The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

On

Event-Based Optimization of Stochastic Systems and Its Applications to Social, Financial and Engineering Problems

by

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Abstract

In many practical systems, such as engineering, social, and financial systems, control decisions are made only when certain events happen. This is either because of the discrete nature of sensor detection and digital computing equipments, or the limitation of computing power, which makes state-based control infeasible due to the huge state spaces. The performance optimization of such systems is generally different from the traditional optimization approaches, such as Markov decision processes, or dynamic programming. In this talk, we introduce, in an intuitive manner, a new optimization framework called event-based optimization. This framework has a wide applicability to aforementioned systems. With performance potential as building blocks, we develop optimization algorithms for the event-based optimization problems. The optimization algorithms are first proposed based on intuition, and theoretical justifications are then given with a performance sensitivity based approach. Finally, we provide a few practical examples to demonstrate the effectiveness of the event-based optimization framework. We hope this framework may provide a new perspective to the optimization of the performance of event-triggered dynamic systems.

Date : 2 May, 2013 (Thursday)
Time : 3:00 p.m. – 4:00 p.m.
Venue : AG710, The Hong Kong Polytechnic University

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