Computational Biology Systems Researcher (R2-3) – codesign activities (LS & CS)

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Job Reference

183_24_LS_CB_R2-3

Position

Computational Biology Systems Researcher (R2-3) – codesign activities (LS & CS)

Closing Date

Tuesday, 30 April, 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 900 staff from 55 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 Laboratory of Open Computer Architecture (LOCA) at Barcelona Supercomputing Center aims to break through traditional disciplinary silos and lead the research and development of European open software and hardware stacks based on the RISC-V Instruction Set Architecture for Exascale and beyond. This will be done with BSC's scientific departments to produce highly optimized grand challenge scientific applications in climate modelling, personalized medicine and energy. LOCA spans topics ranging from Computer Architecture to System Software to Applications, in both traditional HPC and emerging High-Performance Data Analytics (HPDA) and is working towards EU autonomy in HPC technologies. BSC is looking for one domain expert for each of the centre's application departments (Earth Science, Life and Engineering Sciences) to contribute to this aim.

In the Life Sciences area, we are looking for a Researcher to work in the computational systems biology approaches to simulate biological networks at different time-scales (Ponce-de-Leon et al., 2023). In particular, we are interested in the development of new approaches to the simulation of different molecular networks and of different type of cells, with emphasis on genome-scale metabolic models, Boolean regulatory networks and agent-based models, as well as the integrations of omic information to validate model predictions. These multi-scale models simulations should be able to be adapted to parallel environments to be deployed to HPC platforms at the BSC and at other HPC centres in Europe.

The Researcher will work in the construction and simulation of context-specific cell-decisions multi-scale models for predictive analysis. The specific tasks involve the development and application of bioinformatics and computational methods to integrate (epi)genomic, proteomic and transcriptomic data into predictive models, with an emphasis on context-specific intracellular models that combine metabolic and signalling pathways and that could be integrated in multi-scale models for personalised medicine.

The candidate will be working in close collaboration with all the different groups and departments to co-design these novels tools to new computer architectures (Kreuzer et al., 2021) in the context of the BSC's Severo Ochoa award for the 2023-26 period, which aims to boost BSC capacities to codesign hardware and software, maximise internal and external synergies, expand international leadership, provide best-practice career development with strong gender actions, and enhance societal engagement and technology transfer (https://www.bsc.es/discover-bsc/research-excellence/severo-ochoa).

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Key Duties

- Co-design multi-scale simulation tools to BSC's RISC-V and other heterogeneous architectures.
- Design, implement and deploy a set of unit tests to study the scalability and efficiency of the co-designed code and architecture.
- Implement efficient tools to simulate biological processes at different time scales through the integration of different modeling approaches (e.g. kinetic modeling, agent-based modeling, constraint-based modeling).
- Integrate multi-omics data in the model and identify actionable patient-specific targets of therapeutic interest.
- Help to characterize the core applications for the department by using the resources available at BSC and contribute to the definition of Key Performance Indicators (KPI) for improving their performance.
- Work to optimize domain applications for BSC-designed RISC-V HPC processors in collaboration with the multi-disciplinary team and contribute to enhancing the full HPC stack.

Requirements

- Education
  - PhD in Computer Science, Bioinformatics or similar topic, with strong background on computational biology.

- Essential Knowledge and Professional Experience
  - Proved experience on bioinformatics and computational biology.
  - Strong background on computer simulation of biological processes (constraint-based, Boolean, kinetic or agent-based modelling).
  - Strong programming skills, in particular on C++ and Python language.
  - Administration level in Linux/Unix systems.
  - Experience in HPC.
- Additional Knowledge and Professional Experience
  - Experience in the preparation and presentation of scientific projects.
  - Experience in reporting progress.
  - Experience in mentoring/advising PhD studentes.
  - Good communication skills (verbal and written) in English
- Competences
  - Ability to effectively communicate technical concepts to non-experts.
  - Proactive and able to take the initiative when needed.
  - Creative thinking.
  - Operate independently but love being part of a collaborative 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: inmediate

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@bsc.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

Application Form

You are applying for the following job offer

183_24_LS_CB_R2-3

Name and Surname *

Gender ** *

Female Male Other

Email *

Nationality** *

Where did you first see this job offer (Please indicate the name of the website, social media, referral etc.)? *

please choose one of this and if needed describe the option : - BSC Website - Euraxess - Spotify - HiPeac - LinkedIn - Networking/Referral: include who and how - Events (Forum, career fairs): include who and how - Through University: include the university name - Specialized website (Metjobs, BIB, other): include which one - Other social Networks: (Twitter, Facebook, Instagram, Youtube): include which one - Other (Glassdoor, ResearchGate, job search website and other cases): include which one

Upload CV (select the file, then click the Upload button) *

Examinar... No se ha seleccion…o ningún archivo. Upload

Please, upload your CV document using the following name structure: **Name_Surname_CV**
Files must be less than **3 MB**.
Allowed file types: **txt rtf pdf doc docx**.

Cover Letter (optional) (if so, select the file and then click the Upload button)

Examinar... No se ha seleccion…o ningún archivo. Upload

Please, upload your CV document using the following name structure: **Name_Surname_CoverLetter**
Files must be less than **3 MB**.
Allowed file types: **txt rtf pdf doc docx zip**.

Other Documents (optional) (if so, select the file and then click the Upload button)

Examinar... No se ha seleccion…o ningún archivo. Upload

Please, upload your CV document using the following name structure: **Name_Surname_OtherDocument**
Files must be less than **10 MB**.
Allowed file types: **txt rtf pdf doc docx rar tar zip**.

** Consider that the information provided in relation to gender and nationality will be used solely for statistical purposes.

Data policy: *

☐ I accept the data policy *

Other: *

☐ I confirm that the information given in this form is true, complete and accurate.

Submit

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Barcelona Supercomputing Center, 2024

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