

**Second European Congress  
on Intelligent Techniques  
and Soft Computing  
Aachen, Germany,  
September 20–23, 1994  
Proceedings  
Volume 3**

***EUFIT*  
**'94****

ELITE-Foundation  
Promenade 9  
D-52076 Aachen, Germany  
Phone: +49-2408-6969  
Fax: +49-2408-94582

Acknowledgement:  
Partial Support for EUFIT '94  
has been provided by  
the European Commission  
(ESPRIT Basic Research).

<b>Function Approximation Based on Fuzzy Relation</b>	
N. Ikoma, Japan	1092
<b>Image Comparison Using Fuzzy Relations</b>	
R. Felix; T. Kretzberg; S. Reddig, Germany	1097
<b>A Prototype of an Integrated Fuzzy-Neuro System</b>	
W. Hauptmann; K. Heesche, Germany	1101
<b>DataEngine: An Object-oriented Tool for Neural- and Fuzzy Systems</b>	
J. Angstenberger, Germany	1105
<b>Fuzzy Chips as Unconventional Programmable Analog and Digital Devices (PAID'S)</b>	
T. A. W. Tilli, Germany	1110
<b>Object-oriented Programming with Fuzzy Types in Neural Applications</b>	
F. Bouillé, France	1116
<b>Knowledge Learning in Expert Systems by Genetic Algorithms</b>	
M. G. H. Negoita; E. Roventa, Romania	1121
<b>Applications of Genetic Algorithms in Solving Fuzzy Relational Equations</b>	
F. Fagarasan; M. G. H. Negoita; A. Agapie, Romania	1126
<b>Genetic Algorithm in the Aid of Fuzzy Rule Deduction</b>	
S. M. George; A. Saxena; P. Rambabu, India	1130
<b>The Fusion of Fuzzy Logic and Neural Networks: Applications to Shape Recognition</b>	
N. Varachiu; M. G. H. Negoita, Romania	1134
<b>Intelligent Planning Systems for Potplant Growers</b>	
A. J. M. Beulens, The Netherlands	1138
<b>Application of PAC Learning Algorithm for Intelligent CAPP Systems</b>	
G. Putnik, Portugal	1143
<b>Learning the Relevance of Symptoms in Fault Trees</b>	
O. Nelles; M. Ayoubi, Germany	1148
<b>Fuzzy Control and Fuzzy Sensors</b>	
L. Foulloy; S. Galichet; E. Benoit, France	1156
<b>State Feedback Fuzzy Controllers</b>	
S. Galichet; L. Foulloy, France	1161
<b>Stability Analysis of Fuzzy Controllers Via Cell-to-Cell Root Locus Analysis</b>	
S. Boverie; B. Demaya; A. Titli, France	1168
<b>Design of Stable Fuzzy Control Systems from Experimental Data</b>	
A. Garcia-Cerezo; A. Ollero, Spain	1175
<b>Comparative Analysis of Stability Methods for Fuzzy Controllers</b>	
A. Titli; P. Marin, France	1183
<b>Comparing Different Methods for Premise Identification in Sugeno-Takagi-Models</b>	
R. Babuska; H. B. Verbruggen, The Netherlands	1188
<b>Decentralized Fuzzy Control of Multivariable Processes by Passive Decomposition</b>	
A. Gegov; P. M. Frank, Germany	1193
<b>Features of Fuzzy Associative Inference</b>	
A. Imura; T. Yamaguchi; H. Ushida; T. Takagi, Japan	1201
<b>Defuzzification and Ranking in the Context of Membership Value Semantics, Rule Modality, and Measurement Theory</b>	
A. Runkler; M. Glesner, Germany	1206
<b>An Evolutive Fuzzy Mechanism Based on Past Experiences</b>	
F. Gomide; G. Nakamiti, Brazil	1211
<b>Storage Capacity Bounds in Multilayer Neural Networks</b>	
A. Wendemuth, Great Britain	1218
<b>An Improvement of Convergency for Neural Networks in Application to Macromodeling</b>	
J. Wilk; E. Wilk; R. Laur, Germany	1225
<b>Reducing Training Set Size to Improve Learning</b>	
T. D. Gedeon; P. Slade, Australia	1232

