Offer #2026-10542

PhD Position F/M Predictable cache memories for Real-Time Embedded Multicore Systems

Contract type : Fixed-term contract

Level of qualifications required : Graduate degree or equivalent

Fonction : PhD Position

Level of experience : Recently graduated

About the research centre or Inria department

Created in 2008, the Inria center at the University of Lille employs 360 people, including 305 scientists in 16 research teams. Recognized for its strong involvement in the socio-economic development of the Hauts-De-France region, the Inria center at the University of Lille maintains a close relationship with large companies and SMEs. By fostering synergies between researchers and industry, Inria contributes to the transfer of skills and expertise in the field of digital technologies, and provides access to the best of European and international research for the benefit of innovation and businesses, particularly in the region.

For over 10 years, the Inria center at the University of Lille has been at the heart of Lille's university and scientific ecosystem, as well as at the heart of Frenchtech, with a technology showroom based on avenue de Bretagne in Lille, on the EuraTechnologies site of economic excellence dedicated to information and communication technologies (ICT).

Context

The PhD student will work in the context of the ANR PRCI CoDaLi project, with Inria Rennes and the RPTU (https://rptu.de/).

The general objective of the CoCoDaLi project is to design and implement offline and runtime techniques that allow precise control cache contents in multi-core architectures for embedded real-time systems.

The main idea is to take advantage of the content lifespan of cache blocks, in order to:

1. prevent the hardware replacement algorithm from removing useful cache blocks;
2. reduce the number of cache errors by placing the application memory in the appropriate cache lines.

The PhD student will spend some time in Kaiserslautern and Rennes to collaborate with the project partners.

Assignment

Missions: 1) Study the state of the art in algorithms for memory placement in cache 2) study algorithms for the static analysis of program binary code, so to obtain the memory location of data an code 3) develop a novel algorithm for memory placement.

For a better knowledge of the proposed research subject :
Scientific references of the research team are available at the followings URLs :

https://www.fil.univ-lille.fr/~lipari/research/phd-call.html

www.cristal.univ-lille.fr/equipes/sycomores

Main activities

Research and development of algorithms and code for optimizing the memory placement.

Skills

Technical skills :

- We require a very good extertise in C/C++ language, compiler and linker
- Optional expertise :
  - Real-Time scheduling, and scheduling analysis
  - Multicore systems,
  - worst-case execution time analysis.

Languages : English B2

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

Remuneration

€2,300 gross per month

General Information

- **Theme/Domain :** Embedded and Real-time Systems
  System & Networks (BAP E)
- **Town/city :** Villeneuve d'Ascq
- **Inria Center :** Centre Inria de l'Université de Lille
- **Starting date :** 2027-04-01
- **Duration of contract :** 3 years
- **Deadline to apply :** 2026-11-30

Contacts

- **Inria Team :** SYCOMORES
- **PhD Supervisor :**
  Lipari Giuseppe / giuseppe.lipari@inria.fr

About Inria

Inria, the French national institute for research in digital science and technology, supports the French government in national research and innovation strategies in the digital field, acting as Digital Programs Agency. Inria leads over 300 research and innovation projects with its 3,500 scientists, engineers, and support staff, in partnership with universities and the digital ecosystem (businesses, entrepreneurs, and public stakeholders). Together, we explore strategic fields such as artificial intelligence, cybersecurity, quantum computing, cloud technologies, digital transformation in healthcare, digital twins, and digital technologies for defence. We develop practical solutions such as software, tech startups, partnerships with national companies, and cutting-edge training programmes. Our goal is to drive scientific, technological, and industrial excellence to ensure France’s digital sovereignty.

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.