



The 6th World Multiconference on Systemics, Cybernetics and Informatics

July 14-18, 2002
Orlando, Florida, USA

PROCEEDINGS

Volume XIII

Concepts and Applications of
Systemics, Cybernetics and Informatics III

Organized by IIIS

International
Institute of
Informatics and
Systemics

Member of
International Federation of
Systems Research IFSR



EDITED BY
Nagib Callaos
Greg Whymark
William Lesso

UB/TIB Hannover 89
124 986 897



CONTENTS

VOLUME XIII

Concepts and Applications of Systemics, Cybernetics and Informatics III

Contents

Human Information Systems

Araki, Junko; Ninomiya, Takashi; Makino, Takaki; Tsujii, Jun'ichi (Japan): "Two Perspective Systems Using a Route as a Reference Object"	1
Chen, Jinji; Mukai, Toshiharu; Takeuchi, Yoshinoru; Matsumoto, Tetsuya; Kudo, Hiroaki; Yamamura, Tsuyoshi; Ohnishi, Noboru (Japan): "Relating Audio-Visual Events Caused by Multiple Movements: In the Case of Entire Object Movements and Sound Location Changes"	5
Hsu, Jeffrey (USA): "The Role Of User Interface On Markup Language Usage: Examining the Impacts of User Interaction (Interaction Mode) on Performance and Satisfaction When Using a Markup Language "	13
Lim, Soojong; Chung, Euisok; Hwang, Yi-Gyu; Yun, Bo-Hyun (Korea- (Republic-of)): "Automatically Constructing Verb Class and Extraction Pattern from Untagged Corpus"	19
Paludo Santos, Cristina; Rodrigues da Silva, Denilson (Brazil): "Integrating Technologies to Assist the Candidate Pre-Selection Process"	25
Shimobaba, Tomoyoshi; Godo, Kazuhiro; Hishinuma, Sinsuke; Horiuchi, Masahiko; Ito, Tomoyoshi (Japan): "Holographic Display System Combined a Reflective Liquid Crystal Display with a Special-Purpose Computer for Holography, HORN-4"	31
Teixeira, Guilherme N.; Feitosa, Raul Q.; Paciornik, Sidnei (Brazil): "Pattern Recognition Applied in Fine Art Authentication"	36
Tsuji, Shogo; Yamamoto, Yoshikazu (Japan): "A Loosely-Coupled Task Model for a Context-Aware Help System"	40
Van der Eijk, C. Christiaan; Van Mulligen, Erik M.; Van Den Berg, Jan (The Netherlands): "Finding Complementary Scientific Concepts Using a Conceptual Associative Spatial Graph"	46
Wada, T.; Yoshii, N.; Yamaji, Y.; Tanaka, S.; Tsukamoto, K. (Japan): "Analysis of Upper Limb Motions in Tennis Swings for Rehabilitation Training"	51
Worm, Arne (Sweden): "A Unified Research Approach to Complex Systems Analysis for High-Risk Mission Command Support"	57

Communication and Cognition

- Hampe, J. Felix; Schönert, Olaf; Schönert, Silke (Germany): "Knowledge Management in Multinational Virtual Projects - Supporting Information Technology based and Interpersonal Communication" 64
- Hoshino, Kiyoshi (Japan): "Dance CG Animation Synthesizer" 70

