

2014 37th International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO)

Microelectronics, Electronics and Electronic Technology

Nanotechnology, from the Recent History to (un) Predictable Future – <i>Invited Paper</i> J. Turkovic	1
Spectroscopic Evidence of Coexistence of Clusters Based on Low (α) and High Temperature (β) GeS₂ Crystalline Phases in Glassy Germanium Disulfide Matrix V. Mitsa, R. Holomb, G. Lovas, M. Veres, M. Ivanda, T. Kovach	7
Synthesis and Characterization of Silver Colloidal Nanoparticles and Their Application in Surface Enhanced Raman Spectroscopy L. Mikac, M. Ivanda, M. Gotic, T. Mihelj	11
Raman Spectroscopy of Tellurite Glasses H. Gebavi, D. Ristic, V. Djerek, L. Mikec, M. Ivanda, D. Milanese	15
Coated Spherical Microresonators for Cutting-Edge Photonics Application D. Ristic, M. Mazzola, A. Chiappini, C. Armellini, A. Rasoloniaina, P. Féron, R. Ramponi, G.N. Conti, S. Pelli, G.C. Righini, G. Cibiel, M. Ivanda, M. Ferrari	18
Examination of Silicon Material Properties Using THz Time-Domain Spectroscopy B. Pejcinovic	22
Impact of Microstrip Width and Annealing Time on the Characteristics of Micro-Scale Graphene FETs M. Poljak, M. Wang, S. Zonja, V. Djerek, M. Ivanda, K.L. Wang, T. Suligoj	27
Graphene Base Transistors with Optimized Emitter and Dielectrics S. Venica, F. Driussi, P. Palestri, L. Selmi	33
Phonon-Limited Hole Mobility in Sub-20 nm-Thick Double-Gate Germanium MOSFETs V. Ivanic, M. Poljak, T. Suligoj	39
Comparison of RF Performance between 20 nm-Gate Bulk and SOI FinFET S. Krivec, H. Prgic, M. Poljak, T. Suligoj	45
Simulation Study of Aging in CMOS Binary Adders T. An, C. Hao, L. Alves de Barros Naviner	51
Analytical Method for Reliability Assessment of Concurrent Checking Circuits Under Multiple Faults T. An, K. Liu, L. Alves de Barros Naviner	56
Synthesis of CMOS Multiplier Structures Using Multifunctional Circuits C. Popa	60

Improved Accuracy Current-Mode Analog Function Synthesizer C. Popa	64
Analysis and Optimization of a SAR ADC with Attenuation Capacitor S. Brenna, A. Bonfanti, A. Abba, F. Caponio, A.L. Lacaita	68
A Simulation and Modeling Environment for the Analysis and Design of Charge Redistribution DACs Used in SAR ADCs S. Brenna, A. Bonetti, A. Bonfanti, A.L. Lacaita	74
High-Speed Energy-Efficient 5:2 Compressor A. Najafi, S. Timarchi, A. Najafi	80
An Electrochemical Sensor ASIC for Agriculture Applications T.K. Yew, Y. Yusoff, L.K. Sieng, H.C. Lah, H. Majid, N. Shelida	85
Application of Charge Amplifiers with Polyvinylidene Fluoride Materials A.S. Marinov, O.P. Stanchev, E.B. Bekov	91
Design of Transdermal Drug Delivery System with PZT Actuated Micropump T. Dolzan, D. Vrtacnik, D. Resnik, U. Aljancic, M. Mozek, B. Pecar, S. Amon	96
Modern Monitoring System for Water Pollution by Petrochemical Products Based on Optical Fibre Refractometer J. Turán, L. Ovseník	100
Broadband Characterization of SMA Connectors by Measurements M. Magerl, T. Mandic, A. Baric	104
Application of TEM Cell in Measurement of Electromagnetic Fields of Electronic Modules K. Ivanus, A. Baric	110
Model of Low-Noise, Small-Current-Measurement System Using MATLAB/Simulink Tools D. Nagradic, K. Pardon, D. Jurisic	115
Algorithm for Fast Determination of LiFePO₄ Battery Nominal Current I. Sirotic, V. Sunde, Z. Ban	121
100 nA Power Management Circuit for Energy Harvesting Devices D. Vinko, G. Horvat	125
Evaluation of the Operation of Depletion-Mode SiC Power JFET in DC-DC Converter Applications J. Bacmaga, K. Bene, B. Pejcinovic, A. Baric	130
Photocopier PID Controller with Iterative Error Compensation K. Fukuda, V. Ceperic, A. Baric	136
Introduction of Some Design Aspects for Improved Performance of the DC/AC Induction Motor Converter J. Podrzaj, G. Babic, M. Podhraski, J. Trontelj	141
Microcontroller Implementation of Dynamically Adaptable Control of Stepper Motor with Continuous Second Derivative of Speed Curve J. Divic, J. Djuric, K. Vrancic	146

