Postdoctoral Opportunities in Computer Science

The Large-Scale Systems Group (LSSG) in the Department of Computer Science, led by Professor Andrew Chien has several new Postdoctoral Scholar openings. These Scholars will lead and drive research efforts that explore the critical research challenges for the large-scale computing systems in a dynamic computer research environment at the University of Chicago. Future global-scale information systems have billions of elements, exabytes of data, and endemic impact on social, consumer, commercial, and scientific applications of unprecedented scale. Achieving this extraordinary scale poses difficult challenges in a number of dimensions systems, architecture, networking, and programming. In the Large-scale Systems Group, we are pursuing a number of projects in this area, and there are additional opportunities to partner with researchers at the Computation Institute, Argonne National Laboratory, Toyota Technological Institute, and other leading research organizations.

10x10 – Taming Heterogeneity for Energy-Efficient, General-Purpose Computing

As Moore Law’s scaling slows in power and speed, energy has become the critical challenge. The emergence of multi-core, GPGPU computing, and other accelerator-based computing approaches are all signs if the imminent crisis. Heterogeneous computing approaches promise of 100-fold, but the ad hoc, irregular, and revocable introduction of large-scale heterogeneity, poses major challenges for software and computer science generally. We are developing the 10x10 paradigm, a principled, systematic approach to heterogeneity in computer architecture. 10x10 exploits deep application knowledge to tame the power of VLSI customized design and create new architectures that are both programmable and low-power, appropriate for future data centers of millions of processors and future billions of mobile devices. These new architectures will represent stable targets for new software stacks that deliver both energy-efficient performance and robust, portable software for future generations of systems. See [1,2] for more information.

EASE -- Easy Exabyte Computing

With billions of consumer Internet devices, medical instruments, and scientific instruments spawning petabytes of data, there are exciting opportunities to create intelligent behavior and new scientific insights. Whilst data has always been extremely valuable, with the explosion in sensing and data acquisition of all types, it now stands poised to eclipse the importance of computation in computer science and informatics. Unfortunately, Petabyte systems remain the tools of elite large corporations with prohibitive cost and complexity. We are interested in new ideas which simplify use and create new capabilities for Exabyte systems of the future – and will enable a personal Exabyte computing revolution. Research areas include systems software (scale, resilience, energy-efficient), novel programming (e.g. declarative), and the impact of emerging future storage technologies (e.g. PCM and molecular storage) on data center and system architecture.

A recent PhD (or other doctoral degree) in Computer Science or related discipline is required. These positions are available as early as Fall 2011 with additional opportunities arising throughout the year. Postdoctoral Scholar appointments are typically renewable on annual basis.
These positions will be located at the University of Chicago. For more information, contact Professor Andrew A. Chien, achien@cs.uchicago.edu, 1100 East 58th Street, Chicago, IL 60637

The University of Chicago
The University of Chicago (www.uchicago.edu) is one of the world’s great intellectual communities. Founded in 1890 with an extraordinary donation by John D. Rockefeller it has grown to over 2,000 faculty and 15,000 students. Founded with a focus on research excellence, the University continues this tradition with numerous Nobel Prize and other notable awards and with two-thirds of the student population in graduate programs. The University of Chicago is consistently ranked in the top dozen universities globally with top-ranked programs in sciences, humanities, and professional schools (business, medicine, and law).

The Department of Computer Science (cs.uchicago.edu) is the hub of a large, diverse computing community of two hundred researchers focused on advancing foundations of computing and driving its most advanced applications. Long distinguished in theoretical computer science and artificial intelligence, the Department is now building a strong Systems research group. This closely-knit community includes the Computation Institute, the Toyota Technological Institute, and Argonne’s Mathematics and Computer Science Division.

References


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