



Offre n°2022-05379

PhD Position F/M PhD student on federate learning and multi-party computation techniques for prostate cancer

Le descriptif de l'offre ci-dessous est en Anglais

Type de contrat : CDD

Niveau de diplôme exigé : Bac + 5 ou équivalent

Fonction : Doctorant

Niveau d'expérience souhaité : Jusqu'à 3 ans

A propos du centre ou de la direction fonctionnelle

The Inria Lille - Nord Europe Research Centre was founded in 2008 and employs a staff of 360, including 300 scientists working in fifteen research teams. Recognised for its outstanding contribution to the socio-economic development of the Hauts-De-France région, the Inria Lille - Nord Europe Research Centre undertakes research in the field of computer science in collaboration with a range of academic, institutional and industrial partners.

The strategy of the Centre is to develop an internationally renowned centre of excellence with a significant impact on the City of Lille and its surrounding area. It works to achieve this by pursuing a range of ambitious research projects in such fields of computer science as the intelligence of data and adaptive software systems. Building on the synergies between research and industry, Inria is a major contributor to skills and technology transfer in the field of computer science.

Contexte et atouts du poste

This PhD student position will be supported by the [HE Flute project](#)

While AI techniques are becoming ever more powerful, there is a growing concern about potential risks and abuses. As a result, there has been an increasing interest in research directions such as privacy-preserving machine learning, explainable machine learning, fairness and data protection legislation. Privacy-preserving machine learning aims at learning (and publishing or applying) a model from data while the data is not revealed. Notions such as (local) differential privacy and its generalizations allow to bound the amount of information revealed.

The goal of the multi-disciplinary FLUTE project is to advance and scale up data-driven healthcare by developing novel methods for privacy-preserving cross-border utilization of data hubs. Advanced research will be performed to push the performance envelope of secure multi-party computation in Federated Learning, including the associated AI models and secure execution environments.

The INRIA MAGNET team (and hence the recruited collaborators) will contribute to this project among others by researching machine learning algorithms and multi-party protocols with improved scalability in the context of medical data, e.g., by exploiting data sparsity. This research will involve both theoretical and more applied components. As coordinator INRIA will also contribute to the integration of the software developed in the FLUTE project (and the complementary TRUMPET project).

Mission confiée

The recruited PhD student will collaborate with colleagues in the MAGNET team and the FLUTE project consortium in general. Part of the work may involve travel to other partners.

If the research features a prototype, it will contribute to the project's open source library and may be supported by engineers in the team.

Possible domains of research include (but are not limited to):

- Cryptography-based strategies to improve the security of privacy-preserving AI systems.
- Inference methods for privacy assessment
- Design and development of the FLUTE platform and its supporting algorithms

Principales activités

- Contribute to the research of the FLUTE project
- Collaborate with other MAGNET and FLUTE team members
- Disseminate research results

Compétences

The ideal candidate will have the following skills:

- Good mastery of English
- A strong background in computer science and mathematics. Subject matters which will be needed during the research include (but are not limited to) machine learning, statistics, cryptography, distributed systems, constraint programming.
- Good programming skills (e.g., C/C++ or python) and supporting tools.
- Relational skills, e.g., working in a team, effective reporting and communication with all involved stakeholders.

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 and 2nd year : 2051€ gross monthly salary (before taxes)

3rd year : 2158€ gross monthly salary (before taxes)

Informations générales

- **Thème/Domaine** : Représentation et traitement des données et des connaissances Statistiques (Big data) (BAP E)
- **Ville** : Villeneuve d'Ascq
- **Centre Inria** : [Centre Inria de l'Université de Lille](#)
- **Date de prise de fonction souhaitée** : 2024-02-01
- **Durée de contrat** : 3 ans
- **Date limite pour postuler** : 2024-03-01

Contacts

- **Équipe Inria** : [MAGNET](#)
- **Directeur de thèse** :
Ramon Jan / jan.ramon@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.

L'essentiel pour réussir

We are looking for a candidate with a strong background in computer science, with interest in research (including the mathematics needed to realize privacy) who welcomes the broad range of challenges leading to a successful result.

Candidates should provide sufficient information to support their application, the page

<https://team.inria.fr/magnet/how-to-apply/> lists the minimum information desired (which is more than what is strictly required by the online submission platform).

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

CV + application letter + recommendation letters + List of publications

Academic transcripts, thesis, project report

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.