

Proceedings

**International Conference
on Systems Engineering
ICSEng 2008**

**19 - 21 August 2008
University of Nevada, Las Vegas, Nevada**

19th International Conference on Systems Engineering

ICSEng 2008

Table of Contents

Preface.....	xii
Committees.....	xiii

1 - Aerospace Systems

Global Positioning System: A Case Study Focused on Systems Engineering	3
<i>Randall Bullard, John Colombi, and G. Richard Freeman</i>	
Human-Robot Lunar Exploration: Pressurized vs. Unpressurized Rovers	8
<i>C. Weisbin, J. Mrozinski, H. Hua, K. Shelton, J. H. Smith, A. Elfes, W. Lincoln, V. Adumitroaie, and R. Silberg</i>	
A Signal Processing Technique for Improving the Accuracy of MEMS Inertial Sensors	13
<i>Peter A. Stubberud and Allen R. Stubberud</i>	
Systems Engineering Data Book (SEDB) – A Product Baseline Definition and Tracking Tool	19
<i>W. D. Deininger, C. M. Cottingham, L. Kanner, and M. A. Verbeke</i>	

2 - General Control Systems

On Existence of Non-stationary Realization of a Linear Multivariable Control System	27
<i>V. A. Rusanov, A. V. Daneev, A. E. Kumenko, and D. Yu. Sharpinskiy</i>	
Computation of Positive Realizations of Singular MIMO Hybrid Linear Systems	32
<i>Sajewski Lukasz and Tadeusz Kaczorek</i>	
Visualization of Active Suspension by Robust Controller in Virtual Reality Toolbox	38
<i>Štěpán Ožana</i>	
On the Development and Usage of the Market Economy Parametrical Regulation Theory on the Basis of One-Class Mathematical Models	43
<i>Abdykappar A. Ashimov, Nurlan A. Iskakov, Yuriy V. Borovskiy, Bahyt T. Sultanov, and Askar A. Ashimov</i>	

Non-minimal State Dependent Riccati Equation and Pole Assignment Control of Nonlinear Systems	49
<i>C. James Taylor and Arun Chotai</i>	
Modeling of Nonlinear Block-Oriented Systems Using Orthonormal Basis and Radial Basis Functions	55
<i>Rafał Stanisławski, Wojciech P. Hunek, and Krzysztof J. Latawiec</i>	
Computed Torque Control of a Quaternion Based Space Robot	59
<i>Douglas R. Isenberg and Y. P. Kakad</i>	
An Improved Recursive Frisch Scheme Identification Algorithm	65
<i>Jens G. Linden, Tomasz Larkowski, and Keith J. Burnham</i>	
Identification of Errors-in-Variables Systems via Extended Compensated Least Squares for the Case of Coloured Output Noise	71
<i>Tomasz Larkowski, Jens G. Linden, Benoit Vinsonneau, and Keith J. Burnham</i>	
Modelling of Hybrid Electric Vehicle All Wheel Drive Driveline System Incorporating Clutch Models	77
<i>Dariusz Cieślak, Jens G. Linden, Keith J. Burnham, Matthew Hancock, and Francis Assadian</i>	
Stability of Delayed Systems Modeled by Fractional Models	83
<i>M. de la Sen</i>	
On Abstraction and Interpretability: A Behavioural Perspective	89
<i>Raphael Pfaff and Keith J. Burnham</i>	

3 - Power Systems

Electromagnetic Interference between Electrical Power Lines and Neighboring Pipelines	97
<i>Ahmed A. Hossam-Eldin and Wael Mokhtar</i>	
Condition Monitoring on Power Systems	103
<i>Francisco Poza, Perfecto Marino, Santiago Otero, and Vicente Pastoriza</i>	
TRT System for Heat Pumps	109
<i>Radovan Hájovský and Martin Pieš</i>	
Algorithms for Balancing Demand-Side Load and Micro-Generation in Islanded Operation	115
<i>Albert Molderink, Vincent Bakker, Johann L. Hurink, and Gerard J. M. Smit</i>	
New Control Strategy for Multiphase Matrix Converter	121
<i>Jerzy Szczepanik and Tomasz Sieńko</i>	
Random Forests Identification of Gas Turbine Faults	127
<i>Manolis Maragoudakis, Euripides Loukis, and Panagiotis-Prodrornos Pantelides</i>	

