2018–01016 - R&D Engineer on "Parallel remeshing based on Mmg platform in the context of LES simulations"

Contract type: Public service fixed-term contract  
Level of qualifications required: PhD or equivalent  
Fonction: Temporary scientific engineer  
Level of experience: Recently graduated

Assignment
The Large Eddy Simulation (LES) becomes more and more attractive for the modelisation of reactive turbulent flow due to the development of super computers. However, the industrialization of this method presents some difficulties, in particular an expensive computational time. The ICARUS project gathers major industrial and academic actors with the aim of facilitate the industrialization of this method.

The LES method is very sensitive to the mesh density and to the mesh quality. Moreover, accurate simulations require very big meshes (several hundred of millions of tetrahedra). Thus, the mesh adaptation techniques are an essential tool to decrease the CPU time. The Mmg platform has already been integrated in the industrial software YALES2 within the collaboration between CARDAMOM team (https://team.inria.fr/cardamom/) and Coria Laboratory (Rouen).

The Mmg platform (https://www.mmgtools.org) is an open-source sequential platform dedicated to triangular and tetrahedra remeshing. It allows to generate high-quality meshes in agreement to an user-defined size map.

YALES2 (https://www.coria-cfd.fr/index.php/YALES2) is an unstructured low Mach number software for the DNS and LES of reacting two-phase flows in complex geometries. It solves instationnary 3d Navier-Stokes equations on massively parallel platform. The two softwares (YALES and Mmg) are coupled in order to perform parallel mesh adaption [1].


Main activities
Within the ICARUS project, the aim is to extract and improve the parallell adaptation module of YALES2 in order to develop a library dedicated to parallel mesh adaptation for LES simulations. This library will be used by the others ICARUS partners (in particular the Cerfacs).

Skills
Technical skills and level required: scientific programming (C++, Fortran), parallel computation (MPI), notion of CFD
Languages: French, English

Benefits package
- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Flexible working hours

Remuneration
From 2632 euros to 2936 euros (gross monthly) depending professional experience

General Information
- Theme/Domain: Numerical schemes and simulations
- Software engineering (BAP E)
- Town/city: Talence
- Inria Center: CRI Bordeaux - Sud-Ouest
- Starting date: 2018-11-01
- Duration of contract: 7 months
- Deadline to apply: 2018-09-12
Contacts

- **Inria Team**: CARDAMOM
- **Recruiter**: Ricchiuto Mario / mario.ricchiuto@inria.fr

About Inria

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Conditions for application

Thank you to give on your online application:

- CV
- cover letter
- recommendation letter

**Defence Security**: This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

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