

Prisoner's Dilemma: John Von Neumann, Game Theory And The Puzzle Of The Bomb

John von Neumann was a Jewish refugee from Hungary – considered a “genius” like fellow Hungarians Leo Szilard, Eugene Wigner and Edward Teller – who played key roles developing the A-bomb at Los Alamos during World War II. As a mathematician at Princeton’s Institute for Advanced Study (where Einstein was also a professor), von Neumann was a leader in the development of early computers. Later, he developed the new field of game theory in economics and became a top nuclear arms policy adviser to the Truman and Eisenhower administrations. “I always thought [von Neumann’s] brain indicated that he belonged to a new species, an evolution beyond man. Macrae shows us in a lively way how this brain was nurtured and then left its great imprint on the world.” – Hans A. Bethe, Cornell University “The book makes for utterly captivating reading. Von Neumann was, of course, one of this century’s geniuses, and it is surprising that we have had to wait so long... for a fully fleshed and sympathetic biography of the man. But now, happily, we have one. Macrae nicely delineates the cultural, familial, and educational environment from which von Neumann sprang and sketches the mathematical and scientific environment in which he flourished. It’s no small task to render a genius like von Neumann in ordinary language, yet Macrae manages the trick, providing more than a glimpse of what von Neumann accomplished intellectually without expecting the reader to have a Ph.D. in mathematics. Beyond that, he captures von Neumann’s qualities of temperament, mind, and personality, including his effortless wit and humor. And [Macrae] frames and accounts for von Neumann’s politics in ways that even critics of them, among whom I include myself, will find provocative and illuminating.” – Daniel J. Kevles, California Institute of Technology “A lively portrait of the hugely consequential nonmathematician-physicist-et al., whose genius has left an enduring impress on our thought, technology, society, and culture. A double salute to Steve White, who started this grand book designed for us avid, nonmathematical readers, and to Norman Macrae, who brought it to a triumphant conclusion.” – Robert K. Merton, Columbia University “The first full-scale biography of this polymath, who was born Jewish in Hungary in 1903 and died Roman Catholic in the United States at the age of 53. And Mr. Macrae has some great stories to tell... Mr. Macrae’s biography has rescued a lot of good science gossip from probable extinction, and has introduced many of us to the life story of a man we ought to know better.” – Ed Regis, The New York Times “A nice and fascinating picture of a genius who was active in so many domains.” –Zentralblatt MATH “Biographer Macrae takes a ‘viewspaperman’ approach which stresses the context and personalities associated with von Neumann’s remarkable life, rather than attempting to give a detailed scholarly analysis of von Neumann’s papers. The resulting book is a highly entertaining account that is difficult to put down.” – Journal of Mathematical Psychology “A full and intimate biography of ‘the man who consciously and deliberately set mankind moving along the road that led us into the Age of Computers.’” – Freeman Dyson, Princeton, NJ “It is good to have a biography of one of the most important mathematicians of the twentieth century, even if it is a biography that focuses much more on the man than on the mathematics.” – Fernando Q. Gouvêa, Mathematical Association of America “Based on much research, his own and that of

others (especially of Stephen White), Macrae has written a valuable biography of this remarkable genius of our century, without the opacity of technical (mathematical) dimensions that are part of the hero's intellectual contributions to humanity. Interesting, informative, illuminating, and insightful." – Choice Review "Macrae paints a highly readable, humanizing portrait of a man whose legacy still influences and shapes modern science and knowledge." – Resonance, Journal of Science Education "In this affectionate, humanizing biography, former Economist editor Macrae limns a prescient pragmatist who actively fought against fascism and who advocated a policy of nuclear deterrence because he foresaw that Stalin's Soviet Union would rapidly acquire the bomb and develop rocketry... Macrae makes [von Neumann's] contributions accessible to the lay reader, and also discusses von Neumann's relationships with two long-suffering wives, his political differences with Einstein and the cancer that killed him." – Publishers Weekly "Macrae's life of the great mathematician shows dramatically what proper care and feeding can do for an unusually capacious mind." – John Wilkes, Los Angeles Times

