

2012 Proceedings of the 35th International Convention MIPRO

**Opatija, Croatia
21-25 May 2012**

Pages 1-904



IEEE Catalog Number: CFP1239K-PRT
ISBN: 978-1-4673-2577-6

MIPRO 2012

35th International Convention on Information and Communication Technology, Electronics and Microelectronics

Microelectronics, Electronics and Electronic Technology

Erbium Doped Silica Microspheres for Lasing Applications	1
D. Ristic, L. Lunelli, A. Chiasera, P. Feron, G. Cibiel, M. Ivanda, G. Righini, M. Ferrari	
Synthesis Flow for Designing a High Performance Microprocessor	5
B. Malnar	
Porous Silicon Prepared by Electrochemical Etching of Silicon Eptaxial Layer	13
M. Ivanda, M. Balarin, O. Gamulin, V. Djerek, D. Ristic, S. Music, M. Ristic, K. Furic, Z. Crnjak Orel	
Formation and Luminescence of P-type Porous Polycrystalline Silicon	15
V. Djerek, M. Ivanda, M. Balarin, O. Gamulin, M. Ristic, S. Music, K. Furic, Z. Crnjak Orel	
Role of the Substrate and the Temperature of Deposition on the Properties of the Ta_xN Thin Films	17
M. Ocko, S. Zonja, M. Ivanda	
On the Application of Boron and Phosphorus Heavily Doped LPCVD Polycrystalline Silicon Thin Films as Thermoelectric Materials	19
S. Zonja, M. Ocko, M. Ivanda, T. Suligoj, P. Biljanovic	
Room Temperature Visible Luminescence in Wide Band Gap Chalcogenide Glasses	21
V.M. Mitsa, R.M. Holomb, G. Lovas, M. Ivanda, G.Yu. Rudyko, E.G. Gule, I.V. Fekeshgazi	
Preparation and Research in Resistive-Strain Sensor Based on Transparent Conducting Graphene Sheets	23
A.S. Berdinsky, I.A. Reshetnyak, J.B. Yoo, E.D. Grayfer, V.G. Makotchenko, V.E. Fedorov	
Study of Electronic Structures of MoX₂ (X = S, Se, Te): Arguments for Interactions of Molybdenum Atoms in Layers	25
V.E. Fedorov, I.V. Mirzaeva, S.G. Kozlova, E.D. Grayfer, M.V. Medvedev	
Investigation of Memory Effect by Measurement of Time Delay of Electrical Breakdown in Commercial Gas filled Surge Arresters	27
M.M. Pejovic, N.T. Nesic, M.M. Pejovic, N.J. Bogdanovic	
RADFET as a Sensor and Dosimeter of Gamma-Ray Irradiation	31
M.M. Pejovic, M.M. Pejovic, N.T. Nesic	
Modelling of Electrical Characteristics of Ultrashallow Pure Amorphous Boron p+n Junctions	36
T. Knezevic, T. Suligoj, A. Sakic, L.K. Nanver	

Model Optimization of Nanocrystalline Si:H Thin Film Solar Cells V. Tadic, Lj. Majdandzic, J. Gros	42
Measurement of Thermal Boundary Resistance in AlGaIn/GaN HEMTs Using Liquid Crystal Thermography D. Babic, Q. Diduck, J. Smart, D. Francis, F. Faili, F. Ejeckam	48
Design of a Planar Inductor for DC-DC Converter on Flexible Foil Applications J. Kundrata, A. Baric	54
Development of an Analog Simulator for the Transient Analysis of Electric Circuits, with the Aim of Teaching Circuit Phenomena by Simulating Equations M. Jenko	60
A Fast and Accurate Simulation Method of Impulse Sensitivity Function in Oscillators F. Pepe, A. Bonfanti, A. Lacaita	66
A Brief Overview of the Black-Box Behavioural Modelling of Electronic Circuits for Transient Simulations V. Ceperic, A. Baric	72
A 2.5-GHz GaN Power Amplifier Design and Modeling by Circuit-Electromagnetic Co-Simulation A. Broznic, R. Blecic, A. Baric	78
Pseudo-Exponential Computational Circuit with Improved Accuracy and Frequency Response C. Popa	83
The Simple CMOS Negative Capacitance with Improved Frequency Response B. Mrkovic, M. Asenbrener	87
Impact of Bipolar Transistor Parameters on the Characteristics of the Double-Balanced Mixer J. Zilak, M. Koricic, T. Suligoj	91
Logic Circuits with High-Impedance Output State for Interconnection of Ternary and Binary CMOS Digital Circuits and Systems D. Bundalo, Z. Bundalo, F. Softic, M. Kostadinovic, D. Pasalic	97
Limitations of the CVSL Driver as Voltage Level Booster for Switching Capacitors in High-Gain Charge Pumps D. Vinko, T. Svedek, A. Baric	103
Intelligent Power MOSFET Driver ASIC J. Podrzaj, A. Sesek, J. Trontelj	107
Reconfigurable Processor Architectures: Varieties and Representations D. Kirasic, D. Basch	112
A Novel Solution for Realisation of Data Transfer in Borehole Measurement Systems V. Dogan, M. Brkic, N. Vukoje, G. Mancic, M.B. Zivanov	118
Design of CIC Compensators with SPT Coefficients Based on Interval Analysis M. Glavinic Pecotic, G. Molnar, M. Vucic	123

