

ROMAN SLOWIŃSKI (Ed.)

## **Fuzzy Sets in Decision Analysis, Operations Research and Statistics**

(The Handbook of Fuzzy Sets Series.)

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xxiv + 456 pages.

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The edited volume contains thirteen contributions focused on interesting and perspective topics connected with the fuzzy set theoretical analysis of real data and their processing in optimization problems. The choice of particular chapters respects the prospectivity of the treated applications of the fuzzy set theory, and they were prepared by qualified and experienced authors.

The contributions are divided into four groups covering more specialized branches of the considered field. Part I, devoted to *Decision Making*, is the most extensive one. It collects five chapters contributed by different authors. They offer clear presentations of the topics regarding fuzzy approaches to preference modelling, aggregation of preferences, multiple criteria decision making, group decision making and also some elements of non-cooperative fuzzy game theory. Part II, oriented to *Mathematical Programming*, is composed of four contributions oriented to fuzzy set theoretical models of linear programming (with single or multiple objective, functions), nonlinear programming, discrete optimization and also dynamic programming.

The extent of the remaining two parts is smaller. Each of them consists of two chapters. Part III, focused to *Statistics and Data Analysis*, deals with selected fuzzy set theoretical methods in statistics with fuzzy data and with fuzzy regression analysis. Finally, Part IV titled *Reliability, Maintenance and Replacement* contains contributions on reliability theory and its fuzzification, and on maintenance and replacement models. Some sections of these two chapters display connections with the topics treated in the previous parts.

The editor and twenty five authors of the chapters of this volume succeeded to create a representative collection of highly qualified surveys of the state-of-art in interesting fields of application of fuzzy set theory. The unifying motive of the chapters gathered in the volume is their orientation to fuzzy set theoretical methods which are near to micro-economic models of optimization. Papers with this orientation gradually become more frequent among the contributions of fuzzy set theoretical conferences. It is useful to summarize some of the most progressive results into one volume.

In accordance with the general development in applied mathematics and artificial intelligence, the mathematical methods connected with economic and social sciences, human behaviour and decision-making become more significant and they attract more and more attention. It is true even for the fuzzy set theory. Its ability to include vagueness into its models makes it especially adequate for this purpose. The soft mathematical procedures, typical for fuzzy set theoretical models, represent one of the perspective directions of further progress in applied mathematics. For these reasons, the referred volume appears especially useful.

The book does not bring a global or complete overview about the very wide field of fuzzy set theoretical methods in optimization and related problems. But it offers a representative selection of interesting and attractive topics in this area. In this sense it is inspirative for those who would like to study some of the presented problems or to contribute actively to its further development.

*Milan Mareš*