From the author of Are You Smart Enough to Work at Google?, a fascinating look at how an equation that foretells the future is transforming everything we know about life, business, and the universe. In the 18th century, the British minister and mathematician Thomas Bayes devised a theorem that allowed him to assign probabilities to events that had never happened before. It languished in obscurity for centuries until computers came along and made it easy to crunch the numbers. Now, as the foundation of big data, Bayes' formula has become a linchpin of the digital economy. But here's where things get really interesting: Bayes' theorem can also be used to lay odds on the existence of extraterrestrial intelligence; on whether we live in a Matrix-like counterfeit of reality; on the "many worlds" interpretation of quantum theory being correct; and on the biggest question of all: how long will humanity survive? The Doomsday Calculation tells how Silicon Valley's profitable formula became a controversial pivot of contemporary thought. Drawing on interviews with thought leaders around the globe, it's the story of a group of intellectual mavericks who are challenging what we thought we knew about our place in the universe. The Doomsday Calculation is compelling reading for anyone interested in our culture and its future.

An easy-to-follow, non-technical approach to using game theory in every business battle Game theory has become entrenched in today's business world. It has also often required oppressive and incomprehensible mathematics. Game Theory at Work steers around math and pedagogy to make this innovative tool accessible to a larger audience and allow all levels of business to use it to both improve decision-making skills and eliminate potentially lethal uncertainty. This proven tool requires everyone in an organization to look at the competition, gauge his or her own responses to their actions, and then establish an appropriate strategy. Game Theory at Work will help business leaders at all levels improve their overall performance in: Negotiating Decision making Establishing strategic alliances Marketing Positioning Branding Pricing Offers a critical assessment of fundamental flaws in the American electoral system, looking at how a minor "spoiler" candidate can affect the election by taking enough votes away from the most popular candidate to tip the election to another, and proposes a simple but fair solution designed to transform the electoral system.

A Memoir

The Left-Hander Syndrome

Moral Calculations

A Beautiful Math

Five Physicists Who Changed the Twentieth Century

Game Theory

*An electrifying biography of one of the most extraordinary scientists of the twentieth century and the world he made. The smartphones in our pockets and computers like brains. The vagaries of game theory and evolutionary biology. Nuclear weapons and self-replicating spacecrafts. All bear the fingerprints of one remarkable, yet largely overlooked, man: John von Neumann. Born in Budapest at the turn of the century, von Neumann is one of the most influential scientists to have ever lived. A child prodigy, he mastered calculus by the age of eight, and in high school made lasting contributions to mathematics. In Germany, where he helped lay the foundations of quantum mechanics, and later at Princeton, von Neumann's colleagues believed he had the fastest brain on the planet—bar none. He was instrumental in the Manhattan Project and the design of the atom bomb; he helped formulate the bedrock of Cold War geopolitics and modern economic theory; he created the first ever programmable digital computer; he prophesized the potential of nanotechnology; and, from his deathbed, he expounded on the limits of brains and computers—and how they might be overcome. Taking us on an astonishing journey, Ananyo Bhattacharya explores how a combination of genius and unique historical circumstance allowed a single man to sweep through a stunningly diverse array of fields, sparking revolutions wherever he went. *The Man from the Future* is an insightful and thrilling intellectual biography of the visionary thinker who shaped our century.*

Reprint of the fine biography first published by Doubleday in 1992. Annotation copyright by Book News, Inc., Portland, OR

*How game theory can offer insights into literary, historical, and philosophical texts ranging from Macbeth to Supreme Court decisions. Game theory models are ubiquitous in economics, common in political science, and increasingly used in psychology and sociology; in evolutionary biology, they offer compelling explanations for competition in nature. But game theory has been only sporadically applied to the humanities; indeed, we almost never associate mathematical calculations of strategic choice with the worlds of literature, history, and philosophy. And yet, as Steven Brams shows, game theory can illuminate the rational choices made by characters in texts ranging from the Bible to Joseph Heller's *Catch-22* and can explicate strategic questions in law, history, and philosophy. Much of Brams's analysis is based on the theory of moves (TOM), which is grounded in game theory, and which he develops gradually and applies systematically throughout. TOM illuminates the dynamics of player choices, including their misperceptions, deceptions, and uses of different kinds of power. Brams examines such topics as the outcome and payoff matrix of Pascal's wager on the existence of God; the strategic games played by presidents and Supreme Court justices; and how information was slowly uncovered in the game played by Hamlet and Claudius. The reader gains not just new insights into the actions of certain literary and historical characters but also a larger strategic perspective on the choices that make us human.*

This fascinating popular science journey explores key concepts in information theory in terms of Conway's "Game of Life" program. The author explains the application of natural law to a random system and demonstrates the necessity of limits. Other topics include the limits of knowledge, paradox of complexity, Maxwell's demon, Big Bang theory, and much more. 1985 edition.

