A propos du centre ou de la direction fonctionnelle

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. Research at Inria is organized in "project teams" which bring together researchers with complementary skills to focus on specific scientific projects. With this 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 at the origin of many innovations that add value and create jobs.

Mission confiée

Inria, the Research Center of Inria Rennes-Bretagne Atlantique is one of the 8 Inria Research Centers. It gathers 620 employees, including 400 scientists, organized in 33 research teams and 8 services supporting the research.

Contexte et atouts du poste

The Myriads research team gathers researchers in large scale distributed systems. Our long-term goal is to build next generation utility computing platforms by designing and implementing systems and environments for autonomous service and resource management in large virtualized infrastructures. https://team.inria.fr/myriads/

The SimGrid project is partly developed in the Myriads research team. This scientific instrument is used to study the behavior of large-scale distributed systems such as Grids, Clouds, HPC or P2P systems. It can be used to evaluate heuristics, prototype applications or even assess legacy MPI applications. http://simgrid.gforge.inria.fr/

The SUMO team proposes to combine formal methods approaches with concurrency theory, in order to address the modeling, analysis and management of large distributed or modular systems exhibiting quantitative aspects. Large distributed softwares and systems are indeed calling for quantitative models involving time, probabilities, costs, and combinations of them. As many problems in this setting become untractable or even undecidable, we are interested in the design of efficient approximation techniques, for example borrowed from electrical engineering approaches to the management of large stochastic systems.

The Myriads and Sumo team already collaborate in the context of IPL Hac Specis (High-performance Application and Computers: Studying Performance and Correctness In Simulation). The aim of the project is to answer methodological needs of HPC application and runtime developers and to allow to study real HPC systems both from the correctness and performance point of view. To this end, we gather experts from the HPC, formal verification and performance evaluation community.

Principales activités

The engineer is in charge of developments and scientific experiments in two international research teams:

- The current SimGrid kernel is the result of almost 20 years of evolution and is widely used in production. The engineer will help improve the documentation, and provide more examples to help new users. S/he will also participate to the maintenance of our codebase, further increasing the continuous integration infrastructure, and proposing more extensive testing.
- The model-checker module is still experimental. We plan to refactor and reorganize this module. The model-checker should be scriptable to make it possible to express new exploration and reduction algorithms through external scripts, without modifying SimGrid itself in any way.
- On top of these refreshed internals, the engineer will integrate recent research results to improve the efficiency of the model-checking algorithm.
- S/he will also help in ongoing efforts to prepare teaching resources that leverage our framework in order to spread the use of SimGrid in universities.

Compétences

Mandatory Expertise and Skills:

- Programming Languages: C or C++ mandatory and good knowledge of abilities in C++ system programming on Linux systems;
- Technical and scientific English, both spoken and written (French is a plus);
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- Open-mindedness, curiosity and taste for innovation are essential qualities to fulfil this assignment.
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Additional skills appreciated, but not requested:
- Experience in software development in geographically distributed teams (participation to free software welcomed)
- Programming in Java and Python
- Theoretical background on distributed systems (Lamports’ clock, notions of concurrency, partial orders, etc)
- System programming on non-Linux systems (Mac OSX, Windows)

Avantages
- Subsidized meals
- Partial reimbursement of public transport costs
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Rémunération
Monthly gross salary from 2562 euros according to diploma and experience