

CONTENTS

Preface	xi
<i>D. Ruan, P. D'hondt, P. Govaerts and E. E. Kerre</i>	
Part 1: Mathematics	
Recent Developments in Fuzzy Logic and Intelligent Technologies <i>H.-J. Zimmermann</i>	3
On the Mathematics of Fuzziness <i>E. E. Kerre</i>	8
On Fuzzy Uncertain Sets <i>Yu. P. Pyt'ev</i>	15
A Possibilistic Uncertainty Model in Classical Reliability Theory <i>G. de Cooman and B. Cappelle</i>	19
An Uncertainty Conserving Probability/Possibility Transformation for the Combined Treatment of Random and Fuzzy Variables <i>S. Wonneberger</i>	26
Reliability Assessment Using the Concept of Possibility <i>P. Ren and G. Zhao</i>	30
Autological Model of a Decision Making Problem <i>Y. P. Shankin</i>	34
Transitivity of Fuzzy Orderings Based on Pairwise Comparisons <i>X. Z. Wang, E. E. Kerre, B. Cappelle and D. Ruan</i>	38
Sophisticated Object Estimation Using Complex Criterion <i>A. I. Piskunov and G. A. Kleymionov</i>	44
Ordering Alternatives in MCDM Problems <i>B. De Baets</i>	48
Dialogue Interpretation of Stochastic Measurement with Fuzzy a Priori Information <i>A. I. Chulichkov, N. M. Chulichkova, Yu. P. Pyt'ev and L. I. Smolnik</i>	54

On the Choice of an Optimal Value-Set of Qualitative Attributes for Information Retrieval in Data Bases <i>A. Ryjov and D. Loginov</i>	58
The Practical Use of the Technique of Choosing an Optimal Value-Set of Qualitative Attributes: the Problem of Stability <i>A. Ryjov</i>	63
Non-Monotonic Transfer Functions as an Alternative to Hidden Layers <i>G. J. Bez and R. Serneels</i>	68
Part 2: Engineering	
Applications of Fuzzy Logic Control in Industry <i>A. J. van der Wal</i>	75
Fuzzy Logic Controller Using Different Inference Methods <i>Z. Liu and R. De Keyser</i>	81
Fuzzy Systems for Process Identification and Control <i>V. Gorrini and H. Bersini</i>	85
Robust Hydraulic Position Control by a Fuzzy State Controller <i>T. Zhao, A. J. van der Wal and T. Virvalo</i>	91
Comparison of Fuzzy Logic and State Feedback Control of a Non-Linear System <i>K. Ait Abderrahim and C. Touseau</i>	96
AutoMF: A Neural Network Tool for the Generation and Tuning of Fuzzy Knowledge <i>B. W. Grant and A. J. van der Wal</i>	103
Nonlinear Process Control Using Adaptive Neural Predictive PID Controller <i>Y.-H. Tan and A. Van Cauwenberghe</i>	109
Construction of Fuzzy Automata by Fuzzy Experiments <i>A. Mironov</i>	113
Catastrophes Control Problem <i>V. V. Velichenko</i>	117
An Avoidance Layer in Hierarchical Process Control <i>A. de Callataj</i>	122

Fuzzy Experiment Interpretation	127
<i>Yu. P. Pyt'ev, V. P. Manolov and B. I. Volkov</i>	
Building Integrated Environment for the Development of Intelligent on-Line Diagnostics Systems	131
<i>V. Mikishev, S. Sokolov and V. Tarassov</i>	
The Flexible Model and its Shell	138
<i>G.-H. Yang and H. Muller-Malek</i>	
Experiments on Co-Operating Robot Arms	144
<i>B. Arthaya and J. De Schutter</i>	
Development of an Expert System for the Aid in Diagnosis of Pressurized Water Loop Transients	150
<i>K. Ouliddren</i>	
Expert System Based on Algebra of Uncertainties with Memory in Process Optimization	156
<i>I. Batyrshin, R. Zakuanov and G. Bikushev</i>	
Man-Machine Systems Research at the OECD Halden Reactor Project	160
<i>F. Øwre, T. J. Bjørlo and K. Haugset</i>	
Computer-Based Operator Support Systems	166
<i>Ø. Berg, T. J. Bjørlo and F. Øwre</i>	
Halden Project Activities on Software Dependability	172
<i>G. Dahll and T. Sivertsen</i>	
Retrofitting of NPP Computer Systems	177
<i>G. Pettersen</i>	
Part 3: Nuclear Science	
Fuzzy Controllers in Nuclear Material Accounting	183
<i>A. Zardecki</i>	
A Study on Water Level Control of PWR Steam Generator at Low Power and the Self-Tuning of Its Fuzzy Controller	188
<i>N. Na, K. Kwon, C. Ham and Z. Bien</i>	
A Real Time Self Tuning Fuzzy Controller for the Steam Generator through Scaling Factor Adjustment	194
<i>C. H. Jung, C. S. Ham and K. L. Lee</i>	