<b>Learning and Extracting Method for Fuzzy Rules Using Neural Networks with Modified Structure Level Adaptation</b>	
E. Tazaki; T. Ichimura, Japan	1237
<b>Use of Recurrent Networks and Genetic Algorithms for Solving Standard Cell Placement Problem</b>	
S. M. George; K. Singh; A. Saxena; P. Rambabu, India	1242
<b>Can We Reach and Agree on Group Decisions in Distributed Environments?</b>	
P. Eklund; D. Kenis; A. Ventre, Finland	1247
<b>Rankings and Aggregation Operators in Fuzzy Group Decisions</b>	
W. Ostasiewicz, Poland	1250
<b>Fuzzy If-then Rules for Modeling Interdependences in FMOP Problems</b>	
C. Carlsson; R. Fuller, Finland	1253
<b>Probabilistic, Fuzzy, and Rough Concepts in Social Choice</b>	
M. Fedrizzi; J. Kacprzyk; H. Nurmi, Italy	1258
<b>The Science of Breeding and its Use in the Breeder Genetic Algorithm</b>	
H. Mühlenbein, Germany	1260
<b>Genetic Breeding of Novel Neural Architectures</b>	
B.-T. Zhang; H. Mühlenbein, Germany	1265
<b>Strategy Adaptation by Competition</b>	
D. Schlierkamp-Voosen, Germany	1270
<b>Simulation of a Batch Production Facility Under Uncertainty</b>	
C. Azzaro; P. Floquet; L. Pibouleau; S. Domenech, France	1275
<b>Fuzzy Knowledge Transfer in Process Engineering</b>	
F. Babinec, Czech Republic	1279
<b>Fuzzy Simulation of the Spray-drying Tower</b>	
A. Kraslawski; G. Fieg; A. Gorak; L. Nyström, Finland	1287
<b>The KONWERK - Workbench: A System of Software Tools to Approache Intelligent Design Support</b>	
A. Günter; H.-J. Sebastian, Germany	1295
<b>The Optimization Model of KONWERK - Using Methods of Operations Research within Knowledge-based Configuration of Complex Systems</b>	
B. Funke, Germany	1303
<b>Optimization Based Configuration Using Evolutionary Algorithm</b>	
M. Thäringen, Germany	1311
<b>Knowlege-based Configuration of Future Space Launch Systems</b>	
T. Goudarzi Pour; K. Lötzerich, Germany	1315
<b>Industrial Neural Controllers</b>	
R. A. Aliev; F. T. Aliev; R. H. Abiev; R. R. Aliev, Russia	1321
<b>Comparison Between Classical and Fuzzy Neurons</b>	
J. Godjevac, Switzerland	1326
<b>A Polymorphic Genetic Algorithm for Classifier Systems</b>	
P. Collard; C. Escazut; J.-P. Aurand, France	1331
<b>Neural Fuzzy Controller for Behavior-oriented Robots</b>	
S. Förster, Germany	1333
<b>Cluster Analysis with Deterministic Annealing</b>	
R. Ehrhardt, Germany	1336
<b>Fuzzy Lower Semi-Continuity of Fuzzy Multivalued Mappings</b>	
E. Tsiporkova-Hristoskova; B. De Baets; E. Kerre, Belgium	1341
<b>Learning and Generalization in Adaptive Fuzzy Logic Networks</b>	
A. P. Heinz, Germany	1347
<b>Pattern Recognition of Stochastical Signals</b>	
A. Grauel; H.-G. Grundmann; F. Berk, Germany	1352
<b>Fuzzy Classification for Position Determination</b>	
C. Klager; V. Khachatouri-Yeghiazarians; G. Zeichen, Austria	1358

