

[430_24_CS_PPC_R1](#)

Job Reference

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Position

PhD Student - Advanced Automotive/Space/Avionics Systems (R1)

Data de tancament

Dimecres, 31 Juliol, 2024

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About BSC

The Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC-CNS) is the leading supercomputing center in Spain. It houses MareNostrum, one of the most powerful supercomputers in Europe, was a founding and hosting member of the former European HPC infrastructure PRACE (Partnership for Advanced Computing in Europe), and is now hosting entity for EuroHPC JU, the Joint Undertaking that leads large-scale investments and HPC provision in Europe. The mission of BSC is to research, develop and manage information technologies in order to facilitate scientific progress. BSC combines HPC service provision and R&D into both computer and computational science (life, earth and engineering sciences) under one roof, and currently has over 1000 staff from 60 countries.

Look at the BSC experience:

[BSC-CNS YouTube Channel](#)

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We are particularly interested for this role in the strengths and lived experiences of women and underrepresented groups to help us avoid perpetuating biases and oversights in science and IT research. In instances of equal merit, the incorporation of the under-represented sex will be favoured.

We promote Equity, Diversity and Inclusion, fostering an environment where each and every one of us is appreciated for who we are, regardless of our differences.

If you consider that you do not meet all the requirements, we encourage you to continue applying for the job offer. We value diversity of experiences and skills, and you could bring unique perspectives to our team.

Context And Mission

Software systems used in domains such as automotive, space, large scientific infrastructures or smart cities, have seen their complexity drastically increased in the last years due to the need of implementing advanced functionalities applied to cutting edge research areas like autonomous driving, traffic management, etc. The performance requirements of these new functionalities urge the use of parallel and heterogeneous architectures capable of delivering the expected throughput while still considering other non-functional aspects of the system like real-time requirements, fault-tolerance, and energy budgets, among others.

The research activities will be focused on one or several of the following topics, among others:

1. In close collaboration with leading automotive, space and avionic companies, development of software system prototypes to address the requirements of cutting-edge functionalities.
2. Optimization of advanced software functionalities targeting parallel computing architectures, including multi-core systems, GPUs and/or FPGAs.
3. Programming models: use, implementation and extension of programming models with parallel capabilities, like OpenMP and CUDA, to target complex software systems, and concurrent languages like RUST and Ada.
4. Code transformation and optimization: high-level synthesis and compilation techniques to boost performance, predictability and correctness, mostly based on LLVM and MLIR.
5. Runtime systems: run-time techniques to boost performance, heterogeneity (targeting GPUs and FPGAs) and fault-tolerance.

Key Duties

- The works to be done in the scope of the last years of a PhD thesis include:
 - Research on parallel programming models towards productivity and other non-functional requirements
 - Development of compiler and run-time techniques to support extensions for performance and other non-functional requirements.
 - Development of advanced application prototypes for the automotive, space and avionics domains to evaluate the proposed techniques
 - Write technical reports and papers
 - Attend technical meetings

Requirements

- Education
 - PhD on parallel programming models and compiler optimization techniques already started
- Essential Knowledge and Professional Experience
 - Linux (0-2 years)
 - Programming fluently in C/C++, OpenMP, CUDA (+4 years)
- Additional Knowledge and Professional Experience
 - Experience on HPC and/or embedded systems
- Competences

- Candidates shall be proactive and self-motivated, with positive work attitude
- Fluent English both written and spoken
- Ability to take initiatives, prioritize tasks and work under set deadlines
- Ability to work both independently and within a team
- Analytical thinking, problem-solving and result-oriented attitude

Conditions

- The position will be located at BSC within the Computer Sciences Department
- We offer a full-time contract (37.5h/week), a good working environment, a highly stimulating environment with state-of-the-art infrastructure, flexible working hours, extensive training plan, restaurant tickets, private health insurance, support to the relocation procedures
- Duration: Open-ended contract due to technical and scientific activities linked to the project and budget duration
- Holidays: 23 paid vacation days plus 24th and 31st of December per our collective agreement
- Salary: we offer a competitive salary commensurate with the qualifications and experience of the candidate and according to the cost of living in Barcelona
- Starting date: 01/08/2024

Applications procedure and process

All applications must be made through BSC website and contain:

- A full CV in English including contact details
- A Cover Letter with a statement of interest in English, including two contacts for further references - Applications without this document will not be considered

In accordance with the OTM-R principles, a gender-balanced recruitment panel is formed for every vacancy at the beginning of the process. After reviewing the content of the applications, the panel will start the interviews, with at least one technical and one administrative interview. A profile questionnaire as well as a technical exercise may be required during the process.

The panel will make a final decision and all candidates who had contacts with them will receive a feedback with details on the acceptance or rejection of their profile.

At BSC we are seeking continuous improvement in our recruitment processes, for any suggestions or feedback/complaints about our Recruitment Processes, please contact recruitment [at] bsc [dot] es.

For more information follow [this link](#)

Deadline

The vacancy will remain open until a suitable candidate has been hired. Applications will be regularly reviewed and potential candidates will be contacted.

OTM-R principles for selection processes

BSC-CNS is committed to the principles of the Code of Conduct for the Recruitment of Researchers of the European Commission and the Open, Transparent and Merit-based Recruitment principles (OTM-R). This is applied for any potential candidate in all our processes, for example by creating gender-balanced recruitment panels and recognizing career breaks etc.

BSC-CNS is an equal opportunity employer committed to diversity and inclusion. We are pleased to consider all qualified applicants for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, disability or any other basis protected by applicable state or local law.

For more information follow [this link](#)

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