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Information Science and Technology Institute Colloquium



Shinpei Kato

University of California, Santa Cruz

“Managing GPUs as First-Class Operating System Resources”

Monday, November 7, 2011

11 AM - 12 PM

National Security Education Center (NSEC), IMMS Access Grid
Conference Room (LARP, 1st Floor, Suite 101A)

Abstract: The graphics processing unit (GPU) is becoming one of the most powerful platforms to support high-performance computing. Due to recent advances in programming support for general-purpose computation on GPUs, also known as GPGPU, GPUs are now used in not only graphics but also general compute domains. This talk presents Gdev, a new approach to GPU resource management in operating systems. Gdev manages GPUs as first-class operating system resources so that GPU-accelerated applications can be provided with fine-grained prioritization and isolation in multi-tasking environments. Gdev also provides a unified application programming interface for operating systems and user-space programs. This unified interface enables operating systems to launch GPU code directly, while user-space programs can also launch the same GPU code through system calls, such as "ioctl", or user-space Gdev runtime. We believe that Gdev will broaden a class of applications that benefit from GPUs and enhance the reliability of GPU computing.

Biography: Shinpei Kato is a Visiting Assistant Research Computer Scientist in the Department of Computer Science at University of California, Santa Cruz. He received his B.S., M.S., and Ph.D. degrees from Keio University in 2004, 2006, and 2008 respectively. He has also worked at The University of Tokyo and Carnegie Mellon University from 2009 to 2011 as a postdoctoral scientist. His research interests include, real-time systems, operating systems, and parallel and distributed systems. More information is available at his website (<http://users.soe.ucsc.edu/~shinpei>).



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