MARIE Skłodowska-CURIE INNOVATIVE TRAINING NETWORK

OPEN CALL – PhD position

Host (recruiting) organisation

Technische Universität München, Germany

Project Title: Reduced order modeling for urgent urban flood simulations

Supervisory team

Primary academic institution W. A. Wall, M. Kronbichler, J. Biehler Technische Universität München	**Industrial institution** S. Trometer CADFEM & virtualcitySYSTEMS
Secondary academic institution S. Zlotnik, P. Diez, A. Huerta Universitat Politècnica de Catalunya	

Project description

An increasing frequency of catastrophic flooding events has led to the implementation of the EU Floods Directive requiring all member states to develop flood risk management plans for endangered regions that have to be revised every six years. The needed hydro-numeric computations are particularly challenging in urban areas, where the damage potential is high and flood relevant structures and conditions (over- and underground) are usually very complex and might change rapidly going along with the city's development. Currently only complex and time-consuming models deliver adequate results, but to support emergency forces in catastrophic events fast solutions are mandatory.

In order to go a major step towards (faster than) real time urban flooding simulations we will develop both novel a-priori reduced models (e.g. network of special 1D models) and also reduced models based on advanced model reduction techniques. In addition, an augmentation approach will be realized that allows continuous adaptations, i.e. improvements and updates, of those models (e.g. based on sophisticated 3D models or especially on incoming data from measurements, i.e. from sensors or other reporting) – both a priori as well as during on-going simulation runs.

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Benefits

- Research supervision and training by recognised international experts in computational mechanics
- Integration within R&D activities of an industry leader
- Doctorate degree from both TUM and UPC
- 36 month full-time employment contract
- Additional mobility and family allowances
- 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, (Applied) Mathematics, Physics or a related field and a good level of English
- To have an enthusiastic attitude to conduct research, being hard-working and critical
- To have a strong background in numerical methods, (fluid and/or solid) mechanics, etc.
- To demonstrate knowledge of a programming language such as C++, Fortran, etc.

Eligibility

Applicants shall, at the time of recruitment by TUM, 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 Germany 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 (Early Stage Researchers)

- Completion of the PhD programme
- Be highly committed with high 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 in the mobility programme both in academia and industry
- Participate in 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

http://www.lacan.upc.edu/ProTechTion

Questions

protechtion.itn@upc.edu