311_24_ES_ACAQ_RE1/RE2-R2

Job Reference

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Position

Postdocs / Research Engineer on machine learning and atmospheric composition (RE1/RE2-R2)

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Dissabte, 31 Agost, 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](#)
[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.

Context And Mission

The Earth Sciences Department at the Barcelona Supercomputing Center (BSC) (www.bsc.es) is embarking on an umbrella of large-scale activities and developments linked to the implementation of a High-Resolution Emission System for Air Quality Prediction and Greenhouse Gas Monitoring. These activities are part of a

large initiative on the "Modernization of observation networks and digitalization of production processes for the development of intelligent meteorological services in the context of climate change" in the framework of the European Recovery, Transformation, and Resilience Plan funded by the European Union - Next Generation EU.

In the frame of this ambitious project, we are offering three positions - two postdoctoral positions in machine learning and/or atmospheric modeling and one research engineer in machine learning - to work in the field of machine learning and investigate data-driven approaches to emulate and accelerate physics-driven atmospheric composition models. These developments will improve our current modeling capabilities in the field of atmospheric composition, which will open new avenues for better constraining air pollutants and greenhouse gas emissions. The successful candidates will work closely with atmospheric scientists and other research engineers from both the Atmospheric Composition (AC) and Computational Earth Science (CES) groups.

Key Duties

- The main tasks of the two postdoctoral researchers include but are not limited to:

  - Reviewing the existing literature on the use of machine learning for emulating and accelerating physics-driven models.
  - Contributing in the preparation of large-scale atmospheric composition datasets.
  - Designing, developing and evaluating data-driven emulators testing different types of machine learning models.
  - Exploring avenues for improving interpretability, plausibility and physical consistency of the machine learning-based predictions.
  - Publishing results in peer-reviewed journals.
  - Communicating their results in workshops and conferences.
  - Participating in the intellectual life of the department.

- The main tasks of the research engineer include but are not limited to:

  - Contributing in the preparation of large-scale machine learning datasets for atmospheric composition applications.
  - Investigate, identify and implement appropriate machine learning models (including deep learning methods) to the tasks within the proposed projects.
  - Provide support on their development on BSC's High-Performance Computing (HPC) facilities.
  - Learning and mastering new technologies and techniques related to machine learning.
  - Contributing to scientific publications that may derive from this project.

Requirements

- Education

- Postdoctoral Researchers: A PhD degree in atmospheric chemistry, physics, climate, remote sensing, environmental engineering, data science, machine learning, computer science or similar (a broad knowledge covering both machine learning and atmospheric sciences would be ideal, but candidates with expertise in only one of these two fields and interest in the other one are also welcome)
    - Research Engineer: A Master degree in data science, machine learning, computer science or similar (candidates with expertise also in Earth sciences will be very valued)

- Essential Knowledge and Professional Experience
    - Postdoctoral researchers:
    - Demonstrated scientific expertise, including but not limited to a record of scholarly publications.
    - Good programming skills in Python or equivalent, experience with Unix/Linux and HPC environments
    - Research Engineer:
    - Experience in designing, developing and training machine learning models using machine learning libraries (Scikit-learn, Pytorch, Keras and/or Tensorflow)
    - Proficiency in scientific programming in Python, and familiarity with working in a UNIX/Linux environment
    - Knowledge on creating, manipulating and/or working with large-scale datasets
    - Expertise in GPUs is not required but will be valued

- Competences
    - Very good interpersonal skills.
    - Excellent written and verbal communication skills.
    - Ability to take initiative, prioritize and work under set deadlines.
    - Ability to work both independently and within a team.
    - Fluency in English (Spanish is optional, free lessons are available at BSC)

Conditions

- The position will be located at BSC within the Earth 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: Temporary (2 - 2.5 years aprox)
- 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: ASAP

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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