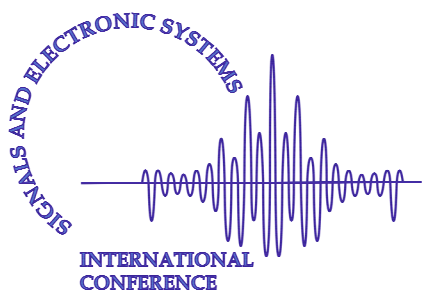


ICSES 2008 International Conference on Signals and Electronic Systems

Conference Proceedings



ICSES'08



Minister of
S. & H.E.



Rector of
AGH-UST



AGH



September 14-17, 2008, Kraków, Poland

Table of Contents

Preface

Plenary Lectures

Ellen J. Yoffa : <i>Human Language Technologies for the Enterprise of the Future</i>	3
Giovanni De Micheli : <i>Designing Micro/Nano Systems for a Safer and Healthier Tomorrow</i>	3
frederic j. harris : <i>Software Defined Radio</i>	4
Janusz Rajski : <i>Embedded Deterministic Test</i>	4
Massimo Caccia : <i>Silicon Detectors: from the Dawn of the Universe to BioMedical Applications and Beyond</i>	4
1 Analog and Digital Signal Processing	5
<i>On Accelerating the Computation of 2-D Discrete Cosine Transform in Image Processing</i>	
G.A. Papakostas, E.G. Karakasis, D.E. Koulouriotis	7
<i>A Current Mode Multi-Channel Wilkinson ADC</i>	
Neena Nambiar, Benjamin J. Blalock, Milton N. Ericson	11
<i>ADC on-Chip Dynamic Test by PWM Technique</i>	
Shakeel Ahmad, Jerzy Dąbrowski	15
<i>Level-crossing sampling using microprocessor based system</i>	
Aldis Baums, Uldis Grunde, Modris Greitans	19
<i>Gain-Phase Relationships Evaluation by Gaussian Quadrature</i>	
Corneliu Rusu, Lacrimioara Grama	23
<i>Robustness of 1-D Integer-to-Integer Transmultiplexer Systems</i>	
Przemysław Sypka, Mariusz Ziółko	27
<i>Fuzzy Extreme Analysis for Signal Compression</i>	
Włodzimierz Pogribny, Marcin Drzycimski	31
<i>High-Performance Floating-Point VLSI Architecture of Lifting-Based Wavelet Processor</i>	
Andre Guntoro, Massoud Momeni, Hans-Peter Keil, Manfred Glesner	35
<i>Real-Time Wavelet Transform with Overlap of the Signal Segments</i>	
Pavel Rajmic, Jan Vlach, Josef Vyoral	39
<i>Particularities of cyclic intelligent ADC design, implementation and adjusting</i>	
Anatoliy Platonov, Jakub Jasnos, Konrad Jędrzejewski, Łukasz Małkiewicz, Zbigniew Jaworski, Elżbieta Piwowarska, Paweł Studziński	43
<i>Accurate Estimation of Harmonic Amplitudes in Voiced Speech Based on Harmonic Transform</i>	
Piotr Zubrycki, Alexander A. Petrovsky	47
<i>On superiority of Successive Approximation Register over Sigma Delta AD converter in standard audio measurements using Maximum Length Sequences</i>	
Daniel Król	51