Method for Selection of Switches for Power Electronic Converters I. Mrčela, V. Sunde, Z. Bencic	129
Simple Control System for Power Converter Connecting Electrochemical Dual-Layer Capacitors to DC Link T. Cihak, Z. Jakopovic	135
Wireless Power Transfer for Mobile Phone Charging Device L. Olvitz, D. Vinko, T. Svedek	141
Hardware Realization of Autonomous Robot Localization System M. Brkic, M. Lukic, J. Bajic, B. Dakic, M. Vukadinovic	146
Development of Cost-Effective Redundant Digital Excitation Control H. Lee, H. Ryu, J. Kwon, G. Park, I. Kim, H. Kim	151
A Fully Integrated Multicolor Photoreceiver J. Dong, W. Gaberl, K. Schneider-Hornstein, H. Zimmermann	156
The Frequency-Modulated Reflective Color Sensor J.S. Bajic, B. Dakic, D.Z. Stupar, M.P. Slankamenac, M.B. Zivanov	162
Implementation of the Optical Beam Profiler System Using LabVIEW Software Package and Low-Cost Web Camera J.S. Bajic, D.Z. Stupar, J. Tomic, M.P. Slankamenac, A. Joza, M.B. Zivanov	167
Performance Analysis of a Tunable Piezoelectric Actuator Based MEMS Resonator R. Resmi, M.R. Baiju	173
Chipless Wireless Sensor Node S. Preradovic, A. Menicanin	179
System for Monitoring Concentration of NO₂ and CO Gasses on Landfill Sites Z. Mihajlovic, V. Milosavljevic, N. Maodus, V. Rajs, M.P. Slankamenac, M.B. Zivanov	183
A Positive Study on Effective Gas Safety Management Using Wireless Sensor Network G.T. Park, Y.G. Kim, I.C. Kim, H.S. Kim	187
Availability and Reliability of FSO Links Estimation from Measured Fog Parameters M. Tatarko, L'. Ovseník, J. Turán	192
Disadvantages of Methods for Power Indication during Treadmill Exercise for Ergospirometry Test A. Badnjevic, E. Beganovic, G. Sehic, A. Badnjevic	196
Estimation of Muscle Fatigue during Dynamic Contractions Based on Surface Electromyography and Accelerometry M. Jordanic, R. Magjarevic	201
Biomechanical Scale for Dynamic Human Body Posture Analysis M. Cifrek, S. Peharec, H. Dzapo, T. Pribanic, S. Mrvos	206
High Quality Hearing Aids J. Ostojic, M. Krhen, B. Somek, V. Pinezic	211

USB RF Front-End of the DRM Receiver under LabView API Environment D. Sostaric, D. Vinko, T. Svedek	218
Verification Structures for Design of Video Processing Circuits A. Trost, A. Zemva	222
Computational Study on Soliton-like Pulses in the Nonlinear RLC Transmission Lines D.L. Sekulic, M.B. Zivanov	228
Ink-jet Printed CPW Inductors in Flexible Technology A. Menicanin, Lj. Zivanov, M. Damnjanovic, A. Maric, N. Samardzic	233
Universal Wireless Communication Detector (UD-100) - Preventing of High-Tech Cheating Methods J.S. Bajic, V. Milosavljevic, V. Rajs, M.P. Slankamenac, M.B. Zivanov	237
Investigation of Electrically Small Monofilar Spherical Helical Antenna Used for Mid-Range Wireless Power Transfer M. Skiljo, Z. Blazevic	241
 Distributed Computing and Visualization Systems	
Green HPC: MPI vs. OpenMP on a Shared Memory System Z. Krpic, G. Martinovic, I. Crnkovic	246
Matrix Multiplication Performance Analysis in Virtualized Shared Memory Multiprocessor M. Gusev, S. Ristov	251
Preventing State Divergence in Duplex Systems Using Causal Memory B. Chitsaz, M. Razzazi	257
An Improved Approach to Track Forest Fires and to Predict the Spread Direction with WSNs Using Mobile Agents I. Vukasinovic, G. Rakocevic	262
Monitoring UNICORE Jobs Executed on Desktop Grid Resources J. Kovacs, F. Araujo, S. Boychenko, M. Keller, A. Brinkmann	265
Transparent Execution of ARC Jobs on Desktop Grid Resources C.U. Soettrup, A. Wäänänen, J. Kovacs	271
Agent-Based Topology Control for Wireless Sensor Network Applications D. Rojkovic, T. Crnic, I. Cavrak	277
Security in Distributed Wireless Sensor Networks T. Petrovic, M. Zagar	283
Evolution and Trends in GPU Computing M.J. Misic, D.M. Djurdjevic, M.V. Tomasevic	289
Application Repository Based Evaluation of the EDGI Infrastructure A. Visegradi, S. Acs, J. Kovacs, G. Terstyanszky	295

Multicluster Hadoop Distributed File System	301
I. Tomasic, J. Ugovsek, A. Rashkovska, R. Trobec	
AbacusFS Integrated Storage and Computational Platform	306
I. Nuhic, M. Sterk, T. Cortes	
Tool Orchestration Framework for Virtual Team Environments	313
A. Martinic, K. Fertalj, D. Kalpic	
Comparative NAMD Benchmarking on BlueGene/P	319
A.H. Poghosyan, L.H. Arsenyan, H.V. Astsatryan	
Accessing and Steering the Elastic OLAP Cloud	322
S. Ye, P. Chen, I. Janciak, P. Brezany	
ECM Integer Factorization on GPU Cluster	328
E. Atanassov, D. Georgiev, N.L. Manev	
An I/O Cost Optimal and Progressive Algorithm for Computing Massive Skyline Points	333
M. Talebi, M. Razzazi	
Non-Blocking Roll-Forward Recovery for Message Passing Systems	339
B. Chitsaz, M. Razzazi	
Non-Blocking N-Version Programming for Message Passing Systems	345
B. Chitsaz, M. Razzazi	
A Cellular Automata Based Algorithm for Voronoi Diagram of Arbitrary Shapes	349
M. Talebi, A. Mohammadalimaddi, M. Razzazi	
Parallel Implementation of a Combustion Chamber Simulation with MPI-OpenMP Hybrid Techniques	356
L. Környei	
FPGA Implementations of Data Mining Algorithms	362
P. Skoda, B. Medved Rogina, V. Sruk	
Parallel Implementation of Option Pricing Methods on Multiple GPUs	368
E. Atanassov, S. Ivanovska, D. Dimitrov	
Analysing User Click Paths in a Wikipedia Navigation Game	374
D. Helic	
Models for the Development of Web Service Orchestration	380
J. Matkovic, K. Fertalj	
Superlinear Speedup in OpenMP Parallelization of a Local PDE Solver	389
G. Kosec, M. Depolli	
Simulated Annealing and Variable Neighborhood Search Algorithm for Automated Software Services Composition	395
V. Giedrimas, L. Sakalauskas	
Running High Performance Linpack on CPUGPU Clusters	400
D. Tomic, D. Ogrizovic	

