



PhD in DESIGN - 39th cycle

PNRR 117 Research Field: PRODUCT-SERVICE SYSTEM DESIGN FOR HIGHLY ENGINEERED MACHINERY SUPPORT

Monthly net income of PhDscholarship (max 36 months)

€ 1195.5

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

Xnext is an innovative SME that has realised a major product innovation in the field of real-time industrial inspection systems and in the food sector in particular. Thanks to its proprietary and patented XSpectra technology, it is now possible to detect product non-conformities that were previously undetectable, such as the presence of plastic and organic foreign bodies. XSpectra uses new concepts and techniques in photonics and artificial intelligence that make it unique in the world. The machines built with XSpectra are complex systems that are inserted into production lines and require the creation of support services ranging from the more traditional ones involving routine and predictive maintenance to new innovative services that include the analysis of metadata via cloud-based networks.

- The objectives of the project can be summarised as follows:
- Mapping of service needs in order to provide customers with support for a 3-level technical service intervention and provide a range of innovative services that are not offered today and are considered latent;
- Explore and identify planning strategies of ordinary and innovative services;
- Implementation of knowledge about product and service promotion methods related to the efficiency and the efficacy of support activities provided by the technology developer.
- Implementation of the systemic vision of product-service



	and full integration between product manufacturing and digitization of services
Methods and techniques that will be developed and used to carry out the research	The research will be conducted through an analysis of the state of the art and of the company's specific production, updating and maintenance processes. Scientific literature knowledge will be explored to create a reference scenario. Case studies will be identified for a typological mapping of services for the maintenance of complex machinery systems. Analogies could be used in similar highly specialized production areas with advanced technological equipment. Through methodologies of the organizational areas, process engineering, user experience, systemic and integrated design, hypotheses and new support programs for complex systems for x-ray technologies will be formulated.
Educational objectives	• Achieving high grade of knowledge about research and development methodologies both in the manufacturing field and in the field of support services for technologies deployable in the field of public use. • Achieving an advanced level of knowledge of digital or manual service techniques and processes useful for the maintenance and upgrading of machinery. • Integrating the design methodology knowledge with that of engineering and the organization of industrial processes.
Job opportunities	Xnext can offer the student the opportunity to join the Business Development team to follow the implementation of the designed service.
Composition of the research group	1 Full Professors 1 Associated Professors 0 Assistant Professors 1 PhD Students
Name of the research directors	Matteo Ingaramo; Anna Meroni

Contacts



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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	597.75 €
By number of months	0

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	Xnext, Italy
By number of months at the company	18
Institution or company where the candidate will spend the period abroad (name and brief description)	TU Delft, The Netherland
By number of months abroad	6

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

Educational activities (purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences):
financial aid per PhD student per year
max 4.872,90 euros per student (total for 3 years)
Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD student there are various forms of financial aid both for research and teaching activities. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.
Computer availability: 1st year, 2nd year and 3rd year: Each research group will supply PhD student with a computer, if necessary.
Desk availability: 1st year, 2nd year and 3rd year: Each research group will supply phd student with a desk.