

Department of Applied Mathematics and Statistics  
The Johns Hopkins University

SEMINAR

Inchi Hu  
Dept. of Info. & Systems Mgmt.  
The Hong Kong University  
of Science and Technology

August 24, 2006  
304 Whitehead Hall  
Refreshments: 3:30 p.m.  
Seminar: 4:00 p.m.

**OPTIMAL STRATEGIES FOR A CLASS OF SEQUENTIAL CONTROL  
PROBLEMS WITH PRECEDENCE RELATIONS**

ABSTRACT

Consider the following multi-phase project management problem. Each project is divided into several phases. All projects enter the next phase at the same point chosen by the decision-maker based on observations up to that point. Within each phase, one can pursue the projects in any order. When pursuing the project with one unit of resource, the project state changes according to a Markov chain. The probability distribution of the Markov chain is known up to an unknown parameter. When pursued, the project generates a random reward depending on the phase and the state of the project and the unknown parameter. The decision-maker faces two problems: (a) how to allocate resources to projects within each phase, and (b) when to enter the next phase, so that the total expected reward is as large as possible. In this talk, we formulate the preceding problem as a stochastic scheduling problem and propose asymptotic optimal strategies, which minimize the shortfall from perfect information payoff. Concrete examples are given to illustrate our method.