

DEPARTMENT OF COMPUTER SCIENCE  
University of Houston

**FALL SEMINAR 2011**

**WHEN:** MONDAY, NOVEMBER 28, 2011  
**WHERE:** PGH 232  
**TIME:** 11:30 AM (please note time)

**SPEAKER:** Dr. David Anderson, U.C. Berkeley Space Sciences Laboratory

Host: Dr. Jaspal Subhlok

**TITLE:** Frontiers of Volunteer Computing

**ABSTRACT:**

Volunteer computing is the most powerful form of scientific distributed computing, exceeding Grids and Clouds in terms of number of nodes and computational throughput. I will discuss several areas of research and development in BOINC, a widely-used middleware system for volunteer computing.

- Client emulation:

The BOINC client embodies scheduling policies that must work well across a wide range of "scenarios": combinations of host characteristics, volunteer preferences, and project parameters. We have developed an emulator with a web-based interface that allows volunteers to upload scenarios and run simulations. This system has been valuable both for designing and evaluating new scheduling policies and for debugging the client software.

- VM-based applications:

BOINC now supports applications that run in virtual machines, using VirtualBox. This reduces heterogeneity-related complexity, and it makes it feasible to use untrusted applications in volunteer computing projects.

- Volunteer storage:

Volunteered hosts are able to provide significant storage as well computing power. I will describe various ways in which this storage can be used, and will discuss the problem of using a high-churn host population to provide high-reliability storage.

- Multi-user projects:

Early volunteer computing projects served a single research group and supported throughput-oriented computing. More recently, many projects serve a large and dynamic set of users (i.e. job submitters), and must support latency-oriented handling of batches of jobs. This requires a set of interrelated policies involving quotas, fairness, and scheduling.

**BIO:**

Dr. David P. Anderson received a Ph.D. in Computer Science from the University of Wisconsin - Madison in 1985. He taught in the Computer Science department at U.C. Berkeley, worked at several startup companies, then returned to U.C. Berkeley as a Research Scientist. His work focuses on Citizen Cyber-Science: using the Internet to involve the global public in scientific research. He leads the BOINC project, which develops middleware for volunteer computing, and he is also involved in creating new technology for distributed thinking and web-based education.