4 - Intelligent Systems

Application of Artificial Neural Networks (ANNs) to Predict Air Quality Classes in Big Cities	135
<i>W. Kaminski, J. Skrzypski, and E. Jach-Szakiel</i>	
Neural Models for Prediction of Maximum Daily Particulate Matter PM10 Concentration in the Air in Big Cities as Ecological Safety Management Tools	141
<i>J. Skrzypski, E. Jach-Szakiel, and W. Kaminski</i>	
Object Recognition with Discriminative Elastic Grids	147
<i>Krzysztof Ślot and Hubert Nowak</i>	
Analysis of System Identification Using the Neural Extended Kalman Filter	153
<i>Stephen C. Stubberud and Kathleen A. Kramer</i>	
Hybrid Adaptative System of Gas Concentration Prediction in Hard-Coal Mines	159
<i>Marek Sikora, Zdzisław Krzystanek, Bożena Bojko, and Karol Śpiechowicz</i>	
Backpropagation through Time for Learning of Interconnected Neural Networks – Identification of Complex Systems	165
<i>Jarosław Drapala and Jerzy Świątek</i>	
Prediction of Queue Lengths in the Multi-Queue-Single-Processor Queuing System Based on Fuzzy-Neural Approach	171
<i>Paweł Świątek</i>	
A University Management Analysis System for Qualitative Strategy Planning	177
<i>Tokuro Matsuo and Takayuki Fujimoto</i>	
The Need of Intelligent Driver Training Systems for Road Safety	183
<i>Husnain Malik and Andry Rakotonirainy</i>	
Domestic Heat Demand Prediction Using Neural Networks	189
<i>Vincent Bakker, Albert Molderink, Johann L. Hurink, and Gerard J. M. Smit</i>	
Selecting Scenario in Adaptive System with Neuro-Fuzzy Decision Maker	195
<i>Krzysztof Brzostowski and Jerzy Świątek</i>	
A Formalization of Quantity Based Double Auction Mechanism	201
<i>Satoshi Takahashi and Matsuo Tokuro</i>	
Adaptive Congestion Control in Computer Networks	205
<i>Magdalena Turowska</i>	

5 - Industrial Automation and Robotics

Modeling of a Vector Controlled Induction Motor for a Demonstration System	213
<i>Gerd W. Wöstenkühler, Thomas Waldhelm, Thomas Wilde, and Christian Heidenreich</i>	
An Approach to Technological Process Control Systems Based on Model with Technological Coalitions	219
<i>Alexander A. Ambartsumian and Dmitry L. Kazansky</i>	
Industrial Transportation Network by Utilization of a Pilot Cable with a Single Frequency	225
<i>Dan Gogoncea and Lidia Cristea</i>	

Possibilities of Development in the Single-Pass Internal Cylindrical Grinding	230
<i>Krzysztof Nadolny and Jarosław Plichta</i>	
Single-Pass Grinding – An Effective Manufacturing Method for Finishing	236
<i>Krzysztof Nadolny, Jarosław Plichta, Daniela Herman, and Bronisław Słowiński</i>	
An Evaluation of Visual Interfaces for Teleoperated Control of Kinematically Redundant Manipulators	242
<i>Shantell R. Hinton, Randy C. Hoover, and Anthony A. Maciejewski</i>	
Estimation of Time and Cost Oriented Assembly Line Balancing Problem	248
<i>Waldemar Grzechca</i>	
Implementation of an Electronic Park Brake Feature with Limited Data Availability	254
<i>K. Ślósarczyk, J. G. Linden, K. J. Burnham, K. Cockings, and R. Capolongo</i>	
Predictive Profile Control for a Hot Strip Mill	260
<i>T. Mróz, G. Hearn, T. Bilkhu, K. J. Burnham, and J. G. Linden</i>	
CG-Guided Signature of Polygon	266
<i>Hina Jain and Laxmi Gewali</i>	

