



# Announcing

A COS 740 Seminar

Friday, October 12, 2007 at 2:00 pm

TEC 205

at The University of Southern Mississippi

**Speaker: Xaio Qin**

Auburn University

**Title: Security-Aware Scheduling for Real-Time Parallel Applications on Clusters**

## Abstract:

Abstract: An increasing number of real-time parallel applications on clusters, such as aircraft control and medical electronics systems, require high quality of security to assure confidentiality, authenticity, and integrity of information. Conventional scheduling algorithms for clusters have been proposed to achieve high performance of parallel applications without security requirements; however, enhancing security of clusters for parallel applications requiring service flexibility remains an open problem. In this tutorial, we will discuss our current research that focuses on developing and evaluating new scheduling mechanisms and algorithms for applications with timing and security constraints on clusters. In particular, we will first describe an adaptive control framework for quality of security in cluster computing systems. The framework is centered on a model of security-sensitive real-time applications and security overhead model. The overhead model is used to measure security overheads incurred by an array of security services, including encryption, authentication, integrity check, etc. Next, we will describe a dynamic real-time scheduling algorithm, or TAPADS (Task Allocation for Parallel Applications with Deadline and Security constraints), which seamlessly integrates security requirements into real-time scheduling for clusters. To quantitatively evaluate the performance TAPADS, we conducted extensive experiments using real world applications and traces as well as synthetic benchmarks. We will present experimental results to demonstratively show that TAPADS significantly improves system performance in terms of quality of security and schedulability over three existing scheduling algorithms.

## Further Information

Further details and information about this and other departmental activities is available online at [http://www.math.usm.edu/bulletin\\_board/](http://www.math.usm.edu/bulletin_board/).