Optimized Coupled Band-Pass Filters N. Mijat, D. Jurisic	150
Development and Testing of Complex PLL Algorithm Using Hardware in the Loop System T. Cihak, M. Puskaric, Z. Jakopovic	156
Software Simulation of LDPC Codes and Performance Analysis C. Sandu, I. Florescu, C. Rotaru	162
Smart Home Automation System for Energy Efficient Housing N. Skeledzija, J. Cesic, E. Koco, V. Bachler, H.N. Vucemilo, H. Dzapo	166
Remote Laboratory for Testing Processor Cores in FPGA Device K. Saksida, A. Trost	172
Towards an Energy Efficient SoC Computing Cluster Z. Krpic, G. Horvat, D. Zagar, G. Martinovic	178
Electronic Interpretation of Selected Lessons in Fuzzy Mathematics L. Perkovic, D. Kovacevic, T. Karadjole, M. Jovic	183
Fuzzy Gates Interchangeability D. Kovacevic, T. Karadjole, J. Vrsalovic	189
Solving Mathematic Problems in Electronic Environment, Finding Global and Local Minimum and Maximum Function Values I. Madunic, D. Kovacevic, L. Perkovic, T. Karadjole	195
 Distributed Computing, Visualization and Biomedical Engineering	
Twenty-Nine-Year Stimulation of the Common Peroneal Nerve in a Hemiplegic Patient P. Peclin, J. Krajnik, R. Acimovic-Janezic, U. Stanic, J. Rozman	200
A Method for Time-Domain Analysis of Respiratory Sinus Arrhythmia R. Trobec, V. Avbelj	204
Review of Regularization Techniques in Electrocardiographic Imaging M. Milanic, V. Jazbinsek, R. Hren	208
Single-Dipole and Dual-Dipole Inverse Solutions in Electrocardiography V. Jazbinsek, R. Hren	214
Automatic Knot Fastener Cor-Knot and United States Pharmacopeial Convention Class I Knot Pull-Apart Force Safety Regulations B. Gersak, J. Sauer	220
Control and Optimization of Complex Biological Systems D. Tomic, B. Pernaric	222
Classification of Benign and Malignant Masses in Breast Mammograms A. Serifovic-Trbalic, A. Trbalic, D. Demirovic, N. Prljaca, P.C. Cattin	228

CHO Cell Viability in CO₂ Saturated Media	234
A. Stefanic, J. Jelenc, A. Osterman, M. Dular, D. Miklavcic, A. Macek Lebar	
Automatic Cell Counter for Cell Viability Estimation	239
J. Lojk, L. Sajn, U. Cibej, M. Pavlin	
Morphological Changes of Pressure Pulses in Oscillometric Non-Invasive Blood Pressure Measurements	245
V. Avbelj	
Personalized Guiding Templates for Pedicle Screw Placement	249
U. Tominc, M. Vesel, S. Al Mawed, M. Dobravec, M. Jug, S. Herman, D. Kreuh	
iHELP Emergency Care Network	252
A. Ogorevc, B. Loncarevic	
Graph-Based Diagnosis and Treatment of Neuronal Communication Disorders	256
M. Veletic	
Use of 3D Preoperative Planning Program in Understanding of Articular Fracture Treatment	262
M. Tomazevic, A. Fischinger, A. Kristan, D. Kreuh, M. Cimerman	
Education of Cosmetic Device Users in Slovenia	266
S.E. Soklic, J. Jelenc	
Telehealth Using ECG Sensor and Accelerometer	270
H. Gjoreski, A. Rashkovska, S. Kozina, M. Lustrek, M. Gams	
Children Obesity Treatment Support with Telemedicine	275
M. Kozlovsky, K. Karóczkai, B. Jókai, B. Ruda, D. Kacsuk, Z. Meixner	
Analysis of sEMG Signals Associated with Isometric Contraction of Triceps Brachii Muscles Using Multifractals	279
K. Marri, R. Swaminathan	
Improving Data-Parallel Construction of δ_N-Nets with Maximum Dispersion	284
P. Zinterhof	
High Productivity Data Processing Analytics Methods with Applications	289
M. Riedel, A.S. Memon, M.S. Memon	
Optimal Block Size for Matrix Multiplication Using Blocking	295
S. Ristov, M. Gusev, G. Velkoski	
Extensible Framework for Execution of Distributed Genetic Algorithms on Grid Clusters	301
D. Georgiev, E. Atanassov	
The Performance Impact Analysis of Loop Unrolling	307
G. Velkoski, M. Gusev, S. Ristov	
Developing a Ticket Management SaaS Solution	313
M. Gusev, S. Ristov, P. Gushev	

