285_24_LS_MLBR_R2

Job Reference

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Position

Postdoctoral Researcher ? Artificial Intelligence for Synthetic Data Generation in Biomedicine (R2)

Data de tancament

Diumenge, 15 Setembre, 2024
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Job title: Postdoctoral Researcher – Artificial Intelligence for Synthetic Data Generation in Biomedicine (R2)

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 Machine Learning for Biomedical Research unit at the BSC, led by Dr. Davide Cirillo, is currently offering a postdoctoral researcher position. This role focuses on employing Artificial Intelligence (AI)

techniques to synthesize various types of biomedical data, including images, genomic sequences, time series, and texts. Synthetic data generation in biomedicine involves creating artificial datasets that mimic real biological data, which is crucial for enhancing privacy protection, increasing data availability, reducing biases, ensuring regulatory compliance, and facilitating more robust and cost-efficient research and development. This initiative is part of a collaborative project supported by an EU public-private partnership, aimed at advancing the frontiers of synthetic data generation in biomedical research.
The Life Sciences Department at the BSC is renowned for its pioneering independent research led by senior scientists. The department's expertise spans the application of computer science to life sciences, encompassing healthcare applications of machine learning and AI, as well as leveraging High-Performance Computing (HPC) for biomedical research pursuits. The Machine Learning for Biomedical Research unit is an integral component of this department, engaged in several projects that range from computational systems biology and network science to digital medicine. More about the unit can be found here: https://www.bsc.es/discover-bsc/organisation/research-departments/machine-learning-biomedical-research
The selected candidate will collaborate extensively with senior researchers within the Life Sciences Department and other research groups at the BSC. The research will align with the unit's focus on AI applications in Personalized Medicine, which includes synthetic data generation, complex systems modeling, and agent-based simulations.
The researcher will operate within a sophisticated HPC environment, with access to cutting-edge systems and computational infrastructures. The role involves extensive collaboration with both international and local experts across public and private sectors. The researcher will develop and implement systems for creating synthetic datasets, which will be pivotal for training and evaluation processes.
Applicants should possess a robust understanding of a broad spectrum of biomedical data and be proficient in deep learning techniques. Familiarity with privacy-preserving AI and explainable AI (XAI) is preferred, enabling the development of innovative and ethically sound AI solutions.
This position offers an exceptional opportunity to contribute to significant advancements in AI-driven biomedical research, working in a dynamic and collaborative international research environment.

Key Duties

- Develop computational solutions, with special emphasis on AI methods, for the generation of synthetic instances of biomedical data of different types and modalities.
- Implement robust and reliable state-of-the-art generative models, such as Transformers, Diffusion models, Variational Autoencoders (VAE), Generative Adversarial Networks (GAN).
- Interact efficiently with the HPC environment of the Barcelona Supercomputing Center.
- Explore the application of explainability to the required tasks.
- Demonstrate skills in scientific communication.
- Establish and maintain collaborations with national and international researchers in both the public and private sector in the area of healthcare and biomedical research.

Requirements

- Education
    - PhD in computer science or bioinformatics with a very strong AI component.
    - Alternatively, an MSc on AI or Bioinformatics, with a strong computer science background, or background on applied mathematics/physics with demonstrated experience in AI methods.

- Essential Knowledge and Professional Experience

    - Experience in AI methodologies, specifically biomedical data analysis.
    - Deep learning frameworks (PyTorch, TensorFlow)
    - Interest in the life sciences area

- Additional Knowledge and Professional Experience
    - Experience in synthetic data generation
    - Knowledge and experience in life sciences research
    - Knowledge and experience in machine learning and data science:
      ? Data pre/post-processing (feature selection, feature reduction, plotting and visualization)
      ? Supervised and unsupervised learning (classification, regression, clustering)
      ? Model deployment and scaling strategies (Docker, Kubernetes)
    - Programming: Python (scikit-learn, numpy, matplotlib), R, Java, C, C++, Git.
    - Fluency in spoken and written English

- Competences
    - Capacity to explore new research lines
    - Good communication and presentation skills
    - Ability to work both independently and within a team

Conditions

- The position will be located at BSC within the Life 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: 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

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