

# Table of Contents

## Keynote Lectures

Medical Decision Support Systems .....	1
<i>T. Wetter (University of Heidelberg, Germany)</i>	
Medical Bayes Networks .....	4
<i>B. Sierra, I. Inza, P. Larrañaga (University of the Basque Country, San Sebastián, Spain)</i>	
Synchronization Analysis of Bivariate Time Series and Its Application to Medical Data .....	15
<i>M. Rosenblum (Potsdam University, Germany)</i>	
A Survey of Data Mining Techniques .....	17
<i>V. Maojo, J. Sanandrés (Universidad Politecnica of Madrid, Spain)</i>	

## Time Series Analysis

Prognoses for Multiparametric Time Courses .....	23
<i>R. Schmidt, L. Gierl (University of Rostock, Germany)</i>	
Estimation of the Time Delay of Epileptic Spikes by ICA .....	34
<i>A. Černošek (Technical University Ostrava, Czech Republic), V. Krajča (Faculty Hospital Bulovka, Prague, Czech Republic), J. Mohylová (Technical University Ostrava, Czech Republic), S. Petránek (Faculty Hospital Bulovka, Prague, Czech Republic), M. Matoušek (Psychiatric Center, Prague, Czech Republic), K. Paul (Institute Care Mother and Child, Prague, Czech Republic)</i>	
Change-Point Detection in Kinetic Signals .....	43
<i>G. Staude, W. Wolf (Universität der Bundeswehr München, Neubiberg, Germany)</i>	
Hierarchical Clustering of Functional MRI Time-Series by Deterministic Annealing .....	49
<i>A. Wismüller (Ludwig-Maximilians-University, Munich, Germany), D. R. Dersch (Integral Energy Corp., Sydney, Australia), B. Lipinski (Max Planck Institute of Psychiatry, Munich, Germany), K. Hahn (Ludwig-Maximilians-University, Munich, Germany), D. Auer (Max Planck Institute of Psychiatry, Munich, Germany)</i>	

Classification of Electro-encephalographic Spatial Patterns .....	55
<i>T. Müller (Zentrum für Datenanalyse und Modellbildung, University of Freiburg, Germany), T. Ball, R. Kristeva-Feige, T. Mergner (Neurologische Universitätsklinik Freiburg, Germany), J. Timmer (Zentrum für Datenanalyse und Modellbildung, University of Freiburg, Germany)</i>	
Detection and Classification of Sleep-Disordered Breathing Using Acoustic Respiratory Input Impedance and Nasal Pressure .....	61
<i>H. Steltner (Center for Data Analysis and Modeling, University of Freiburg, Germany), R. Staats, M. Vogel, C. Virchow, H. Matthys, J. Guttmann (University Hospital Freiburg, Germany), J. Timmer (Center for Data Analysis and Modeling, University of Freiburg, Germany)</i>	
Some Statistical Methods in Intensive Care Online Monitoring - A Review	67
<i>R. Fried, U. Gather (University of Dortmund, Germany), M. Imhoff (Community Hospital Dortmund, Germany), M. Bauer (University of Dortmund, Germany)</i>	
Entropy Measures in Heart Rate Variability Data .....	78
<i>N. Wessel (University of Potsdam, Germany), A. Schumann (University of Applied Sciences Jena, Germany), A. Schirdewan (Humboldt-University Berlin, Germany), A. Voss (University of Applied Sciences Jena, Germany), J. Kurths (University of Potsdam, Germany)</i>	
Determinism and Nonlinearity of the Heart Rhytm .....	88
<i>L. Cimponeriu, A. Bezerianos (University of Patras, Greece)</i>	
<b>Bayes Networks</b>	
Feature Subset Selection Using Probabilistic Tree Structures. A Case Study in the Survival of Cirrhotic Patients Treated with TIPS .....	97
<i>I. Inza (University of Basque Country, San Sebastián, Spain), M. Merino (Basque Health Service - Osakidetza, Comarca Gipuzkoa - Este, San Sebastián, Spain), P. Larrañaga (University of Basque Country, San Sebastián, Spain), J. Quiroga (University Clinic of Navarra, Pamplona - Iruña, Spain), B. Sierra (University of Basque Country, San Sebastián, Spain) and M. Girala (University Clinic of Navarra, Pamplona - Iruña, Spain)</i>	
Deconvolution and Credible Intervals Using Markov Chain Monte Carlo Method .....	111
<i>R. Hovorka (City University London, United Kingdom)</i>	

Graphical Explanation in Bayesian Networks .....	122
<i>C. Lacave (University of Castilla-La Mancha, Ciudad Real, Spain), R. Atienza, F. J. Díez (Universidad Nacional de Educación a Distancia (UNED) Madrid, Spain)</i>	

## Neural Nets

About the Analysis of Septic Shock Patient Data .....	130
<i>J. Paetz, F. Hamker (J.W. Goethe-University Frankfurt am Main and Hospital of the J.W. Goethe-University, Germany), S. Thöne (Hospital of the J.W. Goethe-University, Frankfurt am Main, Germany)</i>	

Data Mining and Knowledge Discovery in Medical Applications Using Self-Organizing Maps .....	138
<i>T. Villmann, W. Hermann, M. Geyer (University of Leipzig, Germany)</i>	

Analysis of Nonlinear Differential Equations: Parameter Estimation and Model Selection .....	152
<i>W. Horbelt, T. Müller, J. Timmer (Freiburger Zentrum für Datenanalyse und Modellbildung, Germany), W. Melzer (University of Ulm, Germany), K. Winkler (University Hospital Freiburg, Germany)</i>	