Economic and Financial Systems

- Anvary Rostamy, Ali Asghar (Iran): "Desining A MCDM Model for Complex Corporate Financing Problems" 75
- Beinsen, Lutz *; Gurgul, Henryk ** (* Austria, ** Poland): "Changes in Foreign Exchange Speculation around the Start of the European Monetary Union" 80
- Bhattacharya, Sukanto (Australia): "Conditional probability of actually detecting a financial fraud—a neutrosophic extension to the application of Benford's law" 86
- Falkowski, B. J.; Wirtschaft, F. B.; Stralsund, F. H. (Germany): "On Soring Systems with Binary Input Variables" 93
- Fernández Jurado, M^a. Yolanda; Vaquero Lafuente, M^a. Esther; Martínez de Ibarreta Zorita, Carlos; (Spain): "Effects of the TIC in the Less Developed Countries" 97
- Haruvy, Nava; Shalhevet, Sarit (Israel): "Economic Evaluation of Wastewater Irrigation and Treatment-Impacts on Groundwater Management" 103
- Jin, Leshan *; Young, Warren ** (* P. R. China, ** Israel): "Water Security and Food Security in China: Challenges, Linkages, and Implications for Policy" 107
- Kim, Sung-Dong; Lee, Jae Won; Lee, Jongwoo (Korea-(Republic-of)): "Induction of Stock Classification Rules Using Distributional Differences" 113
- Nizami, Helal Uddin (Bangladesh): "Banking Sector Reforms in Bangladesh: In Search of Solution" 119
- Nojumi, M. Hassan (USA): "Interest Rate Derivatives and the Market Price of Risk" 125
- Novobilski, Andy; Kamangar, Farhad (USA): "A Genetic Algorithm Based Approach for Discovering Temporal Trends Using Bayesian Networks" 130
- Patni, Chandra K. (UK): "Next Generation of B2B Internet Payment Services in Europe – Revenue and Pricing Model Analysis" 135
- Siddiqi, Abul Hasan *; Manchanda, Pannny **; Kocvara, Michel *** (* Saudi-Arabia, ** India, *** Czech-Republic): "Fast Wavelet-based Algorithms for Option Pricing" 141

Thulasiram, Ruppa K.; Jayaraman, Suresh; Sampath, Srinivasan (Canada): "Financial Forecasting using Neural Networks under Multithreaded Environment"	147
Trinh, Quang; Mitra, Arindam; Thulasiraman, Ruppa K; Thulasiram, Parimala (Canada): "A Multi-Agent Algorithm for Financial Derivatives"	153

Globalization, Development and Emerging Economies

Brown, Molly E. (USA): "The Contribution of Satellite Derived Vegetation to the Variation of Food Prices in Three Sahelian Countries"	159
Marcos, Moises (UK): "A Glance of The Free Trade Agreement Between Mexico and the European Union "	165
Nedanovski, Pece B. (Macedonia): "Globalization, Free Trade And Diversity Of The Systems Of Environmental Standards"	169
Regmi, Suresh Kumar (Nepal): "Software and IT Services in Nepal"	175
Sait, Sadiq M.; Al-Tawil, Khalid M.; Ali, Shahid; Ali, Hussain (Saudi- Arabia): "Use And Effect Of Internet In Saudi Arabia"	181
Umpleby, Stuart A. (USA): "The Design of Intellectual Movements"	187

Systemic, Cybernetic, and Information in Biology and Medicine

Aloisio, Giovanni; Blasi, Euro; Cafaro, Massimo; Mirto, Maria ; Fiore, Sandro (Italy): "A Genetic Algorithm for Medical Image Registration"	192
Barbosa, Ana Karina P.; Novaes, Magdala de A.; de Vasconcelos, Alexandre M. L. (Brazil): "Using an Application to Support Remote Medical Assistance for Constructing an <i>Integrated Network for Cooperation in Health</i> "	198
Cunha, João Paulo; Li, Zhanjian; Martins da Silva, A. (Portugal): "A New Quantified Approach to Video-EEG Analysis in Epileptic Seizures"	203
Chauhan, Sunita; Mishra, Ranjan Kumar (Singapore): "Conceptualization & Implementation of Safety Aspects in Surgical Robotic System"	208
Debrunner, C.; Carollo, J. J.; He, Q. (USA): "Classification of Gait Abnormalities Using Continuous Hidden Markov Models"	214
Heidari Namarvar, Hassan *; Shahidi, A. Vahid ** (* USA, ** Canada): "Detection of Intraventricular Conduction Disturbance in Electrocardiogram Signals by Using a Hybrid Neuro-Fuzzy System"	221
Hong-Kee, Kim; Young, Huh Mee; Sung, Choi Jin; Bin, Kim Hyun; Don, Lee Won (Korea-(Republic-of)): "A method of Secondary Structure Prediction of Protein by Error Back Propagation"	227
Kilduff, Margaret; Blewett, Doug (USA): "The Informatics of a Specialty Practice in a Health Sciences University"	231

