Algorithmic Information Disclosure in Optimal Auctions

Dr. Yingkai Li

Department of Economics
National University of Singapore

🎤 Host：孔雨晴 助理教授
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📍 静园五院204室

Abstract

This paper studies a joint design problem where a seller can design both the signal structures for the agents to learn their values, and the allocation and payment rules for selling the item. In his seminal work, Myerson (1981) shows how to design the optimal auction with exogenous signals. We show that the problem becomes NP-hard when the seller also has the ability to design the signal structures. Our main result is a polynomial-time approximation scheme (PTAS) for computing the optimal joint design with at most an ϵ multiplicative loss in expected revenue. Moreover, we show that in our joint design problem, the seller can significantly reduce the information rent of the agents by providing partial information, which ensures a revenue that is at least $1-1/e$ of the optimal welfare for all valuation distributions.

Biography

Yingkai Li is an Assistant Professor (Presidential Young Professor) in Economics at the National University of Singapore. He was a postdoctoral fellow at the Cowles Foundation for Research in Economics and the Department of Computer Science at Yale University, working with Prof. Dirk Bergemann and Prof. Yang Cai. He received his PhD in Computer Science from Northwestern University, advised by Prof. Jason Hartline. He completed his BS in Computer Science from Shanghai Jiaotong University in 2015 and his MS in Computer Science from Stony Brook University in 2018.