DEPARTMENT OF COMPUTER SCIENCE
FACULTY CANDIDATE 2010 SEMINAR

WHEN: MONDAY, APRIL 19, 2010
WHERE: PGH 232
TIME: 11:00 AM

SPEAKER: Dr. Weidong (Larry) Shi, ViTie, Inc.

Host: Dr. Barbara Chapman

TITLE: Towards Fun, Secure, and Dependable Computing Platforms and Services

Abstract
In the past few years, cloud has profoundly altered the landscape of service computing. One potential impact of cloud computing is that it supports on-demand infrastructure provisioning and allows end systems to migrate certain power-hungry and resource-intensive processing into the cloud. In this talk, I will describe some of my recent research on applying cloud and virtualization to support real-time 3D graphics applications. In particular, I will show a service prototype that provides scalable support for 3D graphics applications in a cloud environment. The service supports instance access to 3D applications in a cross-platform and cross-device manner. It cloudifies a wide range of applications such as 3D computer games, scientific visualization software, 3D authoring tools, virtual reality software, just to name a few. Such service is also ideally suited for mobile devices with broadband data connections.
In addition, I will touch upon my research in creating network exploit survivable and self-recoverable service systems using specially designed many-core processor with architecture enhancements for dependability and revivability. Currently I am transferring prior discoveries and experiences in this area to new dependability challenges in data centers and mission-critical computing systems. Virtual machine checkpoint has been used for the purpose of improving reliability and workload migration. Combining virtual machine checkpoint technique with multimedia oriented cloud services creates innovative futuristic user experiences. In this talk, I will describe a continuous virtual machine checkpoint and time travel approach that can enable interactive replay of virtual 3D graphics applications such as computer games and virtual desktop applications from captured video. The technique blurs the boundary between software delivery and multimedia delivery. It holds great potential not only as an enabling technique for future multimedia services but also as a solution of cloud forensic and as a technique for improving data center availability and dependability. Last but not least, I will discuss some research challenges and trends of virtualization and cloud computing under the context of many-core computer architecture.

Bio
Weidong (Larry) Shi received his Ph.D. of Computer Science from Georgia Institute of Technology where he did research in computer architecture and computer systems. He was previously a senior research staff engineer at Motorola Research Lab. Currently he is a co-founder of a technology startup working on solution of virtual appliance management, cloud based service provisioning, and support for real-time multimedia/3D graphics in cloud computing environments. In the past, he contributed to design of multiple Nvidia platform products and was credited for published Electronic Art console game. In addition, he authored and co-authored 28 journal/conference/workshop papers covering research problems in computer architecture, high performance systems, multimedia/graphics system, mobile computing, and computer security. His publication includes first-authored papers in HPCA, ISCA, MICRO, PACT, Financial Cryptography and co-authored paper in Transactions on Multimedia and Transactions on Sensor Network. He has 7 issued and pending USPTO patents.