



# MARIE SKŁODOWSKA-CURIE POSTDOCTORAL FELLOWSHIPS 2025 EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS

## HOST INSTITUTION

NOVA School of Science and Technology - Faculdade de Ciências e Tecnologia da Universidade NOVA de Lisboa (*NOVA FCT*)

#### **RESEARCH GROUP AND URL**

UNIDEMI - Unidade de Investigação e Desenvolvimento em Engenharia Mecânica e Industrial

UNIDEMI was created in 2003 as a research unit of the Department of Mechanical and Industrial Engineering of the Faculdade de Ciências e Tecnologia da Universidade NOVA de Lisboa.

https://www.unidemi.com/

## SUPERVISOR (NAME AND E-MAIL)

Prof. Radu Godina

#### SHORT CV OF THE SUPERVISOR

Radu Godina is an Assistant Professor and a researcher in several national and international research projects. Coordinator of the Master in Maritime Logistics. Vice-director of the UNIDEMI research centre - Department of Mechanical and Industrial Engineering. Teaching courses such as Lean Six Sigma, Quality Planning and Control, Research Methodologies, etc. Supervising several Pos-doc, PhD students, and master students. He has authored or co-authored more than 185 indexed international journals, book chapters and conference proceedings papers in such topics as industrial symbiosis, sustainability, lean manufacturing, electric vehicles, circular economy, life cycle assessment and quality control. He has published with 28 international universities and 14 distinct enterprises and/or corporations.

#### **5 SELECTED PUBLICATIONS**

- S. Kokare, L. Moraes, N. Fernandes, Andrew Norman, R. Godina, "Toward cleaner space explorations: a comparative life cycle assessment of spacecraft propeller tank manufacturing technologies", The International Journal of Advanced Manufacturing Technology (Springer), May 2024.
- Adriana S.F. Alves, Leonel J.R. Nunes, J.C.O. Matias, P. Espadinha-Cruz, Radu Godina, "Proposal of an integrated PROMETHEE II-Roadmap model - an application to the valorization of residual agroforestry biomass in Portugal", Journal of Cleaner Production (Elsevier), Vol. 445, pp. 141307, March 2024.
- I.A. Ferreira, R. Godina, A. Pinto, P. Pinto, R. Gonçalves and H. Carvalho, "Boosting additive circular economy ecosystems using blockchain: An exploratory case study" Computers & Industrial Engineering (Elsevier), Vol. 175, 108916, January 2023.
- A.S.L. Neves, R. Godina, S. G. Azevedo, J.C.O. Matias, "A Comprehensive Review of Industrial Symbiosis: Opportunities and Challenges" Journal of Cleaner Production (ELSEVIER), Vol. 247, pp. 119113, February 2020.
- S. Kokare, J.P. Oliveira, T. Santos, R. Godina, "Environmental and Economic Assessment of a steel wall fabricated by Wire-based Directed Energy Deposition", Additive Manufacturing (Elsevier), Vol. 61, 103316, January 2023.





## Title: Assessing the sustainability of manufacturing as a service (MaaS) business model

**Description**: The manufacturing sector has encountered various challenges in recent years, as it adapts to rapidly changing interests, demands, and other crises. These challenges have underscored the need for methodologies or technologies that allow the sector to adjust before losing value. Manufacturing as a Service (MaaS) is introduced as a concept that utilises existing resources in a value network by connecting manufacturers to service providers on demand through a connected network. This enables companies to recover from unforeseen external events by connecting to new services and reconfiguring value networks using internal and external manufacturing services. However, no system is perfect or free of uncertainties. Concepts for automated matching of products and applicable manufacturing resources through algorithmic extraction of manufacturing features are already under development but lack sufficient capabilities for a seamless integration in the overall manufacturing environment. Reconfiguration comes at the cost of quality and environmental footprint.

In order to stay competitive while confirming with customer needs for quality and environmental regulations, companies need to evaluate the consequences of market and technology drivers on their current business models, adapt themselves or develop new and innovative business models. Large-scale enterprises take a leading position in implementing the potential of MaaS in their business models. However, small and medium-sized enterprises (SME) face a high threshold and therefore hesitate to exploit the potential of MaaS. While there are initial approaches to automated manufacturing matching and platforms to access manufacturing experts, current proposals lack decision support for enterprises, in particular SMEs, to position themselves in a changing manufacturing landscape.

This project aims to assess the sustainability impact of MaaS, i.e. (i) economic, (ii) environmental, and (iii) social, while MaaS models are still in its development stage and not fully mature. Synergies of MaaS with Industrial Symbiosis and Zero-Defect Manufacturing are considered a must for the Circular Economy transition. Through case studies in key manufacturing sectors (e.g., metal processing, electronics, agri-food), the research will demonstrate how the integrated approach can create resilient manufacturing ecosystems that achieve superior environmental performance while maintaining zero defect quality standards.

### SCIENTIFIC AREA WHERE THE PROJECT FITS BEST\*

# **ENG\_Information Science and Engineering**

ECO\_Economic Sciences