Alert Notification as a Service M. Gusev, S. Ristov, G. Velkoski, P. Gushev	319
Crowd Computing to Support EGI Scientists J. Kovács, R. Lovas	325
Obtaining Massive Data Sets for Contextual Experiments in Quantum Information M. Pavicic	332
Parallel Implicit Time Integration for Particle-Based Models on Graphics Clusters A. Sabou, D. Gorgan	336
Frequency Table Computation on Dataflow Architecture P. Skoda, V. Sruk, B. Medved Rogina	342
Virtue - a Different Approach to Human/Computer Interaction Z. Sojat, T. Cosic, K. Skala	347
Dynamic Workflow Support in gUSE E. Kail, A. Bánáti, K. Karóczkai, P. Kacsuk, M. Kozlovsky	354
Formal Checking of WS-BPEL Orchestrations J. Matkovic, K. Fertalj	360
Hybrid MPI-OpenMP Parallel Optimization for Thermo-Fluid Problems M. Depolli	367
Delivering Bioinformatics MapReduce Applications in the Cloud L. Forer, T. Lipic, S. Schönherr, H. Weißensteiner, D. Davidovic, F. Kronenberg, E. Afgan	373
Microspheres as Sensors to Measure Instant Refractive Index Variation During Phase Transition of Low Melting Substances H.-B. Fu, Y.-X. Huang	378
Multilingual Cloudlet-Based Dictionary A. Bahtovski, M. Gusev	380
Mjolnirr: Private PaaS as Distributed Computing Evolution D. Savchenko, G. Radchenko	386
Visualization Support for Code Development in EUROfusion Integrated Modelling L. Kos	392
Fast Motion Estimation Algorithm Using Dual Bit-Plane Matching Criteria C. Choi, J. Jeong	398
Edge Detection in Segmented Non-Convex Space Polygon I. Kozar, D. Lozzi-Kozar, Z. Jericevic	402
Visualization of Meteorological Data I. Hakstok, Z. Mihajlovic	406
3D Volume Localization Using Miniatures L. Sajn, M. Radojevic, T. Dobravec	411

Evaluation of Image Processing Algorithms on ARM Powered Mobile Devices D. Demirovic, A. Serifovic-Trbalic, N. Prljaca, P.C. Cattin	417
Natural Eye Gaze Computer Interaction for Medical Oculography Diagnosis: Current Status and Future Prospects I. Grubisic, I. Grbesa, T. Lipic, K. Skala, O. Zrinscak, R. Ivekovic, Z. Vatavik	421
Telecommunications and Information	
Green ICT for Sustainability: A Holistic Approach – <i>Invited Paper</i> S. Aleksic	426
4G Mobile Internet, Services, Regulation and Mobile Operators in Bosnia and Herzegovina D. Serval, C. Markovic, S. Kovacevic	432
Creating Regulatory Environment for Cloud Services S. Hadzovic, R. Seremet	436
Emergency Communication in IMS Network: Challenges in Implementation I. Krevatin, I. Viskovic	440
Connecting Clouds I. Vrbovcan, T. Pavic, M. Sosa Anic	444
Competence Transfer through Enterprise Mobile Application Development S. Vojvodic, M. Zovic, V. Rezik, H. Maracic, M. Kusek	448
An Empirical Study of Factors Affecting the Adoption of Self-Service Checkout Terminals in Slovenia B. Sumak, M. Pusnik, M. Hericko	453
Cash Register Lines Optimization System Using RFID Technology D. Budic, Z. Martinovic, D. Simunic	459
Multi-User Web Application for Content Management on Multi-Touch Devices M. Cvijanovic, P. Kirin, D. Plesa, J. Soko, S. Stamenov, A. Cikojevic, S. Kelemen, A. Karin	463
Front End Optimization Methods and Their Effect I. Iliev, G. Petrov Dimitrov	467
Comparative Analysis of Google and Bing SEO on leading Croatian News portals I. Britvic, J. Djuric, D. Buzic	474
State of the Art in IPTV B. Veselinovska, M. Gusev, T. Janevski	479
Kinect-based Presenter Tracking Prototype for Videoconferencing D. Gadanac, M. Dujak, D. Tomic, D. Jercic	485
Iterative Receiver for Qc-LDPC Coded Underwater Acoustic Communication Systems L. Zhao	491

Software Platform for Wireless Indoor Localization Planning Based on the Strength of Received Radio Signal	495
I. Vitas, B. Lukovac, D. Simunic	
Management in M2M Networks	501
V. Cackovic, Z. Popovic	
Next-Generation Utilities Based on M2M Communications	507
M. Dujak, Z. Kljaic, M. Serbec, H. Jelacic	
Applications Methods of the Objects, and Suitability for Universal Applications in Computer Graphics Context	514
N. Zeqiri	
On-line Rapid Diagnostics of the Human Immune Status	519
T.A. Hryhorova, L.V. Vorobiov	
Information System Infrastructure Planning - Threshold Setting Based on Risk Analysis	524
I. Golub, B. Radojevic	
Interactive Application in Service of Popularizing Architectural Heritage	529
M. Jozic, T. Ostarcevic, M. Salkovic, D. Simunic	
Real Time Assuring QoE in the Lowest OSI/ISO Layers During Delivering of IPTV Services	532
N. Goran, M. Hadzialic, A. Begovic	
Measuring XML Schema Standard Quality Change through Versioning	536
M. Pusnik, M. Hericko, B. Sumak	
N-BEB: New Backoff Algorithm for IEEE 802.11 MAC Protocol	540
M. Shurman, B. Al-Shua'b, M. Alsaedeen, M.F. Al-Mistarihi, K. Darabkh	
Multi-Objective Parameter Optimization of S-MAC Protocol	545
E. Kaljic, S. Konjicija	
Experiences from Building a EUD Business Portal	551
N. Tankovic, T. Galinac Grbac, M. Zagar	
Modeling of Software Failure Cost in ERP Systems	557
F. Urem, K. Fertalj, I. Livaja	
Reselection of Base Station in TETRA Network	562
S. Puncikar	
Inventory Management System for Water Supply Network	567
O. Jukic, I. Hedji	
Incremental-Relaying Cooperative-Networks Using Dual Transmit Diversity and Decode and Forward Relaying Scheme with Best Relay Selection	571
A.M. Hayajneh, M. Khodeir, M.F. Al-Mistarihi	
Closed-form Expression for Outage Probability in Relay-Based Cooperative Diversity Systems over Nakagami Fading Channels with Interference	577
R. Mohaisen, M.F. Al-Mistarihi, A. Sharaqa	

