Offer #2020-02984

PhD Position F/M PhD on 3D Scene Understanding for Autonomous Driving

Contract type : Fixed-term contract

Level of qualifications required : Graduate degree or equivalent

Fonction : PhD Position

Level of experience : Recently graduated

Context

In the context of a French research project including other academicals and industrials we are looking for a very good PhD student on 3D scene understanding from Image and Lidar data for autonomous driving applications.

The job is located in center of Paris (France), at the Inria national research institute RITS team (Robotics and Intelligent Transportation System). The team has approx. 20 people working on Computer Vision/Planning/Control for intelligent transportation and autonomous vehicles (to test/validate our researches). The environment is nice and lively, with people from worldwide origins. Social skills will be appreciated, as collaborations with other researchers/PhDs is expected.

Assignment

The candidate will research on 3D vision and will propose new algorithms and methodology to provide 3D scene understanding. Of importance, outdoor mobile robotics must observe and sense their environment accurately to take wise decisions. While earlier researches were processing 2D vision (object detection, semantic segmentation, etc.) recent deep networks are now able to handle 3D data and to reason in 3D to solve the same tasks directly in the 3D world referential. The candidate will have first to study the literature and master the existing techniques relying on voxel based or point based representations. During the PhD, it is intended for the candidate to propose new ideas and research directions.

While the project framework is rather flexible and allows a variety of works, we intend to tackle some of the followings: 3D semantic completion, 3D semantic segmentation, 3D odometry, 3D geometry reconstruction, etc. In a second part of the PhD we propose to extend the work to semi-supervised or unsupervised techniques so as to address domain adaptation and overcome the limitation of fully supervised techniques.

The applications will necessarily include autonomous driving but might extend to a wide range of other applications (virtual/augmented reality, entertainment, etc.). Of interest, the team has real working prototypes and the student could (but not mandatory) include some real experiments.

Main activities

See above

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.)
- 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

General Information

- **Theme/Domain** : Robotics and Smart environments
- **Town/city** : Paris
- **Inria Center** : Centre Inria de Paris
- **Starting date** : 2020-11-01
- **Duration of contract** : 3 years
- **Deadline to apply** : 2020-12-03

Contacts

- **Inria Team** : RITS
- **PhD Supervisor** :
  De Charette Raoul / raoul.de-charette@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

– Excellent knowledge of deep learning
– Good knowledge of either: computer vision, deep learning, etc
– Good programming skills (Python and C++)

– Experience in deep 3D vision algorithms is **required**

– Experience in research is **required** (internships, projects, publications)

– Experience with real world mobile robotics or autonomous driving is a plus

– English skills are **required** and french is optional

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.