Early Stage Researcher (PhD candidate) – Marie Skłodowska-Curie Action

Integration of "digitally-" and "socially-" driven decision-making approaches in contemporary industries

Position Details

Position Title:	ESR #7 - Integration of "digitally-" and "socially-" driven decision-making approaches in contemporary industries
Project:	European Training Network for InduStry Digital Transformation across Innovation Ecosystems – EINST4INE (funded by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 956745).
Field of Expertise:	Engineering, management, psychology
Faculty / Research Group:	Institute for manufacturing, Department of Engineering, University of Cambridge
Employment type:	Full-time, fixed-term (36 months)
Gross annual salary:	Equivalent to 52,095.96 euros, paid in GBP – additional family allowance based on personal circumstances may apply
Starting date:	1st September 2021
Location:	Cambridge (UK)

- Full-time, 36-months fixed-term contract based at the University of Cambridge but may be required to work remotely
- International mobility: various short and long-term travel foreseen, including industry and academic secondments
- Open to any nationality (requires a UK work permit)
- Research activities focusing on different domains (engineering, psychology, management)
- Enrolment as a PhD candidate
- Opportunities to conduct innovative research activities in collaboration with high level academic and industrial partners
- Competitive remuneration

About us

The University of Cambridge (UoC) is one of the most renowned Research /Higher Education Institutes and is frequently ranked amongst the top 5 in international academic rankings such as ARWU and Shanghai Ranking. The top-level strategic mission of UoC's Department of Engineering (CUED) is the development of 21st century engineers by "inspiring future generations of engineers, equipping them with the best integrated engineering education, and engaging them at the leading-edge of engineering thinking, so that they can change the world". The ESR will be based at the Institute for Manufacturing (IfM), one of CUED's divisions, which addresses the most pressing issues facing manufacturing today. The IfM's research activities

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are carried out in partnership with both government and industry across a wide variety of sectors in the UK and around the world, and lead to practical techniques that companies can apply to improve their strategy, operations and technology. At IfM, the ESR will be based at the Centre for Technology Management https://www.ifm.eng.cam.ac.uk/research/ctm/.

About the position

The PhD position is part of the Marie Skłodowska-Curie Action "European Training Network for InduStry Digital Transformation across Innovation Ecosystems" (EINST4INE), coordinated by RMIT Europe. EINST4INE project aims to develop new concepts, approaches and methods in the area of digital transformation and brings together a unique group of world-leading experts in the areas of Open Innovation, Industry 4.0, digital transformation and innovation ecosystems. EINST4INE six academic beneficiaries will recruit altogether 15 Early Stage Researchers (ESRs) working in the domain of industrial digital transformation who will meet regularly via a coordinated exchange programme organised across the international network, comprising secondments, visits, training events, workshops, and summer schools. The successful candidate will be based at the University of Cambridge (Cambridge, UK) and will be enrolled in a PhD programme at the Department of Engineering. For more information about EINST4INE project, visit our website: https://www.einst4ine.eu/

PhD Project Description

Title: Integration of "digitally-" and "socially-" driven decision-making approaches in contemporary industries

Description: How do digital tools, such as artificial intelligence suggestion systems, integrate with traditional socially-driven intelligence methods in the development of technology strategy?

Background: Several emerging and potentially transformative technologies for manufacturing industries, e.g. additive manufacturing, quantum computing, graphene materials, machining learning and IoT are maturing at a fast pace. When firms find themselves in such a fast-changing environment, they need to quickly adapt if they want to survive. As such, they need to develop what scholars call "dynamic capabilities" to: "sense" the important changes in the technological environment, "seize" the opportunities and potentially "reconfigure" their organisations as a result (Teece 2007). By relying on a complex web of data gathering approaches for a changing landscape of technological emergence, technology intelligence systems (Mortara et al. 2009) are the basis for such capabilities since they are set up by companies to capture and deliver insight to decision makers on the opportunities and threats that new technologies present (Kerr et al. 2006). As such they are fundamental for "sensing" and "seizing". These systems are today increasingly empowered and supported by digital systems, based on a variety of artificial intelligence tools, which are able to analyse trends and suggest implications for the firm. However, informing and taking decisions on emerging technologies is still one of the hardest tasks for engineering management in a continuously shifting environment (Mortara 2015). In many organisations, the interface between decision-

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making and intelligence delivery relies on human inputs and social interaction, even when it is supported by artificial intelligence algorithms and is facilitated by planning tools such as road mapping (Kerr and Phaal 2012). Further, intelligence and decision-making effectiveness are very hard to assess (Loh & Mortara 2017). As a result, managers who take decisions typically face several challenges (Mortara 2015) such as: absorbing insight from overwhelming (Eppler et al 2004) or cognitively distant knowledge (Petruzzelli et al 2009), navigating company social and political dynamics, and overcoming cognitive and personal barriers (Mortara 2015). This PhD research will investigate the integration of digitally-driven (e.g. AI-driven suggestion systems) with the human driven-approaches used in strategic technological decision-making. The focus will be to review in a variety of industries the use of these AI-driven approaches, their impact on the communication of insight about emerging technology, and their integration with socially- driven approaches. Areas of work will potentially cover:

- A review of current practice and knowledge about the interface between decision-making and intelligence systems
- A review of the specific variety of AI-driven approaches existing and their uses and integration with socially- driven approaches in practice, with specific focus on their integration in strategic planning
- Derivation of principles of how AI tools for technology intelligence should be developed, integrated and operated within strategic planning, based on evidence and theory.

