



# Collaborative Graduate Specialization in Computational Science and Engineering

## WEEKLY COLLOQUIUM

Tuesday, 6 March 2007

2:30-3:30 in Dunning 27

**Speaker:** Ahmad AFSABI, Associate Professor  
Electrical and Computer Engineering, Queen's University

**Title:** High-Performance and Power-Aware Computing

**Abstract:** High-performance computing (HPC) has always been associated with performance, and occasionally, price/performance. To cope with the increasing demand in tackling computationally intensive problems and supporting the emerging networking and commercial applications, larger systems are being designed and built. On the other hand, HPC systems consume a significant amount of power, resulting in high operational costs, reduced reliability, and wasting of natural resources. Therefore, power consumption has become an increasingly important constraint in HPC and data centers.

In this presentation, I will elaborate on some of the research projects we are currently pursuing in the aforementioned fronts: HPC at-any-cost and power-aware HPC. In the first instance, I will describe a number of techniques to improve the performance of communication subsystems for point-to-point and collective communications in Message Passing Interface (MPI) applications running on high-performance clusters. In the latter case, I will present a new scheduler as well as a power-aware library to manage the power/energy consumption of servers and clusters for OpenMP and MPI applications while sustaining their performance.

**About the speaker:**

*Ahmad Afsahi is currently an Associate Professor in the Department of Electrical and Computer Engineering at Queen's University. He is also an affiliated faculty in Queen's Collaborative Graduate Specialization in Computational Science and Engineering. Dr. Afsahi received his Ph.D. in Electrical Engineering from the University of Victoria, British Columbia, in 2000. His research interests include parallel and distributed processing, network-based high-performance computing, power-aware high-performance computing, and advanced computer architecture. His research has earned him a Canada Foundation for Innovation Award, and an Ontario Innovation Trust Award. He is a licensed Professional Engineer (P.Eng.) in the province of Ontario*