On Practical Solutions of AQM Queues with Large Buffers P. Mrozowski, A. Chydzinski	582
 Computers in Education	
Children as Co-Creators of Video Stories: Mobile Videos for Learning – <i>Invited Paper</i> J. Multisilta, H. Niemi	588
Children’s Safety on the Internet-Development of the School Curriculum – <i>Invited Paper</i> L. Kralj	593
Introducing E-CRM into Academic Libraries: Exploration of Needs and Possibilities A. Papic, M. Primorac	597
Virtual Machines in Education V. Mateljan, V. Juricic, M. Moguljak	603
Openⁿ H. Jaakkola, T. Mäkinen, J. Henno, J. Mäkelä	608
From Learning to E-learning to M-learning to C-learning to ... ? J. Henno, H. Jaakkola, J. Mäkelä	616
The Evocation of Creativity and Critical Thinking: Analysis of Information Competencies and Behaviour Among Students of Electrical Engineering and Computing D. Vrkic, M. Pavlovski	623
Application of Modern Teaching Techniques in the Educational Process M. Filipovic Tretinjak, A. Bednjanec, M. Tretinjak	628
Open Access Initiative and Its Impact on Use of Digital Information Resources for Research and Teaching in Higher Education Institutions in Croatia R. Vrana	633
The Organization of Classes and Assessment System Using Moodle T. Alajbeg, T. Horvat, T. Novak	639
Perceived Quality of Verificator in Teaching Programming T. Orehovacki, D. Radosevic, M. Konecki	643
E-learning Materials to Study Properties of Liquid Crystals at University Level and in Schools R. Repnik, A. Sabeder, M. Krasna	649
Distance Learning: Challenges, New Solution P. Panahi, F. Borna	653
Online vs. Paper-Based Testing: A Comparison of Test Results S. Candrljic, M. Asenbrener Katic, M. Holenko Dlab	657
Comparing Classification Models in the Final Exam Performance Prediction J. Gamulin, O. Gamulin, D. Kermek	663

The Role of Management in Career Development M. Lamza-Maronic, J. Glavas, I. Uroda	669
E-learning Next Step – Learning Materials for Students M. Krasna, M. Duh, T. Bratina	674
Configurable Image-Processing System for Education in Automotive Applications C. Madritsch, T. Klinger	682
Using Hybrid Mobile Applications for Adaptive Multimedia Content Delivery A. Karadimce, D. Capeska Bogatinoska	686
A Model of Adaptive Learning with Interactive Images – ADELE M. Gusev, S. Ristov, P. Gushev, G. Velkoski	692
User Satisfaction Evaluation of the Electronic Student Services System – iKnow A. Guseva, M. Gusev, S. Ristov	698
Sign Language Tutor - Rebuilding and Optimizing N. Ackovska, M. Kostoska	704
Interoperability Challenges Among University Electronic Services Systems M. Kostoska, M. Gusev, S. Ristov	710
Cloud Based Laboratory for Distance Education S. Ristov, M. Gusev, A. Donevski	716
Mediated Heritage Learning in Formal and Informal Contexts: Antiquity CyberEd G. Zlodi, Z. Miklosevic	722
Development of an Online Multimedia Course M. Troselj, M. Matetic, M. Tkalcic, M. Brkic, P. Pahljina	727
Are they a Perfect Match? Analysis of Usage of Author Suggested Keywords, IEEE Terms and Social Tags D. Vrkic	732
Lab Assessments in Undergraduate Course in Compilers for Students with No Prior Knowledge in Assembly V. Kirandziska, M. Jovanov, M. Mihova, M. Gusev	738
Analysis of Elective Courses Selection in Post - Bologna Programmes I. Rozanc, B. Slivnik	744
Data Mining of Computer Game Assisted e/m-learning Systems in Higher Education P. Juric, M. Matetic, M. Brkic	750
E-education 2.0: Students' Digital Identity and Online Learning Activities S. Babic, M. Kresic, K. Kucel	756
Usefulness of Prezi and PowerPoint Presentation A. Spornjak	762
An On-line Solution Verification System for Programming Competitions A.S. Dorofeev	765

