Game Theory Department Of Mathematics Home

This book is a collection of selected papers presented at the consecutively held international conferences on "Game Theory and Networks", organized by the Department of Mathematics, Dibrugarh University, India, in collaboration with the Economics Department of Queen's University, Belfast, UK, during September 6–9, 2019 and September, 13–15 2018. The book includes chapters on network measures and network formation, application of network theory to contagion, biological data and finance and macroeconomics as expository articles. The book also contains chapters on fair allocation in the context of queuing, rationing and cooperative games with transferable utilities for engaged researchers. A few survey chapters on non-cooperative game theory, evolutionary game theory, mechanism design and social choice theory are also incorporated to cater to the needs of the beginners in the field. This book discusses the use of game theoretic tools and network models across disciplines: mathematics, statistics, economics, computer science, political science, sociology and psychology. It aims at providing a suitable learning experience to beginners on the basics of cooperative games, networks and mechanism design, as well as recent developments to research scholars having the basic knowledge of these topics.

Networking Games applies game theory methods to network analyses. Its concentration on rigorous mathematical techniques distinguishes it from other books on game theory. Developed by a mathematician and game theorist with extensive contributions to applied mathematics, game theory, and probability theory and written for graduate students and professionals, its illuminations of network games can be applied to problems in economics (in industrial organization, regulation, and competition policy, for instance) and operations research. Reviews new directions in networking games, including paradoxes and puzzles designed to inspire competing answers and further investigation Addresses the need of theorists and those applying advanced game theory to problems in various disciplines Evaluates a wide spectrum of game-theoretical models, including routing, distribution of information resources, task management in the organization of computing, social networks, competition and cooperation in transport networks, tasks of pricing and allocation of resources in the transport services market

Covering both noncooperative and cooperative games, this comprehensive introduction to game theory also includes some advanced chapters on auctions, games with incomplete information, games with vector payoffs, stable matchings and the bargaining set. Mathematically oriented, the book presents every

theorem alongside a proof. The material is presented clearly and every concept is illustrated with concrete examples from a broad range of disciplines. With numerous exercises the book is a thorough and extensive guide to game theory from undergraduate through graduate courses in economics, mathematics, computer science, engineering and life sciences to being an authoritative reference for researchers.

An exciting new edition of the popular introduction to game theory and its applications The thoroughly expanded Second Edition presents a unique, hands-on approach to game theory. While most books on the subject are too abstract or too basic for mathematicians, Game Theory: An Introduction, Second Edition offers a blend of theory and applications, allowing readers to use theory and software to create and analyze real-world decision-making models. With a rigorous, yet accessible, treatment of mathematics, the book focuses on results that can be used to determine optimal game strategies. Game Theory: An Introduction, Second Edition demonstrates how to use modern software, such as MapleTM, Mathematica®, and Gambit, to create, analyze, and implement effective decision-making models. Coverage includes the main aspects of game theory including the fundamentals of two-person zero-sum games, cooperative games, and population games as well as a large number of examples from

various fields, such as economics, transportation, warfare, asset distribution, political science, and biology. The Second Edition features: • A new chapter on extensive games, which greatly expands the implementation of available models • New sections on correlated equilibria and exact formulas for three-player cooperative games • Many updated topics including threats in bargaining games and evolutionary stable strategies • Solutions and methods used to solve all odd-numbered problems • A companion website containing the related Maple and Mathematica data sets and code A trusted and proven guide for students of mathematics and economics, Game Theory: An Introduction, Second Edition is also an excellent resource for researchers and practitioners in economics, finance, engineering, operations research, statistics, and computer science. This collection of papers is an outgrowth of the `Game Practice I' conference. The overall content of this book is firmly rooted in existing game theory. Much experimental and observational evidence demonstrates that there is a large gap between theory and `practice'. There is no doubt that theory is nonetheless needed, and that it has to be developed. At the same time there is a risk of sterile developments if theory is not fed by challenges coming from confronting the real world. In this respect, the editors' feelings are that there is now a need for a better balance between theory and applications. The kind of considerations

sketched above gave birth to the idea of organizing a series of meetings to stimulate research in game theory which seeks a more direct connection with real world problems. Most of the contributions can be roughly classified into four groups: political applications, problems of cost/reward sharing, economic applications, and experiments. The collection is relevant to academics working in game theory and related topics such as management, decision theory and industrial organization.