<i>Improvement of Short Noisy Chirp Signals Recognition</i>	
Włodzimierz Pogribny, Tadeusz Leszczyński	55
2 Design of Integrated Circuits and Microsystems	59
<i>3D Electromagnetic Chip Package Simulation for high-speed serial interface application</i>	
Adam Rydygier, Ralf Kakerow, Irina Munteanu, Michael Buchmann, Markus Müller	61
<i>On Pixel Signal Processing for MAPS Sparsified Readout Implemented in CMOS VLSI Technology</i>	
Janusz Młynarczyk, Eleuterio Spiriti	65
<i>Ultra Low Power Analog Standard Cell for Low Frequency CMOS Filters Design</i>	
Tomasz Kulej	69
<i>Highly Linear Wideband Low Power Current Mode LNA</i>	
Naveed Ahsan, Christer Svensson, Jerzy Dąbrowski	73
<i>Design of 64-channel Analogue Multiplexer for Neural Application in CMOS 180 nm Technology</i>	
Maciej Kachel, Mirosław Żołądź, Piotr Kmon	77
<i>Programmable Logic Arrays in Single-Electron Transistor Technology</i>	
Costa Gerousis, Arthur Grepitotis	81
<i>Thermal noise measurement of SI integrator</i>	
Andrzej Handkiewicz, Paweł Śniatała, Radosław Rudnicki, Jacek Pierzchlewski	85
<i>Four-Stage Ring Oscillator for Quadrature Signal Generation</i>	
Takashi Kusaga, Takeshi Shima	89
<i>Influence of Circuit Nonidealities on Switched-Capacitor Resonators</i>	
Massoud Momeni, Andre Guntoro, Hans-Peter Keil, Manfred Glesner	93
<i>Feasibility of achieving high calculation speeds on the RASC platform</i>	
Maciej Wielgosz, Ernest Jamro, Kazimierz Wiatr	97
<i>Experimental Results of CMOS-Implemented Conscience Mechanism Applied for WTA Networks</i>	
Tomasz Talaśka, Rafał Długosz, Jakub Dalecki, Witold Pedrycz, Ryszard Wojtyna	101
<i>A Low-Power Sample-and-Hold Circuit Based on a Switched-OpAmp Technique</i>	
Francesco Centurelli, Andrea Simonetti, Alessandro Trifiletti	105
<i>Minimum Power-Delay Product Design of MCML Gates</i>	
Giuseppe Caruso, Alessio Macchiarella	109
<i>Energy Losses in digital CMOS Integrated Circuits: State-of-the-art and Future Trends</i>	
Adam Gołda, Andrzej Kos	113
<i>Neuronal Circuit with Floating-Gate Transistor</i>	
A. Medina Santiago, M. A. Reyes Barranca	117
<i>Configurable VLSI Architecture of a 3-Input Floating-Point Adder</i>	
Andre Guntoro, Manfred Glesner	121
<i>Time-to-Digital Converter with Serial Output Interface</i>	
Dariusz Kościelnik, Marek Jabłeka, Marek Miśkiewicz	125
<i>Low-Power Design of Delay Interpolating VCO</i>	
Giuseppe Caruso, Alessio Macchiarella	129
<i>Calculation Methods of New Circuit Activity Measure for Low Power Modeling</i>	
Ireneusz Brzozowski, Andrzej Kos	133
<i>AES hardware implementation in FPGA for algorithm acceleration purpose</i>	
Artur Gielata, Paweł Russek, Kazimierz Wiatr	137
<i>Low-Power Low-Noise Versatile Amplifier for Neural Signal Recording</i>	
Piotr Kmon	141
<i>Low Voltage Charge-Pump-Based VCO Circuits Using Cmos Inverters as Building Blocks</i>	
Wojciech Kołodziejski, Witold Machowski, Jacek Jasielski, Stanisław Kuta	147