<b>Solving Job-Shop Scheduling Problem with Fuzzy Processing Time Using Genetic Algorithm</b>	
M. Gen; Y. Tsujimura; E. Kubota, Japan	1363
<b>A Fuzzy CUSUM Algorithm Used in an Early Warning System</b>	
P. Westerlund, Sweden	1364
<b>Case-based Reasoning in CAD: A Case Study</b>	
B. Ungureanu; D. Rusu; I. Ziman, Romania	1372
<b>Fuzzy Implications</b>	
R. Mesiar, Slovakia	1378
<b>Comparison of Three State Feedback Controllers. Why Fuzzy Control?</b>	
S. Preitl; R.-E. Precup, Romania	1383
<b>Structural Fuzzy Models</b>	
A. I. Piskunov; G. A. Kleymionov, Russia	1388
<b>Necessary and Sufficient Conditions for the Identification Problem</b>	
I. Perfilyeva, Russia	1393
<b>Problem of Associative Memory in Systems of Coupled Oscillators</b>	
M. G. Kuzmina; E. A. Manykin; I. I. Surina, Russia	1398
<b>Application of a Rough Fuzzy Controller to the Stabilization of an Inverted Pendulum</b>	
E. Czogala; A. Mrozek; Z. Pawlak, Germany	1403
<b>Dynamic Fuzzy Control</b>	
C. V. Buhusi, Romania	1408
<b>Fuzzy Control Neural Networks for Ship's Driving</b>	
L. Wei, China	1412
<b>Multilayered Neural Networks with Fuzzified Synaptic Operation Using Additive Hybrid Operators</b>	
S. M. George; P. Pandey; P. Rambabu, India	1415
<b>A Generalised Mean Field Approach for Oscillatory Networks</b>	
M. G. Kuzmina; I. I. Surina, Russia	1420
<b>Computer Study of Phaselocking in Oscillatory Networks</b>	
M. G. Kuzmina; E. A. Manykin; I. I. Surina, Russia	1425
<b>Fuzzy Exploration of an Unknown Environment</b>	
J. Weisbrod; J. Eisenbiegler, Germany	1428
<b>Robot Trajectory Generator with Integrated Fuzzy Layer for Redundancy Resolution</b>	
V. Khachatouri-Yeghiazarians; B. Favre-Bulle, Austria	1434
<b>Scene Analysis for a Mobile Robot</b>	
F. Sandakly; G. Giraudon, France	1439
<b>Fuzzy Range Sensor Fusion for the Navigation of Mobile Robots</b>	
G. Mauris; E. Benoit; L. Foulloy; J.-F. Josserand, France	1446
<b>A Rule-based Representation of Fuzzy Knowledge for Control Purposes by Means of Petri Nets</b>	
F. Capkovic, Slovakia	1451
<b>Quantification of Inconsistencies in Fuzzy Knowledge Bases</b>	
H. Scarpelli; F. Gomide; W. Pedrycz, Brazil	1456
<b>A Study of Different Fuzzy Petri Net Concepts</b>	
R. Günther; H.-P. Lipp, Germany	1461
<b>PENSUM - A Decision Support Tool Using Fuzzy Petri Nets</b>	
B. Fischer; W. Meier, Germany	1469
<b>Modified Control Nets Application for Complex Information Systems Simulation and Design</b>	
V. A. Shoomov, Ukraine	1475

<b>A Massively Parallel Neural Net Emulator</b>	
M. Schwarz; B. J. Hosticka; M. Kesper; M. Scholles, Germany	1477
<b>Various Neural Network Implementations on a Low Cost Versatile and Programmable DSP Card</b>	
G. Mercier; C. Barret; K. Madani; G. Crespy, France	1482
<b>The NeuroSIM Development System and Its Embedding Strategy</b>	
M. Raus; W. Ameling, Germany	1489
<b>On Acceleration of Sequential Association Using Recurrent Neural Networks</b>	
M. Sugawara; E. Tazaki, Japan	1495
<b>Fuzzy Multiple Objective Programming Techniques in Modeling Forest Planning</b>	
C. Anderle; M. Fedrizzi; S. Giove, R. Fuller, Italy	1500
<b>Fuzzy if-then Rules for Modeling Interdependencies in FMOP Problems</b>	
R. Fuller; C. Carlsson, Hungary	1504
<b>A Decision Support System for Medical Diagnosis</b>	
M. Fathi-Torbaghan; D. Meyer, Germany	1509
<b>Automatic Design of Hierarchical Fuzzy Controllers Using Genetic Algorithms</b>	
F. Hoffmann, G. Pfister, Germany	1516
<b>About the Fitness of Simulations Whose Fuzzy Rules Are Learned by Genetic Algorithms</b>	
L. Gacogne, France	1523
<b>Fuzzy Tools to Improve Genetic Algorithms</b>	
F. Herrera; M. Lozano; J. L. Verdegay, Spain	1532
<b>Solving Job-Shop Scheduling Problem with Fuzzy Processing Time Using Genetic Algorithm</b>	
M. Gen; Y. Tsujimura; E. Kubota, Japan	1540
<b>On-Chip Integrated Fuzzy Temperature Control</b>	
J. Knobloch; M. Koch, Germany	1548
<b>Fuzzy Logic Control of Electric Feed Drive of CNC Machine Tools</b>	
F. Lederle; P. Eubert; H. Eichfeld, Germany	1552
<b>A Design Method for High-Resolution Integrated Fuzzy Controller</b>	
D. Herbst; A. P. Ungering, Germany	1557
<b>Automatic Generation of Analogous Fuzzy Controller Hardware Using a Module Generator Concept</b>	
J. Kelber; S. Triebel; K. Pahnke; G. Scarbata, Germany	1562
<b>Some Recent Advances in Knowledge Discovery</b>	
D. A. Bell, United Kingdom	1570
<b>Fuzzy Logic on Boolean Algebras</b>	
J. W. Guan; D. A. Bell, United Kingdom	1575
<b>The Zadeh Criticism of Normalization and the Continuity of Operators in Evidential Reasoning</b>	
J. W. Guan; D. A. Bell, United Kingdom	1579
<b>Efficient Algorithms for Evidential Reasoning in Intelligent Techniques</b>	
J. W. Guan; D. A. Bell, United Kingdom	1584
<b>Development of Intelligent Help Systems for Using Complex Software Packages</b>	
J. Hong, United Kingdom	1589
<b>Inference Method for Truth-qualified Natural Language Propositions Involving Fuzzy Quantifiers</b>	
W. Okamoto; S. Tano; T. Iwatani; A. Inoue, Japan	1594
<b>High-Speed Fuzzy Inference Methods with Low Memory Requirements</b>	
T. A. W. Tilli, Germany	1599
<b>An Evidential Reasoning Method Based on Plausibility Function-based Models for Modal Logic</b>	
T. Murai; M. Miyakoshi; M. Shimbo, Japan	1605
<b>Use of Fuzzy Reasoning and Systems Thinking in a Decision Aid for Designers</b>	
J. Darzentas; T. Spyrou; J. S. Darzentas, Greece	1609

