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Preface: The Special Issue on Dynamic and Networking Games

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Numerous game theory-based techniques to characterize agent behavior have emerged in response to the swift advancements in technology, communications, industrial organization, economic integration, and international trade. There is a huge variety of mathematical techniques used in game theory. The application of dynamic and networking game techniques is the main topic of this special issue. Studying strategic interactions between many decision-makers with dynamic and varied connections is the focus of research in the game theory discipline of dynamic and networking games. This field of study examines how agents or people make choices in dynamic circumstances and how those choices impact their overall outcomes and payoffs.

Dynamic games involve players making sequential decisions over time, where their choices today can impact future decisions and outcomes. This research investigates the strategic behavior and optimal decision-making strategies in such settings, considering factors such as timing, uncertainty, and information asymmetry.

On the other side, networking games study strategic interactions where the relationships or network among the players affect their decisions. This can be shown as a graph, with the players represented by nodes and their relationships or interactions by edges. Researchers study how the network structure affects the players' decisions, outcomes, and the stability of the game. The development of new information technologies, particularly the worldwide Internet, mobile communications, distributed and cloud computing, and social networks, coincided with the appearance of this direction in game theory. The emergence of novel graph-theoretic techniques for network research has been spurred by online social networks. On these networks, users group

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together to build communities and create networks with different topologies. Examining the configuration of these graphs is crucial not only for its own sake but also for evaluating the outcomes of equilibrium game-theoretic interactions inside these kinds of networks. Information technology, biology, physics, and economics are just a few of the disciplines that employ social network analysis techniques.

Understanding and analyzing dynamic and network games in game theory have wide-ranging applications in various fields, including economics, finance, computer science, social sciences, biology, and engineering. This research aids in designing efficient resource allocation mechanisms, optimizing network architectures, predicting outcomes in strategic environments, and developing strategies for decision-making in dynamic and networked systems.

Papers on a broad spectrum of mathematical techniques applied to dynamic and network game theory are included in this special issue. These include fresh improvements in classical results as well as recent breakthroughs in fields that show promise for future research. Twelve excellent pieces, including research on game-theoretic approaches to a range of market evolution problems, cooperation and competition in resource extraction models, traffic management, opinion dynamics, etc., are included in this edition. More than thirty specialists in the domains of game theory and allied fields were invited by the editors to submit to the special issue, and two to three experts were asked to assess each submission.

A Dynamic Network Game of the Fintech Industry examines a dynamic network game for financial institutions that suggests a payoff distribution technique that ensures the Shapley value distribution is fulfilled at every step of collaboration.

A Note on Transition Kernels for the Most Unfavorable Mixed Strategies of the Market applies a game-theoretic approach to the superhedging problem in a deterministic model of market evolution with trading restrictions.

Differential Game Model of Resource Extraction with Continuous and Dynamic Updating explores a new class of differential games with continuous and dynamic updating and applications in the problem of resource extraction.

Equilibrium Arrivals to Preemptive Queuing System with Fixed and Random Population Size offers a strategic approach to a queuing system with priority access. The Nash equilibrium and the price of anarchy are found.

Essential Players in Cooperative Games with Graph Communication Structure proposes a rule for the payoff distribution in the class of cooperative games with a network communication structure, taking into account the presence of some important (essential) players.

Opinion Dynamics in Two-Layer Networks with Hypocrisy proposes the opinion dynamics in a network structure with two levels, in which players can exchange opinions at the internal level.

Competitive resource allocation among urban congestion areas in a modern big city proposes a procedure for computing Nash equilibria in the game of transport companies distributing their resources among urban congested areas.

The Generalized Stackelberg Equilibrium of the Two-Person Stopping Game models a bilateral selection game in which players use stopping points as strategies, and where players have different information about the process itself.

Zero-Sum Continuous-Time Markov Games with One-Side Stopping finds the optimal strategies of players in a dynamic two-person game in which one of the players can stop the game.

Strong Subgame Consistency of the Core in Stochastic Network Formation Games proposes a model of network formation as a stochastic game with random duration.

The article *Structural stability of the financial market model*: *continuity of superhedging price and model approximation* shows the role of structural stability in financial modeling.

Irrational-Behavior-Proof Conditions for Stochastic Games over Event Trees finds sufficient conditions for protection against irrational behavior in the class of stochastic dynamic games over event trees.

This special issue will be of interest to researchers working on one of the various applications of game theory or doing theoretical research in the area. Here, we would especially want to thank the editorial staff of JORSC for their support during the project. We also like to thank the experts in particular for their excellent article reviews. Additionally, we would like to express our gratitude to the readers of this special issue and the writers who contributed to it. We really believe that this special issue will further the advancement of game theory research.