Implementation of Information Competencies as Key Employment Skills at the Faculty of Humanities and Social Sciences S. Spiranec, T. Ivanjko, D. Pecaric	768
Learning Management Systems: Trends and Alternatives L. Abazi-Bexheti, M. Apostolova-Trpkovska, A. Kadriu	773
Information Competences - Students' Perspective K. Pavlina, S. Spiranec, A. Pongrac Pavlina	778
Development and Analyses of "ProSysEngine" M-Learning Course Management System J. Saveski, M. Fetaji, B. Fetaji, M. Ebibi, L. Abazi	782
Investigation of Natural User Interfaces and Their Application in Gesture-Driven Human-Computer Interaction A. Petrovski, B. Fetaji, M. Fetaji, M. Ebibi	788
ICT Supported Laboratory Testing of Installation Circuit Breaker D. Gadze, M. Puzak, D. Haldek	795
Web-based Control of Programmable Logic Controllers in Process Control Computers Education R. Buinac, D. Marsic, G. Malcic	799
Towards More Efficient Teaching J. Zufic, T. Zajgar	803
The Potential of Multimedia in Cross-Cultural Education Z. Buzasi	808
Computer Network Applications, Practical Implementations and Structural Control System Representations N. Zeqiri	813
The Significant Progress of the Microprocessors and Microcontrollers Course for Computer Science Students S. Ristov, N. Ackovska, V. Kirandziska, D. Martinovikj	818
State of e-Learning Projects in Croatian Companies T. Dragicevic, M. Cukusic, M. Jadric	824
PaintArt 2.0 - Computer Program for Education of Visual Arts in Secondary Schools Z. Prohaska, Z. Prohaska, I. Uroda	830
Informatics as a Basis for a Knowledge-Based Society M. Nadrljanski, V. Domitrovic	834
Information Education in a Knowledge-Based Society M. Nadrljanski, V. Domitrovic	837
Visual Verification of the Properties of Pseudorandom Sequences S. Predanic, G. Vujisic, T. Horvat	841
Integration of Conceptual Data Modeling Methods: Higher Education Experiences L. Kazi, B. Radulovic, I. Berkovic, Z. Kazi	845

Technology Use in EFL Learning D. Pesut	851
Development of a Computer System to Support Knowledge Acquisition of Basic Logical Forms Using Fairy Tale “Alice in Wonderland” A. Mihaljevic Spanjic, A. Jakupovic, M. Tomic	856
Designing the Programming Assignment for a University Compiler Design Course I. Budiselic, D. Skvorc, S. Srblijic	861
Micro Assessment SaaS Cloud Solution A. Bundovski, M. Gusev, S. Ristov	867
The Role of IC Technology in Development and Application of Experimental Methods and Multivariate Analysis M. Orlic, M. Marinovic	873
The Views of Students and Teachers on Implementation of E-learning in Educational Process D. Glusac, D. Radosav, D. Karuovic, Z. Juhas	879
The Model of Remote Video Surveillance in Hierarchical Autonomous E-testing <i>WbeTS</i> System for Knowledge Testing D. Purkovic, E. Ban	883
Web Application Development with Component Frameworks V. Okanovic	889
Agile Management: A Teaching Model Based on SCRUM Z. Pozgaj, N. Vlahovic, V. Bosilj-Vuksic	893
Ethical Aspects and Capabilities of Social Networks – Students, Teachers, and Facebook in Elementary Schools D. Vincek	899
Computer Classroom Operating System Security (Windows) M. Zovkic, T. Vrbaneć	905
Elementary School Students Using Facebook: A Case Study Of Croatian Elementary School ban Josip Jelacic M. Drazenovic	911
Evaluation Study and Results of Intelligent Pedagogical Agent-led Learning Scenarios in a Virtual World M. Soliman, C. Guetl	914
LeCTo: a Rich Lecture Capture Solution P. Pale, J. Petrovic, B. Jeren	919
Using Data Mining for Learning Path Recommendation and Visualization in an Intelligent Tutoring System I. Jugo, B. Kovacic, V. Slavuj	924
Security Analysis of Wireless Network Access Following 802.11 Standard in Educational Institutions of the Republic of Croatia A. Skendzic, B. Kovacic	929

Use of iPads in Foreign Language Classes K. Starkl Crnkovic	937
Tablet PC & Smartphone Uses in Education (TabletTours) K. Bedi	940

Computers in Technical Systems

Learning From Success Cases in Steel Industry Electrical and Automation Applications – <i>Invited Paper</i> P. Paganini	946
The Multimedia Devices Portable Automated Test System – <i>Invited Paper</i> V. Pekovic, I. Kastelan, G. Velikic, N. Teslic	949
Static Characteristic and Describing Function of Polynomial Compensated Nonlinearities O. Kuljaca, K. Horvat, Z. Eskinja	953
A New Approach for Maximum Utilization of the Mother Steel Plates for Rectangular Steel Plates Orders L. Kasapinov, M. Jovanov, D. Trajanov	959
Simulation Environment for Creating Artificial Range Data in Underwater Object Reconstruction I. Aleksi, D. Kraus, Z. Hocenski	966
Cooperative Ramp Metering Simulation M. Greguric, E. Ivanjko, S. Mandzuka	970
Interpretation of Divers' Symbolic Language by Using Hidden Markov Models M. Menix, N. Miskovic, Z. Vukic	976
Cooperative Control of Heterogeneous Robotic Systems N. Miskovic, S. Bogdan, I. Petrovic, Z. Vukic	982
Program Solutions for the Complex Cooling Process via LADDER Logic T. Spoljaric, M. Fruk, G. Vujisic	987
The Use of the Internet and Wireless Communications in the Monitoring and Control of Industrial Processes V. Tasic, M. Pavlov, D. Brodic, V. Despotovic, D.R. Milivojevic	993
Community Structure in Networks: Girvan-Newman Algorithm Improvement L. Despalatovic, T. Vojkovic, D. Vukicevic	997
Performance Evaluation of WebSocket Protocol for Implementation of Full-Duplex Web Streams D. Skvorc, M. Horvat, S. Srbljic	1003
Improving Thread Scheduling by Thread Grouping in Heavily Loaded Many-Core Processor Systems L. Milic, L. Jelenkovic	1009

