



Offer #2024-07288

Post-Doctoral Research Visit F/M Modeling and simulation of the heart hemodynamics

Contract type : Fixed-term contract

Renewable contract : Yes

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

Assignment

The objective of this research project is to develop a mathematical model and associated numerical methods for the simulation of the hemodynamics in the four cavities of the heart. The main motivation of this work is driven by the development of a simulation tool to simulate pathological scenarios, such as the Hypoplastic Left Heart Syndrome (HLHS), and numerically assess different surgical options. This work will be performed in the framework of the [MEDITWIN](#) project, which involves a collaboration between COMMEDIA project-team, Dassault Systèmes and SIMBIOTX project-team.

Main activities

The post-doctoral project proposes to address this problem via kinematic uncoupling approach and a reduced modeling of the valve dynamics. The external circulation will be modeled via a closed-loop lumped parameter models.

Main activities:

- Bibliographic studies
- Development of mathematical models
- Development of numerical methods
- Numerical implementation (FELiScE software)

Skills

Candidates must hold a doctorate in applied mathematics, and have interest in biomedical applications and some experience in the following fields: mathematical modeling, discretization of PDEs, finite element methods, fluid-structure interaction, blood flows simulations.

Technical Skills: C/C++ programming skills required.

Languages: English

Interpersonal skills: ability to work in a team

General Information

- **Theme/Domain :** Modeling and Control for Life Sciences
Scientific computing (BAP E)
- **Town/city :** Paris
- **Inria Center :** [Centre Inria de Paris](#)
- **Starting date :** 2024-05-01
- **Duration of contract :** 2 years
- **Deadline to apply :** 2024-05-01

Contacts

- **Inria Team :** [COMMEDIA](#)
- **Recruiter :**
Fernandez Varela Miguel Angel / Miguel-Angel.Fernandez_Varela@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.

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.