Mathematical Go

A Concise Multidisciplinary Introduction

Game Theory at Work

The Strange Career of Cold War Rationality

The Calculus of Selfishness

Paradox, Puzzles, and the Frailty of Knowledge

*If science has the equivalent of a Bloomsbury group, it is the five men born at the turn of the twentieth century in Budapest: Theodore von Karman, Leo Szilard, Eugene Wigner, John von Neumann, and Edward Teller. From Hungary to Germany to the United States, they remained friends and continued to work together and influence each other throughout their lives. As a result, their work was integral to some of the most important scientific and political developments of the twentieth century. Istvan Hargittai tells the story of this remarkable group: Wigner won a Nobel Prize in theoretical physics; Szilard was the first to see that a chain reaction based on neutrons was possible, initiated the Manhattan Project, but left physics to try to restrict nuclear arms; von Neumann could solve difficult problems in his head and developed the modern computer for more complex problems; von Karman became the first director of NASA's Jet Propulsion Laboratory, providing the scientific basis for the U.S. Air Force; and Teller was the father of the hydrogen bomb, whose name is now synonymous with the controversial "Star Wars" initiative of the 1980s. Each was fiercely opinionated, politically active, and fought against all forms of totalitarianism. Hargittai, as a young Hungarian physical chemist, was able to get to know some of these great men in their later years, and the depth of information and human interest in *The Martians of Science* is the result of his personal relationships with the subjects, their families, and their contemporaries. "This is an important story that needs to be told, and Hargittai tells it well." - Nature "What a story! Hargittai, a Jewish-Hungarian like his heroes, tells the remarkable story of five immigrants, of vastly different politics, without whom American science (and the world) would not be the same." - Roald Hoffmann, Nobel laureate, Cornell University*

*A famed political scientist's classic argument for a more cooperative world We assume that, in a world ruled by natural selection, selfishness pays. So why cooperate? In *The Evolution of Cooperation*, political scientist Robert Axelrod seeks to answer this question. In 1980, he organized the famed Computer Prisoners Dilemma Tournament, which sought to find the optimal strategy for survival in a particular game. Over and over, the simplest strategy, a cooperative program called Tit for Tat, shut out the competition. In other words, cooperation, not unfettered competition, turns out to be our best chance for survival. A vital book for leaders and decision makers, *The Evolution of Cooperation* reveals how cooperative principles help us think better about everything from military strategy, to political elections, to family dynamics.*

*A pioneer in evolutionary game theory looks at selfishness and cooperation How does cooperation emerge among selfish individuals? When do people share resources, punish those they consider unfair, and engage in joint enterprises? These questions fascinate philosophers, biologists, and economists alike, for the "invisible hand" that should turn selfish efforts into public benefit is not always at work. *The Calculus of Selfishness* looks at social dilemmas where cooperative motivations are subverted and self-interest becomes self-defeating. Karl Sigmund, a pioneer in evolutionary game theory, uses simple and well-known game theory models to examine the foundations of collective action and the effects of reciprocity and reputation. Focusing on some of the best-known social and economic experiments, including games such as the Prisoner's Dilemma, Trust, Ultimatum, Snowdrift, and Public Good, Sigmund explores the conditions leading to cooperative strategies. His approach is based on evolutionary game dynamics, applied to deterministic and probabilistic models of economic interactions. Exploring basic strategic interactions among individuals guided by self-interest and caught in social traps, *The Calculus of Selfishness* analyzes to what extent one key facet of human nature—selfishness—can lead to cooperation.*

