Table of Contents

Plenary lecture

Snoeys W.	Chips for Discovering the Higgs Boson and Other Particles at CERN: Present and Future	1
Blahnik V., Talla J., Kosan T., Peroutka Z.	Control of Three Phase 7-Level CHB Voltage-Source Active Rectifier	7
Brtnik B.	Solving of the Switched Circuits by Combination Diakoptic Methods and by Combined Transformation Method	11
Brtnik B., Matousek D.	Modified Summary Graph Method Solving of the SC Circuits	15
Dobias M., Stastny J.	Classifying Direction of the Right Index Finger Movement from Delta Band Activity Using HMM	19
Dostalek L., Ledvina J.	Strong Authentication for Internet Mobile Application	23
Dudacek K., Dudacek K., Vavricka V.	Comparison of Short Delay Measurement Methods	27
Dvorak J., Havlik J.	Changes in Arterial Stiffness Index Depending on the Cardiovascular System Condition	33
Eichler J., Kosek M., Novak M.	Two Methods of Scalar Preisach Function Identification for Grain Oriented Steel	37
Fric M., Fikejz F.	Correlation between Three Facial Vibration Measurement Methods	41
Gil-Garcia J., Garcia I., Zubia J., Aranguren G.	Measurement of Blade Tip Clearance and Time of Arrival in Turbines Using an Optic Sensor	45
Hargas L., Koniar D., Loncova Z., Hrianka M., Hurtukova Z., Simonova A.	Regular Shapes Detection for Analysis of Biomedical Image Sequences	49
Hirman M. Steiner F.	Influence of Electrically Conductive Adhesive Amount on Shear Strength of Glued Joints	53

Hlousek P.	Advanced Methods of Design of Complex Track Circuits	**57**
Hofmann G. Scharfenberg G.	Random Hardware Failure Compliance of a Cell Balancing Circuit with the Requirements of Automotive Functional Safety	**61**
Horky J. Pokorny M. Havlik J.	FAT File Systems for Embedded Systems and its Optimization	**67**
Hrbac R. Kolar V. Novak T.	Prototype of a Luxmeter with High Sensitivity Suitable for Long-Term Data Recording	**71**
Ionescu L. Mazare A. Anton C.	Configurable Hardware Accelerator for Solving Equations in Real Time	**75**
Janik D. Kosan T. Janous S. Sadsky J. Peroutka Z.	The SVPWM Modulation Technique with Active Voltage Balancing Control for 3-Level ANPC Inverter	**81**
Jilek J. Stork M.	Wrist Cuff Method Determines Diastolic Pressure in Dual Cuff Blood Pressure System	**85**
Kartci A. Ayten U. Herencsar N. Sotner R. Jerabek J. Vrba K.	Floating Capacitance Multiplier Simulator for Grounded RC Colpitts Oscillator Design	**93**
Kelnar M. Vanus J. Martinek R. Bilik P. Koziorek J. Zidek J.	Visualization and Communication System for Robotic Head Control	**97**
Kment A. Pipa M. Janicek F.	Automated Measurements of Mechanical Strength and Durability of Selected Cables	**103**
Konecny I. Kroupa M. Polansky R. Prosr P. Steiner F.	Innovated Relays for Railway Signalling and Interlocking	**107**

Kosan T. Jara M. Blahnik V. Peroutka Z.	A Universal Configurable Sinusoidal Modulator for H-Bridge Based Converters Implemented in FPGA	**111**
Kozacek B. Frivaldsky M. Kostal J. Piri M.	Figure of Merit of Semiconductor Structures: Determination of the Impact on the System Efficiency of LLC Converter	**115**
Krstic D. Marjanovic I. Zdravkovic S. Veljkovic S. Masadeh B. Y. M.	Moments of Macrodiversity SC Receiver Output Signal with Two Microdiversity EGC Receivers with Three Branches over Rayleigh Multipath Fading Environment	**121**
Kuhajda B. Martinek R. Kelnar M. Vanus J. Bilik P.	New Strategies for Frequency Measurement Using High-Speed Video Camera System	**125**
Kus V. Josefova T.	The Influence of the Dead Time Duration and Switching Frequency on the Input Current Distortion of Voltage-Source Active Rectifiers	**131**
Kus V. Pittermann M. Fort J.	DC-Source with Minimal Influences on the Supply Network	**135**
Kutilek P. Socha V. Schlenker J. Skoda D. Hybl J. Frynta D. Landova E. Haskova T. Cerny R. Kurali A.	System for Measuring Movement Response of Small Animals to Changes in their Orientation	**139**
Lafata P. Nevosad M.	Modelling of Metallic Cables at G.fast Frequencies	**145**
Li G. Lin C. Bai Y. Liu P.	Echo Simulation Method for Doppler Beam Sharpening Imaging of the Missile-Borne Radar	**149**
Linhart R. Georgiev V. Kopal J.	Broadband Bias Networks for Pulse Signal RF Amplifiers	**153**