This textbook presents the basics of game theory both on an undergraduate level and on a more advanced mathematical level. It is the second, revised version of the successful 2008 edition. The book covers most topics of interest in game theory, including cooperative game theory. Part I presents introductions to all these topics on a basic yet formally precise level. It includes chapters on repeated games, social choice theory, and selected topics such as bargaining theory, exchange economies, and matching. Part II goes deeper into noncooperative theory and treats the theory of zerosum games, refinements of Nash equilibrium in strategic as well as extensive form games, and evolutionary games. Part III covers basic concepts in the theory of transferable utility games, such as core and balancedness, Shapley value and variations, and nucleolus. Some mathematical tools on duality and convexity are collected in Part IV. Every

chapter in the book contains a problem section. Hints, answers and solutions are included.

Herbert Scarf is a highly esteemed distinguished American economist. He is internationally famous for his early epoch-making work on optimal inventory policies and his highly influential study with Andrew Clark on optimal policies for a multi-echelon inventory problem, which initiated the important and flourishing field of supply chain management. Equally, he has gained world recognition for his classic study on the stability of the Walrasian price adjustment processes and his fundamental analysis on the relationship between the core and the set of competitive equilibria (the so-called Edgeworth conjecture). Further achievements include his remarkable sufficient condition for the existence of a core in non-transferable utility games and general exchange economies, his seminal paper with Lloyd Shapley on housing markets, and his pioneering study on increasing returns and models of production in the presence of indivisibilities. All in all, however, the name of Scarf is always remembered as a synonym for the computation of economic equilibria and fixed points. In the early 1960s he invented a path-breaking technique for computing equilibrium prices. This work has generated a major research field in economics termed Applied General Equilibrium Analysis and a corresponding area in operations research known as Simplicial Fixed Point Methods. This book comprises all his research articles and consists of four volumes. This volume collects Herbert Scarf's papers in the area of Economics and

Game Theory.

This present book provides an alternative approach to study the pre-kernel solution of transferable utility games based on a generalized conjugation theory from convex analysis. Although the pre-kernel solution possesses an appealing axiomatic foundation that lets one consider this solution concept as a standard of fairness, the pre-kernel and its related solutions are regarded as obscure and too technically complex to be treated as a real alternative to the Shapley value. Comprehensible and efficient computability is widely regarded as a desirable feature to qualify a solution concept apart from its axiomatic foundation as a standard of fairness. We review and then improve an approach to compute the pre-kernel of a cooperative game by the indirect function. The indirect function is known as the Fenchel-Moreau conjugation of the characteristic function. Extending the approach with the indirect function, we are able to characterize the pre-kernel of the grand coalition simply by the solution sets of a family of quadratic objective functions.

Die schon seit einigen Jahren beobachtbare erfreuliche Tendenz, daB die Jahrestagungen der Deutschen Gesellschaft fOr Operations Research zunehmend von allen Interessentengruppen . der Unternehmensforschung innerhalb sowie auBerhalb der Gesellschaft als willkommenes Forum fOr einen breiten, dabei aber zugleich auch intensiven wissenschaftlichen Meinungs- und Erfahrungsaustausch genutzt werden, hat sich auf der 9. Jahrestagung, die vom 24. bis 26. September 1980 in den Raumen der

Universitat Essen durchgefOhrt wurde, fortgesetzt und weiter verstarkt. Dies zeigt sich allein schon dadurch, daB auf dieser von Ober 400 Teilnehmern besuchten 9. Jahrestagung 135 Vortrage gehalten wurden. Hinzu kamen der Eroffnungs-und der Plenarvortrag, die Hohepunkte der Tagung darstellten und fOr die ein auf nationaler Ebene renommierter Praktiker sowie ein international angesehener Wissenschaftler des Opera tions Research gewonnen werden konnten. Der hiermit vorgelegte Pro ceedings-Band, der erstmals!1" Springer-Verlag erscheint, gibt einen Oberblick Ober das wissenschaftliche Programm dieser 9. Jahrestagung. Bei der Vielzahl der eingegangenen Vortragsanmeldungen konnte - wie auch schon in den beiden Jahren zuvor - durch die Einordnung der Beitrage in 26 Sektionen eine fruchtbare Fachdiskussion zwischen Vertre tern der Hochschule und der Praxis auf den unterschiedlichen Teildiszipli nen des Operations Research ermoglicht werden. Zugleich wurde damit auch den interessierten Zuhorern ein nach bewahrten Themengebieten strukturiertes reichhaltigesAuswahlangebot gemacht, das in dieserVielfalt gerne aufgenommen worden ist. Dabei lieBen sich gemaB der inhaltlichen Bezeichnung und vortragsmaBigen Gestaltung der Sektionen zwei durch aus begrOBenswerte Entwicklungsrichtungen des Operations Research erkennen. In everyday life we must often reach decisions while knowing that the outcome will not only depend on our own choice, but also on the choices of others. These situations are the focus of epistemic game theory. Unlike classical game theory, it explores how

