



Offer #2024-07209

Software development for free-surface hydraulic modeling; applications to urban floods

Contract type : Fixed-term contract

Level of qualifications required : Graduate degree or equivalent

Fonction : Temporary scientific engineer

About the research centre or Inria department

The Inria centre at Université Côte d'Azur includes 37 research teams and 8 support services. The centre's staff (about 500 people) is made up of scientists of different nationalities, engineers, technicians and administrative staff. The teams are mainly located on the university campuses of Sophia Antipolis and Nice as well as Montpellier, in close collaboration with research and higher education laboratories and establishments (Université Côte d'Azur, CNRS, INRAE, INSERM ...), but also with the regional economic players.

With a presence in the fields of computational neuroscience and biology, data science and modeling, software engineering and certification, as well as collaborative robotics, the Inria Centre at Université Côte d'Azur is a major player in terms of scientific excellence through its results and collaborations at both European and international levels.

Context

LEMON is a joint project-team between Inria, Hydrosiences Montpellier (HSM) and the Institut Montpellierrain Alexander Grothendieck (IMAG). The team brings together applied mathematicians and hydraulic engineers to work on flood risk modelling, from physical equations to software development and numerical and statistical data processing. For many years, the team has been developing the SW2D-LEMON software, which simulates the shallow water equations for free-surface flows. This model is used in particular for flood forecasting.

Within the framework of a partnership with the **CEREG** engineering company, the LEMON team wishes to professionalise the SW2D-LEMON software in order to make it more complete (new functionalities), more robust and more efficient so that it can be used in an operational context (studies for local authorities, for example).

Assignment

The main objective of the assignment is to make the SW2D-LEMON software operational for an industrial partner outside the development team (CEREG), running the code in several environments (Windows, Linux, MacOS). The person recruited will be in regular interaction both with members of the LEMON team and with CEREG engineers, and will be at the heart of the collaboration.

Main activities

More specifically, the person recruited will :

- analyse the code currently being developed by the team
- understand CEREG's business needs
- set up a user community for the software
- create and document test cases to answer the questions posed
- help manage the source code (GIT repository, code reviews, continuous integration)
- contribute to the development and optimization of the software and its specific functionalities

Skills

The person recruited should hold a Master's degree in either :

- in the field of applied mathematics, scientific computing or hydraulics, with a taste for software development
- in computing and software development, with a taste for physical modeling and its applications

Required skills:

- sound knowledge of C++ programming;

- sound knowledge of the compilation chain (including Windows) and code profiling tools;
- knowledge of finite volume/hydraulics techniques would be a plus;

Languages :

- French (read, spoken, written)
- English (read, spoken, written)

Interpersonal skills :

The engineer will work in a team of around ten people. As the work will be carried out in a collaborative environment, regular and effective communication of progress will be expected from the person recruited.

Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Remuneration

From 2692 € gross monthly (according to degree and experience)

General Information

- **Theme/Domain** : Earth, Environmental and Energy Sciences
Software engineering (BAP E)
- **Town/city** : Montpellier
- **Inria Center** : [Centre Inria d'Université Côte d'Azur](#)
- **Starting date** : 2024-09-01
- **Duration of contract** : 12 months
- **Deadline to apply** : 2024-05-17

Contacts

- **Inria Team** : [LEMON](#)
- **Recruiter** :
Rousseau Antoine / antoine.rousseau@inria.fr

About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

The keys to success

The successful candidate will:

- be very comfortable with collaborative software development in C++,
- have a taste for physical models in general and fluid flows in particular,
- enjoy working in a team,
- be at ease to talk to different scientific communities (mathematics, engineering sciences, software development, hydraulics, etc.).

Warning : you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.

Instruction to apply

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.

Recruitment Policy :

As part of its diversity policy, all Inria positions are accessible to people with disabilities.