

# SEMINAR ANNOUNCEMENT

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UNITED NATIONS  
UNIVERSITY

**UNU-EGOV**

Operating Unit on Policy-Driven  
Electronic Governance

## WHERE

UNU-EGOV, Rua de Vila Flor 166, 4800-445 Guimarães, Portugal

## WHEN

30 April 2019 | 11:30 – 12:30

## TITLE & ABSTRACT

### New Technology adoption and commercialisation

My research has been primarily concerned with new technology adoption and commercialization, innovation and skills, bridging the different literatures on technological innovation and human capital development. This work contributes to the literature on entrepreneurship and technological innovation, connected to human capital issues, by looking at how technology commercialization drives industrial development, while based on more sophisticated skills and on the ability to generate and absorb technology. Research has focused on the Portuguese case in an international context, tackling these issues in different ways. In this context, I will present a set of different results:

1) A case study of Embraer's supply chain in Brazil and Portugal, that looks into the role of New technology Based Firms in aeronautics industrialization processes. This case is of particular relevance not only because Embraer pioneered the introduction of the risk-sharing partnership concept in aeronautics, which led to significant changes in their supply chain structure, but also because both countries have small aeronautical supply chain. Our research leverages on 100 interviews with aeronautics experts to provide a taxonomy for the integration of NTBF in the aircraft development process, depending on the firm's activities.

2) The introduction of Metal Additive Manufacturing (MAM), and the path leading to its diffusion in different contexts. Commercialising an emerging technology that employs an immature production process can be challenging, particularly when there are many different sources of uncertainty. In industries with stringent safety requirement, regulatory interventions that ensure safety while maintaining incentives for innovation can be particularly elusive. We use the extreme case of metal additive manufacturing in commercial aviation to unpack how the characteristics of a technology may influence the options for regulatory intervention. Based on our findings, we propose an adaptive regulatory framework in which standards are periodically revised and in which different groups of companies are regulated differently as a function of their technological capabilities. We conclude by proposing a generalizable framework for regulating emerging process-based technologies in safety-critical industries in which the optimal regulatory configuration depends on the industry structure (number of firms), the performance and safety requirements, and the sources of technological uncertainty.

3) The impact of industry 4.0 on employment, bringing the analysis on technology adoption and evolution of skills. We first address the technological concepts of industry. With use of natural language processing, technology terms from 4310 research articles are extracted to create a technology map. Network analysis revealed two groups of technological concepts. First, there are three operations centered concepts. Industry 4.0 and Smart Manufacturing constitute, at their core, IoT Infrastructure, (sensors, network, and computing). Intelligent Manufacturing represents, an outgrowth of Algorithmic Tools. Second, there are two product-centered concepts, Advanced and Digital Manufacturing, which show a strong relation to Additive Manufacturing, and Virtual Design and Production. Since 2015 publications focus strongly on production-centered concepts and particularly on IoT Infrastructure. Discussion suggests a broader view of the fourth industrial revolution, focusing on Artificial Intelligence and all areas of the technology landscape. In addition, we look at the evolution of skills in manufacturing. The focus on people and skills needs to take into account the availability of capabilities and the existence of users with the ability to create and commercialize products, engaging directly in the production processes, and contributing to new industrialization processes.

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The work to be presented has made several important methodological contributions, including work using different datasets, contributing to the novel use of available data, through the combination of several datasets, or even through the use of mixed approaches combining quantitative and qualitative work, done through an interdisciplinary approach to the problems.

## SPEAKER

### Joana Mendonça

Assistant Professor, University of Lisbon / IST (Portugal)



Joana Mendonça joined the Engineering and Management Department at IST/University of Lisbon as an assistant professor in January 2017, where she has been teaching courses on Entrepreneurship, Engineering Economics and Project Appraisal, to Undergraduates, Masters and PhDs students. She researches IN+, Center for Innovation, Technology and Policy Research, where she leads the Laboratory of Technology Management and Policy. Her research focuses on processes of new technology commercialization, industrial development and in the role of skills and human capital in these processes. She has published in peer-reviewed journals, such as

Research Policy, Small Business Economics and Technological Forecasting and Social Change. She has been promoting cooperation with companies, having established joint work with companies in different sectors and locations in Portugal. Parallel to her research, she has followed and helped technology commercialization projects from students and other researchers. She is a Scientific Director of the Carnegie Mellon Portugal Partnership and a scientific coordinator at CEiiA.

During 2016, she was an assistant to the Minister for Economy for issues related to Innovation, Technology and Science. She was a guest lecturer at IST in 2013/14 and 2014/15, during which she lectured Technology-Based Entrepreneurship, Practice and Analysis of Public Policy and Advanced Topics in Public Policy Analysis. She won the Best Paper Award at IECER in 2015 with the paper *Business Owners' Educational Skills and Entrepreneurial Teams on Workers Wages: The Role of Business Owners Gender*, co-authored with Filipa Madeira and Miguel Torres. In 2012, she integrated the International Risk Governance Council (IRGC) network and contributed with research on technology adoption and industrial development. Between 2010 and 2012, she was a Deputy Director at the Directorate for Education and Science Statistics (DGEEC). In 2009-2010, she was an assistant to the Secretary of State for Science, Technology and Higher Education. She obtained her PhD in Engineering and Industrial Management at IST, University of Lisbon, in 2009. In 2008, she was invited researcher at ZEW (Centre for European Economic Research), maintaining this collaboration since. Before her PhD, she obtained a Master's in Engineering Policy and Management of Technology and obtained her Diploma in Chemistry from Lisbon University. She was a researcher at Instituto Tecnológico e Nuclear, focusing on Solid State Chemistry, and made her diploma thesis at Bern University on Vitamin B12 Derivatives.