people may reason about their opponents before they make their final choice in a game. Packed with examples and practical problems based on stories from everyday life, this is the first textbook to explain the principles of epistemic game theory. Each chapter is dedicated to one particular, natural way of reasoning. The book then shows how each of these ways of reasoning will affect the final choices that can rationally be made and how these choices can be found by iterative procedures. Moreover, it does so in a way that uses elementary mathematics and does not presuppose any previous knowledge of game theory.

Most of the 26 papers are research reports on probability, statistics, gambling, game theory, Markov decision processes, set theory, and logic. But they also include reviews on comparing experiments, games of timing, merging opinions, associated memory models, and SPLIF's; historical views of Carnap, von Mises, and the Berkeley Statistics Department; and a brief history, appreciation, and bibliography of Berkeley professor Blackwell. A sampling of titles turns up The Hamiltonian Cycle Problem and Singularly Perturbed Markov Decision Process, A Pathwise Approach to Dynkin Games, The Redistribution of Velocity: Collision and Transformations, Casino Winnings at Blackjack, and Randomness and the Foundations of Probability. No index. Annotation copyrighted by Book News, Inc., Portland, OR

These Lecture Notes arose from discussions we had over a working paper written by the first author in fall 1987. We decided then to write a short paper about the basic

structure of evolutionary stability and found ourselves ending up with a book manuscript. Parts of the material contained herein were presented in a seminar at the Department of Mathematics at the University of Vienna, as well as at a workshop on evolutionary game theory in Bielefeld. The final version of the manuscript has certainly benefitted from critical comments and suggestions by the participants of both the seminar and the workshop. Thanks are also due to S. Bomze-de Barba, R. Burger, G. Danninger, J. Hofbauer, R. Selten, K. Sigmund, G. Stiastny and F. Weising. The co-operation of W. Muller from Springer Verlag, Heidelberg, is gratefully acknowledged. Vienna, November 1988 Immanuel M. Bomze Benedikt M. Potscher III Contents 1. Introduction 1 2. Strategies and payoffs 5 2. 1. A general setting for evolutionary game theory 6 2. 2. Mixed strategies and population games 8 2. 3. Finite number of strategies . . . . . 13 2. 4. Infinitely many (pure) strategies 15 2. 5. Structured populations: asymmetric contests and multitype games 17 2. 6. Additional remarks . . . . 21 3. Evolutionary stability 25 3. 1. Definition of evolutionary stability 25 3. 2. Evolutionary stability and solution concepts in classical game theory 30 3. 3. Conditions for evolutionary stability based on the normal cone 31 3. 4.

This comprehensive work examines important recent developments and modern applications in the fields of optimization, control, game theory and equilibrium programming. In particular, the concepts of equilibrium and optimality are of immense practical importance affecting decision-making problems regarding policy and

strategies, and in understanding and predicting systems in different application domains, ranging from economics and engineering to military applications. The book consists of 29 survey chapters written by distinguished researchers in the above areas. To derive rational and convincible solutions to practical decision making problems in complex and hierarchical human organizations, the decision making problems are formulated as relevant mathematical programming problems which are solved by developing optimization techniques so as to exploit characteristics or structural features of the formulated problems. In particular, for resolving con?ict in decision making in hierarchical managerial or public organizations, the multi level formula tion of the mathematical programming problems has been often employed together with the solution concept of Stackelberg equilibrium.

