



**The Hong Kong Polytechnic University  
Department of Applied Mathematics**

## **Colloquium**

**On**

**Consensus in Networked Multi-agent Systems with Communication Constraints**

**by**

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### **Abstract**

In this talk, we firstly discuss the consensus problem in directed static networks with arbitrary finite communication delays. For the considered networked system, only locally delayed information is available for each node and also the information flow is directed. We find that consensus can be realized whatever the communications delays are. One well-informed leader is proved to be enough for the regulation of all nodes' final states, even when the external signal is very weak. Further, we discuss the consensus problem of multi-agent networks subject to communication constraints. Two types of communication constraints are discussed in this paper: i) each agent can only exchange quantized data with its neighbors and ii) each agent can only obtain the delayed information from its neighbors. An explicit relationship among time delay, quantization parameter and the practical consensus set are theoretically presented. Numerical simulations in small-world and scale-free networks are given to demonstrate the potentials of our analytic results.

**Date : 3 Sep, 2014 (Wednesday)**

**Time : 4:00 p.m. - 5:00 p.m.**

**Venue : TU717, The Hong Kong Polytechnic University**

**\* \* \* ALL ARE WELCOME \* \* \***