Offre n°2021-03794

Post-Doctorant F/H One year renewable or Inria Started Research Position available at Inria Grenoble Rhône-Alpes in cooperation with Toyota: AI based Perception and multiple Objects Tracking for Autonomous Driving

Type de contrat : CDD

Contrat renouvelable : Oui

Niveau de diplôme exigé : Thèse ou équivalent

Autre diplôme apprécié : Master in Computer Science and Robotics (or closely related fields)

Fonction : Post-Doctorant

A propos du centre ou de la direction fonctionnelle

Grenoble Rhône-Alpes Research Center groups together a few less than 650 people in 37 research teams and 8 research support departments.

Staff is localized on 5 campuses in Grenoble and Lyon, in close collaboration with labs, research and higher education institutions in Grenoble and Lyon, but also with the economic players in these areas.

Present in the fields of software, high-performance computing, Internet of things, image and data, but also simulation in oceanography and biology, it participates at the best level of international scientific achievements and collaborations in both Europe and the rest of the world.

Contexte et atouts du poste

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, open 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.

Inria Grenoble Rhône-Alpes Research Center groups together a few less than 650 people in 37 research teams and 8 research support departments. Staff is localized on 5 campuses in Grenoble and Lyon, in close collaboration with labs, research and higher education institutions in Grenoble and Lyon, but also with the economic players in these areas. Present in the fields of sofware, highperformance
computing, Internet of things, image and data, but also simulation in oceanography and biology, it participates at the best level of international scientific achievements and collaborations in both Europe and the rest of the world.

The Inria research team Chroma is involved in several academic and industrial projects in the field of Autonomous Vehicles. The proposed R&D work has to be performed in the scope of the ES3CAP (Embedded Smart Safe Secure Computing Autonomous Platform) project, in cooperation with several companies and laboratories. The objective of Inria in the project is to develop robust perception systems for Autonomous vehicles by fusing multiple sensor data using Deep Learning approaches. The developed approaches have to be tested on several datasets and experiments have to be conducted on our Autonomous vehicle platform to demonstrate the feasibility in the real world. Several studies have already been done and published by the Chroma team on this topic. Some approaches have also been patented.

Mission confiée

A one year renewable Post-Doc or Starting Research position (SRP) is available at Inria Grenoble Rhône-Alpes (France) in the scope of a long-term (13 years) Inria-Toyota cooperation on autonomous driving. We are looking for a highly motivated post-doctoral researcher or confirmed researcher interested in AI

based Perception and Decision-making for autonomous vehicles.

The R&D work must be done at Inria Grenoble-Rhône-Alpes, with regular progress meetings (approximately every month) with Toyota Motor Europe located in Brussels. These progress meetings are mostly done by videoconference, but some of them are organized at Toyota Motor Europe (TME) in Brussels. The experimental validation of the research work will be carried out using the instrumented Toyota Lexus vehicle (which is located at Inria Grenoble), and with annotated open datasets or private datasets provided by TME. The R&D work must also be carried out in conjunction with a researcher from the Chroma team who works within the framework of the Inria -Toyota cooperation, and with some engineers from the team.

The proposed R&D work will focus on the development of models and methods to detect, locate, classify, characterize and monitor in real time the movements of entities (vehicles, cycles, pedestrians ...) located around the autonomous vehicle. The main objective of the project is to improve and extend the existing methods of "3D tracking" and "grid tracking", in order to adapt them to the different sensor modalities that can be found on existing platforms, as well as in real driving scenarios. The candidate will build upon a set of published and/or patented technologies developed by our team during our 13-year collaboration with Toyota. Several Inria-TME patents have been filed during the 5 past years, and another one is expected by the end of the current project.

Principales activités

The activities of the recruited postdoc or researcher will consist on some of the followings (depending on the scientific profile of the candidate):

- Develop deep learning architectures, fusing multiple sensor data for autonomous vehicle perception system.

- Propose and develop new objects detection / classification / tracking methods, and their integration in the current framework.

- Write documentation, reports, and participate in scientific paper writing.

- Run tests on publicly available datasets and our experimental platform.

- Participate in presentations and demonstrations with the automated vehicle in Industrial or Research (e.g. International Conferences) events

Compétences

Main requirements:

- PhD in Computer Science and Robotics (or closely related fields)
- Good theoretical and practical background in one of the following domains: Robotics, Multi-sensors perception, Scene Understanding, Deep learning approaches.
- Good skills in C/C++, Python and Linux.

The following qualifications would be an advantage:
- Experience using the Robotics library ROS
- Familiarity with CUDA and Boost libraries
- Theoretical knowledge of Bayesian models

- Ability to work as a teammate with other researchers

- Reasonable English skills (written and spoken)

Avantages

- Restauration subventionnée
- Transports publics remboursés partiellement
- Congés: 7 semaines de congés annuels + 10 jours de RTT (base temps plein) + possibilité d'autorisations d'absence exceptionnelle (ex : enfants malades, déménagement)
- Possibilité de télétravail (après 6 mois d'ancienneté) et aménagement du temps de travail
- Équipements professionnels à disposition (visioconférence, prêts de matériels informatiques, etc.)
- Prestations sociales, culturelles et sportives (Association de gestion des œuvres sociales d'Inria)
- Accès à la formation professionnelle
- Sécurité sociale

Rémunération

Gross salary : from 2 653 euros before deduction of tax incomes depending on experiences.

Informations générales

- **Thème/Domaine :** Robotique et environnements intelligents
  Calcul Scientifique (BAP E)
- **Ville :** Montbonnot

- **Centre Inria :** Centre Inria de l'Université Grenoble Alpes
- **Date de prise de fonction souhaitée :** 2021-09-01
- **Durée de contrat :** 12 mois
- **Date limite pour postuler :** 2021-08-31

Contacts

- **Équipe Inria :** CHROMA
- **Recruteur :**
  Laugier Christian / christian.laugier@inria.fr

A propos d'Inria

Inria est l'institut national de recherche dédié aux sciences et technologies du numérique. Il emploie 2600 personnes. Ses 215 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3900 scientifiques pour relever les défis du numérique, souvent à l'interface d'autres disciplines. L'institut fait appel à de nombreux talents dans plus d'une quarantaine de métiers différents. 900 personnels d'appui à la recherche et à l'innovation contribuent à faire émerger et grandir des projets scientifiques ou entrepreneuriaux qui impactent le monde. Inria travaille avec de nombreuses entreprises et a accompagné la création de plus de 200 start-up. L'institut s'efforce ainsi de répondre aux enjeux de la transformation numérique de la science, de la société et de l'économie.

Attention: Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.

Consignes pour postuler

Sécurité défense :
Ce poste est susceptible d'être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2011-1425 relatif à la protection du potentiel scientifique et technique de la nation (PPST). L'autorisation d'accès à une zone est délivrée par le chef d'établissement, après avis ministériel favorable, tel que défini dans l'arrêté du 03 juillet 2012, relatif à la PPST. Un avis ministériel défavorable pour un poste affecté dans une ZRR aurait pour conséquence l'annulation du recrutement.

Politique de recrutement :
Dans le cadre de sa politique diversité, tous les postes Inria sont accessibles aux personnes en situation de handicap.