Job vacancy #2023-06845

Private and Decentralized Machine Learning

Contract type: Fixed-term contract
Renewable contract: Yes
Level of qualifications required: Graduate degree or equivalent
Other valued qualifications: PhD

Fonction: Temporary scientific engineer

About the research centre or Inria department

The Inria Rennes - Bretagne Atlantique Centre is one of Inria's eight centres and has more than thirty research teams. The Inria Center is a major and recognized player in the field of digital sciences. It is at the heart of a rich R&D and innovation ecosystem: highly innovative PMEs, large industrial groups, competitiveness clusters, research and higher education players, laboratories of excellence, technological research institute, etc.

Context

The selected applicant will work within the WIDE research team at Inria of the University of Rennes (https://team.inria.fr/wide/). WIDE focuses on large-scale distributed systems and applications, as well as on privacy, and distributed machine learning.

This engineering position is funded by the SOTERIA H2020 project (https://www.soteria-h2020.eu/) which aims to develop a user-centric, citizen-driven tool to help European citizens to manage their personal data. The project therefore involves close collaboration with French international partners such as AriadNext by IDNow, Idiap Switzerland, COSIC Team @ KU Leuven, a complete list is available at https://www.soteria-h2020.eu/partners/.

The successful applicant will have the opportunity to travel and collaborate with such international partners. All travel expenses will be covered by Inria.

Assignment

The recruited engineer is expected to contribute to the implementation of a distributed data vault that can (i) store personal data while keeping it safe from third parties, (ii) support computation on encrypted or otherwise protected personal data to obtain aggregate statistics while respecting the privacy of the individual data items, (iii) provide means to remunerate users that enable computation on their personal data.

More specifically, the engineer will initially work on key management and distribution protocols. In particular, they will work on use of trusted execution environments like Intel SGX, ARM TrustZone and iOS's Secure Enclave, to store and process private information in the key-management process.

Later on they will contribute to the implementation of privacy-preserving machine-learning algorithms using TEEs, multiparty computation and other cryptographic techniques.

The engineer will work in close contact with the researchers involved in the project, both at Inria, and at KU Leuven. They will also have frequent interaction with other project partners across Europe.

Main activities

- Understanding the specification operation usage of Trusted Execution Environments.
- Understanding the specification of the Key Distribution Protocols developed by the project.
- Testing the feasibility of specific operations on Android and IOS.
- Designing and implementing the necessary software components for key management
- privacy preserving machine learning
- Testing
- Writing documentation

Skills
Technical:
- Proficiency in C and C++
- Knowledge of Rust, Swift and/or Kotlin is a plus.
- At least basic terminal usage: bash or other environments
- Familiarity with git

Non technical:
- Fluent written and spoken English
- French can be a plus
- Ability to work in a team
- Flexibility
- Planning and ability to meet deadlines

Benefits package
- Subsidized meals
- Partial reimbursement of public transport costs
- Possibility of teleworking (90 days per year) and flexible organization of working hours
- Partial payment of insurance costs

Remuneration
monthly gross salary from 2655 euros according to diploma and experience

General Information
- Theme/Domain : Algorithmics, Computer Algebra and Cryptology
  Software engineering (BAP E)
- Town/city : Rennes
- Inria Center : Centre Inria de l'Université de Rennes
- Starting date : 2024-01-01
- Duration of contract : 1 year
- Deadline to apply : 2023-12-25

Contacts
- Inria Team : WIDE
- Recruiter : Frey Davide / davide.frey@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
You are interested in systems programming, cryptography, and machine learning. You are not afraid to design and implement large pieces of software. You can clearly write documentation in English.

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
Please submit online : your resume, cover letter and letters of recommendation eventually

For more information, please contact davide.frey@inria.fr

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.