Marina Whitman is the daughter and only child of John von Neumann, one of the five Hungarian scientific geniuses dubbed "the Martians" by their colleagues, a figure often hailed as the greatest mathematician of the 20th century and even as the greatest scientist after Einstein. He was a key figure in

the Manhattan project; the inventor of game theory; the pioneer developer of the modern stored-program electronic computer; and, right up until his death, an adviser to the top echelons of the American military establishment. Whitman's memoir is the story of how the cosmopolitan environment in which she was immersed, the demanding expectations of her parents, and her own struggles to emerge from the shadow of a larger-than-life parent shaped her life and work. Starting as, in her words, "a trailing spouse," she rose to become a noted academic during the 1960s and '70s, casting her teaching and writing in the framework of globalization before the word had been invented. She was the first woman ever to serve on the President's Council of Economic Advisers and participated actively in U.S. efforts to reshape the international monetary and financial system during the early 1970s. She pioneered the role of women on the boards of leading multinational corporations, and became the highest-ranking female executive in the American auto industry in the 1980s, serving not only as GM's vice president and chief economist but also as its Cassandra while the firm persisted along a path that led eventually to its collapse into bankruptcy.

How to Use Game Theory to Outthink and Outmaneuver Your Competition

Adventures of a Mathematician

Theory of Games and Economic Behavior

The Martian's Daughter

An Introduction

Chilling Gets the Last Point

The Book That Gives the Inside Story on Hundreds of Secrets of American Life --Big Secrets. Are there really secret backward messages in rock music, or is somebody nuts? We tested suspect tunes at a recording studio to find out. What goes on at Freemason initiations? Here's the whole story, including -- yes! -- the electric carpet. Colonel Sanders boasted that Kentucky Fried Chicken's eleven secret herbs and spices "stand on everybody's shelf." We got a sample of the seasoning mix and sent it to a food chemist for analysis. Feverish rumor has it that Walt Disney's body was frozen and now lies in a secret cryonic vault somewhere beneath the Pirates of the Caribbean exhibit at Disneyland. Read the certified stranger-than-fiction truth. Don't bother trying to figure out how Doug Henning, David Copperfield, and Harry Blackstone, Jr., perform their illusions. Big Secrets has complete explanations and diagrams, nothing left to the imagination.

Nine out of every ten human beings are naturally right-handed. Those who were not right-handed were feared, shunned, or forcibly retrained in many periods and cultures. Indeed, some members of fundamentalist sects still regard left-handers as in league with the devil, and prejudices against left-handers are reflected in the multiple associations of right with good and left with bad that have become enshrined in everyday language and folklore. A "left-handed compliment" is actually an insult, and the dictionary definition of left-handed includes the terms "awkward," "clumsy," "ill-omened," and "illegitimate." In his summary of scientific research into sidedness, Stanley Coren rapidly dismisses the notion of the southpaw as somehow tainted. Increasingly we are coming to understand, however, that left-handedness does have

social, educational, medical, and psychological implications. Coren uses entertaining examples to illuminate the paths of research he has followed, and answers vitally important questions such as: What are the neuropsychological and behavioral implications of differences for left-handers themselves, as well as for their parents, teachers, spouses, children, counselors, and physicians? How can we determine our own patterns of sidedness? Are they encoded in our genes? And, very importantly, how can we make the world more comfortable and safer for left-handers? Coren persuasively argues that left-handers are an invisible minority who must define themselves and organize for self-protections in the same way that more visible minorities have done. Much (though not all) of the risk to which left-handers are exposed derives from the fact that the tools they use and the machines they operate are designed for right-handers, a flaw that given heightened public awareness would be easy to correct. Coren advocates a change in the way the right-handed majority treats its left-handed minority to eliminate the risks left-handers face.

