A propos du centre ou de la direction fonctionnelle

Grenoble Rhône-Alpes Inria Research Center groups together a few less than 800 people in 38 research teams and 8 research support departments.

Staff is localized on 5 campuses in Grenoble and Lyon, in close collaboration with labs, research and higher education institutions in Grenoble and Lyon, but also with the economic players in these areas.

Present in the fields of software, high-performance computing, Internet of things, image and data, but also simulation in oceanography and biology, it participates at the best level of international scientific achievements and collaborations in both Europe and the rest of the world.

Contexte et atouts du poste

Within the framework of a partnership

• informal scientific collaboration between the CONVECS project-team and GSSI (L'Aquila, Italy) models, studies, and/or prototypes more specifically dedicated to the formal verification of collective adaptive systems.

Mission confiée

The study of collective systems is central to several disciplines such as ecology, epidemiology, sociology, economics and other social sciences. At the same time, the design of artificial adaptive systems is a major topic of research in computer science and robotics. Agent-based, or individual-based models, are becoming increasingly popular as a tool to specify and analyse collective systems [BOZ, FFD9]. These models describe the [W10] idea under analysis as a multi-agent system [TB99]. A major goal while developing agent-based models is to check whether collective properties emerge from individual behaviour and interaction among agents. Several paradigms have been developed to help specifying emergent behaviour, including attribute-based communication (ABC) [ADL98] and stigmergic interaction (TB99, PLB1).

Currently, analysis of agent-based models through simulation and testing is commonplace [MI16]. These approaches can be effective at bug-finding, but may only draw shallow conclusions about the correctness of the model, or the emergence of collective properties [W10]. On the other hand, process algebras provide several advantages as a modelling tool, and they provide a rigorous framework for formal analysis [TB16]. Thus, we are interested in developing correct-by-design procedures to formally analyse the correctness of agent-based descriptions with existing process-algebraic techniques and tools, such as the ones provided by the CADP toolbox [G+13].

We also aim at devising a compositional verification strategy for ABC, and/or stigmergy-based, descriptions by leveraging recent developments in compositional verification based on sharp-bisimulation [LM20]. A possible way to proceed is by studying the representation of the schedulers present in these models as sets of priority rules, and subsequently investigating how to exploit this representation to carry out compositional verification based on sharp-bisimulations. Another goal is to investigate complementary, simulation-based techniques such as statistical model checking, or coverage techniques, which may be helpful in the analysis of massive collective systems.

References:


Informations générales

• Thème/Domaine : Preuves et vérification Ingénierie logicielle (BAP E)
• Ville : Montbonnot
• Centre Inria : CRI Grenoble - Rhône-Alpes
• Date de prise de fonction souhaitée : 2020-10-01
• Durée de contrat : 12 mois
• Date limite pour postuler : 2020-04-26

Contacts

• Equipe Inria : CONVECS
• Recruteur : Mateescu Radu / radu.mateescu@inria.fr

A propos d’Inria

Inria is the national institute of research dedicated to sciences and technologies of the digital. It employs 2600 people. Its 200 teams agiles, in general communes with partners, are at the interface of disciplines. Inria proposes to a number of talents in more than a quarantaine of ways. It is interested in the business world and in the innovation contribute to a future and grand of projects scientifics or entrepreneurs that impact the world. Inria works with as few busines entreprises and accompanied the creation of more than 180 start-ups. The institute's success is based on the exchange of the transformation of the science, of the society and of the economy.

L’essentiel pour réussir

The candidate should possess a solid background in the formal modeling and verification of concurrent systems. A taste for software development and experimentation is strongly desired.

Consignes pour postuler

February to April 26th : submission of applications / June : selection / October : starting date

Duration : 16 months.

Applicants should hold a PhD defended after 1st September 2018.

... Important information concerning the COVID-19 epidemic: in case the rules by the French government and Inria related to the epidemic make it impossible for the candidate to physically start the position at Inria Grenoble, the position will start with teleworking.

Sécurité défense :

Ce poste est susceptible d’être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2020-1425 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 de diversité, tous les profils de recrutement sont accessibles aux personnes en situation de handicap.

Attention : Les candidatures doivent être déposées en ligne sur le site Inria.
Main activities:
- Study the state of the art in specification and analysis of multi-agent systems with a focus on emerging collective behaviour.
- Propose formal techniques to reduce verification of multi-agent systems to analysis of concurrent value-passing systems.
- Investigate compositional verification strategies for collective systems.
- Investigate other analysis approaches that may complement formal verification, such as statistical model checking, or coverage techniques.
- Implement the techniques as part of automated verification tools for multi-agent systems.

Additional activities:
- Gather a selection of suitable systems for benchmarking purposes.
- Present the results at conferences and workshops.
- Participate in project meetings.

Compétences
Technical skills and level required: knowledge of specification languages for concurrent asynchronous systems
Languages: proficiency in English; knowledge of French also welcome
Relational skills: team working

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
Salary (before taxes): 2,653 Euros per month.

Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.