MURPA Seminar Friday 14th May 2010 at 10am, Monash Clayton

Gordon: A New Kind of Supercomputer for Data-Intensive Applications

Presenter: **Michael L. Norman**

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Abstract

Today's most powerful supercomputers have impressive floating point capabilities, but are rather unbalanced from the standpoint of memory and interconnect bandwidth, not to mention disk IO bandwidth. One measure of this balance is the Amdahl number, which is defined as the ratio of the IO bandwidth in Byte/s and the CPU performance in FLOPS. A balanced system has an Amdahl number of 1. The fastest machines on the Top500 list have Amdahl numbers in the range of 0.05 – 0.1, which makes them ideal for compute-intensive applications. In 2011 the San Diego Supercomputer Center (SDSC) will deploy a supercomputer architected for data-intensive applications like data mining and database which are growing in importance in science, engineering, medicine, and the social sciences. I will describe the architectural features of Gordon and present some preliminary results on several applications using a prototype system at SDSC called Dash.

Bio:

Michael L. Norman is professor of physics at UCSD where he directs the Laboratory for Computational Astrophysics. He received his B.S. from Caltech in 1975, and his Ph. D. from UC Davis in 1980. After holding appointments at the Lawrence Livermore and Los Alamos National Laboratories, the Max Planck Institute for Astrophysics, and the National Center for Supercomputing Applications, he joined the faculty at UCSD in 2000. His research focus is the computer simulation of astronomical phenomena using supercomputers. He is the author of over 200 papers on diverse topics including star formation, cosmic jets, and galaxy formation. His computer visualizations have appeared in numerous educational TV shows and films, including PBS Nova and The Discovery Channel. He is the recipient of the Alexander von Humboldt Research Prize and the IEEE Sidney Fernbach Award. He was elected Fellow of the American Physical Society in 2001, and the American Academy of Arts and Sciences in 2005.