However,weconceivethatapairoftheconventionalformulationandthesolution concept is not always suf?cient to cope with a large variety of decision making situations in actual hierarchical organizations. The following issues should be taken into consideration in expression and formulation of decision making problems. Informulationofmathematicalprogrammingproblems,itistacitlysupposedthat decisions are made by a single person while game theory deals with economic be havior of multiple decision makers with fully rational judgment. Because two level mathematical programming problems are interpreted as static Stackelberg games, multi level mathematical programming is relevant to noncooperative game theory; in conventional

multi level mathematical programming models employing the so lution concept of Stackelberg equilibrium, it is assumed that there is no communi cation among decision makers, or they do not make any binding agreement even if there exists such communication. However, for decision making problems in such as decentralized large ?rms with divisional independence, it is quite natural to sup pose that there exists communication and some cooperative relationship among the decision makers. INTRODUCES THE FUNDAMENTALS OF PROBABILITY, STATISTICS, DECISION THEORY, AND GAME THEORY, AND FEATURES INTERESTING EXAMPLES OF GAMES OF CHANCE AND STRATEGY TO MOTIVATE AND ILLUSTRATE ABSTRACT MATHEMATICAL CONCEPTS Covering both random and strategic games, Probability, Decisions and Games features a variety of gaming and gambling examples to build a better understanding of basic concepts of probability, statistics, decision theory, and game theory. The authors present fundamental concepts such as random variables, rational choice theory, mathematical expectation and variance, fair games, combinatorial calculus, conditional probability, Bayes Theorem, Bernoulli trials, zero-sum games and Nash equilibria, as well as their application in games such as Roulette, Craps, Lotto, Blackjack, Poker, Rock-Paper-Scissors, the Game of Chicken and Tic-Tac-Toe. Computer simulations, implemented using the popular R computing environment, are used to provide intuition on key concepts and verify complex calculations. The book starts by introducing simple concepts that are carefully

motivated by the same historical examples that drove their original development of the field of probability, and then applies those concepts to popular contemporary games. The first two chapters of Probability, Decisions and Games: A Gentle Introduction using R feature an introductory discussion of probability and rational choice theory in finite and discrete spaces that builds upon the simple games discussed in the famous correspondence between Blaise Pascal and Pierre de Fermat. Subsequent chapters utilize popular casino games such as Roulette and Blackjack to expand on these concepts illustrate modern applications of these methodologies. Finally, the book concludes with discussions on game theory using a number of strategic games. This book: · Features introductory coverage of probability, statistics, decision theory and game theory, and has been class-tested at University of California, Santa Cruz for the past six years · Illustrates basic concepts in probability through interesting and fun examples using a number of popular casino games: roulette, lotto, craps, blackjack, and poker · Introduces key ideas in game theory using classic games such as Rock-Paper-Scissors, Chess, and Tic-Tac-Toe. · Features computer simulations using R throughout in order to illustrate complex concepts and help readers verify complex calculations · Contains exercises and approaches games and gambling at a level that is accessible for readers with minimal experience · Adopts a unique approach by motivating complex concepts using first simple games and then moving on to more complex, well-known games that illustrate how these concepts work together

Probability, Decisions and Games: A Gentle Introduction using R is a unique and helpful textbook for undergraduate courses on statistical reasoning, introduction to probability, statistical literacy, and quantitative reasoning for students from a variety of disciplines. ABEL RODRÍGUEZ, PhD, is Professor in the Department of Applied Mathematics and Statistics at the University of California, Santa Cruz (UCSC), CA, USA. The author of 40 journal articles, his research interests include Bayesian nonparametric methods, machine learning, spatial temporal models, network models, and extreme value theory. BRUNO MENDES, PhD, is Lecturer in the Department of Applied Mathematics and Statistics at the University of California, Santa Cruz, CA, USA. BRUNO MENDES, PhD, is Lecturer in the Department of Applied Mathematics and Statistics at the University of California, Santa Cruz, CA, USA.INTRODUCES THE FUNDAMENTALS OF PROBABILITY, STATISTICS, DECISION THEORY, AND GAME THEORY, AND FEATURES INTERESTING EXAMPLES OF GAMES OF CHANCE AND STRATEGY TO MOTIVATE AND ILLUSTRATE ABSTRACT MATHEMATICAL CONCEPTS Covering both random and strategic games, Probability, Decisions and Games features a variety of gaming and gambling examples to build a better understanding of basic concepts of probability, statistics, decision theory, and game theory. The authors present fundamental concepts such as random variables, rational choice theory, mathematical expectation and variance, fair games, combinatorial calculus, conditional probability, Bayes Theorem, Bernoulli trials, zero-sum games and