6 - Information and Communication Systems

Implementation of Recursive Queries for Information Systems	273
<i>Kazem Taghva and Jayalakshmi Jeyaraman</i>	
Preliminary Study on Optimization of Data Distribution in Resource Sharing Systems	276
<i>Grzegorz Chmaj and Krzysztof Walkowiak</i>	
A Hybrid Orthogonal Genetic Algorithm for Global Numerical Optimization	282
<i>Peter A. Stubberud and Matthew E. Jackson</i>	
Strategy of Digital Contents Archive Based on Reputation Model	288
<i>Hiroyuki Kawano</i>	
Design and Evaluation of IP Multipath Transmission with Feedback	294
<i>Takahiro Kawamoto and Kunio Goto</i>	
Heterogenic Distributed System for Cryptanalysis of Elliptic Curve Based Cryptosystems	300
<i>Piotr Majkowski, Mariusz Rawski, Tomasz Wojciechowski, Zbigniew Kotulski, and Maciej Wojtyński</i>	
Review of Packet Switching Technologies for Future NoC	306
<i>Dawid Zydek, Neveen Shlayan, Emma Regentova, and Henry Selvaraj</i>	

7 - Distributed Computer and Computer Networks Systems

Algorithms for Capacities and Flow Assignment Problem in Computer Networks	315
<i>Abdulhakim F. Zantuti</i>	
Tabu Search Algorithm for Two-Layer Networks Design Problem	319
<i>Krzysztof Lenarski, Bartosz Czajka, Iwona Poźniak-Koszalka, and Andrzej Kasprzak</i>	
Virtual Capacity and Dimensioning Issues in Multilayer Networks	325
<i>Michał Kucharzak, Leszek Koszalka, and Andrzej Kasprzak</i>	
Performance Study of Routing Protocols for Wireless Mesh Networks	331
<i>Anna Zakrzewska, Leszek Koszalka, and Iwona Poźniak-Koszalka</i>	

Optimization of Two-Level Topological Structure of Distributed Intrusion Detection System	337
<i>Adam Grzech</i>	

8 - Analog and Digital Hardware Systems

Dedicated Hardware Architecture for Partially Mapped Crossover	345
<i>Masaya Yoshikawa and Hidekazu Terai</i>	
Application of Functional Decomposition in Synthesis of Boolean Function Sets	350
<i>Pawel Morawiecki, Mariusz Rawski, and Henry Selvaraj</i>	
A Graph-Based Approach to Symbolic Functional Decomposition of Finite State Machines	356
<i>Piotr Szotkowski, Mariusz Rawski, and Henry Selvaraj</i>	
Personalized Location Area Design with Genetic Algorithm for Future PCS Networks	362
<i>Radhika Varadarajan, Emma Regentova, and Jun Zheng</i>	
Reducing the Discovery Overheads in a DHT Based P2P Network by Using Virtual Resources	368
<i>Uram H. Yoon, Keon-Il Jeong, Kyung-Lang Park, Jiyon Han, Jaemin Ahn, Jeonghwa Song, and Shin-Dug Kim</i>	
Characterizing Free-Regions of Sensor Nodes	375
<i>Navin Rongratana, Laxmi Gewali, and Henry Selvaraj</i>	
Design Rationale in System Design	380
<i>J. Verries, A. E. K. Sahraoui, and M. Paludetto</i>	

9 - Biometrics Systems

Bio-Surveillance Monitoring with a Wireless Network	389
<i>P. Marino, F. P. Fontán, M. A. Domínguez, and S. Otero</i>	
Fingerprint Alignment with Deformable Templates	395
<i>Krzysztof Ślot and Marek Goździk</i>	
Detection Algorithms for the Nano Nose	399
<i>J. M. Karthikeya Udayagiri V. R., Taleb Moazzeni, Yingtao Jiang, and Biswajit Das</i>	

10 - Photonics and Lighting Systems

A Novel RGBW Pixel for LED Displays	407
<i>Neveen Shlayan, Rama Venkat, Paolo Ginobbi, and Glenn Mercier</i>	
A Robotic Spectrometer System for LED Display Measurements	412
<i>Glenn Mercier, Jonathan Ross, Paolo Ginobbi, and Rama Venkat</i>	

11 - System Engineering Standards, Paradigms, Metrics, Testing, etc.