Raspberry Pi as a Wireless Sensor Node: Performances and Constraints V. Vujovic, M. Maksimovic	1013
Remote Firmware Update for Constrained Embedded Systems G. Jurkovic, V. Sruk	1019
Performance-Occupation Trade-off Examination in Custom Processor Design D. Ivosevic, N. Frid	1024
Critical Path Method Based Heuristics for Mapping Application Software onto Heterogeneous MPSoCs N. Frid, V. Sruk	1030
Event Calendar for Internet Data Sources P. Rantanen, P. Sillberg	1035
Simulation Library for Resource Constrained Project Scheduling with Uncertain Activity Durations M. Brcic, N. Hlupic	1041
Methods and Software for Estimation of Information System Dependability N. Samec, A. Jakupovic	1047
Internet of Things Cloud Mediator Platform K. Misura, M. Zagar	1052
Second Screen User Experience: A New Digital Television Frontier N. Soskic, N. Kuzmanovic, M. Vidakovic, G. Miljkovic	1057
Device Cloud Platform with Script-Based Agents for “Anywhere Access” Applications Development M. Bjelica, N. Ignjatov, I. Papp, N. Teslic	1061
Sound Quality Assessment in VOIP Environment D. Luksa, S. Fajt, M. Krhen	1066
Automatic Interpretation of Aircraft Piston Engine Monitor Log D. Miljkovic	1071
Regime Dependent Aircraft Piston Engine Monitoring D. Miljkovic	1077
 Intelligent Systems	
Intelligent Support Used for Providing a Pleasant User Experience J. Kaljun, G. Harih, B. Dolsak	1083
Regular Equivalence in Informed Network Search D. Helic	1088
Algorithms for 2D Nesting Problem Based on the No-Fit Polygon D. Domovic, T. Rolich, D. Grundler, S. Bogovic	1094

An Optimal Control Module for Sustainable Natural Resources Consumption Control Synthesis for Decision Support Systems	1100
E. Cherkashin, S. Badmatsyrenova, I. Vladimirov, A. Popova, A. Davydov	
Evolving Genetic Algorithms for Fault Injection Attacks	1106
S. Picek, L. Batina, D. Jakobovic, R. Boix Carpi	
An Overview of Free Software Tools for General Data Mining	1112
A. Jovic, K. Brkic, N. Bogunovic	
Intelligent Multi Agent Systems for Decision Support in Insurance Industry	1118
I. Markic, M. Stula, J. Maras	
Solving Tourist Trip Planning Problem Via Simulated Annealing Algorithm	1124
K. Sylejmani, A. Muhaxhiri, A. Dika, L. Ahmedi	
Generating Spatio-Temporal Streaming Trajectories	1130
E. Meskovic, D. Osmanovic, Z. Galic, M. Baranovic	
Automatic Recognition of Handwritten Corrections for Multiple-Choice Exam Answer Sheets	1136
M. Cupic, K. Brkic, T. Hrkac, Z. Mihajlovic, Z. Kalafatic	
Discrimination Between Serbian and Slovenian Language by Texture Analysis	1142
D. Brodic, Z. Milivojevic, C. Maluckov, M. Jevtic	
Script Independent Feature Set for Handwritten Text Recognition	1147
D. Khanduja, N. Nain	
An Efficient Feature Extraction Method for Segmented Cursive Characters Recognition	1153
S. Panwar, N. Nain	
An Annotated Urdu Corpus of Handwritten Text Image and Benchmarking of Corpus	1159
P. Choudhary, N. Nain	
Non-Standard Words as Features for Text Categorization	1165
S. Beliga, S. Martincic-Ipsic	
Developing a Text Classifier with Constrained Development and Execution Time	1170
I. Budiselic, G. Delac, K. Vladimir	
Application of the NOK Method in Sentence Modeling	1176
M. Rauker Koch, M. Pavlic, A. Jakupovic	
An Improved Image Least Significant Bit Replacement Method	1182
K. Darabkh, I. Jafar, R. Al-Zubi, M. Hawa	
New Recognition Methods for Human Iris Patterns	1187
K. Darabkh, R. Al-Zubi, M. Jaludi	
Feature Selection for Object Detection: The Best Group vs. the Group of Best	1192
L. Fürst, A. Leonardis	
Movie Posters Classification into Genres Based on Low-level Features	1198
M. Ivasic-Kos, M. Pobar, L. Mikec	