When John Nash won the Nobel prize in economics in 1994, many people were surprised to learn that he was alive and well. Since then, Sylvia Nasar's celebrated biography *A Beautiful Mind*, the basis of a new major motion picture, has revealed the man. *The Essential John Nash* reveals his work--in his own words. This book presents, for the first time, the full range of Nash's diverse contributions not only to game theory, for which he received the Nobel, but to pure mathematics--from Riemannian geometry and partial differential equations--in which he commands even greater acclaim among academics. Included are nine of Nash's most influential papers, most of them written over the decade beginning in 1949. From 1959 until his astonishing remission three decades later, the man behind the concepts "Nash equilibrium" and "Nash bargaining"--concepts that today pervade not only economics but nuclear strategy and contract talks in major league sports--had lived in the shadow of a condition diagnosed as paranoid schizophrenia. In the introduction to this book, Nasar recounts how Nash had, by the age of thirty, gone from being a wunderkind at Princeton and a rising mathematical star at MIT to the depths of mental illness. In his preface, Harold Kuhn offers personal insights on his longtime friend and colleague; and in introductions to several of Nash's papers, he provides scholarly context. In an afterword, Nash describes his current work, and he discusses an error in one of his papers. A photo essay chronicles Nash's career from his student days in Princeton to the present. Also included are Nash's Nobel citation and autobiography. *The Essential John Nash* makes it plain why one of Nash's colleagues termed his style of intellectual inquiry as "like lightning striking." All those inspired by Nash's dazzling ideas will welcome this unprecedented opportunity to trace these ideas back to the exceptional mind they came from.

Many illuminating and instructive examples of the applications of game theoretic models to problems in political science appear in this volume, which requires minimal mathematical background. 1975 edition. 24 figures. /div

A Graphic Guide

Game Theory and Strategy

Gaming the Vote

The Causes and Consequences of Left-Handedness

Why Elections Aren't Fair (and What We Can Do About It)

John von Neumann and the Origins of Modern Computing

The definitive introduction to game theory This comprehensive textbook introduces readers to the principal ideas and applications of game theory, in a style that combines rigor with accessibility. Steven Tadelis begins with a concise description of rational decision making, and goes on to discuss strategic and extensive form games with complete information, Bayesian games, and extensive form games with imperfect information. He covers a host of topics, including multistage and repeated games, bargaining theory, auctions, rent-seeking games, mechanism design, signaling games, reputation building, and information transmission games. Unlike other books on game theory, this one begins with the idea of rationality and explores its implications for multiperson decision problems through concepts like dominated strategies and rationalizability. Only then does it present the subject of Nash equilibrium and its derivatives. Game Theory is the ideal textbook for advanced undergraduate and beginning graduate students. Throughout, concepts and methods are explained using real-world examples backed by precise analytic material. The book features many important applications to economics and political science, as well as numerous exercises that focus on how to formalize informal situations and then analyze them. Introduces the core ideas and applications of game theory Covers static and dynamic games, with complete and incomplete information Features a variety of examples, applications, and exercises Topics include repeated games, bargaining, auctions, signaling, reputation, and information transmission Ideal for advanced undergraduate and beginning graduate students Complete solutions available to teachers and selected solutions available to students

This fascinating and provocative book presents the fundamentals of two-person game theory, a mathematical approach to understanding human behavior and decision-making.

Edited by three leading figures in the field, this exciting volume presents cutting-edge work in decision theory by a distinguished international roster of contributors. These mostly

unpublished papers address a host of crucial areas in the contemporary philosophical study of rationality and knowledge. Topics include causal versus evidential decision theory, game theory, backwards induction, bounded rationality, counterfactual reasoning in games and in general, analyses of the famous common knowledge assumptions in game theory, and evaluations of the normal versus extensive form formulations of complex decision problems.

John von Neumann and Oskar Morgenstern conceived a groundbreaking mathematical theory of economic and social organization, based on a theory of games of strategy. Not only would this revolutionize economics, but the entirely new field of scientific inquiry it yielded--game theory--has since been widely used to analyze a host of real-world phenomena from arms races to optimal policy choices of presidential candidates, from vaccination policy to major league baseball salary negotiations. And it is today established throughout both the social sciences and a wide range of other sciences.