Nash equilibria, as well as their application in games such as Roulette, Craps, Lotto, Blackjack, Poker, Rock-Paper-Scissors, the Game of Chicken and Tic-Tac-Toe. Computer simulations, implemented using the popular R computing environment, are used to provide intuition on key concepts and verify complex calculations. The book starts by introducing simple concepts that are carefully motivated by the same historical examples that drove their original development of the field of probability, and then applies those concepts to popular contemporary games. The first two chapters of Probability, Decisions and Games: A Gentle Introduction using R feature an introductory discussion of probability and rational choice theory in finite and discrete spaces that builds upon the simple games discussed in the famous correspondence between Blaise Pascal and Pierre de Fermat. Subsequent chapters utilize popular casino games such as Roulette and Blackjack to expand on these concepts illustrate modern applications of these methodologies. Finally, the book concludes with discussions on game theory using a number of strategic games. This book: • Features introductory coverage of probability, statistics, decision theory and game theory, and has been class-tested at University of California, Santa Cruz for the past six years • Illustrates basic concepts in probability through interesting and fun examples using a number of popular casino games: roulette, lotto, craps, blackjack, and poker • Introduces key ideas in game theory using classic games such as Rock-Paper-Scissors, Chess, and Tic-Tac-Toe. • Features computer simulations using R throughout

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Useful Tools to Help Solve Decision Making Problems Applied Game Theory and Strategic Behavior demonstrates the use of various game theory techniques to address practical business, economic, legal, and public policy issues. It also illustrates the benefits of employing strategic thinking that incorporates the uncertainty surrounding the behavior of other parties. Real-world applications of game theory Exploring a variety of games, the book outlines the process of modeling game theory questions while

thinking strategically. It introduces core concepts through simple examples and case studies taken from the authors' consulting work in the automotive, beer, wine, and spirits industries as well as in debates over government regulation. The authors include newly developed software applications that can construct and solve game theory models and present strategic options in clear, visual diagrams. Out of the box and into the business world Striking the right balance between necessary mathematics and practical applications, this book shows how game theory can be used in real life, not just in mathematical models. It helps readers improve their strategic thinking, define games based on actual situations, model games with payoffs and probabilities, and make strategically sound decisions.

Game Theory for Economic Analysis

Written engagingly and with agreeable humour, this book balances a light touch with a rigorous yet economical account of the theory of games and bargaining models. It provides a precise interpretation, discussion and mathematical analysis for a wide range of "game-like problems in economics, sociology, strategic studies and war. There is first an informal introduction to game theory, which can be understood by non-mathematicians, which covers the basic ideas of extensive form, pure and mixed strategies and the minimax theorem. The general theory of non-cooperative games is then given a detailed mathematical treatment in the second chapter. Next follows a "first class account of linear programming, theory and practice, terse, rigorous and

readable, which is applied as a tool to matrix games and economics from duality theory via the equilibrium theorem, with detailed explanations of computational aspects of the simplex algorithm. The remaining chapters give an unusually comprehensive but concise treatment of cooperative games, an original account of bargaining models, with a skillfully guided tour through the Shapley and Nash solutions for bimatrix games and a carefully illustrated account of finding the best threat strategies. Balances a light touch with a rigorous yet economical account of the theory of games and bargaining models Shows basic ideas of extensive form, pure and mixed strategies, the minimax theorem, non-cooperative and co-operative games, and a "first class" account of linear programming, theory and practice Based on a series of lectures given by the author in the theory of games at Royal Holloway College
Game TheoryAn IntroductionJohn Wiley & Sons
This new edition is unparalleled in breadth of coverage, thoroughness of technical explanations and number of worked examples.
This unified 2001 treatment of game theory focuses on finding state-of-the-art solutions to issues surrounding the next generation of wireless and communications networks. The key results and tools of game theory are covered, as are various real-world technologies and a wide range of techniques for modeling, design and analysis.
This book, which first appeared in Chinese, comprises an introduction to game theory. It aims to present the fundamental concepts while developing themes such as continuous games, and n-person non-co-operative and co-operative games in a rigorous fashion. The first part of the

book explores the properties of matrix games, and two elementary proofs of the Minimax Theorem are given. The author then considers the theory and applications of continuous games and n-person non-co-operative games. The book culminates in a comprehensive treatment of n-person co-operative games and includes an introduction to the nucleolus concept which is of great significance in this context. Students of mathematics and related subjects will find this to be a readable first account of game theory and an invaluable introduction to key topics.