The Segmentation of Data Set Area Method in the Clustering of Uncertain Data I. Lukic, M. Köhler, N. Slavek	405
Bridging the Gaps: Federation of Clouds Using Grid Services and Standards S. Memon, J. Rybicki, M. Riedel, S. Memon, E. Yen	411
Security Issues of the Combined Usage of Grid and Cloud Resources E. Atanasov, T. Gurov, A. Karaivanova	417
Framework for Implementation of Complex Dynamic Web Forms K. Kroflin, S. Prstacic, M. Zagar	421
Interfaces of Nested Web Application Framework as Reusable Software Component S. Prstacic, M. Zagar, K. Kroflin	424
Maxwell's Equations for Nanotechnology M. Perkovic	429
CloudMan as a Tool Execution Framework for the Cloud E. Afgan, K. Skala, D. Davidovic, T. Lipic, I. Sovic	437
Short Fragment Sequence Alignment on the HP-SEE Infrastructure M. Kozlovsky, G. Windisch, Á. Balaskó	442
Remote Monitoring of Vital Functions - Proof-of-Concept System A. Rashkovska, I. Tomasic, K. Bregar, R. Trobec	446
A Distributed Clinical Information System for Pediatric Surgery - Basics and Specifics D.L. Petrova, G. Spasov, P. Stefanova-Peeva	451
Modeling and Analysis of the Gateway Node in Body Sensor Networks M.P. Shopov, G.V. Spasov, G.I. Petrova	457
Coarse Grain Simulation and Visualisation of Lipid and Water Molecules Ensembles J.I. Pavlic, R. Trobec	462
What is the Destiny of Information Science Doctors? D. Pecaric	467
Auditory Display of Biomedical Signals through a Sonic Representation: ECG and EEG Sonification V. Avbelj	474
Video Driver Assistance System Using Optical Correlator T. Harasthy, L'. Ovsenik, J. Turán	476
Integration of Skype Client and Performance Analysts on Television Platform D. Zivkov, M. Davidovic, M. Vidovic, N. Zmukic, A. Andjelkovic	479
A Visualization and User Interface Framework for Heterogeneous Distributed Environments M. Mahnic, D. Skocaj	483
K-Means Image Segmentation on Massively Parallel GPU Architecture J. Sirotkovic, H. Dujmic, V. Papic	489

Telecommunications and Information

Opportunities for Telecom Operators in Cloud Computing Business N. Katica, A. Tahirovic	495
The Use of IMS for Cloud Based Services Control and Management V. Cackovic, Z. Popovic	501
Possible Scenarios for Cloud-Based Offering by Operators S. Pocuca, B. Marsic, A. Grgic	506
REST-Style Actionscript Programming Interface for Message Distribution Using Amazon Simple Queue Service K. Popovic, Z. Hocenski	512
Result of Using Formal Methods in Modeling Telecommunication Business Management D. Markulin, M. Kunstic	517
Proposal for Business Process Modelling and Development in Condition of Complex Telecommunication Market K. Musa, D. Markulin	523
Evaluation of a Development Framework for a Mobile Gaming Platform with Financial Transfers R. Hable, E. Platzer	528
Wireless Connecting of Substations for the Purposes of Business and Process Networks of HEP I. Fosic, V. Ecimovic	534
An Optimum Scheme for WiMAX Bandwidth Management Using Dynamic Channel Allocation M.F. Al-Mistarihi, M.Y. Mowafi, M.S. Marei	538
Methodology for Optimal Link Selection Using Multivariant Normal Distribution M. Hruby, M. Olsovsky, M. Kotocová	542
A Dual Usage of Cognitive Radio in Managing the WiMAX Bandwidth M.Y. Mowafi, M.F. Al-Mistarihi, M.S. Marei	548
Comparison Ways of Assignment of Codes in UMTS Networks S. Kasapovic, S. Mujacic, D. Ceke, A. Hadzimehmedovic	552
One Approach to the Development of Custom SNMP Agents and Integration with Management Systems T. Kazaz, M. Kulin, E. Kaljic, T. Carsimanovic	557
Optimal Techno-Economic Selection of the Optical Access Network Topologies Z. Bozinovic, H. Dizdarevic, S. Dizdarevic	562
Availability of All-Optical Switching Fabrics Used in Optical Cross-Connects M. Dzanko, B. Mikac, V. Miletic	568