Design of the Electronic Protection Systems with Utilization of the Method of Analysis of Reliability Structures	421
<i>Adam Rosinski</i>	
Evolutionary Algorithm Reinforce with Linear Projection and Clustering	427
<i>E. Tomczak and W. Kaminski</i>	

A Task Scheduling Procedure in Multimachines System for Special Type of Processing Time Function	431
<i>Zbigniew Buchalski</i>	
Modeling Techniques Used in Addressing the Quality of Software	436
<i>Peter A. Keiller, Thomas A. Mazzuchi, and Marlon Mejias</i>	
Modernizing Software & System Engineering Processes	442
<i>Liliana Favre</i>	
The Shape of Technical and Economical Conditioning of Distribution Centers in Optimization Problem of Supply Chain	448
<i>Fijalkowski Janusz, Ambroziak Tomasz, and Jacyna Marianna</i>	
The Modeling of the External Cost Influence on the Modal Split in the Transport Network	453
<i>Jacyna Marianna</i>	
MAE-P3 – A System to Gain Transparency of Production Structure as a Basis for Production Relocation Planning	458
<i>Frederik Reichert, Andreas Kunz, and Ralf Moryson</i>	
Multi-criterion Evaluation of Development Strategy Components in the Presence of Intangibles and Uncertainty	464
<i>Mirosław Dyteczak and Grzegorz Ginda</i>	
A SOA-Based Vulnerability System Engineering for E-Government Solution	468
<i>Namho Yoo</i>	
Determination of Active Pattern during the Conceptual Design of Self-Optimizing Systems Demonstrated by an Air Gap Adjustment System	474
<i>Jürgen Gausemeier, Herbert Podlogar, Jörg Donoth, Detmar Zimmer, and Alexander Schmidt</i>	
Reflective Framework for Interactive Modeling and Simulation of Intelligent Systems	480
<i>Vladimír Janoušek and Előd Kironský</i>	
Identification of Key Development Areas for the Opole Region	486
<i>Mirosław Dyteczak and Grzegorz Ginda</i>	
Vector Conception of Technical Systems' Dependability	492
<i>Lech Bukowski and Jerzy Feliks</i>	
TTCN-3 Test Data Analyser Using Constraint Programming	498
<i>Diana Vega, George Din, and Ina Schieferdecker</i>	
An Objective Method to Measure the Effectiveness of a Risk Management System	508
<i>Milton A. Austin III and M. H. Samadzadeh</i>	
Particle Attrition Analysis in a High Temperature Rotating Drum	512
<i>B. R. Vijayarangan, Samir Moujaes, and Michael Flores</i>	
12 - Computer Assisted Medical Diagnostic Systems	
2D & 3D Shepp-Logan Phantom Standards for MRI	521
<i>H. Michael Gach, Costin Tanase, and Fernando Boada</i>	

Applying Role-Based Access Control in Combining the Chinese and Western Medicine Systems	527
<i>Mei-Yu Wu and Yao-Bao Fong</i>	
A New Method of Detecting Microcalcification Clusters for Computer Aided Digital Mammography	532
<i>G. Veni, E. E. Regentova, and A. K. Mandava</i>	
A Network-Enabled Platform for Reducing Hospital Emergency Department Waiting Times Using an RFID Proximity Location System	538
<i>D. Sanders, S. Mukhi, M. Laskowski, M. Khan, B. W. Podaima, and R. D. McLeod</i>	
Epidemic Modeling with Discrete Space Scheduled Walkers	544
<i>M. Borkowski and R. D. McLeod</i>	
Poster Papers	
Fuzzy Approach in Quality Management of Higher Education	553
<i>Lidia Cristea and Dan Gogoncea</i>	
Remarks on Automated Ontology Merging Algorithm	555
<i>Monika Koprowska</i>	
Detection of Cardiac-Related Diseases Using Nonlinear Analysis of Short-Term ECG Signal with Aural Stimuli	557
<i>Rafal Ladysz, Tomasz Fabiszak, Wojciech Pospiech, Marta Pilaczynska-Cemel, and Jacek Kubica</i>	
Author Index	561