Kim, Hyung-Rae; Kim, Ki-Hong; Sin, Su-In; Kim, Soo-Yong; Go, Hyo-Jin (Korea-(Republic-of)): "Interhemispheric dysfunction in Alzheimer's disease revealed by mutual information of multi-channel EEG"	237
Kim, Ki Ho; Park, Seon Hee; Chi, Myung Hwan; Yoon, Chang No (Korea-(Republic-of)): "Real-Time Force Vector Generation for Molecular Visualization System"	244
Kofránek, Jiří; Andrlík, Michal; Kripner, Tomáš; Mašek, Jan (Czech-Republic): "From Art to Industry in Design of Biomedical Simulators – Experience of the Golem Simulator Project"	249
Lamberti, Fabrizio; Montrucchio, Bartolomeo; Sanna, Andrea; Zunino, Claudio (Italy): "A Web-based Architecture Enabling Multichannel Telemedicine Applications"	257
Mangina, Eleni *; Giavasis, Ioannis ** (* Ireland, ** UK): "The theoretical framework of agent based monitoring for use in the production of gellan gum in a microbial fermentation system"	262
Nakanishi, Kenichi; Pan, Tao; Hashimoto, Atsushi; Kameoka, Takaharu (Japan): "Quantification System of Ionic Dissociative Materials in Glycolytic Pathway using Infrared Spectroscopic Information"	268
Nawab, S. Hamid; Wotiz, Robert; Hochstein, Lorin; De Luca, Carlo J. (USA): "Improved Decomposition Of Intramuscular Emg Signals"	274
Nirmaier, Thomas; Droste, Dirk; Bille, Josef (Germany): "Hartmann-Shack Sensor ASIC's for Real-Time Adaptive Optics in Biomedical Physics"	280
Park, Seo-Hee; Hwang, Young-Sup; Choi, Jae-Hun (Korea-(Republic-of)): "Dynamic Patterns in a Biological Neural Network Model with Time-delayed Interactions"	285
Park, Seon-Hee; Hwang, Young-Sup; Choi, Jae-Hun (Korea-(Republic-of)): "Multistable Phase Locking Patterns in a Bursting Neural System"	288
Qidwai, Uvais (USA): "Predictive Model for Stem Cell Cultures Using Auto-Regressive Coefficients"	292
Shin, Miyoung *; Goel, Amrit L. **; Park, Seon Hee * (* Korea-(Republic-of), ** USA): "Error Control in Medical Classification Models"	298
Wu, Chia-Hsiang; Lin, Sheng-Che; Sun, Yung-Nien (Taiwan): "Robust Measurement of Human Faces"	302
Wu, Shiquan; Gu, Xun (USA): "Random Shuffling Permutations of Nucleotides"	308
Yamauchi, Satoshi; Hashimoto, Shigehiro; Murashige, Yoshinori; Oku, Hiroshi; Sakai, Masahiko; Sahara, Tomohiro; Otani, Hajime; Imamura, Hiroji (Japan): "Measurement System for Local Electric Impedance of Gel in Cell With Vibrating Electrode"	314
Zoltani, Csaba K.; Baskin, Steven L (USA): "Computer Simulation of the Effects Organophosphate-Induced Cardiac Toxicity"	320

