

# Preface

Modern game theory has evolved enormously since its inception in the 1920s from the work of Borel (1921, 1924, 1927) and von Neumann (1928). Dynamic game theory branched from the pioneering work on differential games by R. Isaacs, L.S. Pontryagin and his school, and from seminal papers on extensive form games by Kuhn and on stochastic games by Shapley.

Since these early development days, dynamic game theory has had a significant impact in such diverse disciplines as applied mathematics, economics, systems theory, engineering, operations research, biology, ecology, and the environmental sciences. Modern dynamic game theory now relies on wide-ranging mathematical and computational methods, and possible applications are rich and challenging.

This edited volume focuses on various aspects of dynamic game theory, providing state-of-the-art information on recent theoretical developments and new application domains and examples. Most of the selected papers are based on presentations at the 13th International Symposium on Dynamic Games and Applications held in Wrocław, Lower Silesia, Poland at the beginning of Summer 2008. The symposium is held every two years under the auspices of the International Society of Dynamic Games (ISDG).

The papers selected to appear in the Annals cover a variety of topics ranging from theory to applications in biology, ecology, engineering, economics, and finance. The list of contributors consists of both well-known and young researchers from all over the world. Every paper has gone through a stringent reviewing process.

While we were in the middle of the review process, our fellow editor and good friend Arik Artavazdovich Melikyan suddenly passed away. This volume is dedicated to him as a tribute to his contribution in the field of dynamic games.

The volume is divided into five parts. The first part contains eight papers devoted to theoretical developments in differential games and general dynamic games, including new numerical methods. Part II contains five papers on pursuit/evasion games, including an historical perspective on the homicidal chauffeur game, collision avoidance and search games, and guidance problems. Part III is devoted to evolutionary games, with four papers on stable strategies, social interactions, mating, and telecommunication. Part IV contains two papers on cooperative games, addressing the problems of dynamic consistency and imputations when the horizon of the game is different or not known with certainty. Finally, Part V contains

nine papers devoted to various applications of dynamic games, covering modeling, solutions, and numerical approaches. Applications range from management of fisheries and environmental agreements to insurance, option pricing and taxation, supply chain management, and channel allocation.

The editors are indebted to many colleagues involved in the editorial process. Special thanks go to Valerii S. Patsko, Andrei R. Akhmetzhanov, and Naira Hovakimyan, who helped us recover the editorial work of Arik after his death, put together his work, and collected testimonies from his friends.

Our warmest thanks go to the large number of referees for the papers submitted to the Annals. Without their important contribution this volume would not have been possible.

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