Game Theory and the Humanities

Revised Edition

How Reason Almost Lost Its Mind

Prisoner's Dilemma/John Von Neumann, Game Theory and the Puzzle of the Bomb

Prisoner's Dilemma

The Art of Strategy

Millions have seen the movie and thousands have read the book but few have fully appreciated the mathematics developed by John Nash's beautiful mind. Today Nash's beautiful math has become a universal language for research in the social sciences and has infiltrated the realms of evolutionary biology, neuroscience, and even quantum physics. John Nash won the 1994 Nobel Prize in economics for pioneering research published in the 1950s on a new branch of mathematics known as game theory. At the time of Nash's early work, game theory was briefly popular among some mathematicians and Cold War analysts. But it remained obscure until the 1970s when evolutionary biologists began applying it to their work. In the 1980s economists began to embrace game theory. Since then it has found an ever expanding repertoire of applications among a wide range of scientific disciplines. Today neuroscientists peer into game players' brains, anthropologists play games with people from primitive cultures, biologists use games to explain the evolution of human language, and mathematicians exploit games to better understand social networks. A common thread connecting much of this research is its relevance to the ancient quest for a science of human social behavior, or a Code of Nature, in the spirit of the fictional science of psychohistory described in the famous Foundation novels by the late Isaac Asimov. In A Beautiful Math, acclaimed

science writer Tom Siegfried describes how game theory links the life sciences, social sciences, and physical sciences in a way that may bring Asimov's dream closer to reality.

When should you adopt an aggressive business strategy? How do we make decisions when we don't have all the information? What makes international environmental cooperation possible? Game theory is the study of how we make a decision when the outcome of our moves depends on the decisions of someone else.

Economists Ivan and Tuvana Pastine explain why, in these situations, we sometimes cooperate, sometimes clash, and sometimes act in a way that seems completely random. Stylishly brought to life by award-winning cartoonist Tom Humberstone, Game Theory will help readers understand behaviour in everything from our social lives to business, global politics to evolutionary biology. It provides a thrilling new perspective on the world we live in.

What does game theory tell us about rational behavior? Is there such a thing as rational behavior, and if so, is it of any use to us? In this fascinating book, renowned Hungarian economist Laszlo Mero shows how game theory provides insight into such aspects of human psychology as altruism, competition, and politics, as well as its relevance to disparate fields such as physics and evolutionary biology. This ideal guide shows us how mathematics can illuminate the human condition.

This book aims to show how game theory can be radically reformulated so as to make it applicable to the study of strategic conflict in a number of fields.

The Man from the Future: The Visionary Ideas of John von Neumann

The Recursive Universe

Game Theory and the Law

Classics in Game Theory

John Nash, Game Theory, and the Modern Quest for a Code of Nature

The Doomsday Calculation

Should you watch public television without pledging?...Exceed the posted speed limit?...Hop a subway turnstile without paying? These questions illustrate the so-called "prisoner's dilemma", a social puzzle that we all face every day. Though the answers may seem simple, their profound implications make the prisoner's dilemma one of the great unifying concepts of science. Watching players bluff in a poker game inspired John von Neumann—father of the modern computer and one of the sharpest minds of the century—to construct game theory, a mathematical study of conflict and deception. Game theory was readily embraced at the RAND Corporation, the archetypical think tank charged with formulating military strategy for the atomic age, and in 1950 two RAND scientists made a momentous discovery. Called the "prisoner's dilemma," it is a disturbing and mind-bending game where two or more people may betray the common good for individual gain. Introduced shortly after the Soviet Union acquired the atomic bomb, the prisoner's dilemma quickly became a popular allegory of the nuclear arms race. Intellectuals such as von Neumann and Bertrand Russell joined military and political leaders in rallying to the "preventive war" movement, which advocated a nuclear first strike against the Soviet Union. Though the Truman administration rejected preventive war the United States entered into an arms

race with the Soviets and game theory developed into a controversial tool of public policy—alternately accused of justifying arms races and touted as the only hope of preventing them. A masterful work of science writing, *Prisoner's Dilemma* weaves together a biography of the brilliant and tragic von Neumann, a history of pivotal phases of the cold war, and an investigation of game theory's far-reaching influence on public policy today. Most important, *Prisoner's Dilemma* is the incisive story of a revolutionary idea that has been hailed as a landmark of twentieth-century thought.

Prisoner's DilemmaAnchor

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.

The magnificent second novel from the Pulitzer Prize-winning author of *The Overstory* and the forthcoming *Bewilderment*.

