



PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 41st cycle

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

Monthly net income of PhDscholarship (max 36 months)

€ 1500.0

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**

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 biomedical and physiological parameters sensing, structural health monitoring, industrial processes monitoring, cultural heritage monitoring. Industrial sensing benefits from the huge innovations in 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, intended for scientific applications for human-centred applications. The main goals of the research include the optimization of the measuring approaches, based on the comparison and choice of the optimal sensors and measurement systems for the specific use, 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**

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



| | |
|--|--|
| | <p>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 biomedical and physiological parameters sensing, structural health monitoring, industrial processes monitoring, cultural heritage monitoring. Industrial sensing benefits from the huge innovations in 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, intended for scientific applications for human-centred applications. The main goals of the research include the optimization of the measuring approaches, based on the comparison and choice of the optimal sensors and measurement systems for the specific use, 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.</p> |
| Educational objectives | <p>We provide doctoral candidates with high-level and competitive scientific training, fostering and refining research and problem-solving abilities by focusing on both theoretical and experimental skills. A person holding a PhD in Mechanical Engineering will be able to layout, draft and perform original research, by working in a team in companies or universities, or leading a research group.</p> |
| Job opportunities | <p>Our last survey on MeccPhD Doctorates highlighted a 100% employment rate within the first year and a 35% higher salary, compared Master of Science holders in the same field.</p> |
| Composition of the research group | <p>3 Full Professors 4 Associated Professors 4 Assistant Professors 10 PhD Students</p> |
| Name of the research directors | <p>Prof. Emanuele Zappa, Prof.ssa Paola Saccomandi</p> |



Contacts

Phone: 02 2399 8470 (Saccomandi) - 02 2399 8445 (Zappa)
Email: paola.saccomandi@polimi.it; emanuele.zappa@polimi.it; phd-dmec@polimi.it

Additional support - Financial aid per PhD student per year (gross amount)

Housing - Foreign Students

--

Housing - Out-of-town residents

--

Scholarship Increase for a period abroad

Amount monthly

750.0 €

By number of months

6

Stage and period abroad

Institution or company where the candidate will spend the period abroad (name and brief description)

By number of months abroad

0

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 € 6.114,50.

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. 750 euro/month- net amount). Additionally, PhD candidates who spend at least 3 months abroad are eligible for an extra reimbursement of €3,000 to cover travel expenses.

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.