An Approach to Estimate Correlation between QoS and Perceptual Video Quality in Packet-Switched Networks J. Zecic, M. Hadzialic, A. Haskovic	573
Access Regulatory Remedies in Point-to-Multipoint Fiber Access Networks T. Majnaric	579
Improvement of Method for Telephony Network Signal Sending over Internet A. Lebl, Z. Markov, D. Mitic	585
Impact of Non-Service Related Signaling in GSM Mobile Networks M. Skomersic, T. Gojevic, M. Zuvanic	589
Implementation of Parlay X Interfaces for Standard GSM Modems to Support the Development of SMS-Based Applications E. Kaljic, M. Hadzialic, M. Kuric	593
Smart Automated Platform for Telecom Operators and Enterprise Users in Industry, Transport and Energy D. Perakovic, Z. Kljaic, S. Steficar	598
The "Horizontalization" of the Machine to Machine (M2M) World and How to Market It A. Metnitzer	603
Machine to Machine (M2M) Communication Impacts on Mobile Network Capacity and Behaviour S. Pocuca, D. Giljevic	607
BFriend: Context-Aware Ad-Hoc Social Networking for Mobile Users V. Smailovic, V. Podobnik	612
Monitoring and Analysis of Player Behavior in World of Warcraft M. Suznjevic, M. Matijasevic, B. Brozovic	618
Social Analytics for Mobile Operators M. Poldrugac, M. Komadina	624
The Challenge of Customer Experience Management D. Tucker	629
Knowledge Granulation in a Telecom Operator Information Systems N. Dragun	635
Computer Aided Competence Management I. Cubic, N. Pivac, G. Skugor	641
Performance Analysis of Multiuser Diversity in Multiuser Two-Hop Amplify and Forward Cooperative Multi-Relay Wireless Networks M.F. Al-Mistarihi, A. Sharaqa, R. Mohaisen, O. Abu-Alnadi, H. Abu-Seba	647
Impact of Frequency Synchronization on QoS in IP Based Networks M. Hadzialic, M. Dzaferagic, D. Raca	652
Quality of Service Mechanisms and Priority Management in HSPA System I. Medvid, M. Mikuc	656

A Multi-Dimensional View of QoE - the ARCU Model L. Skorin-Kapov, M. Varela	662
An IP Based Security Threat in Mobile Networks M. Nagy, M. Kotocová	667
Mobile Network Protection System against Fraudulent and Unwanted Messaging Traffic T. Gojevic, K. Matas, M. Skomersic, M. Zuvanic	671
Denial of Service (DoS) Attacks in Green Mobile Ad-Hoc Networks A. Kanthe, D. Simunic, M. Djurek	675
Analyses and Optimisation of ADSL/VDSL Lines Using Ericsson APM System – Comparing Results of Two Operators A. Kerner, P. Cota	681
Archetypes Based Development from the Perspective of Domain Engineering Research Topics J. Tepandi, G. Piho, V. Puusep	686
Agile Experiences in Software Development D. Duka	692
Multivariate Logistic Regression Prediction of Fault-proneness in Software Modules G. Mause, T. Galinac Grbac, B. Dalbelo Basic	698
Integration of Hosting Service into Triple Play Service of Telecom Operator A. Tanovic, F. Orucevic	704
Telecom Services Self-Care Portal for Business Customers K. Rebernak, M. Botincan, D. Saric	710
Evaluating a Medical Grade Network through Network Calculus N.R. Kakanakov	715
Towards LIMS (Laboratory Information Management Systems) Software in Global Context G. Piho, J. Tepandi, M. Parman	721
Active Wireless Sensor with Radio Frequency Identification Chip D. Cika, M. Draganic, Z. Sipus	727
Fundamental Optimization Criteria for Green Wireless Communications M. Pejanovic-Djurisic, E. Stovrag, M. Ilic-Delibasic	733
Performance Analysis of Covariance Based Detection in Cognitive Radio T. Dhope, D. Simunic	737
Benchmarking Performance and Energy Efficiency of Microprocessors for Wireless Sensor Network Applications U. Pesovic, Z. Jovanovic, S. Randjic, D. Markovic	743
Using Radio Irregularity for Vehicle Detection in Adaptive Roadway Lighting G. Horvat, D. Sostaric, D. Zagar	748

Energy Consumption in Android Phones when Using Wireless Communication Technologies G. Kalic, I. Bojic, M. Kusek	754
Power Line Communication System Modeling Based on Coded OFDM M. Bogdanovic	760
Hybrid Detection Method for Spectrum Sensing in Cognitive Radio D. Simunic, T. Dhope	765
A Solution for BER Performance and Energy Efficiency Improvements of OFDM-CDMA System with Pilot Tone U. Urosevic, Z. Veljovic, M. Pejanovic-Djurisic	771
Wireless InSite Software Verification via Analysis and Comparison of Simulation and Measurement Results P. Medjedovic, M. Veletic, Z. Blagojevic	776
Cooperative Relaying Techniques for Energy Efficient Wireless Communications M. Pejanovic-Djurisic, E. Kocan, M. Ilic-Delibasic	782

Computers in Technical Systems

Describing Function Analysis of Systems with NN Compensated Odd Symmetric Nonlinear Actuators O. Kuljaca, K. Horvat, J. Gadewadikar	788
Hydroelectric Power Unit Simulator for Turbine Governor Testing V. Bakaric, I. Miskovic, K. Horvat	794
Design and Simulation of Turbine Governing Hydraulic Systems with FluidSIM Software L. Stipisic, D. Kosic, M. Kurtela	800
Virtual Target Algorithm in Cooperative Control of Marine Vessels Z. Triska, N. Miskovic, D. Nadj, Z. Vukic	806
Testing and Technical Characteristics of a Small Overactuated Marine Platform N. Stilinovic, N. Miskovic, D. Nadj, Z. Vukic	812
Evolution of Automatic Robot Control with Genetic Programming L. Paic-Antunovic, D. Jakobovic	817
Automated Design of Combinatorial Logic Circuits I. Bajer, D. Jakobovic	823
Quasi-Stationary Optimal Control for Wind Farm with Closely Spaced Turbines T. Horvat, V. Spudic, M. Baotic	829
Identification of Wind Turbine Mathematical Model Suitable for Advanced Controller Design V. Petrovic, N. Peric	835
Debugging in Consumer-Programming Oriented Environments Z. Pavlic, T. Lugaric, M. Silic	841