“Accomplished . . . mature and assured. . . A major American novelist.” — *New Republic* Something is wrong with Eddie Hobson, Sr., father of four, sometime history teacher, quiz master, black humorist, and virtuoso invalid. His recurring fainting spells have worsened, and given his ingrained aversion to doctors, his worried family tries to discover the nature of his sickness. Meanwhile, in private, Eddie puts the finishing touches on a secret project he calls Hobbstown, a place that he promises will save him, the world, and everything that's in it. A dazzling novel of compassion and imagination, *Prisoner's Dilemma* is a story of the power of individual experience.

Introducing Game Theory

Game Theory, Logic, and Human Frailty

The Essential John Nash

The Evolution of Cooperation

Labyrinths of Reason

This is the most authoritative and accessible single-volume reference book on applied mathematics. Featuring numerous entries by leading experts and organized thematically, it introduces readers to applied mathematics and its uses; explains concepts; describes important equations, laws, and functions; looks at exciting areas of research; covers modeling and simulation; explores areas of application; and more. Modeled on the popular *Princeton Companion to Mathematics*, this volume is an indispensable resource for undergraduate and graduate students, researchers, and practitioners in other disciplines seeking a user-friendly reference book on applied mathematics. Features nearly 200 entries organized the

and written by an international team of distinguished contributors Presents the major ideas and branches of applied mathematics in a clear and accessible way Explains important mathematical concepts, methods, equations, and applications Introduces the language of applied mathematics and the goals of applied mathematical research Gives a wide range of examples of mathematical modeling Covers continuum mechanics, dynamical systems, numerical analysis, discrete and combinatorial mathematics, mathematical physics, and much more Explores the connections between applied mathematics and other disciplines Includes suggestions for further reading, cross-references, and a comprehensive index

This book deals with applications of game theory in a wide variety of disciplines.

The authors of *Thinking Strategically* demonstrate how to apply the principles in game theory to achieve greater personal and professional successes, drawing on a diverse array of case studies to explain how to develop a win-oriented way of thinking in the world.

The ancient game of Go is one of the less obvious candidates for mathematical analysis. With the development of new concepts in combinatorial game theory, the authors have been able to analyze Go games and find solutions to real-world problems that have stumped professional Go players. Go players with an interest in mathematics and mathematicians with an interest in Go will find this book a most interesting read. John von Neumann: The Scientific Genius Who Pioneered the Modern Computer, Game Theory, Nuclear Deterrence, and Much More

How an Equation that Predicts the Future Is Transforming Everything We Know About Life and the Universe

Two-person Game Theory

Game Theory and Politics

Big Secrets

Bridging Two Worlds

Classics in Game Theory assembles in one sourcebook the basic contributions to the field that followed on the publication of *Theory of Games and Economic Behavior* by John von Neumann and Oskar Morgenstern (Princeton, 1944). The theory of games, first given a rigorous formulation by von Neumann in a paper in 1928, is a subfield of mathematics and economics that models situations in which individuals compete and cooperate with each other. In the "heroic era" of research that began in the late 1940s, the foundations of the current theory were laid; it is these fundamental contributions that are collected in this volume. In the last fifteen years, game theory has become the dominant model in economic theory and has made significant contributions to political science, biology, and international security studies. The central role of game theory in economic theory was recognized by the award of the Nobel Memorial Prize in Economic Science in 1994 to the pioneering game theorists John C. Harsanyi, John Nash, and Reinhard Selten. The fundamental works for which they were honored are all included in this volume. Harold Kuhn, himself a major contributor to game theory for his reformulation of extensive games, has chosen eighteen essays that constitute the core of game theory as it exists today. Drawn from a variety of sources, they will be an invaluable tool for researchers in game theory and for a broad group of students of

economics, political science, and biology.

This sharply intelligent, consistently provocative book takes the reader on an astonishing, thought-provoking voyage into the realm of delightful uncertainty--a world of paradox in which logical argument leads to contradiction and common sense is seemingly rendered irrelevant.

