Center for Quantum Science and Engineering (CQSE)

Weekly Seminar
May 27, 2011 (Friday)

TIME May 27, 14:30 ~ 15:30
TITLE Developments of Augmented Reality and GPU Acceleration within the NCHC
SPEAKER Dr. Matthew Smith
National Center for High-performance Computing, National Applied Research Laboratories
PLACE Rm716, CCMS & New Physics Building, NTU

Abstract

The multi-billion dollar computer gaming industry has been a major driving force for the development of computer technology. Major innovations in hardware architecture have been driven by demands from consumers for higher performance. One of the outcomes of this drive has been the development of hardware dedicated in support of visualization – graphics accelerators. These devices are traditionally designed specifically to perform the large amounts of simple vector computation required to draw complex images on-screen, consisting of (up to) hundreds of simple processors connected to high speed memory. Shortly after the introduction of programmable graphics hardware, the computing potential of GPU (Graphics Processing Units) was realized by the scientific community. Currently, several major GPU manufacturers have created (and continued to develop) hardware specifically focused at the HPC market.

This presentation will focus on the role of the NCHC in the development and application of numerical analysis tools supported by GPU with integrated Augmented Reality support. The shift of computational workload from the CPU to the GPU device allows for new possibilities – the idle CPU time can be used for other computations or calculations. Conventional approaches lean towards using the CPU to aid with GPU computation. We propose the integration of Augmented Reality technologies with the power of GPU computation to open new possibilities for GPU powered services and programs. I will discuss the approach taken and provide some live demonstrations of our current work.