	<i>Low Voltage Charge-Pump-Based Sigma-Delta Modulator Using CMOS Inverters as Building Blocks</i>	
	Jacek Jasielski, Wojciech Kołodziej, Stanisław Kuta, Witold Machowski, Maria Sapor	153
	<i>Antialiasing Filter for NSDM codec</i>	
	Juliusz Godek, Ryszard Golański, Jacek Kołodziej	159
	<i>The Two Channel CMOS Converter for Silicon Photomultiplier</i>	
	Wojciech Kucewicz, Jerzy Barszcz, Jan Juraszek, Rafał Mos, Maria Sapor	165
3	Image Processing and Recognition	169
	<i>VHDL described Finger Tracking System for Real-Time Human-Machine Interaction</i>	
	Xabier Iturbe, Andoni Altuna, Alberto Ruiz de Olano, Imanol Martinez	171
	<i>Lifting-based Wavelet Transform for Images on Modern CPU Architectures</i>	
	Jan Maly, Pavel Rajmic	177
	<i>A New Hardware Algorithm for Searching Genome Patterns</i>	
	Andrzej Pułka, Adam Milik	181
	<i>Predictor Blending Technique for Lossless and Near-Lossless Image Coding</i>	
	Grzegorz Ulacha, Ryszard Stasiński	185
	<i>Performance Evaluation of Interpolative BTC Image Coding Algorithms</i>	
	Fituri Belgassem, Elganai Rhoma, Andrzej Dziech	189
	<i>Polyphase Downsampling Based Multiple Description Image Coding using Optimal Filtering with Flexible Redundancy Insertion</i>	
	Çağlar Ateş, Yılmaz Ürgün, Begüm Demir, Oğuzhan Urhan, Sarp Ertürk	193
	<i>Computationally Simple Super-Resolution Algorithm for Video from Endoscopic Capsule</i>	
	Krzysztof Duda, Tomasz Zieliński, Mariusz Duplaga	197
	<i>On-Line Writer Identification Method based on FIR System Characterizing Pen-tip Movement</i>	
	Takenobu Matsuura, Pitak Thumwarin	201
	<i>Object detection in grayscale images based on covariance features</i>	
	Ints Mednieks	205
	<i>A Hybrid Technique for Stereoscopic Depth Estimation in Video</i>	
	Olgierd Stankiewicz, Krzysztof Wegner	209
	<i>Texture synthesis using a combination of Cellular Neural Networks and Wei-Levoy method</i>	
	Łukasz Kornatowski, Krzysztof Ślot	213
4	Medical Applications	217
	<i>Nucleotide Genomic Signal Analysis</i>	
	Paul Dan Cristea, Rodica Tuduce, Jan Cornelis, Adrian Munteanu	219
	<i>Analysis of Vocal Folds Movement in High Speed Videoendoscopy Based on Level Set Segmentation and Image Registration</i>	
	Andrzej Skalski, Tomasz Zieliński, Dimitar Deliyski	223
	<i>32x32 Oscillator Network Chip For Binary Image Segmentation</i>	
	Jacek Kowalski, Michał Strzelecki	227
	<i>Heuristic method for heartbeat detection in fetal phonocardiographic signals</i>	
	Endre Kósa, Ádám Tamás Balogh, Bálint Üveges, Ferenc Kovács	231
	<i>Individual HRTF Measurements for Accurate Obstacle Sonification in an Electronic Travel Aid for The Blind</i>	
	Michał Pec, Michał Bujacz, Paweł Strumiłło, Andrzej Materka	235
	<i>Implementation of Prioritised ROI Coding for Medical Image Archiving using JPEG2000</i>	
	K.V. Sridhar	239