Montanez G. Patino D. Mendez D.	Comparison of Model Predictive Control Techniques for Active Suspension	**157**
Muzikova V. Glasberger T.	Control Strategies Enabling High Frequecy Injections for PMSM Position Estimation	**161**
Nahlik J. Hospodka J. Subrt O. Bonilla A.	Optimization Methods for Switched Capacitor Circuits	**165**
Nimz T. Bodenstein C. Berekovic M.	LED Application Specific Calibration Method for Color Measurements	**169**
Pancik J.	The Low Cost Embedded Control of the Industrial Hydraulic Pulse System Based on PLC and State Machine Design	**175**
Peniak P., Franekova M.	Open Communication Protocols for Integration of Embedded Systems within Industry 4	**181**
Peresini O., Krajcovic T.	Internet Controlled Embedded System for Intelligent Sensors and Actuators operation	**185**
Pittermann M. Drabek P. Bednar B.	Switching Algorithms for Single Phase Matrix Converter with Input Capacitance	**189**
Pittermann M. Drabek P. Bednar B.	Control Algorithms for Traction Drive with High Voltage Matrix Converters and Medium Frequency Transformer	**193**
Pittermann M. Drabek P. Bednar B.	High Voltage Converter for Purpose to Minimizing of Weight of Traction Transformer	**197**
Poljak L. Drabek P.	Metods for Voltage Ripple Mitigation on DC Side of Single-Phase AC\DC Converters	**201**
Rath G. Probst G. Kollment W.	Robot Control Unit for Educational Purposes	**205**
Ravindra J.	CCSDR: Design of Ultra Low Power FFT Processor Using Novel Conditional Canonic Sign Digit Representation	**89**
Skala B. Kus V. Kindl V. Mraz P.	Construction of Low-Pass HV Filter for Measuring of Partial Discharge	**209**

Socha V. Kutilek P. Schlenker J. Socha L. Begera V. Cerny R. Szabo S.	An Evaluation Method of Complex Movement and Dynamic Stability of the Arm during Walking Based on Gyroscope Data	**215**
Sostronek M. Matousek Z. Lakota B. Matejcek M.	W-Band Direct Detection Radiometer Model	**221**
Sotner R. Prokop R. Jerabek J. Kledrowetz V. Fujcik L. Dostal T.	Design of Current-Controlled Current Conveyor Stage with Systematic Current Offset Reduction	**225**
Stork M. Hrusak J. Mayer D.	A New Chaotic System Based on State Space Energy Feedback	**229**
Stork M., Kurt E.	Control System Approach to the Dynamics of Nonidentical Josephson Junction Systems	**233**
Stork M. Skala J. Weissar P. Holota R. Kubik Z.	Various Approaches to Driver Fatigue Detection: A Review	**239**
Stork M., Vancura V.	Pacemaker Leads Place Optimization Based on Vectorcardiography Signal Processing	**245**
Tagkalakis F. Fotopoulos V.	A Low Cost Finger Vein Authentication System Using Maximum Curvature Points	**249**
Talla J. Peroutka Z. Blahnik V. Streit L.	Rotor and Stator Resistance Estimation of Induction Motor Based on Augmented EKF	**253**
Teodorescu H.	Applicative Appraisal of the Temperature Dependence of the Noise in Preamplifiers: The Very Low Frequency Case	**259**
Tolar D., Stork M.	Acknowledged Data Transmissions in Wireless Sensor Network with Optimized Sensor Energy Consumtion	**263**
Valda L., Kosturik K.	Comparison of Li-ion Active Cell Balancing Methods Replacing Passive Cell Balancer	**267**

Volf J. Novak V. Ryzhenko V. Hurtecak J.	Effect of Circle Electrodes with Conductive Ink on Properties of Tactile Sensors	**271**
Votava M., Glasberger T.	A Carrier Redistribution PWM for Dual Inverter with Separated DC Circuits	**275**
Wolfram H.	Controller Fixed-Point Optimization with Genetic Algorithms	**279**
Yu S. Hsieh Y. Lai P. Chen Y. Yang C. Lin K.	FPGA-Based Resonant-Frequency-Tracking Power Amplifier for Ultrasonic Transducer	**285**
Zahour J. Krivka J. Kosturik K.	Engine Type Independent SCR system	**289**
Zak T. Sotner R. Jerabek J. Vrba K. Dostal T.	Reconfigurable First-Order Filter Operating with Non-Ideal Parameters of Active Elements	**293**
Zdansky J. Rastocny K. Hrbcek J.	Influence of Architecture and Diagnostic to the Safety Integrity of SRECS Output Part	**297**