Detection of Roadside Vegetation Using Features from the Visible Spectrum I. Harbas, M. Subasic	1204
Predictions of Cloud Movements and the Sun Cover Duration A. Radovan, Z. Ban	1210
Intelligent Modelling for Predicting Students' Final Grades M. Simjanoska, M. Gusev, A. Madevska Bogdanova	1216
Determining the Impact of Demographic Features in Predicting Student Success in Croatia B. Trstenjak, D. Djonko	1222
Intelligent Question – Answering Systems: Review of Research J. Tomljanovic, M. Pavlic, M. Asenbrener Katic	1228

Biometrics & Forensics & De-Identification and Privacy Protection

Face De-Identification with Perfect Privacy Protection L. Meng, Z. Sun	1234
De-Identifying Facial Images Using Singular Value Decomposition P. Chriskos, O. Zoidi, A. Tefas, I. Pitas	1240
An Approach to the De-Identification of Faces in Different Poses B. Samarzija, S. Ribaric	1246
Retaining Expressions on De-Identified Faces L. Meng, Z. Sun, A. Ariyaeinia, K.L. Bennett	1252
Reversible De-Identification for Lossless Image Compression Using Reversible Watermarking R.A. Farrugia	1258
Online Speaker De-Identification Using Voice Transformation M. Pobar, I. Ipsic	1264
Privacy-Preserving Speaker Verification Using Secure Binary Embeddings J. Portêlo, B. Raj, A. Abad, I. Trancoso	1268
Legal Aspects of CCTV Data De-Identification O. Pastukhov	1273
Social Costs of Surveillance and the Case of Biometrics M. Krlic	1278
Removing Gender Signature from Fingerprints L. Lugini, E. Marasco, B. Cukic, J. Dawson	1283
An Experimental Tattoo De-Identification System for Privacy Protection in Still Images D. Marcetic, S. Ribaric, V. Struc, N. Pavesic	1288
Person De-Identification in Activity Videos M. Ivasic-Kos, A. Iosifidis, A. Tefas, I. Pitas	1294

De-Identification in Natural Language Processing V. Vincze, R. Farkas	1300
Evaluation of Different Feature Sets for Gait Recognition Using Skeletal Data from Kinect B. Dikovski, G. Madjarov, D. Gjorgjevikj	1304
A Novel Approach Used for Measuring Fingerprint Orientation of Arch Fingerprint G. Li, C. Busch, B. Yang	1309
Systematic Evaluation Methodology for Fingerprint-Image Quality Assessment Techniques J. Hämmerle-Uhl, M. Pober, A. Uhl	1315
Preventing Converted Speech Spoofing Attacks in Speaker Verification J. Correia, A. Abad, I. Trancoso	1320
Non-Linguistic Vocal Event Detection Using Online Random Forest M. Abou-Zleikha, Z.-H. Tan, M. Græsbøll Christensen, S. Holdt Jensen	1326
A Study of Acoustic Features for the Classification of Depressed Speech P. Lopez-Otero, L. Docio-Fernandez, C. Garcia-Mateo	1331
SIFT vs. FREAK: Assessing the Usefulness of Two Keypoint Descriptors for 3D Face Verification J. Krizaj, V. Struc, S. Dobrisek, D. Marcetic, S. Ribaric	1336
Impact of Severe Signal Degradation on Ear Recognition Performance A. Pflug, J. Wagner, C. Rathgeb, C. Busch	1342
RGB Ratios Based Skin Detection S. Omanovic, E. Buza, I. Besic	1348
Exploiting Periocular and RGB Information in Fake Iris Detection F. Alonso-Fernandez, J. Bigun	1354

Information Systems Security

Password Security – No Change in 35 Years? V. Taneski, M. Hericko, B. Brumen	1360
Brute Force Analysis of PsychoPass-generated Passwords B. Brumen, A. Cernezel	1366
Security Assessment of Eucalyptus' Web Management Interface A. Donevski, S. Ristov, M. Gusev	1372
CROFlux –Passive DNS Method for Detecting Fast-Flux Domains T. Grzinic, D. Perhoc, M. Maric, F. Vlasic, T. Kulcsar	1376
A Survey of Static Code Analysis Methods for Security Vulnerabilities Detection M. Kulenovic, D. Djonko	1381
Random Flip-Flop and Its Applications M. Stipcevic	1387

Comparison of ID-Based Blind Signatures from Pairings for E-Voting Protocols P. Ribarski, L. Antovski	1394
Homomorphic Encryption in the Cloud D. Hrestak, S. Picek	1400
Secure and Privacy-Enhanced E-Mail System Based on the Concept of Proxies I. Kounelis, S. Muftic, J. Löschner	1405
Requirements of Practice in Relation to the Existing Information Technology and Security Management Competencies K. Arbanas, D. Alagic	1411
Development of Users' Information Security Awareness Questionnaire (UISAQ) - Ongoing Work T. Velki, K. Solic, H. Ocevcic	1417
Question Based User Authentication in Commercial Environments K. Skracic, P. Pale, B. Jeren	1422
Technique for Detection of Cooperative Black Hole Attack Using True-link in Mobile Ad-hoc Networks G. Wahane, A.M. Kanthe, D. Simunic	1428
The Effects of Combined Application of SOM, ANFIS and Subtractive Clustering in Detecting Intrusions in Computer Networks Z. Avdagic, A. Midzic	1435
Customer and User Education as a Tool to Increase Security Level I. Sedinic, Z. Lovric, T. Perusic	1441
 Business Intelligence Systems	
Log-Driven User-Centric OLAP – <i>Invited Paper</i> P. Marcel	1446
Combining Domain and Business Ontologies in a Modular Construction Method: EDF Study Case K. Royer, L. Bellatreche, S. Jean	1452
Data Modeling Styles in Data Warehousing V. Jovanovic, D. Subotic, S. Mrdalj	1458
Big Data and Sentiment Analysis using KNIME: Online Reviews vs. Social Media A. Mihanovic, H. Gabelica, Z. Krstic	1464
Implementing the Additional Knowledge in the Croatian Scientific Bibliography T. Jagust, J. Stojanovski, M. Baranovic	1469
The Impact of Training Data Tailoring on Demand Forecasting Models in Retail M. Karan, D. Pintar, Z. Skocir, M. Vranic, A. Alajkovic, J. Milojevic, M. Plesa	1473