	<i>Implementation of a Modified Wavelet based Video Compression on a ADSP Blackfin 533 Processor for Medical Imaging Applications</i>	
	K. V. Sridhar, K. S. R. Krishna Prasad	243
	<i>Associative Properties of Artificial Immune Systems</i>	
	Barbara Borowik, Bohdan Borowik, Jan Kucwaj, Chris Laird, Sophie Laird	247
5	Analysis and Modelling of Circuits and Systems	251
	<i>Passive and Reciprocal Network Description of Independent Sources for Efficient Model Reduction</i>	
	Stefan Ludwig, Ljubica Radic-Weissenfeld, Wolfgang Mathis, Werner John	253
	<i>Combined Pseudochaotic Psudorandom Generator</i>	
	Mieczysław Jessa	257
	<i>Transconductance Realization of Block-diagrams of Electronic Networks</i>	
	Vladimir Filaretov, Konstantin Gorshkov	261
	<i>New Modulation Strategy for Controlled Power Electronic Applications with Low Switching Frequencies</i>	
	Olaf Schnick, Niklas E. Rüger, Axel Mertens, Wolfgang Mathis	265
	<i>Developing Automated Design Procedure for Operational Amplifier Blocks</i>	
	Jiří Maršík, Ondřej Šubrt, Pravoslav Martinek	269
	<i>Use of Neural Networks and Brownian Motion in Local Positioning Systems</i>	
	Maciej Rutecki, Tomasz Kacprzak	273
	<i>A Recursive Multi-Output Discrete-Time Sinusoidal Oscillator</i>	
	Ewa Hermanowicz, Tomasz Krupski	277
	<i>Residual Offset Optimization for a Continuous Time Autozero Amplifier</i>	
	Andrei Danchiv, Mircea Bodea	281
	<i>Short periodic orbits for the Lorenz system</i>	
	Zbigniew Galias, Warwick Tucker	285
	<i>Sensitivity Analysis of Overall Transfer Functions of Active Affined Two-Ports</i>	
	Andrzej Kukielka, Jacek Izydorczyk	289
	<i>Design method of a 3-phase VSI for UPS systems</i>	
	Zbigniew Rymarski	293
	<i>Optimizing neural network for function extreme searching in the Remez algorithm</i>	
	Mariusz Nawara	297
	<i>Parameter Decision Diagram in the Structural Synthesis of Analog Networks</i>	
	Sławomir Lasota	301
	<i>Volterra Models Structure Identification using a Symmetric Input</i>	
	Houda Mathlouthi, Kamel Abderrahim, Faouzi Msahli, Gérard Favier	305
	<i>On Performance Limits of Switched-Capacitor Multi-Phase Charge Pump Circuits. Remarks on papers of Starzyk et al.</i>	
	Marek S. Makowski	309
	<i>Application of Singular Value Decomposition to Estimation of Displacements of Deformable Grid Nodes</i>	
	Marek Goździk, Krzysztof Ślot	313
	<i>Improved Electrothermal Model of the Thermoelectric Generator Implemented in SPICE</i>	
	Artur Mirocha, Piotr Dziurdzia	317
6	Analog and Digital Filters	321
	<i>Compensation of Two-periodic Nonuniform Holding Signal Distortions by Using a Variable FIR Filter</i>	
	Christian Vogel	323

