Offer #2025-08672

Edge AI, Tiny Machine Learning, MLOps Security and Open Source Embedded Rust

Renewable contract : Yes

Level of qualifications required : Graduate degree or equivalent

Fonction : Temporary scientific engineer

About the research centre or Inria department

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** .

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 people, scientists and research and innovation support staff, including 44 different nationalities.

Context

Concepts and prototypes enabling TinyML and secure MLOps will be prototyped, combining microcontroller-based hardware similar to Nordic nRF52, STM32, ESP32 or RISC-V, via network links such as BLE, 802.15.4 or LTE-M, programmed with an open source operating system coded in embedded Rust (Ariel OS). These prototypes will be co-developed and tested jointly with Freie Universität Berlin. This project follows-up on RIOT-ML (see below).

Assignment

Collaboration :

The recruited person will be in connection with the Ariel OS open-source community & developers, collaborators at Freie Universität Berlin and Inria researchers in the domains machine learning and secure network protocols for low-power IoT, as well as the engineers we collaborate with at Campus Cyber.

Responsibilities :

The recruited person will be responsible for core embedded OS development, and the development of prototypes enabling various neural network models compilation, compression, execution, as well as reformable models on divers IoT hardware. For preliminary information: check out Ariel OS at https://github.com/ariel-os/ariel-os as well as RIOT-ML (see https://link.springer.com/content/pdf/10.1007/s12243-024-01041-5.pdf and https://github.com/TinyPART/RIOT-ML). A first step will be to design an equivalent of RIOT-ML for Ariel OS.

Steering/Management :

The person recruited will be a hands-on contact point between Inria, Freie Universität Berlin, and Ariel OS maintainers.

Main activities

Examples of activities:

- implementation, documentation and CI of embedded Rust components
- integration of existing Rust crates and/or embedded C libraries as components in the Rust OS
- hardware prototype developement and testing on IoT hardware use cases
- interacting with Machine Leanring and secure low-power IoT network protocols experts
- upstreaming and active participation in open-source communities

Skills

Technical Skills:

- embedded Rust/C
- git
- open-source software workflows
- ML and MLOps (theory and practice)
- RTOS or bare-metal experience on 32-bit microcontrollers such as ARM Cortex-M, RISC-V, ESP32
- knowledge of network protocols stack (BLE, NB-IoT, TCP/IP, TLS, 6LoWPAN...)

Non-Technical / Soft skills:

- distributed team work
- good english skills (written, spoken, read)
- consensus building

Benefits package

- 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

Remuneration

Regarding professional experience.

General Information

- **Theme/Domain :** Networks and Telecommunications System & Networks (BAP E)
- **Town/city :** Palaiseau
- **Inria Center :** Centre Inria de Saclay
- **Starting date :** 2025-03-03
- **Duration of contract :** 2 years, 1 month
- **Deadline to apply :** 2025-04-27

Contacts

- **Inria Team :** TRIBE
- **Recruiter :**
  Baccelli Emmanuel / Emmanuel.Baccelli@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

This job is for people who are passionate about prototyping, embedded Rust, Edge AI and low-power hardware. Obviously having cybersecurity at heart and being an open-source enthusiast is a plus!

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

To apply, please provide :

- CV
- Cover letter
- Letter(s) of recommendation, where applicable

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.