



Essentials of Game Theory: A Concise, Multidisciplinary Introduction (Synthesis Lectures on Artificial Intelligence and Machine Learning)

By Kevin Leyton-Brown



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Game theory is the mathematical study of interaction among independent, self-interested agents. The audience for game theory has grown dramatically in recent years, and now spans disciplines as diverse as political science, biology, psychology, economics, linguistics, sociology, and computer science, among others. What has been missing is a relatively short introduction to the field covering the common basis that anyone with a professional interest in game theory is likely to require. Such a text would minimize notation, ruthlessly focus on essentials, and yet not sacrifice rigor. This Synthesis Lecture aims to fill this gap by providing a concise and accessible introduction to the field. It covers the main classes of games, their representations, and the main concepts used to analyze them.

Table of Contents: Games in Normal Form / Analyzing Games: From Optimality to Equilibrium / Further Solution Concepts for Normal-Form Games / Games with Sequential Actions: The Perfect-information Extensive Form / Generalizing the Extensive Form: Imperfect-Information Games / Repeated and Stochastic Games / Uncertainty about Payoffs: Bayesian Games / Coalitional Game Theory / History and References / Index

"This introduction is just what a growing multidisciplinary audience needs: it is concise, authoritative, up to date, and clear on the important conceptual issues."
--Robert Stalnaker, MIT, Linguistics and Philosophy

"I wish I'd had a comprehensive, clear and rigorous introduction to the essentials of game theory in under one hundred pages when I was starting out." --David Parkes, Harvard University, Computer Science

"Beside being concise and rigorous, Essentials of Game Theory is also quite comprehensive. It includes the formulations used in most applications in

engineering and the social sciences and illustrates the concepts with relevant examples." --Robert Wilson, Stanford University Graduate School of Business

"Best short introduction to game theory I have seen! I wish it was available when I started being interested in the field!" --Silvio Micali, MIT, Computer Science

*"Although written by computer scientists, this book serves as a sophisticated introduction to the main concepts and results of game theory from which other scientists, including social scientists, can greatly benefit. In eighty pages, *Essentials of Game Theory* formally defines key concepts, illustrated with apt examples, in both cooperative and noncooperative game theory."* --Steven Brams, New York University, Political Science

"This book will appeal to readers who do not necessarily hail from economics, and who want a quick grasp of the fascinating field of game theory. The main categories of games are introduced in a lucid way and the relevant concepts are clearly defined, with the underlying intuitions always provided." --Krzysztof Apt, University of Amsterdam, Institute for Logic, Language and Computation

"This unique book is today the best short technical introduction to game theory. Accessible to a broad audience, it will prove invaluable in artificial intelligence, more generally in computer science, and indeed beyond." --Moshe Tennenholtz, Technion, Industrial Engineering and Management

"Excerpted from a much-anticipated, cross-disciplinary book on multiagent systems, this terse, incisive and transparent book is the ideal introduction to the key concepts and methods of game theory for researchers in several fields, including artificial intelligence, networking, and algorithms." --Vijay Vazirani, Georgia Institute of Technology, Computer Science

"The authors admirably achieve their aim of providing a scientist or engineer with the essentials of game theory in a text that is rigorous, readable, and concise." --Frank Kelly, University of Cambridge, Statistical Laboratory



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