



Autobidding Equilibria in Sponsored Shopping



Dr. Yifeng Teng

Research Scientist
Google Research

🎤 Host: 李彤阳 助理教授

🕒 2026年3月5日 星期四 16:00

📍 静园五院204室



Abstract

As commerce shifts to digital marketplaces, platforms increasingly monetize traffic through Sponsored Shopping auctions. Unlike classic "Sponsored Search", where an advertiser typically bids for a single link, these settings involve advertisers with broad catalogs of distinct products. In these auctions, a single advertiser can secure multiple slots simultaneously to promote different items within the same query. This creates a fundamental complexity: the allocation is combinatorial, as advertisers simultaneously win a bundle of slots rather than a single position.

We study this setting through the lens of autobidding, where value-maximizing agents employ uniform bidding strategies to optimize total value subject to Return-on-Investment (ROI) constraints. We analyze two prevalent auction formats: Generalized Second-Price (GSP) and Vickrey-Clarke-Groves (VCG). Our first main contribution is establishing the universal existence of an Autobidding Equilibrium for both settings. Second, we prove a tight Price of Anarchy (PoA) of 2 for both mechanisms.

This is joint work with Paul Duetting, Yuhao Li, Renato Paes Leme and Kelly Spendlove.

Biography

Yifeng Teng is a research scientist in the Algorithms and Optimization team at Google Research. He received his Ph.D. from the Department of Computer Sciences at the University of Wisconsin-Madison, and his B.Eng. from the Institute for Interdisciplinary Information Sciences at Tsinghua University. He is broadly interested in topics in theoretical computer science and economics, with a primary focus on algorithmic game theory, online algorithms, learning theory, and their applications to real-world mechanism design. His work was recognized by the best paper award at WINE 2023.