

The Hong Kong University of Science and Technology
Dept of Information Systems, Business Statistics and Operations Management
Dept of Industrial Engineering & Decision Analytics
Joint Seminar Announcement



Market Clearing Beyond Submodularity
by
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Date : **17 Apr 2026 (Friday)**
Time : **10:30 – 11:45 AM**
Venue : **Classroom 2003, 2/F, LSK Business Building**

Abstract: The ability to coordinate market sides at speed and scale is a cornerstone of modern platform business models and resource allocation systems more broadly. At its core, market clearing involves two fundamental tasks: allocation and pricing. This talk develops primal-dual based approaches to tackle each task in settings that go beyond the submodular structure typically required for tractable, optimal solutions.

On the allocation side, we study multi-sided matching under supply and demand uncertainty with capacity constraints. The key technical contribution is identifying a relaxation of submodularity that emerges naturally from primal-dual analysis of a linear programming formulation of the allocation task. Leveraging this, we establish constant-factor approximation guarantees for a broad class of problems that subsume not only matching but also flexibility design, facility location, and subset selection.

On the pricing side, we consider when anonymous per-unit prices can support an approximately efficient allocation. Motivated by settings such as standardized procurement, cloud resource pricing, and posted-price sales of homogeneous goods, we leverage a linear programming representation of the market-clearing objective and again utilize the primal-dual approach to define a suitable approximation of Walrasian equilibrium. Building on this, we design and analyze algorithms that yield the uniform price that clears the market and supports an approximate equilibrium with corresponding welfare guarantees.

Bio: Saša Pekeč is the Peterjohn-Richards Distinguished Professor of Business Administration in the Decision Sciences Area at the Fuqua School of Business, Duke University. Professor Pekeč research is interdisciplinary and revolves around decision-making in complex competitive environments. He is a board member and the past president of the INFORMS Section on Auctions and Market Design, serves on editorial boards on several scientific journals, and has published in top academic journals in management sciences, operations research, economics, mathematics and psychology. Outside academia, Professor Pekeč serves on the Supervisory Board of Atlantic Grupa, one of the leading FMCG companies in SE Europe, and was a member of the Council of Economic Advisors to the President of Croatia from 2010 to 2015.