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Game Theory. Decisions, Interaction and Evolution

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x + 240 pages.
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The referred book is announced as a textbook. It can be surely successfully used in this way but the field of its effective applicability is much wider. Its main advantage consists in the organization of particular topics and chapters, which is innovative and inspiring. It supports new views on the structure of non-cooperative games of strategy and on the proportion of individual decision-making and conflict of interests in strategic behaviour.

The text of the book is divided into nine chapters grouped into three main parts. The fourth part is devoted to appendices, and the book is completed by *Solutions* of exercises, short comments and recommendations for eventual *Further Reading*, not very rich (25 items) but modern and innovative *References*, and the *Index*.

The traditional textbooks of the theory of strategic games are divided into chapters on games in extended form, games in normal form (with minimax and Nash solutions), and eventually introduced by information on elements of the utility theory and decision-making methods. In contrast to them, the referred monograph (it is difficult to limit its mission to textbook, only) deals in its particular parts with the following topics.

Decisions, which part includes chapter on *Simple Decision Models* (meaning the essential concepts of decision-making, optimization, individual rationality, and also natural selection models), further chapter on *Simple Decision Processes* (with the basic concepts of games in extended forms like the decision tree, pure and randomized strategies and their optimality), and, finally, a chapter on *Markov Decision Processes* (including sections on the stochastic inputs into the decision process, namely, the state and Markov dependence, optimality for finite and infinite horizon Markov decision processes, decision strategies, and related concepts).

The second part, *Iteration*, introduces the multilaterality of interests in the decision process, and their conflict. Four chapters of this part roughly follow the structure of decision processes formulated in the former part. They are devoted to *Static Games* (which means, in the traditional terms, two- and n-players non-cooperative games, antagonistic and non-antagonistic, further the Nash equilibrium and its alternatives). The next brief chapter, *Finite Dynamic Games*, deals with the games in extended form (game tree) and concepts related to it. Chapter, named *Games With Continuous Strategy Set,* also very briefly refers to games with infinite sets of pure strategies and their special cases like duopoly models and optimal division of sources. Finally, the last chapter of this part, *Infinite Dynamic Games,* deals with basic ideas of supergames, and stochastic games.

The third part, *Evolution*, includes two chapters, mostly devoted to non-traditional game theoretical models. The chapter on *Population Games* presents some aspects of evolutionary games and strategies, contest games, and several related concepts and results. The models of evolutionary games and contest games are investigated also in the next chapter, *Replicator Dynamics*, treated as dynamic model without stable situations in which the evolutionary stable strategies either do not exist or they are random.

The presentation of all above topics and chapters is brief, focused on the fundamental concepts and ideas, only, and carefully illustrated by lucid examples. This attribute turns the monograph near to the category of textbooks.

But the methodological structure of the text, the organization of particular topics and the stress on modern interpretations and mutual relations of particular concepts and methods, is novel and inspirational. Just for illustrations, among the 25 references, only

three (seminal book by von Neumann and Morgenstern, and, let us say, the monograph by Maynard from 1982 and Bram's book from 1983) belong to the classical ones. All others were published after 1990 and most of them (namely 11 items) are not older than 10 years. What is much more important, most of the references regard original, new, inspiring and sometimes even surprising views on the theory of non-cooperative games. This regards the referred book, as well.

To summarize the above review. The referred book can be used as a textbook and the reader will gain a creative approach to the theory of strategic games. Nevertheless, perhaps everyone who starts his study of the game theory by this book will have some problems in communication with game-theorists having passed the classical game-theoretical education. It can be useful to suggest to a potential student seriously approaching the study of games, to read both – some simple textbook of the classical non-cooperative games model, and the referred book, and to compare their points of view. Similarly, the book can be recommended to every game-theoretical specialist with the same destination – to compare both presentations. The reader can be sure that his time will not be lost.

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