



MARIE Skłodowska-CURIE INNOVATIVE TRAINING NETWORK

OPEN CALL – PhD position



Host (recruiting) organisation

ESI Group, Paris, France

Supervisory team

Primary academic institution Prof Francisco Chinesta Ecole Centrale de Nantes	Industrial institution Jean Louis Duval ESI
Secondary academic institution Dr. Sergio Zlotnik, Prof. Antonio Huerta Universitat Politecnica de Catalunya, BarcelonaTech	

Project Title: Real-time monitoring and control of additive manufacturing

Project description

Production of large complex parts is a challenging issue for today's industry. Additive manufacturing (3D printing) appears to be an appealing process where material is placed and progressively added on the substrate already formed. The desired properties and geometry are produced laying additional layers in a predefined trajectory. The thermal process is significantly affected by many material and process parameters (thermal power, velocity...). Moreover, heat conduction inside the part depends on contact resistances and change of phases, and induces residual stresses. Real-time monitoring techniques for such process are extremely valuable in industrial practice. An offline/online approach is considered. In the offline stage the thermal parametric model is solved, and it dialogues, in the online stage, from a smart enrichment within a generalized formulation of finite elements looking for a non-intrusive implementation.

Benefits

- Research supervision and training by recognised experts in computational mechanics from **industry** and **academia**
- Doctorate degree from both Ecole Centrale de Nantes and UPC·BarcelonaTECH
- 36 month full-time employment contract
- Additional mobility and family allowances
- Integration within the research group of leading software provider.
- Training in transversal skills



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Prerequisites

- To have a strong undergraduate and MSc degree (or equivalent) in Structure Engineering, Mathematics, and a good level of English
- To have an enthusiastic attitude to conduct research, being hard-worker and critic
- To demonstrate knowledge of some programming languages such as Matlab and Fortran
- To have some experience with Finite Element analysis

Eligibility

Applicants shall, at the time of recruitment by ESI Group, 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 entitle 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 FRANCE 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 36 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

March 31, 2016

How to apply

www.lacan.upc.edu/AdMoRe

Questions

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