Offer #2025-08711

Robotics Engineer Position H/F within the framework of the Courrier project

Contract type : Fixed-term contract

Level of qualifications required : Graduate degree or equivalent

Fonction : Temporary scientific engineer

Level of experience : From 3 to 5 years

About the research centre or Inria department

The Inria center at the University of Bordeaux is one of the nine Inria centers in France and has about twenty research teams.. The Inria centre is a major and recognized player in the field of digital sciences. It is at the heart of a rich R&D and innovation ecosystem: highly innovative SMEs, large industrial groups, competitiveness clusters, research and higher education players, laboratories of excellence, technological research institute...

Context

The Auctus team (https://auctus-team.gitlabpages.inria.fr/) at Inria Bordeaux is recruiting a research engineer for two years within the framework of the Courrier project. This project aims at exploring the role of intentions expressed by the robot in human-robot cooperation.

Indeed, despite considerable scientific progress in the field of collaborative robotics, the application of this knowledge to industry remains extremely limited. However, the technological changes taking place in the field of collaborative robotics could profoundly alter the interaction between humans and machines. For collaborative robotics to really reach this level of maturity and provide assistance to qualified human operators, a number of research questions need to be addressed. One of these

issues is the readability of the robotic system by the user, which is the focus of this project. We draw on the theoretical framework of joint action (i.e. action requiring coordination with another human agent). It is now accepted that the production of joint action relies on the exchange of information between partners; in particular, on the ability to infer the intentions of others. Thus, many authors emphasize that sharing agents' intentions, both before and during the action, is an essential element of cooperation. We therefore hypothesize that the readability of robotic system intentions is a key factor in their predictability and, by extension, in the human operator's ability to interact efficiently (i.e. achieve an acceptable level of performance while minimizing cognitive cost) with highly automated robotic systems. The aim of the project is to explore 1/ the link between the readability of the intentions of the robotic system and its predictability, 2/ the impact of this predictability on the performance and cognitive cost of carrying out a common task, 3/ how the level of predictability of the system evolves with learning, and 4/ what generic framework for formulating robotic control can allow the rich expression of modalities for communicating intention.

Assignment

The research engineer recruited within the framework of this project will integrate the Auctus team at Inria (Talence, Campus de l'Université de Bordeaux) to develop the experimental implementation of the protocols proposed in the project to validate the hypotheses related to the predictability of the robot's intentions. This implementation will be carried out using a serial manipulator arm, enabling the deployment of the constrained optimization based control architecture (https://gitlab.inria.fr/auctus-team/components/control/qontrol). This implementation, along with that of the various sensors required, on the one hand, for measuring relevant metrics for the project, will be conducted through the ROS middleware and associated simulation tools. These simulation tools will allow for the preliminary validation of the experimental approach as well as the validation of certain initial scientific results. Furthermore, simplified simulators will be developed to validate certain hypotheses that do not require a physically realistic simulation of the robot.

The Auctus team is approximately composed of 15 people whose core expertise ranges from robotics to cognitive sciences including biomechanics and numerical constrained optimization. The recruited person will have the opportunity to benefit from exchanges with these people but will also be working closely with:

- Vincent Padois, PI of the Extender project for the Auctus team with a core scientific expertise in robot control, especially in the collaborative context;
- Lucas Joseph, research engineer at Inria strongly involved in the research projets of the Auctus team both in terms on the development of control software libraries and in terms of setting-up and running experimental developments.

Several collaboratives robots (Franka Panda, Kuka IIWA and more coming) as well several sensors (Optitrack, 2D laser sensor, 6 axis FT sensors, Gelsight tactile

sensor,...) and experimental facilities will be accessible to the hired person.

Main activities

The main activities of the hired person will be:

- Robotics control architecture developments
- Software Developments
- Technology watch
- Scientific and technical reporting and documentation
- Technical meetings with partners
- Experimental robotics activities

Skills

Technical skills and knowledge:

- Modelling and control of robotic systems
- Control theory and signal processing
- Linear algebra and numerical optimization
- Python and C++ programming
- ROS middleware and associated tools (Rviz, MoveIt!, etc.)
- Linux and RTOS
- Code versioning and continuous integration (git)

Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Possibility of teleworking 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

The gross monthly salary will be between 2692€ and 3085€, depending on your qualifications and professional experience (before social security contributions ans monthly witholding tax).

General Information

- **Theme/Domain :** Robotics and Smart environments
  Instrumentation et expérimentation (BAP C)
- **Town/city :** Talence
- **Inria Center :** Centre Inria de l'université de Bordeaux
- **Starting date :** 2025-05-01
- **Duration of contract :** 2 years
- **Deadline to apply :** 2025-04-30

Contacts

- **Inria Team :** AUCTUS
- **Recruiter :**
  Padois Vincent / vincent.padois@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

Required soft skills:

- Rigour and intellectual honesty
- Curiosity and desire to learn
- Analytical mindset and abstraction skills
- Practical mindset and ability to develop robust and reliable solutions
- Autonomy and organizational skills
- Team spirit and ability to report progress

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

If you are interested by this job, please could you apply on website jobs.inria with the following documents :

- cv
- cover letter
- recommendation letters

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.