

Control and Cybernetics

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P r e f a c e

by

Jan Sokolowski and John Taylor

Continuing the tradition of Professor Maksymilian Tytus Huber's research, considerable development of mechanical sciences has been achieved in Poland in the last fifty years. Among the scientists of the Polish school, Zenon Mroz is one of the leading contributors to this development.

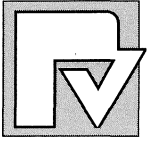
Professor Zenon Mroz is the head of Research Division at the Institute of Fundamental Technological Research of the Polish Academy of Sciences in Warsaw. His research is mainly related to inelastic analysis of materials and structures with account for plasticity and damage, critical and post-critical states, sensitivity analysis, and optimal design of structures. He authored or co-authored more than 200 research papers published in international journals, and several monographs. In particular, he developed constitutive models for cyclic plasticity of metals and geomaterials, which have been widely used and extended by other researchers. His recent interest is concentrated on optimal shape and topology design of structures through the use of generalized sensitivities associated with shape or topology variation.

Professor Zenon Mroz is the member of editorial boards of 15 scientific journals and was a member of scientific committees of numerous international conferences. He obtained *honoris causa* doctorates from the University of Miskolc (Hungary, 1996), Polytechnique de Mons (Belgium, 1997) and Technical University of Cracow (1997).

Historically, optimization in mechanics has substantial tradition in Poland. In 1936 Professor Zbigniew Wasutyński formulated the optimality criterion for mean stiffness optimal design, using an elastic energy concept. Professor Zenon Mroz is well known in the world for his many research accomplishments that contribute to further developments in methods for structural optimization. The present issue of the journal contains papers dedicated to him, in particular in the domains of structural optimization and in modelling for plasticity theory.

We have the pleasure to be his friends, and we dedicate these contributions in honor of his 65th birthday.

Jan Sokolowski and John Taylor, Guest Editors



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Vol. 15: G.I. Klir, M.J. Wierman

**Uncertainty-Based Information
Elements of Generalized Information Theory**

1998. XVI, 168 pp. 11 figs., 10 tabs. Hardcover
DM 98,-; iiS 716,-; sFr 89,50 ISBN 3-7908-1073-8

The book is an overview of the development of basic ideas and mathematical results regarding measures and principles of uncertainty-based information formalized within the framework of classical set theory, probability theory, fuzzy set theory, possibility theory, and the Dempster-Shafer theory of evidence.

Vol. 16: D. Driankov, R. Palm (Eds.)

Advances in Fuzzy Control

1998. VIII, 421 pp. 146 figs., 16 tabs. Hardcover
DM 148,-; iiS 1081,-; sFr 135,- ISBN 3-7908-1090-8

The papers presented in the volume cover methods that constitute the major trends in this area, that have shown their relevance in solving practical problems, whose implementation can be easily automated, and last but not least, that can be especially interesting from the point of view of conventional modern control theory.

Vol. 17: L. Reznik, V. Dimitrov, J. Kacprzyk (Eds.)

**Fuzzy Systems Design
Social and Engineering Applications**

1998. XVI, 334 pp. 95 figs., 21 tabs. Hardcover
DM 148,-; iiS 1081,-; sFr 135,- ISBN 3-7908-m8-1

Fuzzy logic is a way of thinking that is responsive to human zeal to unveil uncertainty and deal with social paradoxes emerging from it. In this book a number of articles illustrate various social applications to fuzzy logic. The engineering part of the book contains a number of papers, devoted to the description of fuzzy engineering design methodologies.

Vol. 18: L. Polkowski, A. Skowron (Eds.)

**Rough Sets in Knowledge Discovery 1
Methodology and Applications**

1998. X, 576 pp. 56 figs., 75 tabs. Hardcover
DM 198,-; iiS 1446,-; sFr 179,- ISBN 3-7908-m9-X

Vol. 19: L. Polkowski, A. Skowron (Eds.)

**Rough Sets in Knowledge Discovery 2
Applications, Case Studies and Software
Systems**

1998. X, 610 pp. 88 figs., 131 tabs. Hardcover
DM 228,-; iiS 1665,-; sFr 206,- ISBN 3-7908-1120-3

The papers in volumes 18 and 19 present a wide spectrum of problems representative to the present stage of this theory. Researchers from many countries reveal their recent results on various aspects of rough sets. The papers are not confined only to mathematical theory but also include algorithmic aspects, applications and information about software designed for data analysis based on this theory.

Vol. 20: J.N. Mordeson, P.S. Nair

**Fuzzy Mathematics
An Introduction for Engineers and Scientists**

1998. XIV, 258 pp. 20 figs., 9 tabs. Hardcover
DM 128,-; iiS 935,-; sFr 116,50 ISBN 3-7908-1121-1

It is dealt with fuzzy graph theory, fuzzy topology, fuzzy geometry, and fuzzy abstract algebra. The purpose of the book is to present the concepts of fuzzy mathematics from these areas which have applications to engineering, science, and mathematics. The style is geared to an audience more general than the research mathematician. In particular, the book is written with engineers and scientists in mind.

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