SCI in Psychology, Cognition and Spirituality

Ahmed, Khorsi (Algeria): "A New Model for Knowledge Representation and Automatic Deduction for A.I applications"	324
Fels, D. I.; Degan, S. S.; Guergachi, A. A. (Canada): "Modeling Fear, Anger, Sadness, and Happiness, for Alternative Displays"	330
George, Susan E. (Australia): "An Artificial Intelligence Informed by Theology"	336
Kagan, Val G. (USA): "Totalitarianism, Terrorism and Mechanisms of Truth Values Formation in Human Brains"	342
Khrustalev, Oleg A.; Timofeevskaya, Olga D. (Russian-Federation): "Towards Quantum Mechanism of Sensory Transduction"	347
Kovchegov, Vladislav B. (USA): "The Mathematical Theory of Emerging and Altering Groups in Human Society"	353
Parenthoen, Marc; Tisseau, Jacques; Morineau, Thierry (France): "Autonomy and Proactive Perception for Virtual Actors"	359
Rybalov, Alexander *; Yager, Ronald R. ** (* Israel, ** USA): "Explicit and Implicit Knowledge in Approximate Reasoning and Cognitive Modeling"	365
Schweizer, Karin (Germany): "A Flow Model Approach to Priming Processes"	371
Shibukawa, Miki; Kasamatsu, Keiko; Funada, Mariko; Ninomija, Satoki P. (Japan): "On Necessity of Comfortable Working Environment for Women at Management"	377
Shibukawa, Miki; Tomoda, Hisao; Suzuki, Satoshi; Kasamatsu, Keiko; Ninomija, Satoki (Japan): "An Analyzing Method for Finger Motion of Mobile Phone Operation"	381
Vityaev, Eugenie Evgenievich; Starikova, Irina Viktorovna (Russian-Federation): "Two new Principles of Brain Activity"	385

Computational Intelligent Methods in Medicine – Invited Session

Organizer: Michael Odetayo (United-Kingdom)

Burn-Thornton, K. E.; Thorpe, S. I. (UK): "Making the Most Use of Data in Order to Provide Accurate Clinical Decision Support Systems (CDSSs) for Use in the Determination of Heart Disease: The Burn-Thornton Curves"	388
Oduşanya, A. A. *; Odetayo, M. O. *; Petrovic, D. *; Naguib, R. N. G. *; Lakshmi, M.S. *; Sherbet, G. V. ** (* UK, ** USA): "A Genetic Algorithm-based Model for Breast Cancer Prognosis"	394
Price, S.; Summers, R. (UK): "To Determine the Efficacy of Headings in the	398

Representation of Clinical Data"

- Seker, H.; Odetayo, M.O.; Petrovic, D.; Naguib, R.N.G. (UK): "Prognostic Decision Making in Prostate and Breast Cancers: Comparison of Statistical, Neural Networks and Fuzzy Approaches" 402

Bioinformatics and Cybernetics: from Gene expression to social interaction – Invited Session

Organizer: Paul Shapshak (USA)

- Kramer, H. Kenneth (USA): "Cell Signalling: The Role of Phosphorylation in Producing Receptor Desensitization and Drug Tolerance.(#633QL)" 406
- Page, J. Bryan (USA): "Networks of Informal Social Relations and HIV: Problems in Characterization and Analysis" 412
- Shapshak, Paul; Stengel, Robert (USA): "Discovering Brain Mechanisms and the Rules of Molecular Biology" 418
- Stengel, Robert F.; Ghigliazza, Raffaele (USA): "Stochastic Optimal Enhancement of Immune Response" 424

Biomedical Signal and Image Processing - Invited Session

Organizer: Taghi Mostafavi (USA)