Research field(s)

To pursue these goals, the ESR will have to work integrating knowledge and approaches across domains (e.g. engineering, psychology, management) and will interact with managers in industry. The ESR will likely work combining different research methods (e.g. ethnographies, experiments, interviews).

Supervisors

EINST4INE research programs involve comprehensive, independent research under the supervision of an expert supervising team. For the current position, these are:

- Dr. Letizia Mortara, main supervisor
- Dr. Rob Phaal

Candidate Profile

Qualifications

Applicants should have (or expect to obtain by the start date) at least a good 2.1 (equivalent to B, or 60%-69%) degree in an engineering or related subject and preferably a master qualification. Profiles covering expertise in management, psychology, neuroscience or economics will be desirable. Knowledge or experience of augmented/virtual reality systems and designing experiments will also be considered advantageous.

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Eligibility

To be eligible, you need to be an "Early Stage Researcher", simultaneously fulfil the following criteria at the time of recruitment:

- Mobility: candidates must not have resided or carried out their main activity (work, studies, etc…) in the UK for more than 12 months in the 3 years immediately prior to recruitment under the EINST4INE project (i.e. from August 2018).
- Qualification: candidates must hold a degree that formally entitles them to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the research training is provided.
  Important! Please check the minimum entry level for enrolment in a **PhD in Engineering at Cambridge**. Please refer to this link https://www.postgraduate.study.cam.ac.uk/application-process/entry-requirements.
- Research experience: at the date of recruitment, candidates must be in the first four years of their research career, after the master's degree was awarded.
- Candidates must be proficient in English (check the requirements for the enrolment as a PhD student in engineering in Cambridge: https://www.postgraduate.study.cam.ac.uk/international/competence-english).

The University actively supports equality, diversity and inclusion and encourages applications from all sections of society adhering also to the European policy of balanced ethnicity, age and gender.

Working Conditions

We offer a 36-months full-time work contract, expected to start on 1st September 2021. The position will be based in Cambridge (UK) and international travels are foreseen.
The remuneration, in line with the European Commission rules for Marie Skłodowska-Curie grant holders, will consists of a salary augmented by a mobility allowance. The salary will comprise a living allowance of 44,895.96 euros per year and a mobility allowance of 7,200.00 euros per year. An additional allowance of 6,000.00 euros per year may be payable but is dependent on individual family circumstances at the time of recruitment. Note that the salary will be paid in GBP and the final amount may depend on exchange rate.

Important!

Whilst the ESR will be employed by the University, s/he will also be enrolled as a PhD student (starting in October 2021). Hence, the position is conditional on receiving an offer from the University of Cambridge Graduates Study Office. To this end, after the interviews are concluded, the selected candidate will be required to apply via the University of Cambridge Graduate Admissions portal (details will be provided to short-listed candidates).
The University has a responsibility to ensure that all employees are eligible to live and work in the UK.

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This is a fixed term position. The funds for this post are available for 36 months in the first instance.

Further benefits

The ESRs will be involved in a Marie Skłodowska-Curie network with excellent opportunities for scientific and personal development. These include:

- Regularly adapted personal career development plans.
- Funding for short stays at top-class research groups.
- Regular training events and meetings across Europe.

Application

Applicants will be selected on their potential for scientific excellence and adaptability to work in a multicultural environment. Recruitment will be a transparent, open and equal process following the guidelines of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. Carefully read the guidelines before applying. NB: the recruitment and interview process for this position is specific to EINST4INE project. Still, applicants should make sure they comply with the recruiting institution conditions.

The application must be submitted online, together with the following supporting documents (in English):

- A detailed Curriculum Vitae (2-pages max);
- A letter of motivation (1,000 words max);
- A brief, non-binding, research proposal for the ESR project, addressing the state of the art, the objectives, the methodology (3,000 words max);
- A copy of your official academic degree(s) and the corresponding transcripts;
- A proof of English proficiency (see requirements to enrol in a PhD course in Engineering: https://www.postgraduate.study.cam.ac.uk/international/competence-english).

Important! The candidate who will be selected for this position will also then need to apply through the Cambridge University's Graduate Admissions application portal. Please note that:

- the university final deadline for PhD applications is 30th June 2021, although it is advisable to apply earlier than this.
- there is a £70 fee which will be refunded.
- the candidate needs to fulfil the University of Cambridge entry criteria for PhD studies: https://www.postgraduate.study.cam.ac.uk/application-process/entry-requirements

The data of the applicant will be collected for the sole purpose of the selection procedure, such as described in Grant Agreement No. 956745 - Horizon 2020 EINST4INE. The candidate may refer to RMIT EU (coordinator) in order to exercise her/his rights under art. 15 – 22 Reg. (EU) 2016/679.

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