



PhD in DATA ANALYTICS AND DECISION SCIENCES - 39th cycle

PARTENARIATO PNRR Research Field: MACHINE LEARNING FOR ZERO-DEFECT ZERO-WASTE MANUFACTURING BASED ON IN-SITU DATA MINING

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

Industry 5.0 is fostering a new generation of enabling technologies driving digital and smart solutions towards circular and sustainable manufacturing. Thanks to smart sensing, a new generation of big data (images, video-images and signals) are available to aid decision-making and define new solutions for zero-defect, zero-waste manufacturing via in-situ inspection, defect detection and classification.

The research activity is financed by LEONARDO S.p.A. in the framework of the MICS 3A-Italy (Partenariato Esteso per il Made in Italy Circolare e Sostenibile PE0000004) - Spoke 8 as part of the National Plan on Recovery and Resilience (PNRR - Missione 4, Componente 2 Dalla Ricerca all'Impresa, Investimento 1.3). Norms of Reference: CUP B83D22001120004, D.D. 1551 del 11/10/2022. D.D. 341 del 15/03/2022

Avviso pubblico per la presentazione di Proposte di intervento per la creazione di "Partenariati estesi alle università, ai centri di ricerca, alle aziende per il finanziamento di progetti di ricerca di base" - nell'ambito del Piano Nazionale di Ripresa e Resilienza, Missione 4 "Istruzione e ricerca" - Componente 2 "Dalla ricerca all'impresa" - Investimento 1.3, finanziato dall'Unione europea - NextGenerationEU.

Methods and techniques that will be

- Spatio-temporal modeling



developed and used to carry out the research	<ul style="list-style-type: none"> - Spatio-temporal modeling - Image and thermal video image data modeling - Multistream data reduction - Statistical quality monitoring and transfer learning - Metamodeling for process optimization
Educational objectives	The PhD will develop skills and core competencies to face data mining, modeling, control to aid defect prediction and prevention in-situ and in-line in manufacturing.
Job opportunities	<ul style="list-style-type: none"> - Industry 4.0 specialist - Data scientists for industry 4.0 - Quality experts - Scientist in data mining for zero-waste advanced manufacturing
Composition of the research group	2 Full Professors 1 Associated Professors 3 Assistant Professors 5 PhD Students
Name of the research directors	B. M. Colosimo, M. Grasso, and L. Cristaldi

Contacts	
Biancamaria.colosimo@polimi.it Department of Mechanical Engineering Voice +3902239985 https://www.mics.tech	

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
List of Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research: 1. Leonardo



2. Massachusetts Institute of Technology (MIT)
3. Georgia Institute of Technology
4. European Space Agency
5. Fraunhofer (IPA)

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.