2018-01012 - PhD contract

Contract type: Public service fixed-term contract
Level of qualifications required: Graduate degree or equivalent
Function: PhD Position

Assignment
Verification framework for performance-oriented memory-safe programming languages

Main activities
Software verification has long grown out of research projects to be used in the industry for security or safety-critical code. However, most of real-world applications of software verification fall into roughly two categories. The first proving some form of memory safety for a large code base written in a memory unsafe language. The second is proving specific and high-level properties for small pieces of code usually written in a functional, garbage-collected language. The idea that writing performant code required unsafe manual memory management such as in C or C++ is being questioned by recent developments in the theory of memory ownership and aliasing. This has led to new programming languages like Mezzo or Rust whose type systems offer some memory safety guarantees. The purpose of this work is to discover in which ways the memory safety properties of such type systems can be integrated in a more general verification framework. Such a verification framework could then be applied to prove more specific and higher-level properties for low-level, performance-oriented codebases of respectable size, on top of memory safety. A possible application for this work is the development of verified cryptographic protocols, which enjoy various security properties, unproven in most of their implementations.

Benefits package
- Subsidised catering service
- Partially-reimbursed public transport

General Information
- Theme/Domain: Security and Confidentiality
- System & Networks (BAP E)
- Town/city: Paris
- Inria Center: CRI de Paris
- Starting date: 2018-11-01
- Duration of contract: 3 years
- Deadline to apply: 2018-09-09

Contacts
- Inria Team: PROSECCO
- Recruiter: Mourey Mathieu / mathieu.mourey@inria.fr

About Inria
Inria, the French National Institute for computer science and applied mathematics, promotes "scientific excellence for technology transfer and society". Graduates from the world's top universities, Inria's 2700 employees rise to the challenges of digital sciences. With its open, agile model, Inria is able to explore original approaches with its partners in industry and academia and provide an efficient response to the multidisciplinary and application challenges of the digital transformation. Inria is the source of many innovations that add value and create jobs.

Conditions for application
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). Authorization 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.

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.