<i>The design of a 4th order Bandpass Butterworth filter with one operational amplifier</i>	
H.Gaunholt	327
<i>An Efficient Long Distance Echo Cancellor</i>	
Artur Ferreira, Paulo Marques	331
<i>Design of Low-Delay Cosine-Modulated Filter Banks with Equiripple Reconstruction Error</i>	
Felicja Wysocka-Schillak	335
<i>Group Delay and Filter Order Estimation for Least-Squares Design of IIR Filters with Unequal Number of Poles and Zeros</i>	
Jacek Konopacki	339
<i>A comparison between prolate spheroidal and Gaussian FIR pulse shaping filters</i>	
Yutaka Jitsumatsu, Masato Ogata, Tohru Kohda	343
<i>Low-Power ANSI S1.11 Filter Bank for Digital Hearing Aids</i>	
Yu-Ting Kuo, Tay-Jyi Lin, Yueh-Tai Li, Chou-Kun Lin, Chih-Wei Liu	347
<i>Approximating the critical bands using warped filter banks based on multiplierless allpass chains</i>	
Marek Parfieniuk, Alexander Petrovsky	351
<i>An Improved Quality Adaptive Rate Filtering Technique Based on the Level Crossing Sampling</i>	
Saeed Mian Qaisar, Laurent Fesquet, Marc Renaudin	355
<i>An NLMS-type Adaptive Filter Using Multiple Fixed Preconditioning Matrices</i>	
Øyvind Lunde Rørtveit, John Håkon Husøy	359
<i>Algorithm of Optical Filter Self-Acting Change for High Temperature Applications of Vision Systems</i>	
Anna Fabijańska, Dominik Sankowski	363
<i>State Space Synthesis of Two-Dimensional FIR Lossless Filters</i>	
Robert Wirski, Krzysztof Wawryn	367
<i>Implementing six-channel linear-phase paraunitary filter banks with quaternion arithmetic</i>	
Marek Parfieniuk, Alexander Petrovsky	371
<i>Optimal Design of Low-Sensitivity, Low-Power 2nd-Order BP Filters</i>	
Drazen Jurisic, Neven Mijat, George S. Moschytz	375
7 Mathematical and Computational Methods	379
<i>Rapid prototyping of real-time reactive systems</i>	
Konrad Kulakowski, Marek Kostrzewa	381
<i>Modeling and Simulation of Ion-sensor Systems</i>	
Jan Ogrodzki	385
<i>Adaptive Predistortion of Hammerstein Systems Based on Indirect Learning Architecture and Prediction Error Method</i>	
Emad Abd-Elrady, Li Gan	389
<i>Mixed fractional Brownian motion: some related questions for computer network traffic modeling</i>	
Daria Filatova	393
<i>Convex Formulation of the Stochastic MV-PURE Estimator and Its Relation to the Reduced Rank Wiener Filter</i>	
Tomasz Piotrowski, Isao Yamada	397
<i>Iterative SVD algorithm as a BSS solution</i>	
Adam Dąbrowski, Damian Cetnarowicz	401
<i>Shortening the Critical Path in CORDIC-Based Approximations of the Eight-Point DCT</i>	
Marek Parfieniuk	405

8	Communication Systems, Network and Transmission	409
	<i>Subword Parallel Conditional Execution in H.264/AVC Deblocking Filter Implementation</i>	
	Tero Sihvo	411
	<i>Detection of GSM speech coding for telephone call classification and automatic speaker recognition</i>	
	Adam Dąbrowski, Szymon Drgas, Tomasz Marciniak	415
	<i>Network-on-Chip Based Architecture of H.264 Video Decoder</i>	
	Adam Łuczak, Paweł Garstecki, Olgierd Stankiewicz, Marta Stepniewska	419
	<i>Performance Analysis of Uncoded/Coded Windowed-OFDM and Circular Wavelet-OFDM Transmission in PLC Channel with Bit-loading</i>	
	Łukasz Zbydniewski, Paweł Turcza, Tomasz Zieliński, Judith Pertejo López	423
	<i>Implementation of Dual Latency Operation in VDSL2 with Downstream Power Back off on DSP Chip</i>	
	S. Ravishankar, Padmaja K.V., Santosh Sridhar	427
	<i>H.264/AVC Multiple Reference Video Frames</i>	
	Andreja Samčović, Jan Turan	431
	<i>The First Erlang Formula and Traffic Description in Asynchronous Networks</i>	
	Erik Chromý, Ivan Baroňák	435
9	Application of Electronic Systems	439
	<i>A new real time and efficient method to automatically count plastic cards</i>	
	Benjamin Tourne, Rachid Harba, Andres Flores, Benoît Berthe, Philippe Ravier	441
	<i>An Implantable System for the in vivo Measurement of Hip and Knee Migration and Micromotion</i>	
	Shiyong Hao, John Taylor, Anthony W. Miles, Chris R. Bowen	445
	<i>Dynamic Adaptation of Interconnections in Inkjet Printed Electronics</i>	
	Heikki Huttunen, Pekka Ruusuvoori, Tapio Manninen, Kalle Rutanen, Risto Rönkkä	449
	<i>Design and Implementation of a Stable Platform Digital Controller Based on DSP</i>	
	Babak Zamanlooy, Hamidreza Chamani Takaldani, Amir Moosavienia, Khalil Monfaredi, Reza Ebrahimi Atani	453
	<i>Electronic Control Unit for the Tuned Combustion Engines with Spark Ignition</i>	
	Dariusz Kościelnik, Jacek Stępień	457
10	Measurement Systems	461
	<i>Feasibility of statistical classifiers for monitoring rollers</i>	
	Sören Wittenberg, Matthias Wolff, Rüdiger Hoffmann	463
	<i>Synchronous measurement of inter-modulation products using a multi-frequency coherent signal</i>	
	Jan Duchiewicz, Andrzej E. Sowa, Jerzy S. Witkowski, Tomasz Duchiewicz	467
	<i>Novel algorithms for ion activity estimation with on-line water monitoring application</i>	
	Leszek J. Opalski	471
	<i>Implementation of PSD Sensor for Measurement of Vibrations</i>	
	G. Beziuk, A. Grobelny, J.S. Witkowski, B. Marek	475
	<i>The Efficiency of the 3-D Delaunay Triangulation Combined with the Advancing Front Method</i>	
	Jan Kucwaj, Barbara Borowik	479
11	Speech Processing Coding and Recognition	483
	<i>On the Inversion of Mel-Frequency Cepstral Coefficients for Speech Enhancement Applications</i>	
	Laura E. Boucheron, Phillip L. De Leon	485
	<i>Speech Coding Influence on Features Dedicated to Speaker Identification</i>	
	Tomasz Maka, Łukasz Bonikowski	489