Reliability Modeling for SOA Systems G. Delac, M. Silic, S. Srbljic	847
Energy Saving Techniques in Datacenters I. Grudenic, N. Bogunovic	853
Custom Designed CPU Architecture Based on a Hardware Scheduler and Independent Pipeline Registers – Architecture Description E. Dodiu, V. Gaitan, A. Graur	859
Gateway Device for Energy-Saving Cloud-Enabled Smart Homes M. Bjelica, B. Mrazovac, V. Vojnovic, I. Papp	865
Energy Management in the Public Building Sector - ISGE/ISEMIC Model Z. Tomsic, I. Gasic, G. Cacic	869
Active Reduction of Power Transformer Noise Based on Synchronous Averaging of the Residual Noise Signal D. Miljkovic	875
Engine Fault Detection in a Twin Piston Engine Aircraft D. Miljkovic	881
Stochastic Approach on Hash Cracking G. Martinovic, L. Horvat, J. Balen	887
Touch Screen Mobile Application as Part of Testing and Verification System D. Zivkov, I. Kastelan, E. Neborovski, G. Miljkovic, M. Katona	892
Augmented Healthcare Contribution by Measurement and Assessment of Locomotion Kinematics with NI Sensor S. Kezic, V. Medved, M. Zagar	896
eMuseum - More Interesting Way of Learning from the Past A. Corovic, L. Kadric, N. Lipa, S. Opanovic, N. Nosovic	900
Synchronization of Information Systems - Case Study D. Cafuta, I. Dodig, D. Grgec	905
Database System Performance in Correlation with Different Storage File Systems T. Kramberger, D. Cafuta, I. Dodig	913
Microcontroller Based Systems for Peak Load Reduction V. Tasic, D. Milivojevic, M. Pavlov, V. Despotovic, D. Brodic	919
Protection Relay Software Models in Interaction with Power System Simulators I.G. Kulis, A. Marusic, G. Leci	924
Microprocessor Based Pipe Rupture Monitoring System on Pumped Storage Power Plant Velebit D. Bojic	930
A New Approach Towards Visual Programming for the Blinds M. Konecki	935

Process Information System Modeling for Distributed Energy Resources Using New Technological Solutions and Standards	941
V. Belasic, J. Simunic, A. Marusic	
Development of a Batch Control System	947
S. Ibrahimkadic, S. Kreso	
A Soft Sensor Development for the Estimation of Benzene Content in Catalytic Reformate	952
Z. Ujevic Andrijic, R. Karlovic, B. Zezelj	

Intelligent Systems

Ultrasound Medical Image Recognition with Artificial Intelligence for Parkinson's Disease Classification	958
J. Blahuta, T. Soukup, P. Cermák, J. Rozsypal, M. Vecerek	
Neural Network-Based Digital Map Extraction Approach	963
S. Tulyakov, D. Vyleghzanin, R. Sadykhov	
Personal Recognition Based on the Gabor Features of Colour Palmprint Images	967
S. Ribaric, M. Marcetic	
Curve Similarity Measurement Algorithms for Automatic Gesture Detection Systems	973
V. Shehu, A. Dika	
Estimating OD Matrices at Intersections in Airborne Video - a Pilot Study	977
V. Braut, M. Culjak, V. Vukotic, S. Segvic, M. Sevrovic, H. Gold	
Comparison between Initial Skew Rate and Moment Based Method for the Printed Text Skew Estimation	983
D. Brodic, D.R. Milivojevic, B. Dokic, V. Tasic	
Croatian Visual Speech Synthesis	987
M. Pobar, I. Ipsic	
Continuity of Approximate Reasoning Using Center of Sums Defuzzification Method	991
T. Mitsuishi	
Comparison of Algorithms for Patent Documents Clusterization	995
D. Kukolj, Z. Tekic, Lj. Nikolic, Z. Panjkov, M. Pokric, M. Drazic, M. Vitas, D. Nemet	
Deep Learning Architecture for Data Mining from Surgical Data	998
I. Nikolova	
Towards Semantic and Affective Coupling in Emotionally Annotated Databases	1003
M. Horvat, S. Popovic, K. Cosic	
Virtual Social Multimedia Streaming with a Novel Haptic Device	1009
M. Gaudina, A. Brogni, M. Migliardi, D. Caldwell	
Novel Approaches to Automated Personality Classification: Ideas and Their Potentials	1017
A. Kartelj, V. Filipovic, V. Milutinovic	

Fast Feature Reduction in Intrusion Detection Datasets S. Parsazad, E. Saboori, A. Allahyar	1023
Topic Models and Advanced Algorithms for Profiling of Knowledge in Scientific Papers V. Jelisavcic, B. Furlan, J. Protic, V. Milutinovic	1030
Etalon-Based Integrated Microchip Inspection System S. Tulyakov, I. Radchanka, S. Basalayev, R. Sadykhov	1036
Wavelet Analysis of Hydrological Signals on an Example of the River Sava A. Sovic, K. Potocki, D. Sersic, N. Kuspilic	1042
Sound of Boiling as a Disturbing Noise and as a Functional Signal A. Smrke, J. Prezelj, P. Steblaj, I. Smrke	1048
Parallel Neural Network Training with OpenCL N. Krpan, D. Jakobovic	1053
Application of Genetic Algorithms in Wire Busbars Design D. Petranovic	1058
On the Analysis of Experimental Results in Evolutionary Computation S. Picek, M. Golub, D. Jakobovic	1064
Stadium Reflector Aiming Using Genetic Algorithms D. Petranovic	1070
Towards Software Autogeneration D. Radosevic, T. Orehovacki, I. Magdalenic	1076
New Transformation Approach for Model Driven Architecture E.A. Cherkashin, I.N. Terehin, V.V. Paramonov, V.S. Tertychniy	1082
Extraction of Thesaurus and Project Structure from Linux Kernel Source Tree A.Y. Sokolov, I.R. Golovko, E.A. Cherkashin	1088
A Review of Iterated Prisoner's Dilemma Strategies M. Jurisic, D. Kermek, M. Konecki	1093
A Model of Software System for Parking Using Search Algorithms D. Draskovic, S. Vukicevic	1098
A Two-Phase Vehicle Based Decomposition Algorithm for Large-Scale Capacitated Vehicle Routing with Time Windows M. Gulic, D. Lucanin, N. Skorin-Kapov	1104
Implementation of Tracking Mobile Application and Analysis of Spatial Data D. Donko, A. Alispahic	1109

