

Software development for design, simulation and control of soft robots

Team:

Defrost team (<https://team.inria.fr/defrost/>) focuses on the modeling, simulation and control of soft deformable robots. Our vision is that future robots don't have to be «rigid» but made of complex deformable structures, composed of stiff and soft regions, close to organic materials that we can find in the nature. Soft robotics opens very attractive perspectives in terms of new applications, reduction of manufacturing costs, robustness, efficiency and security. It could result in great advances in robotics in the next years.

The researcher and software developer within the team are using the open source SOFA simulation framework (<https://www.sofa-framework.org>) for which we have developed several plugins for soft robots.

Description of the work:

Within a team of three developers, the recruited experienced engineer will work on designing new 3D interactive software to design soft-robots. This new software will be on the top of our existing software stack. This stack, relying on SOFA for all numerical simulation aspects and 3D rendering aspects, is developed with the following technologies (c++, cmake, gtest, qt-quick, OpenGL, SOFA).

We expect the engineer to do the following tasks:

- • Analysis of existing CAD tools,
- • Helping the design of User Interactions and tool workflow,
- • Taking part in the development of the soft-robots design software by making specific software components (resource manager, User Interface components and widgets),
- • Assisting the integration within the tool of external software component needed by the team's member (eg: Matlab, ICESL for 3D printing, ROS).
- • More generally, take part in the general development of the different plugins made in the team through our coding sessions.

Background:

- • Master or engineer degrees in the fields of Computer Science, numerical simulation, or related fields
- • Experiences large software development
- • Experiences in User-Interface, robotics and/or physics-based simulation

Skills:

Skills and curiosity required in the following domains:

- • Highly skilled in C++ and Python programming
- • Knowledge of mechanic modeling tool (CADs)
- • Knowledge of Qt/QML
- • Knowledge of software development practices (test framework, continuous integration, Git...)
- • Knowledge of scientific tools/libraries, such as Matlab/SciPy/NumPy
- • Capacity to write documentation in English

Information:

Location: Lille (France)

Duration : 24 months. The position should be started before December 2018.

Salary: Between 30K-35K Euros, depending on the experiences.

Contact: Send your CV and Cover letter to gang.zheng@inria.fr