PhD student positions in Parallel Computing for Future Extreme-Scale Systems

The Department of Computing Science invites excellent candidates to apply for PhD student positions. The successful candidate(s) will join NLAFET, which is one of the high-profile extreme-scale computing projects funded within the recent FET-HPC call under Horizon 2020. NLAFET is coordinated by Umeå University with international partners from INRIA (France), University of Manchester and STFC-RAL (UK). The successful candidate will have access to excellent computational research facilities that are supported by competent scientific staff, and will also benefit from attractive working conditions (4-year salary, no tuition fees, comprehensive health care, and modern working environment).

Project description

Future extreme-scale supercomputers will be heterogeneous and lead to new and challenging demands for efficient numerical algorithms and parallel software libraries. The aim of NLAFET is to tackle these challenges and ultimately deliver new scalable numerical libraries for fundamental problems in numerical linear algebra, including the solution of dense and sparse systems of equations and eigenvalue problems. Achieving this requires a co-design effort including developing novel algorithms, exploration of advanced scheduling strategies and runtime systems, offline and online autotuning, as well as avoiding communication and synchronization bottlenecks.

The positions will focus on design, implementation, and evaluation of parallel algorithms for matrix eigenvalue problems with regards to the extreme-scale challenges. The research will be done in close collaboration with recognized researchers in the research group as well as with other partners in NLAFET.

Admission requirements

The general admission requirements for third-cycle study programmes are a second-cycle degree and completed courses carrying at least 240 higher (ECTS) education credits, at least 60 of which were awarded in the second-cycle, or substantially equivalent knowledge otherwise acquired in Sweden or abroad.

To fulfill the specific entry requirements for third-cycle studies in computing science the applicant is required to have completed courses at second-cycle level degree equivalent to 60 ECTS credits in computing science, computational science or another subject considered to be directly relevant for the specialization in question.

Documented knowledge and proven experience with software development for parallel numerical computations and good insight into algorithms for matrix computations is required. Documented knowledge and proven experiences of scheduling and run-time systems as well as software autotuning are strong merits.

Since you will work in an international research team, the ability for good team work, and a very good command of the English language, both written and spoken, are key qualifications.

Further information

The positions are aimed for PhD studies and research leading to a PhD exam. The position includes a competitive salary for a period of four years research time, provided that expected study and research results are achieved. The position may also include part-time teaching

(normally up to 20%). If so, the total time for the position is extended accordingly (up to maximum five years). The employment will start **May 1, 2015** or as otherwise agreed.

The procedure for recruitment for the position is in accordance with the Higher Education Ordinance (chapt. 12, 2 §) and the decision regarding the position cannot be appealed.

Submitting your application
The application should be written in English or Swedish and contain:

- A cover letter including a description of your research interests your reasons to apply for the position, and your contact information
- A curriculum vitae
- Copies of degree certificates
- Reprints / copies of Bachelors / Masters thesis, and other relevant publications, if any
- Contact information for three reference persons
- Documentation and description of experiences from parallel software development and work in or with industry.

Applications must be submitted electronically using the e-recruitment system MyNetwork Pro, and be received no later that April 4, 2016. Reference number: AN 2.2.1-243-16. Log on to the system and apply via the button at the bottom of the web page.

Further information can be obtained from Professor Bo Kågström, 090-786 5933, (email: bokg@cs.umu.se) or Ass. Professor Lars Karlsson, 090-7866190, (email: larsk@cs.umu.se).

More about us
The Department of Computing Science is a dynamic environment with around ninety employees representing more than ten countries worldwide. We conduct education and research on a broad range of topics in Computing Science. The focus of the research in the Parallel and Scientific Computing group coincides largely with the objectives of the NLAFET project.

The High Performance Computing Center North (HPC2N) is a prominent part of the Swedish National Infrastructure for Computing (SNIC). HPC2N provides a wide spectrum of services ranging from internationally competitive Tier-1-type HPC resources and e-Infrastructure to education and user training programs. The procurement of a heterogeneous Peta-scale system is ongoing. The new HPC system will include multi-core CPUs nodes, accelerators and/or nodes using integrated many-core CPUs as well as a portion of fat nodes (at least 4TB memory per node), and becomes a highly relevant platform for NLAFET.

Umeå University wants to offer an environment where open dialogue between people with different backgrounds and perspectives lay the foundation for learning, creativity and development. In each recruitment we aim to increase diversity and the opportunity to affirmative action. In particular, we encourage female applicants!

We kindly but firmly disclaim all contacts from recruitment agents and personnel who sell job postings/ads.

We look forward to receiving your application!