Computers in Education

Laboratory Exercises for Embedded Engineering Learning Platform I. Kastelan, D. Majstorovic, M. Nikolic, J. Eremic, M. Katona	1113
---	------

Assessment of e-Learning Materials Aesthetic Design M. Duh, B. Bedrac, M. Krasna	1118
Automating the Formal Logic Course G. Molnar, V. Omrcen, M. Cupic	1124
Croatian Libraries on Facebook – Content Analysis M. Banek Zorica, T. Ivanjko, M. Bencec	1130
Personal Learning Environments: The Implication on Process of e-Learning Z. Pozgaj, V. Bosilj Vuksic	1135
Developing the Course Database Systems to Respond to Market Requirements P. Poscic, D. Subotic, M. Ivasic-Kos	1141
ViSA: Visualization of Sorting Algorithms I. Reif, T. Orehovacki	1146
An Innovative Industrial Automation System Showcase for Quality Management and Statistical Process Control Lectures C. Madritsch, C. Ungermanns, T. Klinger, W. Werth	1152
Cultural Influence on the Intellectual Honesty and Fairness of the German and Croatian Students D. Lukac, M. Cicin-Sain	1156
Education via Modeling and Simulation L. Révészová	1161
Role of ICT in Learning and Knowledge Acquisition: How Much Students Know about Their Research Skills? J. Lovrinevic, D. Kovacevic, M. Erl Safar	1166
E-Learning as a Tool for Improving ICT Knowledge of University Teachers D. Palóvá	1172
Students' Perceptions of Scrum Practices V. Mahnic, I. Rozanc	1178
Promoting Knowledge Society through Quality Assurance Model M. Lamza-Maronic, J. Glavas, T. Horvatin	1184
Community Management in Informal E-Learning Environment - Analysis and Vision of Facebook in Central Library of Faculty of Electrical Engineering and Computing J. Lisek, D. Vrkic, I. Jelic	1189
Students' Perception of Institutional Affect Towards Minorities: Case-Study of European, American and Australian Universities A. Delic, K. Pazur, V. Vidacek-Hains	1193
Advanced Types of Electronic Testing of Student's Performance M. Krasna, R. Repnik, T. Bratina, B. Kaucic	1198

Computer in Testing the Fundamentals of Electrical Engineering at the University of Zagreb Faculty of Electrical Engineering and Computing A. Pavic, F. Skopljanac-Macina	1205
Does a Gifted Student Need a Mentor? J. Haložan, F. Vrbancić	1211
Simulation Model of Distance Learning Planning and Implementation on the Basis of ECTS Credits B. Misnevs, N. Fila, A. Dunjashkins, C. Abasheva	1215
Introduction to Electronic Banking by eLearning Methods M. Vejčka	1220
Podcasting for Electrical Power Systems Y. Grigoriadis, L. Fickert, M. Ebner, M. Schön, W. Nagler	1226
Quo vadis, IT Education? J. Henno, H. Jaakkola, J. Mäkelä	1232
Upbringing Children for Responsible Utilization of Information and Communication Technologies E. Krelja Kurelović, D. Kukuljan, M. Turk	1239
Information Anxiety: Research Among Students about Impact of Different Media on Them A. Papic, A. Hefer, T. Krstanović	1244
Information Society and e-Learning K. Bedi, M. Milic, I. Stedul	1249
Computer – Aided Aviation English Testing on Example of RELTA Test M. Zokic, D. Boras, N. Lazic	1254
Electronic Mail as a Possibility of Inapt Communication M. Braut, M. Pogarcic, I. Pogarcic	1258
Students and Teachers' Usage of e-Learning Artifacts in Tertiary Education in Croatia D. Plantak Vukovac	1264
Recommender System in e-Student Web-Based Adaptive Educational Hypermedia System R. Pinter, T. Marusic, D. Radosav, S. Maravic Cisar	1270
The Role of Information Technology in Teaching Civil Engineering at Polytechnic of Zagreb M. Orlic, M. Marinović	1274
Use of Web 2.0 Tools in Teaching M. Gligora Marković, M. Rauker Koch, M. Francić	1279
Multimedia Assisted Learning of Japanese <i>Kanji</i> Characters S. Librenjak, K. Vucković, Z. Dovedan	1284
Tools for Grading Students' Exercises for Microsoft Access Applications N. Majstorović, Z. Siranović, K. Kavran	1290

