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## CCT Colloquium Series

**An Introduction to Research Issues in Heterogeneous Parallel and Distributed Computing****Prof. H. J. Siegel, Colorado State University**

Department of Electrical and Computer Engineering and Department of Computer Science

Johnston Hall 338  
April 27, 2007 - 03:00 pm**Abstract:**

In heterogeneous parallel and distributed computing environments, a network (or cluster or grid) of different machines is interconnected to provide a variety of computational capabilities. These capabilities can be used to execute a collection of applications, each of which may consist of multiple tasks, where the tasks have diverse computational requirements. The execution times of a task may vary from one machine to the next, and tasks must share the computing and communication resources of the system. Furthermore, there can be inter-task data dependencies. An important research problem for heterogeneous computing is how to decompose applications into tasks, and then assign tasks to machines and schedule the order of their execution to maximize some given performance criterion. One long-term pursuit in the field of heterogeneous computing is to do this automatically. An overview of a conceptual model of what this involves will be given. An example of resource allocation research will be presented. The example involves an ad hoc grid environment, with energy constrained mobile computing devices that could be used in a disaster management scenario. Open problems in the field of heterogeneous parallel and distributed computing will be discussed. "Alligators" that make heterogeneous computing challenging will be shown.

**Speaker's Bio:**

H. J. Siegel is the George T. Abell Endowed Chair Distinguished Professor of Electrical and Computer Engineering at Colorado State University (CSU), where he is also a Professor of Computer Science. He is the Director of the CSU Information Science and Technology Center (ISTeC), a university-wide organization for promoting, facilitating, and enhancing CSU's research, education, and outreach activities pertaining to the design and innovative application of computer, communication, and information systems. From 1976 to 2001, he was a Professor in the School of Electrical and Computer Engineering at Purdue University. He received two B.S. degrees from the Massachusetts Institute of Technology (MIT), and the M.A., M.S.E., and Ph.D. degrees from Princeton University. He is a Fellow of the IEEE and a Fellow of the ACM. Prof. Siegel has co-authored over 330 published technical papers in the areas of parallel and distributed computing and communications. He was a Coeditor-in-Chief of the Journal of Parallel and Distributed Computing, and was on the Editorial Boards of the IEEE Transactions on Parallel and Distributed Systems and the IEEE Transactions on Computers.

**Refreshments will be served.**