *paola.saccomandi@polimi.it*, 02 2399 8470

Prof. Alfredo Cigada *alfredo.cigada@polimi.it*

Prof. Bortolino Saggin *bortolino.saggin@polimi.it*

Prof. Emanuele Zappa *emanuele.zappa@polimi.it*

For questions about scholarship/support *phd-dmec@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	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Financial aid is available for all PhD candidates (purchase of study books and materials, funding for participation in courses, summer schools, workshops and conferences) for a total amount of euro 5.707,13.

Our candidates are strongly encouraged to spend a research period abroad, joining high-level research groups in the specific PhD research topic, selected in agreement with the Supervisor. An increase in the scholarship will be applied for periods up to 6 months (approx. 700 euro/month - net amount).

Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD candidate. 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.