



Offre n°2024-07180

Research and Development Engineer (M/F), Formal Verification of Rust Programs

Type de contrat : Fixed-term contract

Contrat renouvelable : Oui

Niveau de diplôme exigé : Graduate degree or equivalent

Autre diplôme apprécié : PhD Thesis in Computer Science

Fonction : Temporary scientific engineer

Niveau d'expérience souhaité : Up to 3 years

A propos du centre ou de la direction fonctionnelle

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.

Contexte et atouts du poste

This job is proposed in the context of the Décysif project (<https://decysif.fr/>), a collaborative project aiming at applying formal methods to the development of high-assurance software that are critical for safety and security. This project gathers the Inria project-team Toccata (<https://toccata.gitlabpages.inria.fr/toccata/>) and industrial partners located in Paris: TrustInSoft, AdaCore and OCamlPro. The general objective is to contribute to the activities of formal verification performed by these partners, those conducted around the verification of programs in Ada, C, C++ and Rust, with techniques using the proof tools developed by the Toccata team, in particular Why3.

The work will be carried out mainly in the Toccata team location in Gif-sur-Yvette and partly in the partner company offices in Paris. Travel expenses are covered within the limits of the scale in force.

Mission confiée

In direct collaboration with the Why3 developers at Toccata and with the research engineers at the industrial partners, the person recruited will have to work on the maturation of the Creusot prototype (<https://github.com/xldenis/creusot>) dedicated to formal verification of Rust programs. This prototype comes from a doctoral thesis and must be improved to be able to be applied to industrial case studies. The objectives concern, among other things, the extension of the supported Rust fragment, the need to complete specifications of Rust libraries, the improvement of the usability of the graphical user interface, the increase of the rate of proof automation, to set up methods to help proof (such as the generation of counterexamples in case of proof failure), to strengthen the robustness and reproducibility of proofs.

Principales activités

Software development in Rust and OCaml, development of library specifications in Why3 and Rust, use of external SMT solvers, software experimentation, writing

documentation, contribution to the writing of scientific articles.

Compétences

We seek for candidates with as much experience and skills as possible in several domains among : development using the OCaml language ; development using the Rust language ; techniques for evaluation, compilation and/or transformation of programs ; formal methods for software engineering ; formal logics ; static analysis of programs ; computer-assisted theorem proving ; use of formal proof environments.

A level of English at least in writing is required. In oral English or French must be sufficiently mastered.

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 (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

Rémunération

Remuneration in regards to professional experience

Informations générales

- **Thème/Domaine** : Proofs and Verification
Software engineering (BAP E)
- **Ville** : Gif-sur-Yvette
- **Centre Inria** : [Centre Inria de Saclay](#)
- **Date de prise de fonction souhaitée** : 2024-05-01
- **Durée de contrat** : 12 months
- **Date limite pour postuler** : 2024-05-31

Contacts

- **Équipe Inria** : [TOCCATA](#)
- **Recruteur** :
Marche Claude / Claude.Marche@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 215 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3900 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 200 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

The candidate will be required to work in a team with all Why3 and Creusot developers and also to participate in joint activities of the research team: joint seminar, working groups, etc. Likewise, he/she will be required to work in collaboration with engineers at AdaCore, TrustInSoft and OCamlPro.

Attention: Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.

Consignes pour postuler

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.