香 港 中 文 大 學
The Chinese University of Hong Kong

Institute of Theoretical Computer Science and Communications

CSE-ITCSC Joint Seminar

Settling the Sample Complexity of Single-parameter Revenue Maximization

By

Dr. Zhiyi Huang

Assistant professor of Computer Science, The University of Hong Kong

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2:30 pm – 3:30 pm
Room 121, 1/F, Ho Sin Hang Engineering Building, CUHK

Abstract:

This work settles the sample complexity of single-parameter revenue maximization by showing matching upper and lower bounds, up to a poly-logarithmic factor, for all families of value distributions that have been considered in the literature. The upper bounds are unified under a novel framework, which builds on the strong revenue monotonicity by Devanur, Huang, and Psomas (STOC 2016), and an information theoretic argument. This is fundamentally different from the previous approaches that rely on either constructing an ϵ-net of the mechanism space, explicitly or implicitly via statistical learning theory, or learning an approximately accurate version of the virtual values. To our knowledge, it is the first time information theoretical arguments are used to show sample complexity upper bounds, instead of lower bounds. Our lower bounds are also unified under a meta construction of hard instances.

Biography:

Zhiyi is an assistant professor of Computer Science at the University of Hong Kong. He works broadly on theoretical computer science, in particular, on algorithmic game theory, online algorithms, and differential privacy. Before joining HKU, Zhiyi was a postdoc at Stanford University from 2013 to 2014, working with Prof. Tim Roughgarden. Before that, he obtained his Ph.D. from the University of Pennsylvania under Prof. Sampath Kannan and Prof. Aaron Roth in 2013, interned at Microsoft Research Redmond under Dr. Nikhil R. Devanur in the summers of 2011 and 2012, and got his bachelor degree from the first "Yao Class" under Andrew Yao at Tsinghua University in 2008.

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Hosted & Enquiries :   Prof Siu On Chan/ Institute of Theoretical Computer Science and Communications   Tel: 3943 4263/ 3943 3452