Abstracts

Contents

Felix Brandt
Technical University of Munich, Germany

Collaborative Giving: Effective Distribution of Individual Contributions

A new trend in computational social choice and fair division is to study how money should be spent on public interest projects based on the preferences of multiple agents. In contrast to the standard model of participatory budgeting, this tutorial focuses on settings where (i) public projects are not associated with fixed costs and (ii) the budget to be distributed is supplied by the agents themselves. An important application of this setting is donor coordination. Here, the agents are donors willing to contribute money for charitable giving, the public projects are charitable organizations, and the donors have preferences over how money should be distributed among charities. I will give an overview of this recent stream of research discussing various types of utility functions such as linear, Cobb-Douglas, and Leontief utilities and illuminate the pervasive conflict between efficiency, strategyproofness, and fairness. The tutorial covers numerous attractive features of the Nash product rule, the computer-aided proof of a sweeping impossibility, and natural spending dynamics that converge to socially desirable outcomes.

Back to Contents Page →

Piotr Faliszewski
AGH University, Poland

Map of Elections: Where Are Real-Life Instances?

We In the map of elections framework we take a dataset of elections and present these elections as points on a 2D plane, so that the distance between the points corresponds to the similarity between the respective elections. In this talk I will first present the basics of the approach for ordinal elections, and then I will show its applications to identify models of generating synthetic elections whose outputs resemble real-life data. Then we will move on to approval elections. In this case, we will argue that currently known maps of approval elections give somewhat misleading insights.

Algorithmic and Game-Theoretic Support for Participatory Budgeting

In the participatory budgeting setting we are given a set of projects, each with a cost, a set of approval votes over these projects, and a budget. The goal is to select projects that will proportionally represent the voters, and whose total cost does not exceed the budget.

Recently, there was a great progress on the participatory budgeting setting, including the inception and practical adoption of the Method of Equal Shares rule. However, using more involved rules leads to a number of problems. For example, how to explain to the voters that cheaper projects with more approvals sometimes have to give way to more expensive ones, with higher costs? And what do we say if a project proposer asks for advice on setting the cost of his or her project? In this talk we will show algorithmic and gametheoretic tools to answer such questions.

Back to Contents Page →

Ayumi Igarashi
University of Tokyo, Japan

Cake Cutting: From Continuous to Discrete Settings

Cake-cutting is a fundamental model for dividing a heterogeneous resource, such as land, broadcast time, or advertisement space. Over the past few decades, a wide variety of results and techniques related to fairness concepts, such as envy-freeness, have been developed. Notably, a classical result shows that, under mild assumptions about the agents' preferences, there exists an envy-free division in which each agent receives a connected piece of the resource. However, in many practical applications, the resource may be indivisible. For instance, time is often divided into discrete units, such as scheduled shifts or research seminars. Similarly, land might be divided into discrete plots due to geographical or historical constraints. Recently, there has been a growing interest in a discrete version of the cake-cutting problem. In this tutorial, I will begin by explaining classical results in cake-cutting and recent progress in the field. I will then focus on the discrete setting, particularly on how to ensure approximate fairness.

Back to Contents Page →

Minming Li
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Facility Location Games: Mechanisms and Variants

The study of approximate mechanism design for facility location games has been in the center of research at the intersection of artificial intelligence and economics for the last decade, largely due to its practical importance in various domains, such as social planning and clustering. At a high level, the goal is to select a number of locations on which to build a set of facilities, aiming to optimize some social objective based on the preferences of strategic agents, who might have incentives to misreport their private information if doing so can bring them benefit. This tutorial presents a comprehensive survey of the significant progress that has been made since the introduction of the problem, highlighting different variants and methodologies, as well as interesting directions for future research.

Back to Contents Page →