<b>Fuzzy Logic for Manufacturing Flexibility Measurement</b>	1619
N. C. Tsourveloudis; Y. A. Phillis, Greece	
<b>Integration of Fuzzy-Sets in the Strategic Corporate Planning Process</b>	1622
O. Homburg, Germany	
<b>A Fuzzy Production Process Controller for a Flexible Production Management</b>	1627
H.-P. Lipp; T. Hack, Germany	
<b>Impact on Integrated Information Systems through Fuzzy Technology</b>	1637
M. Rehfeldt; K. Turowski, Germany	
<b>Recognizing the Power Transformer Inrush with Neural Network</b>	1646
J. Pihler; B. Grcar; Z. Mocnik, Slovenia	
<b>A Neural Measurement System for a Moving Object Using Magnetic Sensors</b>	1651
M. Akutagawa; Y. Kinouchi; H. Nagshino, Japan	
<b>Visual Field Forecasting Using an Artificial Neural Network</b>	1656
K.-W. Cho; X. Liu; G. Loizou; J. X. Wu, Great Britain	
<b>Analysis Methods and Toolkit Selections for Data Mining Problems</b>	1662
P. Eklund, Finland	
<b>Shape of the Fuzzy Conclusion Generated by Linear Interpolation in Trapezoidal Fuzzy Rule Bases</b>	1666
L. T. Koczy; S. Kovacs, Hungary	
<b>Constructing Rule Bases and Fuzzy Sets for Interpolation: Experiences from Quality Evaluation</b>	1671
M. Hartmann; F. Klawonn; R. Kruse; K. Petras; Germany	
<b>IC Engine Misfire Detection Algorithm Generation Using Genetic Programming</b>	1674
R. J. Hampo; B. D. Bryant; K. A. Marko, USA	
<b>Resource Allocation by Genetic Algorithms</b>	1679
A. E. Eiben; L. Hartsuiker, The Netherlands	
<b>Employing Gradient Information in a Genetic Algorithm</b>	1683
A. Autere, Finland	
<b>Optimizing Load Forecast Models Using an Evolutionary Algorithm</b>	1690
S. Heine; I. Neumann, Germany	
<b>VLSI Design, Specification, and Simulation of a Fuzzy Co-Processor</b>	1695
J. Zhang; J. Raczkowski; M. Webler, Germany	
<b>Fuzzy Logic in Field Oriented Induction Motor Control</b>	1703
L. Isopescu, Germany	
<b>Tuning a Fuzzy Controller by Systematic Selection of Parameters</b>	1714
W. Splettstößer; C. Hamm, Germany	
<b>Analysing the Probabilistic Background of Mass Functions</b>	1722
W. Liu, United Kingdom	
<b>Knowledge-based Support for User Interface Development</b>	1727
E. McDaid; A. Hashim, United Kingdom	
<b>Knowledge Engineering for Practical Applications</b>	1730
M. Mulvenna; P. Ye; M. Murphy; E. McTear, United Kingdom	
<b>A Combination-Update Methodology for Handling Uncertainty</b>	1736
S. Shi; M. E. C. Hull; D. A. Bell, United Kingdom	
<b>A Method for Dynamic Job Shop Scheduling Problems</b>	1741
M. Mulvenna; P. Ye; A. Thompson; E. McTear, United Kingdom	
<b>Fuzzy Micro Controller and Gas-Sensors in Air-Quality Control Applications</b>	1746
O. Breiden, Germany	
<b>Neurofuzzy Circuits Based on CMOS Weak Inversion</b>	1749
I. Gheorghie; E. Sofron; F. Balteanu; L. Balteanu; C. Miroiu, Romania	