338_19_CASE_Q_R3

Job Reference

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Position

Quantum annealer control designer (R3)

Data de tancament

Dijous, 09 Gener, 2020
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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, and is a hosting member of the PRACE European distributed supercomputing infrastructure. 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 650 staff from 49 countries.

Look at the BSC experience:
BSC-CNS YouTube Channel
Let's stay connected with BSC Folks!

Context And Mission

The Quantic group is a BSC initiative to study Quantum annealers. These superconducting devices encode problems in their internal quantum interactions, and are a promising candidate for an operating quantum computer in the near future.
Completing the experimental construction of a quantum Annealer at BSC, a lot of key aspects of these devices have to be studied. These range from quantum algorithms available in such scenarios, to the design and study of the theoretical properties of superconducting circuits.
The final goal of this project is the application of this new computing power to real world problems. This will require a refinement of current algorithms to the particular properties of the quantum device, and an interaction between the quantum device and a classical control system. One of the approaches will involve
using modern machine learning techniques (and in particular deep learning) to optimize both the design and the operation of a quantum device.

**Key Duties**

- Study and implementation of quantum algorithms on a real superconducting device
- Analysis of theoretical properties of the quantum annealing process
- Search of industrial applications of quantum algorithms
- Requirements for an interface between classical and quantum algorithms
- Control requirements of a superconducting circuit
- Develop and implement deep reinforced learning algorithms to control a quantum algorithm operating on a real device.

**Requirements**

- **Education**
  - PhD in Physics

- **Essential Knowledge and Professional Experience**
  - Knowledge of state of the art quantum algorithms
  - Expertise on quantum information processing techniques
  - Basic understanding of quantum computation based on superconducting circuits
  - Experience with general machine learning techniques
  - Experience with deep learning and other neural network architectures

- **Additional Knowledge and Professional Experience**
  - High degree of programming skills
  - Experience with Python programming Language
  - Experience with numerical optimization techniques

- **Competences**
  - Fluency in spoken and written English, while fluency in other European languages will be also valued

**Conditions**

- The position will be located at BSC within the CASE Department
- We offer a full-time contract, a good working environment, a highly stimulating environment with state-of-the-art infrastructure, flexible working hours, extensive training plan, tickets restaurant, private health insurance, fully support to the relocation procedures
- Duration: Temporary - 3 years renewable
- 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: 1/1/2020
Applications Procedure

All applications must include:

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

Deadline

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

Diversity and Equal Opportunity Employment

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.

This position is reserved for candidates who meet the requirements and have the legal status of disabled persons with a degree of disability equal to or greater than 33%. In case there are no applicants with disabilities that meet the requirements, the rest of the candidates without declared disability will be evaluated.

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