MARIE Skłodowska-CURIE INNOVATIVE TRAINING NETWORK

OPEN CALL – PhD position

Host (recruiting) organisation

Eindhoven University of Technology, Eindhoven, The Netherlands

Project Title: Modeling and Simulation of Fluid-Solid Interaction in Inkjet Printing Technologies

Supervisory team

Primary academic institution	Industrial institution
Prof. Harald van Brummelen Dr. Clemens Verhoosel Eindhoven University of Technology	Prof. Herman Wijshoff Océ Technologies NV
Secondary academic institution Prof. Ferdinando Auricchio Prof. Alessandro Reali University of Pavia	

Project description

Drop-on-demand printing is a key future production technology, in view of its extreme versatility and its direct connection to digital information. Optimization of such printing processes requires a detailed understanding of the fluid dynamics, wetting behaviour and solidification process of single droplets and droplet arrays. Contemporary understanding of the interactions between new liquid droplets and previously deposited, partly solidified droplets is only rudimentary, and significant developments in this area are required to support future inkjet-printing and additive-manufacturing (AM) technologies.

The aim of this project is to develop state-of-the-art mathematical models and numerical simulation techniques for solidification processes in droplets in printing processes, including the interactions of droplets in distinct solidification regimes. Various aspects need to be addressed, including liquid-solid phase transformations, dynamic wetting and (elasto-capillary) fluid-solid interaction. It is envisaged that phase-field models can provide a robust and versatile modelling paradigm for the targeted application field.

Benefits

- Doctorate degree from both Eindhoven University of Technology and University of Pavia
- Integration within the research department of the world's leading inkjet-printing-equipment company
- 48 month full-time employment contract
- Additional mobility and family allowances
- Research supervision and training by recognised experts in computational mechanics from academia and industry
- Access to state-of-the-art research and computing facilities
- Training in transversal skills (e.g. communication skills, entrepreneurship)

Prerequisites

- To have a strong undergraduate and MSc degree (or equivalent) in Engineering, Mathematics, Physics or a related field and a good level of English
- To have an enthusiastic attitude to conduct research, being hard-worker and critic
- To demonstrate knowledge of programming languages such as Matlab, Python, C++
- To have experience with Finite Element analysis and Computational Fluid Dynamics

Eligibility

Applicants shall, at the time of recruitment by Eindhoven University of Technology, be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree. Full-Time Equivalent Research Experience is measured from the date when a researcher obtained the degree, which would formally entitles him/her to embark on a doctorate, irrespective of whether or not a doctorate is or was ever envisaged.

At the time of recruitment by the host organisation, researchers must not have resided or carried out their main activity (work, studies, etc.) in THE NETHERLANDS for more than 12 months in the 3 years immediately prior to the reference date.

Duration of the project

The total duration of the project is 48 months.

Obligations of ESRs

- Completion of the Erasmus Mundus Joint PhD programme Simulation Engineering and Entrepreneurship Development (SEED)
- Be highly committed with quality research, training and management. The successful candidate is expected to become a future leader on the development and application of advanced computational methods for industry
- Take part of the mobility programme both in academia and industry
- Participate on the dissemination and outreach activities associated to the project
- Attend international conferences and present the research undertaken
- Contribute to the writing of articles in high impact international journals

Closing date: Until position is filled

How to apply: www.lacan.upc.edu/ProTechTion

Questions: protechtion.itn@upc.edu