- Jason Chen, Jia-Jin; Wu, Chi-Hsun; Lin, Chi-Hsuan; Li, Jian-Shu; Bih, Liu-Ing (Taiwan): "Image Analysis System for Acquiring Three-Dimensional Footprint Contour" 431
- Karimi, Bijan; Baradaran-seyed, Taraneh (USA): "A Systolic Array Architecture For 2-D Discrete Hartley Transform" 434
- Najarian, K.; Bak, E.; Li, Z.; Fan, J.; Brockway, J.; Harris, S. (USA): "Computer-Based Automated Classification of Pap Smear Tests Using Neural And Fuzzy Classifiers" 441
- Tavakoli, Siamak *; Ahmadiania, Kasra **; Ashenayi, Kaveh ** (* Germany, ** USA): "A Novel Glaucoma Detector" 445

Medical Imaging and Image Analysis/Indexing/Retrieval – Invited Session

Organizer: Xuli Zong (USA)

- Lee, Chung-Wei; Yeh, Jyh-Haw (USA): "A Real-Time Multimedia Medical Information System in Mobile Environments" 451
- Schmalz, Mark S. (USA): "Analysis of Error in Digital Image Processing Algorithms Using Coincidence Measures" 457
- Schmalz, Mark S. (USA): "Error Measurement Benchmarks and Techniques for Medical Image Compression Algorithms" 463

Ethics and Artificial Intelligence – Invited Session

Organizer: Rodney Smith (USA)

Hibbard, William L. (USA): "Emotions Versus Laws as the Keys to the Ethical Design of Intelligent Machines"	469
Leven, Sam (USA): "Conflict Detection and Resolution within Intelligent Agents"	473
Pribram, Karl (USA): "Choice and Values"	479
Smith, Rodney G. (USA): "Towards an Ethical Hierarchy in Artificial Intelligence"	481

Functional patterns and strategy of Fibonacci in irreversible processes – Invited Session

Organizer: Boris Palamarchuk (Ukraine)

Kalion, V. A. (Ukraine): "Some Results of Mathematical Modeling of Microcirculation Blood Flow"	487
Kryshov, G. *; Nastenka, E. *; Maksymenko, V. *; Palets, B. *; Philipp, A. **, Grzenkowski, U. ** (* Ukraine, ** Germany): "The Possible Role of Golden Section Invariants of Cardio-Vascular System Functional Parameters"	488
Nastenko, E. (Ukraine): "Self-Organization Phenomena in Databases of Quantitative Parameters of Complex Systems. Fibonacci-Like Strategy of Regularities Recognition"	490
Palamarchuk, B. I. (Ukraine): "Functional Patterns of Strong Blast and their Analogs in Biological Processes"	491

Digital Processing and Recognition of the Brainstem Auditory Evoked Potentials (BAEP) – Invited Session

Organizer: Andrzej Izworski (Poland)

Izworski, Andrzej; Tadeusiewicz, Ryszard; Paslawski, Andrzej (Poland): "The Context Analysis of BAEP Signals by Application of Neural Networks"	492
Kochanek, Krzysztof; Janczewski, Grzegorz; Skarzynski, Henryk; Pilka, Adam (Poland): "A Comparison of Auditory Brainstem Responses Elicited by Tone Pips with the Same Rise/Fall Times but Different Acoustic Spectra in Subjects with High-Frequency Hearing Loss"	497
Lorens, Artur; Piotrowska, Anna; Śliwa, Lech; Walkowiak, Adam; Skarzynski, Henryk; Wąsowski, Arkadiusz (Poland): "Application of Stapedius Muscle Reflex Measurement in Cochlear Implant Speech Processor Fitting"	502

Signal Processing and Computational Intelligence in Medical Diagnostics – Invited Session

Organizer: Daniel J. Strauss (Germany)

Delb, W.; Plinkert, P. K. (Germany): "A Time-Scale Feature Extraction Scheme for the Automated Detection of Binaural Interaction in Auditory Brainstem Responses"	505
Hoppe, Ulrich; Doellinger, Michael; Lohscheller, Joerg; Eysholdt, Ulrich (Germany): "Mechanisms of Hoarseness - Visualization and Interpretation by Means of Nonlinear Dynamics"	511
Quian Quiroga, R. *; van Luijelaar, E. L. J. M. ** (* USA, ** The Netherlands): "A Wavelet Denoising Implementation for Obtaining Single-Stimulus Evoked Potentials"	516
Walter, Thomas; Klein, Jean-Claude (France): "A Computational Approach to Diagnosis of Diabetic Retinopathy"	521