<i>Speech formant frequency and pitch estimation using instantaneous complex frequency</i>	
Magdalena Kaniewska	493
<i>Fast Vector Quantization Search Using Multipath Tree in the Structuralized Codebook of LSF Coefficients</i>	
Andrzej Sawicki, Alexander Petrovsky	497
<i>Lexical model for ASR of fluent polish speech – analyze of polish phonology and phonetics</i>	
Krzysztof Rutecki, Ryszard Makowski	501
12 RF Circuits and Systems	505
<i>Experimental RFID System with Active Tags</i>	
Gustaw Mazurek	507
<i>Radio Frequency Identification and Integrity Control System for collision monitoring</i>	
Paolo Zicari, Giuseppe Cocorullo	511
<i>A New Resonance-Shift Voltage Limiting Mechanism for RFID Transponder Front-end Circuit</i>	
Sau-Mou Wu, Chun-Wei Tsai, Yachi Hong,	515
<i>Robust Noise Radar Detection in the Presence of Alpha-Stable Disturbances</i>	
Zbigniew Gajo, Krzysztof Kulpa	519
<i>Software-defined digital radio baseband processor using Blackfin DSP</i>	
Łukasz Krzak, Rafał Mielniczuk, Cezary Worek	523
<i>RF-based node system for blind navigation in running activities</i>	
Alexandra Skripko, Pavel Skripko, Arturs Gailitis, Leo Selavo	527
13 Testing and Reliability	531
<i>Multiple Soft Fault Diagnosis of Analogue Electronic Circuits</i>	
Stanisław Hałgas, Michał Tadeusiewicz	533
<i>Sensitivity analysis of ramp response of VLSI interconnects</i>	
Agnieszka Ligocka, Wojciech Bandurski	537
<i>Optimization of PWL Analog Testing Excitation by Means of Genetic Algorithm</i>	
Tomasz Golonek, Damian Grzechca, Jerzy Rutkowski	541
<i>Fault-Tolerant Architecture for Nanoelectronic Digital Logic</i>	
Jacek Flak, Mika Laiho, Ari Paasio	545
<i>DWT Algorithm for Fault Detection and Localization</i>	
Marek Ossowski, Andrzej Kuczyński	549
<i>Dictionary Method for Multiple Soft and Catastrophic Fault Diagnosis Based on Evolutionary Computation</i>	
Marek Korzybski	553
<i>The Use of Variable Load for RF Circuit Testing</i>	
Piotr Kyziol, Damian Grzechca, Tomasz Golonek, Jerzy Rutkowski	557
Index of Authors	561