



Job vacancy #2022-05651

Software integration engineer

Contract type : Fixed-term contract

Level of qualifications required : Graduate degree or equivalent

Other valued qualifications : Master in Robotics/Computer sciences

Fonction : Temporary scientific engineer

Level of experience : From 3 to 5 years

About the research centre or Inria department

The Inria Université Côte d'Azur center counts 37 research teams as well as 8 support services. The center's staff (about 500 people) is made up of scientists of different nationalities, engineers, technicians and administrative staff. The majority of the center's research teams are located in Sophia Antipolis and five of them are based in an Inria antenna in Montpellier. The Inria branch in Montpellier is growing in size, in accordance with the strategy described in the institution's Contract of Objectives and Performance (COP).

Context

The ACENTAURI research team (<https://team.inria.fr/acentauri/>), located in the Inria Center of the Côte d'Azur University in Sophia-Antipolis, is **offering different robotics engineer positions** working in a team for the coming years.

ACENTAURI is a robotics team that studies and develops autonomous and intelligent robots that collaborate with each other to perform difficult tasks in complex and dynamic environments.

The team addresses perception, decision and control problems for multi-robot collaboration by proposing an original hybrid approach to artificial intelligence based on models and data and by studying efficient algorithms. The team focuses on applications such as multi-robot patrol systems for environmental monitoring and transporting people and goods. In these applications, several robots share multi-sensor information possibly coming from the infrastructure.

The effectiveness of the proposed approaches is demonstrated on real robotic systems such as cars and drones in collaboration with industrial partners.

Within the Framework of the European project Agrifood-TEF (01/01/2023-31/12/2028), INRIA-ACENTAURI is working to set up a Living Lab (Mobile Laboratory) in order to deliver on site services for SMEs or farmers. The project is organized with different national nodes and satellites. Inria belongs to the french national node.

The first two years of the project will focus on the setup of the system and services, while the three remaining years will be used to provide and maintain services.

The Living Lab will contain a multi-robot platform composed of aerial drones and autonomous ground robots that communicates with each other. All the robots will be equipped with dedicated sensors for navigation and for the dedicated uses cases of SMEs or farmers.

The complete system will be able to:

- Register and georeference cameras data, Lidar data, and specific sensors data
- Perform mapping of the environment
- Monitor the progress of the task from the Living Lab
- Process data in the living Lab using AI based techniques (Model based, Data based and Hybrid based)

INRIA Acentauri is looking to setup a team of engineers in this aim, composed by:

- one experienced engineer also assuming the role of project manager
- one hardware integration engineer
- one software integration engineer
- two engineers developing robotics applications to setup services

As a whole, the team will have to cover a wide area of requirements :

- Robotic hardware and software integration and validation (robots and sensors)
- Autonomy in energy (charging, recharging and monitoring) (robots and living Lab)
- Environment representation (3D Mapping)
- Localization, Planning and control of robots (AGV and UAV)
- Georeferencing and timestamping of datasets (RTK-GPS, Cameras, Lidar,)
- Communication (Wifi, 5G, 802.11, ...)
- IHM and monitoring
- Cybersecurity and network management
- Mechanical design and prototyping (3D printing)
- Project and services management (reporting, meetings, planning, scheduling)
- Car driver licence
- UAV control (Telepilot)

Travel: Travel is expected for system development, data acquisition and on site services.

Assignment

The missions entrusted to the software integration engineer will mainly be the following:

- Definition and implementation of an open architecture for autonomous robots (AGV, UAV) for environment perception, situation analysis and understanding, decision making and vehicle control (Ubuntu 20.04, ROS2, Open-Rox[1])
- Georeferencing and timestamping of datasets
- Develop basics control algorithms based on RTK-GPS localization
- Develop autonomous landing and takeoff for UAV
- Develop trajectory tracking based on RTK-GPS
- Evaluation of integration tests and upward compatibility of versions
- Monitoring robots using efficient communication
- Making experiments and demonstrations
- Report and documentation
- Customisation of the living Lab

[1] Open-ROX is a software suite developed in the ACENTAURI team

Collaboration : The candidate will therefore work in close collaboration with the Agrifood-TEF engineers team, doctoral students and post-docs of the team.

Responsibilities: The candidate will have to integrate into the ACENTAURI engineering team and participate in the animation of the projects. In addition, he (she) will have to perform the important tasks of communication, report writing, and methodology implemented in ACENTAURI (project monitoring and project management under Git and Gitlab)

Main activities

- Analyze the users needs
- Propose solutions
- Develop programs/ applications/ interfaces
- Design experimental platforms
- Write documentation

Complementary activities:

- Write the reports
- Write meeting minutes
- Test, modify until validated

Skills

Technical skills and level required:

The candidate should preferably have obtained a PhD in Robotics or an engineering degree with an already proved experience (at least 3 years). The candidate must have a solid foundation in software development (Matlab, C/C++, Python, Git, OpenCL, CMAKE, ROS1, ROS2, ...). He must have knowledge in programming of machine learning methods (learning and inference) and GPU programming will be highly appreciated.

Languages:

a good level in English read/written/spoken is expected.

Interpersonal skills:

The candidate will be in contact with the members of the team and will have to integrate into the ACENTAURI engineering team. He/she must have the appropriate relational qualities.

Additional skills appreciated:

The car driven licence and the drone remote control licence are a plus, if necessary these licence will have to be passed within the first three months of the contract.

He/she must also be highly motivated for multidisciplinary studies and all aspects of R&D ranging from fundamental to experimental work.

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 2652 € gross monthly (according to degree and experience)

General Information

- **Theme/Domain** : Robotics and Smart environments
Instrumentation et expérimentation (BAP C)
- **Town/city** : Sophia Antipolis
- **Inria Center** : [Centre Inria d'Université Côte d'Azur](#)
- **Starting date** : 2023-04-01
- **Duration of contract** : 2 years
- **Deadline to apply** : 2023-09-30

Contacts

- **Inria Team** : [ACENTAURI](#)
- **Recruiter** :
Martinet Philippe / philippe.martinet@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 keys to success

Portrait in broad strokes of the expected collaborator:

- tastes and appetites for technology
- excellence in robotics
- great working capacity
- persevering and communicating
- enthusiastic
- team work
- good organization and rigor in the work
- knowledge and know-how in programming and debugging
- Feeling at ease in a dynamic scientific environment, enjoying learning and listening are essential qualities to succeed in this mission.
- Passionate about innovation, with expertise in robotics development and a great capacity for conviction.

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.