Job vacancy #2023-06793

Internship : Indoor visual positioning

Contract type : Internship
Level of qualifications required : Bachelor's degree or equivalent
Fonction : Internship Research

About the research centre or Inria department

The Centre Inria de l'Université de Grenoble groups together almost 600 people in 22 research teams and 7 research support departments.

Staff is present on three campuses in Grenoble, in close collaboration with other research and higher education institutions (Université Grenoble Alpes, CNRS, CEA, INRAE, ...), but also with key economic players in the area.

The Centre Inria de l’Université Grenoble Alpes is active in the fields of high-performance computing, verification and embedded systems, modeling of the environment at multiple levels, and data science and artificial intelligence. The center is a top-level scientific institute with an extensive network of international collaborations in Europe and the rest of the world.

Context

Global Navigation Satellite System (GNSS) such as the GPS, offer a positioning service to a great number of applications. However, GNSS are limited to spaces where the sky is free from occlusions. Spaces such as underground or multi-level parkings are not covered by these systems and require other types of sensors for localisation and navigation.

Assignment

We are seeking a highly motivated and talented intern to join Inria's Experimentation and Development Service (SED). This internship will focus exclusively on the localisation and positioning aspect of autonomous vehicle technology, specifically for navigating vehicles from a parking entrance to a designated parking place within a mapped indoor environment. While the vehicle navigation system is not within the scope of this internship, your work will be crucial in ensuring the vehicle's precise location within this complex indoor environment.

To achieve this goal, you will: (1) study the state of the art in indoor navigation and mapping (visual SLAM, landmark detection, camera pose estimation, optimisation), and (2) test a selected set of algorithms in a simulated environment.

Main activities

- Collaborate with the SED and the Chroma research engineers to develop and enhance computer-vision based algorithms for precise vehicle localisation within a pre-mapped indoor environment.
- Work on real-time data processing and sensor fusion techniques to optimize positioning accuracy.
- Implement and fine-tune computer vision and machine learning models for robust vehicle positioning, even in cluttered environments with other vehicles and obstacles.
- Conduct experiments and tests in a simulated environment to validate the accuracy and reliability of the positioning system.
- Analyze and interpret data to identify areas for improvement and propose innovative solutions.

Skills

- Currently pursuing a M1 or master's (M2) degree in computer science, electrical engineering, robotics, or a related field.
- Good programming skills in Python, C++ or similar.
- Familiarity with computer vision, machine learning, and sensor fusion concepts.
- Solid understanding of mathematics, especially linear algebra and statistics.
- Strong problem-solving skills and the ability to work both independently and in a collaborative team environment.
- Excellent communication and presentation skills.

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.)
Professional equipment available (videoconferencing, loan of computer equipment, etc.)
Social, cultural and sports events and activities
Access to vocational training
Social security coverage

Remuneration

Gratification = 4,05€ gross / hour

General Information

- Town/city: Montbonnot
- Inria Center: Centre Inria de l'Université Grenoble Alpes
- Starting date: 2024-01-01
- Duration of contract: 6 months
- Deadline to apply: 2023-11-30

Contacts

- Inria Team: SED-RAL (DGD-I)
- Recruiter: Borkowski Stanislaw / stan.borkowski@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

How to apply:

Please send your application including

- Mandatory: Complete CV
- Mandatory: Letter of motivation (at most one page)
- Recommended: Degrees and lists of grades (translated to English or French)
- Recommended: Name and e-mail address of at most two references

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

Applications must be submitted online via the Inria website. Processing of applications submitted via other channels is not guaranteed.

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.