MARIE Skłodowska-CURIE INNOVATIVE TRAINING NETWORK

OPEN CALL – PhD position

Host (recruiting) organisation
Centrale Nantes, Nantes, France

Project Title: Compact High-Order Accurate Schemes for Unstructured Grids and Turbulent Incompressible Multi-Fluid Flows

Supervisory team

Primary academic institution	Industrial institution
Dr. Michel Visonneau Centrale Nantes, LHEEA, Nantes, France	Eng. Benoît Mallol, NUMECA Int., Brussels, Belgium
Secondary academic institution Prof. Luis Eca Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal	

Project description

Most of the discretisation methods applicable to the unstructured meshes often used in the solution of the Navier-Stokes Equations for high Reynolds number industrial flows are at best second order accurate. However, there is a strong need of higher accuracy for the simulation of vortex-dominated flows that control the maneuvering performances of air or sea vehicles. Moreover, in the perspective of Large Eddy Simulation or Hybrid RANSE: LES turbulence modelling applied to industrial flows, the increase of the temporal and spatial accuracy is crucial to reach the desired temporal and spatial resolutions with reasonable computational resources.

The aim of this thesis is therefore to evaluate the possibility to exceed the actual limits of face-based unstructured finite volume second order accurate incompressible flow solvers by developing new compact high-order accurate discretisation techniques on unstructured fully hexahedral grids. The aimed framework of applications concerns high Reynolds number free-surface incompressible flows on industrial geometries.

Benefits

- Doctorate degree from both Universidade de Lisboa and École Centrale de Nantes
- 36 month full-time employment contract
- Additional mobility and family allowances
- Research supervision and training by recognised experts in computational mechanics from academia and producers of composite materials in industry
- Access to 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, e.g. Fortran
- To have experience with applied mathematics
- To have a strong background in computational fluid dynamics

Eligibility

Applicants shall, at the time of recruitment by Centrale Nantes, 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

Until position is filled

How to apply

www.lacan.upc.edu/ProTechTion

Questions

protechtion.itn@upc.edu