THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering
Seminar

Competitions in Nonlinear Polya Urn Processes with Fitness
by
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Date : **11 Jan., 2018 (Thur.)**
Time : **2:30pm – 3:30pm**
Venue : **Room 833, Ho Sin Hang Engineering Building**
The Chinese University of Hong Kong

Abstract

Cumulative advantage (CA) refers to the notion that accumulated resources foster the accumulation of further resources in competitions, a phenomenon that has been empirically observed in various contexts. The oldest and arguably simplest mathematical model that embodies this general principle is the Polya urn process, which finds applications in a myriad of problems. The original model captures the dynamics of competitions between two equally fit agents under linear CA effects. In his talk, Bo will discuss the generalization of the basic model to incorporate different fitnesses and nonlinear CA effects, with focus on two statistics of competitions, duration (i.e., time of the last tie) and intensity (i.e., number of ties). He will show how fitness and nonlinearity in different regimes affect the tail distributions of both duration and intensity, which exhibit very interesting and sometimes unexpected behaviors. For example, the introduction of fitness superiority induces much shorter competitions in the sublinear regime but may result in much longer competitions in the superlinear regime, with further complications in the linear regime.

Biography

Bo Jiang is a postdoc in the College of Information and Computer Sciences at the University of Massachusetts Amherst. He works with Don Towsley on modeling, analysis and algorithm design for social and computer systems. He received his B.S. in Electronic Engineering from Tsinghua University in 2006. He received his M.S. in Electrical and Computer Engineering, M.S. in Applied Mathematics, and Ph.D. in Computer Science from the University of Massachusetts Amherst in 2008, 2012 and 2015, respectively. He received the best paper award at Sigmetrics 2016.

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