

2022-05381 - Post-Doctoral Research Visit F/M federate learning and multi-party computation techniques for prostate cancer

Type de contrat : CDD

Niveau de diplôme exigé : Thèse ou équivalent

Fonction : Post-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 320, including 280 scientists working in fourteen 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 post-doctoral position will be supported by the **HE Flute project**. While this position will be in the MAGNET team in Lille, we will collaborate with the several European project partners.

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 FLUTE project).

The start and end date of the offered post-doctoral positions can be negotiated, subject to the administrative constraints that they start at the earliest on 1/1/2023 and end before or around 31/12/2025 and that individual contracts last no longer than 2 years.

Mission confiée

The recruited post-doc will collaborate with colleagues in the MAGNET team and the FLUTE project consortium in general.

If the research features a prototype, it will contribute to the project's open source library.

We hope the post-doc can bring new expertise to the group and/or can help intensifying collaboration in the project consortium. He will collaborate closely with the other group members on realizing the research objectives of the project. Engineers in the team can support the prototyping and validation.

Possible topics 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
- Collaborate with engineers to prototype proposed algorithms and validate them
- Disseminate research results

Compétences

The following skills are desired for this position:

- a strong research background in the domain of the project (or at least a specific area such as privacy, cryptography, statistics, distributed systems, ...)

Informations générales

- **Thème/Domaine** : Sécurité et confidentialité Statistiques (Big data) (BAP E)
- **Ville** : Villeneuve d'Ascq
- **Centre Inria** : Centre Inria de l'Université de Lille
- **Date de prise de fonction souhaitée** : 2023-09-01
- **Durée de contrat** : 1 an, 11 mois
- **Date limite pour postuler** : 2023-06-30

Contacts

- **Equipe Inria** : MAGNET
- **Recruteur** :
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 200 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3500 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 180 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 the multiple challenges related to privacy and an approach involving several specializations (e.g., machine learning, security, cryptography,

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

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.

Attention: Les candidatures doivent être déposées en ligne sur le site Inria.

- good communication and reporting skills, and an interest in collaborative work
- proficiency in English

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

Gross monthly salary (before taxes) : 2 746 €

Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.