The true story that inspired the 2020 film. The autobiography of mathematician Stanislaw Ulam, one of the great scientific minds of the twentieth century, tells a story rich with amazingly prophetic speculations and peppered with lively anecdotes. As a member of the Los Alamos National Laboratory from 1944 on, Ulam helped to precipitate some of the most dramatic changes of the postwar world. He was among the first to use and advocate computers for scientific research, originated ideas for the nuclear propulsion of space vehicles, and made fundamental contributions to many of today's most challenging mathematical projects. With his wide-ranging interests, Ulam never emphasized the importance of his contributions to the research that resulted in the hydrogen bomb. Now Daniel Hirsch and William Mathews reveal the true story of Ulam's pivotal role in the making of the "Super," in their historical introduction to this behind-the-scenes look at the minds and ideas that ushered in the nuclear age. An epilogue by Françoise Ulam and Jan Mycielski sheds new light on Ulam's character and mathematical originality.

In the United States at the height of the Cold War, roughly between the end of World War II and the early 1980s, a new project of redefining rationality commanded the attention of sharp minds, powerful politicians, wealthy foundations, and top military brass. Its home was the human sciences—psychology, sociology, political science, and economics, among others—and its participants enlisted in an intellectual campaign to figure out what rationality should mean and how it could be deployed. How Reason Almost Lost Its Mind brings to life the people—Herbert Simon, Oskar Morgenstern, Herman Kahn, Anatol Rapoport, Thomas Schelling, and many others—and places, including the RAND Corporation, the Center for Advanced Study in the Behavioral Sciences, the Cowles Commission for Research and Economics, and the Council on Foreign Relations, that played a key role in putting forth a “Cold War rationality.” Decision makers harnessed this picture of rationality—optimizing, formal, algorithmic, and mechanical—in their quest to understand phenomena as diverse as economic transactions, biological evolution, political elections, international relations, and military strategy. The authors chronicle and illuminate what it meant to be rational in the age of nuclear brinkmanship.

An Introduction to Game Theory

Princeton Companion to Applied Mathematics

A Game Theorist's Guide to Success in Business & Life

Cosmic Complexity and the Limits of Scientific Knowledge

The Martians of Science

Essentials of Game Theory

This text emphasizes the ideas behind modern game theory rather than their mathematical expression, but defines all concepts precisely. It covers strategic, extensive and coalitional games and includes the topics of repeated games, bargaining theory and evolutionary equilibrium.

John von Neumann invented the digital computer, played a key role in the development of the atom bomb, constructed a branch of mathematics known as game theory, and became a defender of a movement to bomb the Russians before they could bomb us. Now comes a biography of this controversial genius and an exploration of his greatest idea--one that

nearly triggered a nuclear war in 1950. Photographs.

William Aspray provides the first broad and detailed account of von Neumann's many different contributions to computing. John von Neumann (1903-1957) was unquestionably one of the most brilliant scientists of the twentieth century. He made major contributions to quantum mechanics and mathematical physics and in 1943 began a new and all-too-short career in computer science. William Aspray provides the first broad and detailed account of von Neumann's many different contributions to computing. These, Aspray reveals, extended far beyond his well-known work in the design and construction of computer systems to include important scientific applications, the revival of numerical analysis, and the creation of a theory of computing. Aspray points out that from the beginning von Neumann took a wider and more theoretical view than other computer pioneers. In the now famous EDVAC report of 1945, von Neumann clearly stated the idea of a stored program that resides in the computer's memory along with the data it was to operate on. This stored program computer was described in terms of idealized neurons, highlighting the analogy between the digital computer and the human brain. Aspray describes von Neumann's development during the next decade, and almost entirely alone, of a theory of complicated information processing systems, or automata, and the introduction of themes such as learning, reliability of systems with unreliable components, self-replication, and the importance of memory and storage capacity in biological nervous systems; many of these themes remain at the heart of current investigations in parallel or neurocomputing. Aspray allows the record to speak for itself. He unravels an intricate sequence of stories generated by von Neumann's work and brings into focus the interplay of personalities centered about von Neumann. He documents the complex interactions of science, the military, and business and shows how progress in applied mathematics was intertwined with that in computers. William Aspray is Director of the Center for the History of Electrical Engineering at The Institute of Electrical and Electronics Engineers.

Game Theory and the Law promises to be the definitive guide to the field. It provides a highly sophisticated yet exceptionally clear explanation of game theory, with a host of applications to legal issues. The authors have not only synthesized the existing scholarship, but also created the foundation for the next generation of research in law and economics."

The Logic of Strategy
Theory of Moves