## Machine Learning

Medical Expert Evaluation of Machine Learning Results for a Coronary Heart Disease Database .....	159
<i>D. Gamberger (Rudjer Bošković Institute, Zagreb, Croatia), G. Krstić (Institute for Prevention of Cardiovascular Disease and Rehabilitation, Zagreb, Croatia), T. Šmuc (Rudjer Bošković Institute, Zagreb, Croatia)</i>	

Combining Methodical Procedures from Knowledge Discovery in Databases and Individual-Oriented Simulation -Data Mining in Time Series- .....	169
<i>F. Köster (Oldenburger Forschungs- und Entwicklungsinstitut für Informatik-Werkzeuge und -Systeme, Germany), R. Radtke (Microsoft Corporation, Redmond, USA), B. Westphal, M. Sonnenschein (Oldenburger Forschungs- und Entwicklungsinstitut für Informatik-Werkzeuge und -Systeme, Germany)</i>	

Inconsistency Tests for Patient Records in a Coronary Heart Disease Database .....	183
<i>D. Gamberger (Rudjer Bošković Institute, Zagreb, Croatia), N. Lavrač (Jožef Stefan Institute, Ljubljana, Slovenia), G. Krstić (Institute for Prevention of Cardiovascular Disease and Rehabilitation, Zagreb, Croatia), T. Šmuc (Rudjer Bošković Institute, Zagreb, Croatia)</i>	

## Architectures for Data Aquisition and Data Analysis

- A MATLAB-Based Software Tool for Changepoint Detection and Nonlinear Regression in Dose-Response Relationships ..... 190  
*S. Wagenpfeil, U. Treiber, A. Lehmer (Technical University of Munich, Klinikum rechts der Isar, Germany)*

- A Web-Based Electronic Patient Record System as a Means for Collection of Clinical Data ..... 198

*L. Fritzsche (University Hospital Charité, Berlin, Germany), K. Schröter, G. Lindemann (Humboldt University Berlin, Germany), R. Kunz, K. Budde, H.-H. Neumayer (University Hospital Charité, Berlin, Germany)*

- The InterAction Database: Synergy of Science and Practice in Pharmacy . 206

*H. Tobi, P.B. van den Berg, L.T.W. de Jong-van den Berg (University of Groningen, The Netherlands)*

## Medical Informatics and Modeling

- A New Computerized Method to Verify and Disseminate Medical Appropriateness Criteria ..... 212

*V. Maojo, L. Laita (Universidad Politecnica de Madrid, Spain), E. Roanes-Lozano (Universidad Complutense de Madrid, Spain), J. Crespo, J. Rodriguez-Pedrosa (Universidad Politecnica de Madrid, Spain)*

- Pharmacokinetic & -dynamic Drug Information and Dosage Adjustment System Pharmdis ..... 218

*F. Keller, D. Czock (University of Ulm, Germany), M. Giehl (Benjamin Franklin University Hospital, Berlin, Germany), D. Zellner (University of Ulm, Germany)*

- Discrete Simulations of Cadaver Kidney Allocation Schemes ..... 225

*D. A. Mattucci, V. Macellari, P. Chistolini, G. Frustagli (Istituto Superiore di Sanita', Rome, Italy)*

- Bootstrap and Cross-Validation to Assess Complexity of Data-Driven Regression Models ..... 234

*W. Sauerbrei, M. Schumacher (Institut für Medizinische Biometrie und Medizinische Informatik, Universitätsklinikum Freiburg, Germany)*

## Genetic and Fuzzy Algorithms

- Genetic Programming Optimisation of Nuclear Magnetic Resonance Pulse Shapes ..... 242

*H.F. Gray (City University London, United Kingdom), R.J. Maxwell (Gray Laboratory Cancer Research Trust, Middlesex, United Kingdom)*

Application of a Genetic Programming Based Rule Discovery System to Recurring Miscarriage Data .....	250
<i>C. Setzkorn, R.C. Paton (University of Liverpool, United Kingdom), L. Bricker, R.G. Farquharson (Miscarriage Clinic, Liverpool Women's Hospital, United Kingdom)</i>	
Detecting of Fatigue States of a Car Driver .....	260
<i>R. Bittner, P. Smrčka, P. Vysoký, K. Hána, L. Poušek, P. Schreib (Czech Technical University in Prague, Czech Republic)</i>	
Operator Method of Fuzzification .....	274
<i>A. Bolotin (Ben-Gurion University of the Negev, Beersheba, Israel)</i>	
<b>Medical Data Mining</b>	
A System for Monitoring Nosocomial Infections .....	282
<i>E. Lamma (Università di Bologna, Italy), M. Manservigi (DIANOEMA S.p.A., Bologna, Italy), P. Mello, S. Storari (Università di Bologna, Italy), F. Riguzzi (Università di Ferrara, Italy)</i>	
A Data Mining Alternative to Model Hospital Operations: Filtering, Adaptation and Behaviour Prediction .....	293
<i>D. Riaño, S. Prado (Universitat Rovira i Virgili, Tarragona, Spain)</i>	
Selection of Informative Genes in Gene Expression Based Diagnosis:	
A Nonparametric Approach .....	300
<i>M. Beibel (University of Freiburg, Germany)</i>	
Principal Component Analysis for Descriptive Epidemiology .....	308
<i>A. Giuliani, R. Benigni (Istituto Superiore di Sanita', Rome, Italy)</i>	
<b>Author Index</b> .....	<b>315</b>



<http://www.springer.com/978-3-540-41089-8>

Medical Data Analysis

First International Symposium, ISMDA 2000 Frankfurt,

Germany, September 29-30, 2000 Proceedings

Brause, R.; Hanisch, E. (Eds.)

2000, XII, 320 p., Softcover

ISBN: 978-3-540-41089-8