Data Mining Meets Network Analysis: Traffic Prediction Models T. Eterovic, S. Mrdovic, D. Djonko, Z. Juric	1479
An Approach to Conceptual Modelling of ETL Processes S. Dupor, V. Jovanovic	1485
UNDERSTANDER Business Intelligence Seeker – User Agent V. Damjanovic, W. Behrendt	1491
Spend Analysis Systems S. Marzic, P. Krneta, M. Pavlic	1497

Digital Economy and Government, Local Government, Public Services

Information Security and the Right to Privacy in Digital Economy – The Case of Republic of Croatia M. Boban	1503
E-business Models for Web Based Social Networks in the Republic of Macedonia D. Jovevski, E. Tijan	1509
Legal Regulation of Public Information Infrastructure in Republic of Croatia G. Vojkovic, T. Katulic	1515
Content Management Systems for Mobile, Context-Dependent Augmented Reality Applications M. Lengheimer, G. Binder, T. Rößler	1521
Statistical Microdata – Production of Safe Datasets, Transparent Presentation of Contents and Advanced Services for Users Through Metadata Authorization System M. Poljicak, H. Stancic	1527
Choosing Broadband Access Solution for Modern Residential Buildings in Densely Populated Urban Center J. Topic, Z. Begic, I. Kapetanovic Serdarevic	1533
ERP Systems in Public Sector R. Kelemen	1537
Comparative Analysis of Tourist Satisfaction and Online Booking Services Usage for Incoming Tourists in Zadar County B. Krce MIOCIC, G. Vidic, T. Klarin	1544
Economic and Financial Analysis of Investments in Information Security Z. Capko, S. Aksentijevic, E. Tijan	1550
Seaport Cluster Information Systems - a Foundation for Port Community Systems' Architecture E. Tijan, S. Aksentijevic, D. Ciscic	1557
Development of e-Clusters M. Davidovic	1563

E-Consultations in Croatian Central Government A.J. Klasinc	1569
Evaluation of Shared Digital Economy Adoption: Case of Airbnb L. Zekanovic-Korona, J. Grzunov	1574
The Digital Economy in Developing Countries - Challenges and Opportunities V. Lazovic, T. Djurickovic	1580
Secure Data Storage P. Ristov, A. Mrvica, T. Miskovic	1586
Implementation of Green ICT for Sustainable Economic Development M. Vidas-Bubanja	1592

MIPRO Junior – Student Papers

Complex Networks Measures for Differentiation between Normal and Shuffled Croatian Texts D. Margan, A. Mestrovic, S. Martincic-Ipsic	1598
Comparison of the Language Networks from Literature and Blogs S. Sisovic, S. Martincic-Ipsic, A. Mestrovic	1603
Performance Analysis of Parallel Master-Slave Evolutionary Strategies (μ,λ) Model Python Implementation for CPU and GPGPU D. Zubanovic, A. Hidic, A. Hajdarevic, N. Nosovic, S. Konjicija	1609
Simulating of Query Processing on Multiprocessor Database Systems with Modern Coprocessors K.Y. Besedin, P.S. Kostenetskiy	1614
Cloud Dilemma R. Petrunic, I. Orovic, V. Buselic	1617
Microcontroller Managed Module for Automatic Ventilation of Vehicle Interior B. Raic, A. Radovan	1622
Acquisition Card NI USB-6009 in Automatic Control Laboratory Exercises H. Benic, M. Fruk, G. Vujisic	1628
Visualization of Streaming Trajectories D. Osmanovic, E. Meskovic	1633
SPAM Trends and Techniques Used on Exchange Online System Used for racunarstvo.hr Domain I. Pavlekovic, V. Gasparevic	1638
An Approach Using Simulation Techniques to Estimate Quality of Service Parameters in Communication Networks H. Kozacinski, P. Knezevic	1642

Mobile Data Wi-Fi Offloading	1648
M. Sraga, N. Momcilovic, A. Tekovic	
Testing Optical Splitters	1650
I. Zuti, A. Komparic	
Comparison of Different DC Motor Positioning Control Algorithms	1654
N. Bacac, V. Slukic, M. Puskaric, B. Stih, E. Kamenar, S. Zelenika	