2010 International Conference on Signals and Electronic Systems

(ICSES 2010)

Gliwice, Poland
7-10 September 2010

IEEE

IEEE Catalog Number: CFP1057D-PRT
ISBN: 978-1-4244-5307-8

TABLE OF CONTENTS

PLENARY LECTURES 1

Rudolf Kruse, M. Steinbrecher, C. Moewes: ***Temporal Pattern Mining*** 3

Zebo Peng: ***Building Reliable Embedded Systems with Unreliable Components*** 9

1. ANALOG AND DIGITAL SIGNAL PROCESSING 15

M. Imran, K. Khursheed, M. O'Nils, O. Gustaffson:
On the Number Representation in Sub-expression Sharing 17

X. Fang, C. Hu-Guo, D. Brasse, Y. Hu:
Design of a High Accuracy Multi-channel Analog CMOS Peak Detect and Hold Circuits for APD-Based PET Imaging 21

M L. R. Peraza, D. M. Halliday:
A Fast Dynamic Bayesian Network Algorithm for Structure Learning Using a Time-Lagged Partial Correlation Matrix 25

P. Falkowski, A. Malcher:
Audio Signal Processing Based on Dynamically Programmable Analog Arrays 29

M L. R. Peraza, D. M. Halliday:
Fourier Bayesian Information Criterion for Network Structure and Causality Estimation 33

E. Pinheiro, O. Postolache, P. Girão:
Stationary Wavelet Transform and Principal Component Analysis Application on Capacitive Electrocardiography 37

K. Jędrzejewski, A. Platonov:
A New Approach to Cancellation of Harmonic Interferences in Intelligent Cyclic A/D Converters 41

M. Tangjitjetsada, P. Thumwarin, T.Matsuura:
Voice Recognition for Thai based on Impulse Response of FIR System Characterizing the Relation between Consonant and Vowel 45

M. Malboubi, F. Razzazi, M. A. Sh:
Elimination of Power Line Noise from EMG Signals Using an Efficient Adaptive Laguerre Filter 49

M. Ghazvini, N. Movahedinia, A. Vafaei:
Pitch Period Detection Using Second Generation Wavelet Transform 53

O. Baser, E. Kilic, I. Konukseven, M. Dolen:
A Hybrid Method to Estimate Velocity and Acceleration using Low-Resolution Optical Incremental Encoders 57

E. Kilic, O. Baser, M. Dolen, I. Konukseven:
An Enhanced Adaptive Windowing Technique for Velocity and Acceleration Estimation using Incremental Position Encoders 61

M. Vashkevich, A. Petrovsky:
A design method for oversampled warped cosine-modulated filter banks 65

M. Wiśniewski, T. Zieliński:
Digital Analysis Methods of Wheezes in Asthma 69

N. Zoghlami, Z. Lachiri:
Perceptual Speech Enhancement System Based on Non-Uniform Analysis 73

W. Oliwa:
An Influence of Signal Amplitude Variation on Interpolated DFT Method 77

R. Krupiński, P. Mazurek:
Sensitivity analysis of eye blinking detection using evolutionary approach 81

O. Abdelfattah, A. Swidan, Z. Zilic:
Efficient Direct Analog-to-Residue Conversion Schemes 85

Y. Shiraki:
Speech-Spectral Deformation and Its Algebraic Invariants 89

G. Dziwoki:
Phase Offset in CMA and MMA Soft Switching Blind Equalization Schemes - a Comparative Study 93

Ł. Małkiewicz, A. Platonov:
Methods of Additional Improvement of Cyclic ADC Performance 97

J. Fiołka:
Postural Stability Analysis : A Wavelet - Based Approach 101
A. Dustor, P. Szwarc:
Spoken Language Identification Based on GMM Models 105

