Job vacancy #2023-06682

Scheduler verification and enlarging the scope of Coccinelle to Software Heritage

Contract type: Fixed-term contract
Level of qualifications required: Graduate degree or equivalent
Fonction: Temporary scientific engineer
Level of experience: Recently graduated

Context

The position will take place in the Whisper team at Inria Paris, that has a long experience with program analysis and transformation of C code, particularly the Linux kernel.

Assignment

This position will consist of two parts.

The first part will focus on designing a framework for the verification of the core selection algorithm of the Linux kernel scheduler, in a way that this verification can be carried out continuously across releases. This is part of the ANR project VeriAmos.

The second part will focus on extending Coccinelle to handle the various constructs found in the C code found in Software Heritage, to generalize the use of Coccinelle beyond the Linux kernel. This is part of the CampusCyber project SWHSec.

Main activities

The main activities will be:

1. Slicing of the Linux kernel scheduler code to obtain a fragment that is manageable and meaningful to analyze in proof assistants, likely Frama-C, followed by development of appropriate invariants and carrying out of the proof.
2. Application of Coccinelle to the C-language software in Software Heritage to identify bottlenecks and then to resolve them

Skills

OCaml programming. Theorem proving.

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 (after 6 months of employment) 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

General Information

- Theme/Domain: Distributed Systems and middleware
- Software engineering (BAP E)
- Town/city: Paris
- Inria Center: Centre Inria de Paris
**Starting date:** 2023-10-01
**Duration of contract:** 2 years
**Deadline to apply:** 2023-10-31

**Contacts**
- **Inria Team:** WHISPER
- **Recruiter:** Lawall Julia / Julia.Lawall@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.

**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**
**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.