190_CS_HPC_RE2

Job Reference

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Position

High Performance Computing (HPC) Compiler Engineer (RE2)

Data de tancament

Divendres, 30 Novembre, 2018

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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 500 staff from 44 countries.

Look at the BSC experience:

BSC-CNS YouTube Channel
BSC-CNS Corporate Video
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Context And Mission

The Computer Sciences (CS) department of the Barcelona Supercomputing Center is a key participant of the European Processor Initiative (EPI) which aims to design and execute a roadmap for a future European low power processor for HPC and automotive. BSC is involved in the EPI project as part of the accelerator stream whose goal is to build an accelerator CPU based on RISC-V. This accelerator will have support for long vectors and presents several requirements in terms of compilation toolchain and system software. We are looking for a compiler engineer with expertise in vectorisation and LLVM who is keen to work in the RISC-V architecture applied on a HPC context. The RISC-V ecosystem is very active at the moment and its ISA includes a vector extension which has potential to enable the power constraints of the future
supercomputers. Also the LLVM ecosystem is undergoing a refactoring of the vectorisation infrastructure under the VPlan project which should enable new vectorisation algorithms and instructions to be explored.

Key Duties

- Extend the LLVM support for the RISC-V vector extension to enable semiautomatic vectorisation via #pragma omp simd and VPlan
- Identify and implement vectorisation strategies and opportunities enabled by the RISC-V extension. Apply the vectorisation results to C, C++ and Fortran applications
- Collaborate with upstream LLVM/Clang to the extent possible and contribute if there is interest in the LLVM community for the implemented features.

Requirements

- Education
  - Bachelor or Master degree in Computer Science

- Essential Knowledge and Professional Experience
  - Good skills in C++
  - Good skills in compiler optimisation in the context of HPC including vectorisation
  - At least 2 years of experience with the LLVM codebase

- Additional Knowledge and Professional Experience
  - Knowledge of HPC architectures and systems
  - Knowledge of Fortran is a plus
  - Knowledge of OpenMP is a plus

- Competences
  - We value candidates who:
    - Have good communication and interpersonal skills to be able to work within a team to complete tasks on schedule
    - Show a problem-solving, can-do, pro-active and result-oriented attitude
    - Are keen to deliver good quality code and follow good practices in the industry
    - Are curious and willing to learn about LLVM, RISC-V and HPC

Conditions

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

All applications must include:

- A motivation letter with a statement of interest, including two contacts for further references - COMPULSORY - Applications without this document will not be considered
- A full CV 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.

Barcelona Supercomputing Center - Centro Nacional de Supercomputación