Offer #2022-05279

Research engineer in Cardiac Ultrasound Modelling

Level of qualifications required : Graduate degree or equivalent

Fonction : Temporary scientific engineer

About the research centre or Inria department

The Inria Sophia Antipolis - Méditerranée center counts 34 research teams as well as 7 support departments. The center's staff (about 500 people including 320 Inria employees) is made up of scientists of different nationalities (250 foreigners of 50 nationalities), engineers, technicians and administrative staff. 1/3 of the staff are civil servants, the others are contractual agents. The majority of the center's research teams are located in Sophia Antipolis and Nice in the Alpes-Maritimes. Four teams are based in Montpellier and two teams are hosted in Bologna in Italy and Athens. The Center is a founding member of Université Côte d'Azur and partner of the I-site MUSE supported by the University of Montpellier.

Assignment

This position is dedicated to the simulation of ultrasound imaging systems, from the transducer to the image through the body, to evaluate global performances in realistic conditions. The benefits of such a tool are manifold. First, it can improve the comprehension of image artifacts that appear in some clinical conditions. Second, it can be used to evaluate the performances of new beamforming algorithms. Third, it can be used to optimise probe design regarding specific applications (numerical phantoms). Last, it can help in defining probe specification based on resulting image quality instead of considering the acoustic performances of the transducer only.

Main activities

The main activity will be the numerical simulation of ultrasound image acquisition and reconstruction for cardiac applications.

Recent developments in artificial intelligence (AI) using deep neural networks could be leveraged to speed up the image generation process, improve the simulated resolution, and optimise the design parameters. AI has been shown to be very efficient in speeding up equation solving, estimating reduced order models and process spatio-temporal data.

This PhD thesis is the result of a collaboration between General Electric Healthcare (GEHC), the French National Research Institute for Digital Science and Technology (Inria), and Nice University Hospital (CHU Nice), started in 2017. It will leverage expertise of all these partners: GEHC in transducer design and cardiac imaging, Inria in cardiac modelling, and CHU Nice in clinical echocardiography.

Skills

- MSc in Applied Mathematics or Computer Science
- Good knowledge of 3D modelling / simulation, physics
- Eager to learn and take initiatives

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 2724 euros gross monthly (according to degree and experience)

General Information

- **Theme/Domain :** Numerical schemes and simulations
  Biologie et santé, Sciences de la vie et de la terre (BAP A)
- **Town/city :** Sophia Antipolis
- **Inria Center :** Centre Inria d'Université Côte d'Azur
- **Starting date :** 2022-10-01
- **Duration of contract :** 7 months
- **Deadline to apply :** 2022-10-05

Contacts

- **Inria Team :** EPIONE
- **Recruiter :**
  Sermesant Maxime / Maxime.Sermesant@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.