Track on Conceptualisation and Implementation of Methodologies for Support of System Design – GDSS – Invited Session

Organizer: Greg Whymark (Australia)

Callan, Jim; Whymark, Gregory K. (Australia): "Surfacing Assumptions Related to Telework: Task Analysis Involving GSS to Investigate Work Design"	527
McCulloch, Rod; Whymark, Gregory K. (Australia): "Adaptation of Technology into an Informal Collaborative Environment"	533
Ward, Sylvia; Whymark, Gregory K. (Australia): "Using GSS technology to support teams of young students dispersed in Australia's remote outback"	538
Whiteley, Alma (Australia): "Core values, GSS and Social Constructionism: Paradigmatic Reflections. A concept by Stephen Simpson (Whiteley, Simpson and Soutar, 2000)"	544
Whiteley, Alma; Marcelo, Mauro (Australia): "An Integrative Connectedness Approach to IS Helpdesk Design"	551
Wood, Elliot; Blyth, David (Australia): "Use of GSS to Develop Comprehensive Risk Profiles on Major Resource Projects: A Case Study and Process Template"	557

Human Information Systems

Pinkett, Randal D. (USA): "Toward Social and Cultural Resonance with Technology: Case Studies from the Creating Community Connections Project"	564
--	-----

Systemic, Cybernetic, and Information in Biology and Medicine

Aloisio, Giovanni; De Paolis, Lucio; Provenzano, Luciana; Cafaro,	570
---	-----

Massimo; Colizzi, Lucio (Italy): "Coronary Stent Implant Simulation using an Haptic Interface: Problems and Solutions"

Xu, Chuanbo; Windemuth, Andreas; Lan, Zhang-Hua; Duan, Daniel ; Wan, Cindy; Hawkes, Kirby; Zhai, Jun; Nalabalou, Sumana; Zhang, Shaowei; Wei, Min; Jiang, Ruhong; Judson, Richard (USA): "Application of Relational Database Management System and Object-Oriented Programming in Pharmacogenomics Based Drug Development Process" 574

Medical Imaging and Image Analysis/Indexing/Retrieval

– Invited Session

Organizer: Xuli Zong (USA)

Chen, Y.; Thiruvankadam, S. R.; Gopinath, K. S.; Briggs, R. W. (USA): "fMRI Image Registration using the Mumford-Shah Functional and Shape Information" 580

Digital Processing and Recognition of the Brainstem Auditory Evoked Potentials (BAEP) – Invited Session

Organizer: Andrzej Izworski (Poland)

Bulka, Jaroslaw; Wochlik, Ireneusz; Izworski, Andrzej; Bania, Piotr (Poland): "Determination of diagnostic parameters in the BAEP Signal Analysis" 584

Signal Processing and Computational Intelligence in Medical Diagnostics – Invited Session

Organizer: Daniel J. Strauss (Germany)

Jung, Jens; Steidl, Gabriele; Strauss, Daniel J. (Germany): "Hybrid Wavelet-Kernel Machines in Endocardial Signal Analysis" 588

SCI in Psychology, Cognition and Spirituality

Dixit, Vijayanti Ulhas (India): "Left Handed Persons and Related Issues" (Invited Paper) 593

Harter, Derek; Kozma, Robert (USA): "Simulating the Principles of Chaotic Neurodynamics" 598

Ethics and Artificial Intelligence – Invited Session

Organizer: Rodney Smith (USA)

Smith, Rodney G. (USA): "Multi-Layer Intelligent Agents: Context, Perspective, and Ethics" 604