Creation and Use of Screencasts in Higher Education S. Mohorovicic	1293
ICT as a Function of the Curriculum and Quality Teaching of Students with Disabilities Z. Stancic, L. Femec, N. Cacko	1299
Base of Short Answers M. Jurinovic	1303
Searching for Information Sources: Students' Behaviour in Electronic Environment I. Hebrang Grgic, P. Miocic	1305
Multilingual Plagiarism Detection Corpus V. Juricic, V. Stefanec, S. Bosanac	1310
The Influence of Social Networks on Communication in the Classroom A. Skendzic, M. Macinko-Kovac, B. Kovacic	1315
Model of 8-bit Microprocessor Intended for Lecturing J. Divic, M. Debeljuh	1320
Hardware Equipment of Computer Classrooms in Croatian Elementary Schools K. Pavlina, A. Pongrac, B. Latas	1325
A Concept of the Web-Based e-Testing System D. Purkovic, Z. Kolumbic	1328
The Use of Web 2.0 Tools in Education from the Point of View of Future Teachers E. Krelja Kurelovic, J. Tomljanovic, M. Ruzic-Baf	1335
Enviromental Education of Students in Vocational Schools in a Multimedia Surrounding V. Matic	1341
Teaching Scientific Literacy by the Help of ICT R. Vrana	1347
Enriching the Learning Experience: Use of Scientific Information Resources and Participation in Scientific Research in Higher Education: Case of Faculty of Humanities and Social Sciences Zagreb R. Vrana	1353
The Impact of the Professional Development of Teachers on the Process of Teaching and Learning I. Tasic, D. Karuovic, D. Glusac	1360
Future of Internet Technologies D. Pavlic, M. Pavlic, V. Jovanovic	1366
Evaluation System for e-Learning Lj. Zekanovic-Korona, V. Mateljan, B. Kree Miocic	1372
Data Warehouse Based Evaluation of Students' Achievements in Information Systems Education Lj. Kazi, Z. Kazi, B. Radulovic	1377

The Application of Web-Based Formative Quizzes in Laboratory Teaching in Higher Education Environment J. Gamulin, O. Gamulin	1383
The Model of ICT Use in Geography Lessons P. Jesenek Bracko	1389
Correlation Educational Model in Primary Education Curriculum of Mathematics and Computer Science M. Macinko Kovac, L. Eret	1393
The Role of Facebook in Elementary School Education M. Drazenovic	1398
American Investor – Simulation of Investments in Stocks and Options Z. Prohaska, I. Uroda, S. Suljic	1401
The Algorithm Design by Using Programming Language Visual Basic for Application on the Example of Critical Path Method (CPM) S. Vukmirovic, M. Cicin-Sain, I. Meznaric	1405
Pupils' Attitude towards the Introduction of ICT in Visual Arts Education in Croatian Primary Schools Z. Prohaska	1412
New Media as a Factor of Learning Efficiency in Dyslexic Persons Z. Buzasi	1418
Discussion Groups in Interactive Online Education S. Vukmirovic, L. Crljenko Perkovic, D. Kovac	1422
 Digital Economy – 9th Alpe Adria Danube Universities Initiative (ALADIN)	
Global Economic Crisis and Future Perspective of Information Society Innovation and Development M. Vidas-Bubanja	1428
Microsoft Office 365 – Cloud in Business Environment A. Skendzic, B. Kovacic	1434
Adoption of Smart Technology in Croatian Hotels B. Krce Miodic, Lj. Zekanovic Korona, M. Matesic	1440
Competence Database: a Precondition for Successful Transfer of Technology and Knowledge H. Bezic, P. Karanikic, E. Tijan	1446
Mobile Banking - Financial Services Technology D. Lacmanovic, I. Lacmanovic, B. Markoski	1451
Prognosis: Cloudy with SAAS B. Kraut	1456

eGovernment and the Digital Divide V. Lazovic, T. Djurickovic	1459
Investment Analysis of Information Security Management in Croatian Seaports S. Aksentijevic, E. Tijan, B. Hlaca	1464
QR Codes as a Time Management Tool in m-Learning I. Culumovic Zupanovic, E. Tijan	1470
Improvement of System for Distance Learning Based on Dialogue by Appliance of Statistical Analysis B. Kovacic, I. Jugo, V. Slavuj	1475
 Information Systems Security	
Security of Service Requests for Cloud Based m-Commerce I. Kounelis, J. Löschner, D. Shaw, S. Scheer	1479
A New Methodology for Security Evaluation in Cloud Computing S. Ristov, M. Gusev, M. Kostoska	1484
Intrusion Detection Parameterization Exchange Data Model B.-C. Bösch	1490
Hashing Scheme for Space-Efficient Detection and Localization of Changes in Large Data Sets V. Kontak, S. Srbljic, D. Skvorc	1496
Internet Application Security A. Simec, O. Stanicic	1502
Combinatorial Testing in Software Projects M. Brcic, D. Kalpic	1508
Implementing Certificate-Based Authentication Protocol on Smart Cards G. Matanovic, M. Mikuc	1514
XML Digital Signature and Its Role in Information System Security S. Geric, T. Vidacic	1520
Determining Autonomous Systems Reputation Based on DNS Measurements S. Gros, M. Stublic, L. Jelenkovic	1526
How Secure is Quantum Cryptography? M. Stipcevic	1529
Data Ownership Model for a Telecom Company Z. Supica, T. Pavic	1534
ICT Services Development Process with Security as Its Integral Part I. Sedinic, Z. Lovric	1539

Information Security Measurement Infrastructure for KPI Visualization K. Hajdarevic, C. Pattinson, K. Kozaric, A. Hadzic	1543
The Role of Perceived Privacy and Perceived Security in Online Market R. Mekovec, Z. Hutinski	1549
The Role of a Stress Model in the Development of Information Security Culture G. Bozic	1555
Assessment Methodology for the Categorization of ICT System Users Security Awareness K. Solic, B. Tovjanin, V. Ilakovac	1560
Building a Framework for the Development of Biometric Forensics M. Baca, P. Koruga, T. Fotak	1565
 Business Intelligence Systems	
Using Ontologies and Requirements for Constructing and Optimizing Data Warehouses L. Bellatreche, S. Khouri, I. Boukhari, R. Bouchakri	1568
How Cloud Computing is (not) Changing the Way We Do BI A. Stipic, T. Bronzin	1574
Some Aspects of Information Systems Integration M. Varga, K. Curko	1583
Semantic Inter-Organizational Performance Analysis Using the Balanced Scorecard Methodology W. Krathu, C. Pichler, M. Zapletal, H. Werthner	1589
Emergency Situations Monitoring Using OLAP Technology T.G. Penkova, A.V. Korobko, V.V. Nicheporchuk	1595
Case Study: Analysis of the Direct Sales Force Performance - Clients Reach by Geographical Area in Telecommunication Industry M. Velic, I. Padavic, Z. Lovric	1601
Constraints to Manage Consistency in Multiversion Data Warehouse I. Zouari Turki, F. Ghazzi Jedidi, R. Bouaziz	1607
The Impact of Threshold Parameters in Transactional Data Analysis M. Vranic, D. Pintar, M. Banek	1613
Effects of Data Anonymization on the Data Mining Results I. Buratovic, M. Milicevic, K. Zubrinic	1619
Setting up, Managing and Using a Complex Business Intelligence Platform M. Boero, M.E. Jackson	1624
PSALM - Tool for Business Intelligence Z. Tekic, D. Kukolj, Lj. Nikolic, M. Drazic, M. Pokric, M. Vitas, Z. Panjkov, D. Nemet	1629

