

Memory Systems for Extreme Scale Computing

Frontiers in Computational and Information Sciences
Seminar Series

Presented by...

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Abstract: Technology advances are unbalanced. CPU performance has been improving at a much faster pace than memory technologies during the last three decades, which has led to the so-called memory-wall problem. In the meantime, newly emerged IT applications, such as computer animation, social networks, and sensor networks, are all data intensive, which has led to the so-called big-data problem. The lasting memory-wall problem compounded with the newly emerged big-data problem has changed the landscape of computing. CPU speed is no longer the performance bottleneck of a computing system, the data access speed is. However, historically computing systems are designed and developed to utilize CPU performance, not data accessing. A paradigm change is needed to support data-centric computing. In this talk we first review the history and concepts of the big-data and memory-wall problems. We then discuss the challenges of design advanced memory systems for extreme-scale computing. Finally, we present some our recent results in understanding and optimizing the performance of memory systems from the data-centric point-of-view.

More info:

Professor Sun is the chairman and a professor of the Department of Computer Science, the director of the Scalable Computing Software laboratory at the Illinois Institute of Technology (IIT) and guest faculty in the Mathematics and Computer Science Division at the Argonne National Laboratory. Before joining IIT, he worked at DoE Ames National Laboratory, at ICASE, NASA Langley Research Center, at Louisiana State University, Baton Rouge, and was an ASEE fellow at Navy Research Laboratories. Dr. Sun is an IEEE fellow and his research interests include parallel and distributed processing, high-end computing, memory and I/O systems, and performance evaluation. He has close to 200 publications and four patents in these areas.

<http://www.cs.iit.edu/~scs/sun/>

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