751_24_CS_CAOS_RE1

Job Reference

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Position

Research Engineer (RE1)

Data de tancament

Divendres, 15 Novembre, 2024
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Job title: Research Engineer (RE1)

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](#)
[Let's stay connected with BSC Folks!](#)

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

The Computer Architecture and Operating System group at the Barcelona Supercomputing Center aims at carrying out research on programming models for critical embedded systems in charge of controlling fundamental parts of cars, airplanes and satellites. Our work is mainly done in the context of bilateral projects with several processor companies as well as several European-funded projects. For a complete list of publications of the group in the last years, please visit: www.bsc.es/caos

The deployment of Artificial Intelligence (AI) based solutions to deliver advanced software functionalities is consolidating as a key competitive factor in several industrial domains. In the automotive industry, autonomous driving (AD) software is meant to support autonomous operation and decision making for all aspects in a vehicle, by processing of a massive amount of data coming from multiple sensors like cameras and LiDARs. The entailed computational requirements can only be matched by complex MPSoCs (Multi-Processor System on Chip) with generic and ah-hoc hardware accelerators. Moreover, the increasing complexity of AI-based software functionalities encourages the use of highly modular middleware frameworks such as ROS2, CyberRT, or Autoware, running on top of general-purpose and/or automotive operating systems. Performance and (timing) analyzability are two fundamental (and sometimes conflicting) requirements for this type of system, where extensive guarantees must be provided on the capability to deliver correct results in a timely manner, as dictated by domain-specific Functional Safety (FuSa) standards.

We invite applications for a PhD student to join us in a groundbreaking journey as we work on the AI4Debunk project. AI4Debunk is dedicated to combating disinformation on two critical fronts: the war in Ukraine and disinformation related to climate change. Through interdisciplinary expertise and sociological insights, we will deeply analyze how to extend the Trustworthy AI framework developed for safety-critical systems to these case studies, with a specific focus on Large Language Models (LLMs) from a mathematical standpoint to provide explainable decisions based on causal inference.

Key Duties

- Explainability in Large Language Models: Investigate and enhance the explainability of LLMs to provide insights into their decision-making processes when analyzing disinformation content, thus making AI-driven debunking more transparent and trustworthy.
- Causality Techniques for Disinformation Analysis: Explore and develop novel causality models and methodologies to identify and understand the causal relationships between disinformation campaigns, their sources, and their impact on society.
- Safety-Critical Systems Integration: Study the application of causality and explainability techniques in the context of safety-critical systems, such as autonomous driving and embedded systems, to ensure that AI4Debunk's methods are robust and reliable.
- Improving Trustworthiness: Extending research to improve the trustworthiness of AI systems in various applications, including healthcare and finance.
- Predictability: Developing techniques for enhancing the predictability of AI systems, making them more reliable and interpretable for critical decision-making.
- Machine Learning for Embedded Systems: Applying machine learning techniques to embedded systems in domains such as automotive, space, and industrial automation to enhance their performance, safety, and adaptability.

Requirements

- Education

- - Master's Degree on Computer Science, Computer Architectures, Mathematics, or similar
    Bachelor's Degree on Computer Science, Computer Architectures, Mathematics, or similar

- Essential Knowledge and Professional Experience
  - Moderate expertise on Machine Learning and Deep Learning, especially from a mathematical standpoint with formal reasoning
  - Familiarity with Deep Learning frameworks (Pytorch, TensorFlow, etc.)
  - Familiarity with scripting languages (e.g. Python)

- Additional Knowledge and Professional Experience
  - Minimal experience with Linux-based environment is also appreciated
  - Knowledge about Causal Inference, specially from the Causal Graph perspective, is a plus

- Competences
  - Problem-solving, proactive, collaborative, and result-oriented work attitude
  - Good communication skills, including proficiency in English (both written and spoken)

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: 1/1/2025

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
Barcelona Supercomputing Center - Centro Nacional de Supercomputación

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