Data Mart Design for Managing IT Department in a Telecommunications Company 1635
J. Mirkovic, Lj. Kascelan

Data Warehouse for FER e-Invoice System 1641
L. Humski, I. Lazegic, Z. Skocir

Data Value in Decision Process: Survey on Decision Support System in Small and Medium Enterprises 1647
M. Pighin, A. Marzona

Government, Local Government, Public Services

Decision Framework for Building Platform as a Service (PaaS) Based Government Services 1655
R. Mutavdzic

Selecting the Optimal Opensource GIS Software for Local Authorities by Combining the ISO 9126 Standard and AHP Approach 1661
D. Jankovic, R. Milidragovic

Raising the Quality of the Inspection Control with the Support of an Expert System 1666
N. Sarajlic, B. Durakovic, N. Delic

The Method of Knowledge Distribution and Use in Public Adminitration 1672
K. Klarin, S. Mladenovic

Traffic Global Analysis for the Whole Italian Road Network 1678
S. Rambaldi, M. Marchioni, A. Bazzani, B. Giorgini

Destination Information System in the Function of Forming an Identity for Zadar County as Tourist Destination 1683
D. Bunja

Efficiency Analysis of e-Business in Croatian City Governments 1689
J. Jardas Antonic, D. Antonic

E-Government Service Generator (Use Case Project e-Government Montenegro) 1694
M. Maric

New Generation Operations Systems and Software and SOA Improving the Business of Telecom Operator 1699
A. Hadzic, T. Mateljan, K. Hajdarevic

Development of the Prototype Solution for User Involvement in the Living Lab Approach 1705
A. Sifrer, A. Pucihar, M. Kljajic Borstnar, G. Lenart

MIPRO Junior – Student Papers

A Method for Real-Time Detection of Human Fall from Video 1709
M. Krekovic, P. Ceric, T. Dominko, M. Ilijas, K. Ivancic, V. Skolan, J. Sarlija

Detection of Commercials in Video Content Based on Logo Presence without Its Prior Knowledge N. Banic	1713
User Authentication Based on Keystroke Dynamics Analysis I. Sluganovic, A. Karlovic, P. Bosilj, M. Sare, S. Horvat	1719
A Brief Introduction to OpenCV I. Culjak, D. Abram, T. Pribanic, H. Dzapov, M. Cifrek	1725
Implementation of Algorithm for Detection and Correction of Defective Pixels in FPGA L. Mijatovic, H. Dean, M. Rozic	1731
Image-Based Visual Servoing for Automatic Control of Balancing Beam S. Markovic, J. Music, M. Bonkovic	1736
Scaling Read-Heavy Web Services E. Dedovic, J. Balagija, N. Cavrak, N. Nosovic	1742
Design and Implementation of Fuzzy Controller on Embedded Computer for Water Level Control S. Krivic, M. Hujdur, A. Mrzic, S. Konjicija	1747
The Procedure of a Camera Calibration Using Camera Calibration Toolbox for MATLAB A. Fetic, D. Juric, D. Osmankovic	1752
A Hybrid Ant Colony System Approach for Solving Capacitated Vehicle Routing Problems with Time Windows F. Boltuzic, A. Rakipovic	1758
Android Application for Sending SMS Messages with Speech Recognition Interface S. Primorac, M. Russo	1763
A Robust Hand Detection and Tracking Algorithm with Application to Natural User Interface T. Benussi, D. Juric	1768
Recommendation of YouTube Videos M. Brbic, E. Rozic, I. Podnar Zarko	1775
A Comparison of Five Parallel Programming Models for C++ E. Ajkunic, H. Fatkic, E. Omerovic, K. Talic, N. Nosovic	1780
Performance Comparison of Simulated Annealing Algorithm Execution on GPU and CPU E. Bajrami, M. Asic, E. Cogo, D. Trnka, N. Nosovic	1785
Parallelization of Array Operations by Using Socket Programming in .NET E. Kurtanovic, E. Meholic, N. Hadzic, B. Davidovic, E. Ljevakovic, N. Nosovic	1789
Tiled 360° Panoramic Projection System D. Hrenek, I. Kust, N. Miksa, P. Prentasic, B. Trubic, A. Hedji, S. Loncaric, M. Subasic	1793
Multi-Camera Person Tracking System D. Komlen, T. Lombarovic, M. Ogrizek-Tomas, D. Petek, A. Petkovic	1798

Artificial Neural Network Based Stock Value Prediction	1803
D. Hrenek, N. Miksa, P. Prentasic, B. Trubic	
CUDA Implementation of the Algorithm for Simulating the Epidemic Spreading over Large Networks	1807
M. Sosic, M. Sikic	
Dijkstra's Shortest Path Algorithm Serial and Parallel Execution Performance Analysis	1811
N. Jasika, N. Alispahic, E. Arslanagic, I. Kurtovic, E. Lagumdzija, N. Nosovic	