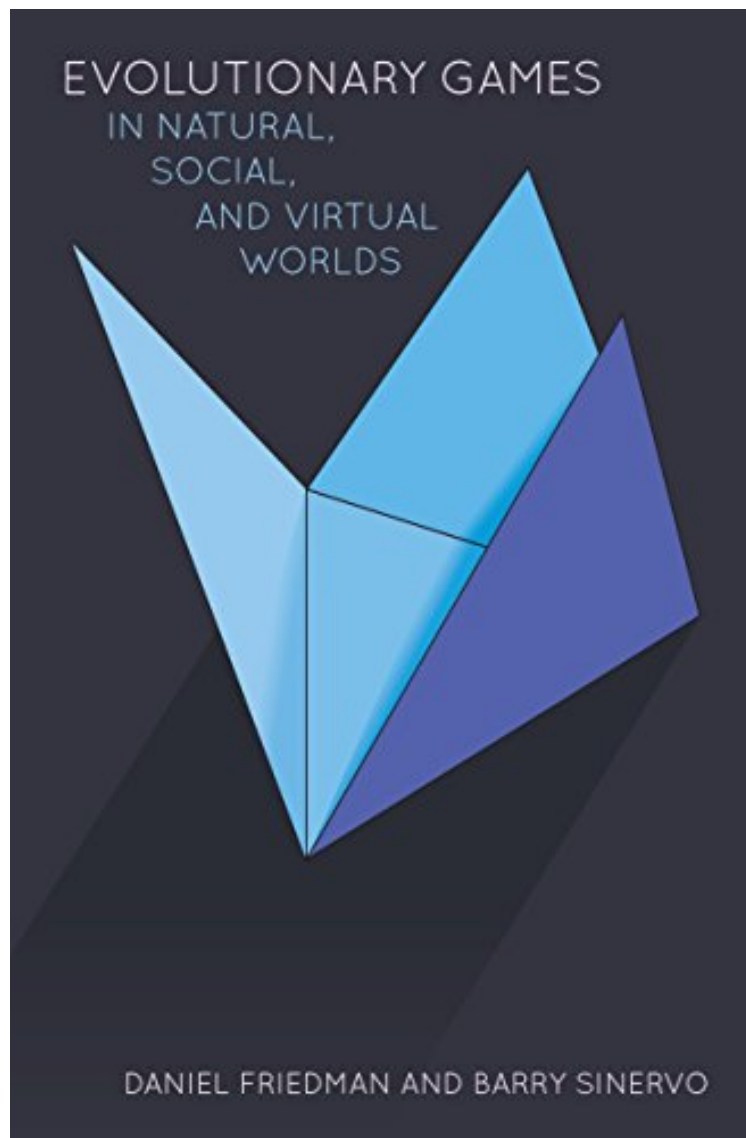


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## Evolutionary Games in Natural, Social, and Virtual Worlds

*Daniel Friedman, Barry Sinervo*

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**Daniel Friedman, Barry Sinervo : Evolutionary Games in Natural, Social, and Virtual Worlds** before purchasing it in order to gauge whether or not it would be worth my time, and all praised Evolutionary Games in Natural, Social, and Virtual Worlds:

0 of 0 people found the following review helpful. ExcellentBy GGreeneOutstanding introduction to applied evolutionary game theory. Worth a read even if you already know the basics.

Over the last 25 years, evolutionary game theory has grown with theoretical contributions from the disciplines of

mathematics, economics, computer science and biology. It is now ripe for applications. In this book, Daniel Friedman---an economist trained in mathematics---and Barry Sinervo---a biologist trained in mathematics---offer the first unified account of evolutionary game theory aimed at applied researchers. They show how to use a single set of tools to build useful models for three different worlds: the natural world studied by biologists; the social world studied by anthropologists, economists, political scientists and others; and the virtual world built by computer scientists and engineers. The first six chapters offer an accessible introduction to core concepts of evolutionary game theory. These include fitness, replicator dynamics, sexual dynamics, memes and genes, single and multiple population games, Nash equilibrium and evolutionarily stable states, noisy best response and other adaptive processes, the Price equation, and cellular automata. The material connects evolutionary game theory with classic population genetic models, and also with classical game theory. Notably, these chapters also show how to estimate payoff and choice parameters from the data. The last eight chapters present exemplary game theory applications. These include a new coevolutionary predator-prey learning model extending rock-paper-scissors; models that use human subject laboratory data to estimate learning dynamics; new approaches to plastic strategies and life cycle strategies, including estimates for male elephant seals; a comparison of machine learning techniques for preserving diversity to those seen in the natural world; analyses of congestion in traffic networks (either internet or highways) and the "price of anarchy"; environmental and trade policy analysis based on evolutionary games; the evolution of cooperation; and speciation. As an aid for instruction, a web site provides downloadable computational tools written in the R programming language, Matlab, Mathematica and Excel.

"Evolutionary Games is an excellent resource for self-study on applications of evolutionary game theory. The underlying mathematics is thoroughly and clearly presented, and the coding resources to help the reader further understand the material are helpful. Exercises and detailed appendices for most chapters round out this well-written and engaging text." -- Megan Sawyer, Southern New Hampshire University

"There is a much to recommend in this book. It is a superior collection of theory and applications. The coverage of the theory of evolutionary games is broad-based. In addition, the chapters on applications span well-known and emerging areas of research. It is a valuable contribution for anyone interested in evolutionary game theory." -- Daniel G. Arce, Ashbel Smith Professor of Economics, University of Texas at Dallas

"Evolutionary game theory offers a wealth of techniques for studying dynamics and stability in the social sciences, biology, and engineering. Through their clear and insightful exposition of a generous range of applications, Friedman and Sinervo have provided an invaluable road map for anyone looking to apply the theory on their own." -- Bill Sandholm, Professor of Economics, University of Wisconsin

**About the Author**  
Daniel Friedman is Distinguished Professor of Economics at the University of California, Santa Cruz. The author of over 100 articles and 5 previous books, his work has appeared in leading academic journals in economics, finance, and psychology. He is founder and director of LEEPS lab which conducts human subject experiments in market and strategic interaction, supported by 14 National Science Foundation grants along with grants from IBM, HP labs, Google, and Environmental Defense.

Barry Sinervo, Full Professor, University of California, Santa Cruz, is an evolutionary biologist who conducts research on Behavioral Ecology, Game Theory and the Biotic Impacts of Climate Change. He has authored over 100 peer-reviewed publications. In addition to his research in game theory, he is currently researching contemporary extinctions of reptiles and amphibians and changes in plant communities driven by climate change, at sites distributed on five continents, leading a multinational research team of scientists developing physiological models of the biotic impacts of climate change on diverse biological systems, and measuring the biotic impacts of climate from equatorial sites to polar regions. He is also Director of the UC-wide Institute for the Study of the Ecological and Evolutionary Climate Impacts, a research consortium funded by a UC Presidential Research Catalyst Award.