A Prototype Neural Network to Preform Early Warning in Nuclear Power Plants	200
<i>F. de Viron, M. De Vlaminck, A. Goosens, M. Monteyne and J. M. Renders</i>	
Application of Fuzzy Logic Control System for Reactor Feed-Water Control	206
<i>T. Iijima, Y. Nakajima and Y. Nishiwaki</i>	
A Fuzzy Linguistic Interface for Data Bases in Nuclear Safety Problems	212
<i>B. Lyapin and A. Ryjov</i>	
Principles of Design for Nuclear Reactor Safety System on the Basis of Neural Network	216
<i>V. K. Abrosimov and E. S. Verbin</i>	
Fuzzy Logic in Monitoring the Non-Spread of Nuclear Weapons	219
<i>A. Belenki and A. Ryjov</i>	
Uncertainty Management in Radioactive Waste Repository Site Assessment	223
<i>J. F. Baldwin, T. P. Martin and A. Tocatlidou</i>	
Opportunities for Fuzzy Logic in Radiation Protection	227
<i>B. Van de Walle and M. Van Camp</i>	
Real-Time Diagnosis of Incipient Multiple Faults with Application for Nuclear Power Plants	232
<i>H.-Y. Chung and Z. Bien</i>	
APL-Graphics Application for Maps of Science Construction in Expert System "Forecaster-E" Used for Scientific Forecasting in Atomic Science and Technology	238
<i>B. A. Makeev and A. V. Zoueva</i>	
Principles of Expert Fuzzy Controller Design: AI Mobile Wall Climbing Robots for Decontamination of Nuclear Power-Station	242
<i>V. G. Gradetsky, G. Rizzotto, A. Pagni, Yu. V. Slesarev, D. A. Pospelov, S. V. Ul'yanov and K. Yamafuji</i>	
Fuzzy Model-Based Control of a Nuclear Reactor	247
<i>L. Van den Durpel and D. Ruan</i>	
Fuzzy Logic and Nuclear Production Processes	254
<i>E. Trauwaert, R. Reynders and T. Van Roy</i>	

- Computer Assisted Reliability Analysis: an Application of Possibilistic Reliability Theory to a Subsystem of a Nuclear Power Plant** 260
B. Cappelle and E. E. Kerre
- An Expert System for the Evaluation of the Negative Effects of Environment on Person During the Liquidation of Nuclear, Industrial and Ecological Accidents** 266
V. Kudrjavcev, A. Ryjov, V. Kozlov and A. Strogalov
- Integrated Fuzzy Cluster, Choice, and Knowledge Acquisition Technology in Problem of Nuclear Safety** 271
S. A. Orlovski
- Two Models for Energy Distribution Control in the Nuclear Power Plants** 274
I. G. Perfilyeva and V. V. Postnikov
- Fuzzy Logic Aquisition and Simulation Modules for Expert Systems to Assist Operator's Decision for Nuclear Power Stations** 277
A. A. Averkin
- SCC Susceptibility Analysis of Stainless Steels in Nuclear Reactor Water: A Neural Network and Expert System Approach** 279
H. M. G. Smets and W. F. L. Bogaerts
- Self-Tuning Fuzzy Logic Nuclear Reactor Controller** 285
N. K. Alang-Rashid and A. Sharif Heger