Optical networks epitomize complex communication systems, and they comprise the Internet's infrastructural backbone. The first of its kind, this book develops the mathematical framework needed from a control perspective to tackle various game-theoretical problems in optical networks. In doing so, it aims to help design control algorithms that optimally allocate the resources of these networks. With its fresh problem-solving approach, Game Theory in Optical Networks is a unique resource for researchers, practitioners, and graduate students in applied mathematics and systems/control engineering, as well as those in electrical and computer engineering.

Mathematical elegance is a constant theme in this treatment of linear programming and matrix games. Condensed tableau, minimal in size and notation, are employed for the simplex algorithm. In the context of these tableau the beautiful termination theorem of R.G. Bland is proven more simply than heretofore, and the important duality theorem becomes almost obvious. Examples and extensive discussions throughout the book provide insight into definitions, theorems, and applications. There is considerable informal discussion on how best to play matrix games. The book is designed for a one-semester undergraduate course.

Readers will need a degree of mathematical sophistication and general tools such as sets, functions, and summation notation. No single college course is a prerequisite, but most students will do better with some prior college mathematics. This thorough introduction to linear programming and game theory will impart a deep understanding of the material and also increase the student's mathematical maturity.

Chapters in Game Theory has been written on the occasion of the 65th birthday of Stef Tijs, who can be regarded as the godfather of game theory in the Netherlands. The contributors all are indebted to Stef Tijs, as former Ph.D. students or otherwise. The book contains fourteen chapters on a wide range of subjects. Some of these can be considered surveys while other chapters present new results: most contributions can be positioned somewhere in between these categories. The topics covered include: cooperative stochastic games; noncooperative stochastic games; sequencing games; games arising form linear (semi-) infinite programming problems; network formation, costs and potential games; potentials and consistency in transferable utility games; the nucleolus and equilibrium prices; population uncertainty and equilibrium selection; cost sharing; centrality in social networks; extreme points of the core; equilibrium sets of bimatrix games; game theory and the market; and transfer procedures for nontransferable utility games. Both editors did their Ph.D with Stef Tijs, while he

was affiliated with the mathematics department of the University of Nijmegen. Herbert Scarf is a distinguished economist and has made a number of extraordinarily significant contributions to economics, game theory and operations research. This work has generated a major research field in economics termed Applied General Equilibrium Analysis. This book comprises all his research articles and consists of four volumes.

A reconstruction of the creation of game theory in the twentieth century by John von Neumann and Oskar Morgenstern.

Social and Economic Networks in Cooperative Game Theory presents a coherent overview of theoretical literature that studies the influence and formation of networks in social and economic situations in which the relations between participants who are not included in a particular participant's network are not of consequence to this participant. The material is organized in two parts. In Part I the authors concentrate on the question how network structures affect economic outcomes. Part II of the book presents the formation of networks by agents who engage in a network-formation process to be able to realize the possible gains from cooperation.

This is the second of a two-volume set that provides an introduction to non-cooperative Game Theory. Volume One covers the basics concepts, while

Volume Two is devoted to advanced topics. This volume is divided into three parts. The first part deals with the notions of knowledge, belief and common knowledge. The second part covers solution concepts for dynamic games and the third part develops the theory of games of incomplete information. This volume is richly illustrated with 200 figures. It is suitable for both self-study and an undergraduate or first-year graduate-level course in game theory. It is written to be accessible to anybody with high-school level knowledge of mathematics. At the end of each chapter there is a collection of exercises accompanied by detailed answers. Volume Two contains over 90 exercises. The formatting has been structured so as to present the concepts in clear steps and enable the reader to easily locate an area where he/she may not have full understanding of the material.

Game theory provides a mathematical setting for analyzing competition and cooperation in interactive situations. The theory has been famously applied in economics, but is relevant in many other sciences, such as political science, biology, and, more recently, computer science. This book presents an introductory and up-to-date course on game theory addressed to mathematicians and economists, and to other scientists having a basic mathematical background. The book is self-contained, providing a formal description of the classic game-

theoretic concepts together with rigorous proofs of the main results in the field. The theory is illustrated through abundant examples, applications, and exercises. The style is distinctively concise, while offering motivations and interpretations of the theory to make the book accessible to a wide readership. The basic concepts and results of game theory are given a formal treatment, and the mathematical tools necessary to develop them are carefully presented. Cooperative games are explained in detail, with bargaining and TU-games being treated as part of a general framework. The authors stress the relation between game theory and operations research. The book is suitable for a graduate or an advanced undergraduate course on game theory.

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