



Offre n°2024-07085

PhD Position F/M Vehicle-and-mobile phone computing sharing as part of the edge-to-cloud continuum

Type de contrat : Fixed-term contract

Niveau de diplôme exigé : Graduate degree or equivalent

Fonction : PhD Position

A propos du centre ou de la direction fonctionnelle

The Inria Saclay-Île-de-France Research Centre was established in 2008. It has developed as part of the Saclay site in partnership with Paris-Saclay University and with the Institut Polytechnique de Paris since 2021.

The centre has 39 project teams, 27 of which operate jointly with Paris-Saclay University and the Institut Polytechnique de Paris. Its activities occupy over 600 scientists and research and innovation support staff, including 54 different nationalities.

Contexte et atouts du poste

The ANR FITNESS project, part of the PEPR Network of the Future, funds this Ph.D. program.

Mission confiée

Context

Intelligent Transport System is open to new applications and services (e.g., infotainment, video streaming, etc.) leveraging vehicle and consumer interaction opportunities. Among such opportunities is the possibility of using computation and/or connectivity resources offered by nearby intelligent vehicles to execute tasks from third-party devices (mobile phones), thus extending the existing Edge-Cloud ecosystem.

Unfortunately, one of the issues making such resource sharing a challenging task is the vehicles and devices heterogeneity in behaviors and resources (e.g., diverse mobility routines, urban traffic, heterogeneous space-time interaction between users and nearby vehicles, etc.). In particular, a direct consequence of hosting or using resources in cars in a distributed way is their exposure and sensitivity to uncertainties of behaviors in users' mobility and vehicle connectivity brought by traffic conditions. It is, therefore, essential to integrate mobility into the provided solutions besides dealing with resources, capabilities, and sharing.

Objective

The objective of this Ph.D. is first to learn and understand (i) the needs of devices around vehicles, (ii) the resources that vehicles around devices offer, and (iii) how the crowd of devices (or a crowd of vehicles) on the resource-sharing zone evolves in space and time? Second, we are assessing the feasibility of deactivating some of the resources at the edge, including base station antennas and some of the edge node computing servers, to optimize resource utilization, reduce energy consumption, and enhance overall operational efficiency. This strategic adjustment aligns with our goal of achieving a more sustainable and cost-effective infrastructure while maintaining the desired level of service and performance.

Principales activités

- Read and synthesize literature work,
- Propose novel approaches, technical solutions
- Design, test, and simulate proposed solutions using simulation tools and, if possible, experimental platforms.
- Write research papers and reports
- Present the research works

Compétences

Technical skills and level required:

- Candidates must have a Master of Science or equivalent degree in Computer Science or Electrical Engineering.
- Strong background in statistical analysis and tools, mobile networking, and communication networks.
- Strong knowledge of machine learning algorithms and AI; Past experience in implementing and applying ML/AI algorithms is very welcome.
- Candidates should be able to perform good critical analyses of obtained results and be creative in proposing solutions.
- Excellent programming skills (e.g., Python, C, C++) and Data Visualisation Tools (Pandas, etc)
- Good English skills, both in written and oral form

Avantages

- 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 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

Rémunération

1st et 2nd year : 2100€ gross/month

3rd année : 2190€ gross/month

Informations générales

- **Thème/Domaine** : Networks and Telecommunications
System & Networks (BAP E)
- **Ville** : Palaiseau
- **Centre Inria** : [Centre Inria de Saclay](#)
- **Date de prise de fonction souhaitée** : 2024-05-01
- **Durée de contrat** : 3 years
- **Date limite pour postuler** : 2024-06-30

Contacts

- **Équipe Inria** : [TRIBE](#)
- **Directeur de thèse** :
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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.

