Book reviews

Kybernetika, Vol. 35 (1999), No. 3, [391]--392

Persistent URL: http://dml.cz/dmlcz/135295

SAUL STAHL

A Gentle Introduction to Game Theory

American Mathematical Society (Mathematical World 13), 1999.
xii + 176 pages
ISBN 0-8218-1339-0.

The game theory was originally developed as a formal mathematical tool for modelling specific economic and social phenomena for which a conflict of interests is an essential attribute. Anyhow, its mathematical formalism sometimes demands too much from the readers whose education was rather oriented to social and humanitarian sciences.

The referred book aims to bridge over this gap and to offer a lucid overview of basic game theoretical methods with application of elementary mathematics. The topics presented in the book are limited to 2-players games, mostly (except the last three chapters) with zero-sum payments.

The text is divided into 14 not very extensive chapters. After introductory heuristic description and formal basic definitions (Chapters 1 and 2) the next four chapters deal with the concept of optimality of strategies and the solutions concepts. The following five chapters are oriented to some special types of zero-sum two-players games and algorithms for their solution. Finally, the conclusive three chapters deal with nonzero-sum two players games, mixed strategies in such games and their equilibria. The book is completed by the Index and Bibliography.

All topics mentioned in the book are explained in a clear way and illustrated by well chosen examples. Some chapters are completed by exercises whose solutions can be found in the conclusive section. The entire text is designed as a textbook which is optimal for elementary courses of 2-players game theory for students with a simple mathematical background. This purpose is very well fulfilled.

The referred book can be recommended to all readers wishing to find basic and well readable introduction to the relevant topic or for university teachers looking for a sophisticated background for their lectures in the elementary game theory including well motivated examples and exercises.

Milan Mareš

ACHIM HOFFMAN

Paradigms of Artificial Intelligence. A Methodological & Computational Analysis

Springer-Verlag, Singapore - Berlin - Heidelberg 1998.
xiii + 332 pages.
ISBN 981-3083-97-2.

The artificial intelligence theory and methods, formally existing since the middle of the fifties, are rather marked by certain bipolarity between two fundamental approaches to the topic. Namely, there exists a formally symbolic approach oriented to mathematics and mathematical logic, and, on the other hand, rather psychologically oriented approach aiming to the models of brain functions, neural models and other similar concepts. The confrontation of these two paradigms characterizes the development of the artificial intelligence models for a long time.

The referred book was written, especially, to analyze both paradigms and to determine their role in the development of AI. The basic motivation for writing it was to suggest

criteria which are to be fulfilled by any effective method for building AI systems, and also by any successful theory for understanding cognition. This aim is connected with the importance which the author attaches to the human factor in the artificial intelligence models. Especially, with the limitations of the human subject to understand a theory or a number of design steps which lead to rather instrumental criterion for the evaluation of paradigms. The human subject's capabilities and limitations inspire the development of more advanced and more suitable frameworks in the cognitive sciences and AI.

The book is formally divided into three main parts where the first one of them is oriented to the basic concepts, main trends and particular models respecting the symbolic paradigm. Similarly, the second part is focused to the methods and background of the models oriented to the connectionistic paradigm. Finally, in the third part the author presents the methodological analysis of both above approaches, he studies different levels of description, computational limits, knowledge types and other aspects of their comparison. The book is completed by the Authors Index, Subject Index, and, especially, by a rich (348 items) Bibliography.

The book is written in a well readable style which successfully combines the necessary exactness and respect to the intuitive clearness of the explanation. The overview of AI methods and approaches summarized in it is representative and well illustrates the state of research in the relevant branches. The book should be useful for researchers, students and (skilled) observers of AI, and its presentation of the topic is fully adequate to this purpose. The field of AI develops rapidly and it is useful to have a book which shows and discusses the trends and methodological rules of the development.

Milan Mareš