2. IMAGE PROCESSING 109

K. Klimaszewski, K. Wegner, M. Domański:
Joint Intra Coding of Video and Depth Maps 111
G. Ulacha, R. Stasiński:
Improved Predictor Blending Technique for Lossless Image Coding 115
S. Maćkowiak, J. Konieczny, M. Kurc, P. Maćkowiak:
A complex system for football player detection in broadcasted video 119
F. Sepehrband, M. Mortazavi, S. Ghorshi:
Efficient DPCM Predictor for Hardware Implementation of Lossless Medical Brain CT Image Compression 123
M. Wafa, E. Zagrouba:
Estimation of Mass Function in Evidence Theory for Fusion of Gray Level Based Images 127
M. Polańczyk, P. Barański, M. Strzelecki, K. Ślot:
The application of Kalman filter in visual odometry for eliminating direction drift 131
A. Fabijańska:
Sub-pixel Approach to Detection of Significantly Blurred Edges 135
C.-C. Lee, C.-Y. Shih:
Gabor Feature Selection for Facial Expression Recognition 139
R. Krupiński, P. Mazurek:
Discrete Laplace estimator with a variable moment order for the modified image reconstruction 143
K. Khursheed, M. Imran, M. O'Nils, N. Lawal:
Exploration of Local and Central Processing for a Wireless Camera Based Sensor Node 147

3. METHODS OF CIRCUITS ANALYSIS, SYNTHESIS AND DESIGN 151

F. Herzel:
An Efficient Algorithm for Phase Error Minimization in Phase-locked Loops 153
P. Brandstetter, L. Klein:
Applications of Non-Inverting Positive Second Generation Current Conveyor as a Commercially Available Versatile Active Element 157
D. Batas, H. Fiedler:
A Python Interface for SPICE-based Simulations 161
N.N. Prokopenko, P.S. Budyakov, A.I. Serebryakov:
Architecture of the Microwave Differential Operating Amplifiers with Paraphrase Output 165
P.-H. Chen, C.-S. Chen, M.-F. Chou, K.-A. Wen:
A Multi-band Frequency Synthesizer for GSM/DCS/WIMAX/WLAN Applications with Ripple-free Circuit 169
Y. Nishida:
The Feedforward ΣΔ ADC Employing an Adder Comparator 173
M. Tadeusiewicz, S. Hałgas:
A fast method for tracing multi-valued characteristics in nonlinear circuits 177
C. Zorn, S. Stegemann, W. Mathis:
An Approach to Stability Analysis of Transfer Systems with Switched Feedback 181
M. Greitans, E. Hermanis, G. Supols:
Analytic Model and Bilateral Approximation for Clocked Comparator 185
E. F. Calandra, D. Lupo:
Synthetic Approach to the Design of Wide-Band Microwave Injection-Locked Amplifiers 189
J. Kulisz, J. Mocha, T. Woźnica:
Reducing Electromagnetic Disturbances in FPGA circuits by using Multiphase Clocks 193

Ł. Golly, A. Pułka:
Fundamental Cycles Generation Based on Dynamic Constructing of Graph Trees 197
Y. Wang, M. Merrett, M. Zwolinski:
Statistical Power Analysis for Nanoscale CMOS 201
S. G. Krutchinsky, M. S. Tsybin, A. E. Titov:
Structural optimization of differential stage operational amplifiers 205
T. Thiessen, M. Gutschke, P. Blanke, W. Mathis, F-E. Wolter:
Numerical Analysis of Relaxation Oscillators Based on a Differential Geometric Approach 209
G. Szczepkowski, J. Dooley, R. Farrell:
The Concept of CMOS OOK Transmitter Using Low Voltage Self-Oscillating Active Inductor 213
P. Kyzioł, J. Rutkowski:
Searching Groups and Layouts in N-terminal Based Test Method using Heuristic PSO Algorithm 217
Q. Nehal, V. Saari, K. Halonen:
A Wideband Variable Gain Amplifier with Feedback DC-Offset Correction in 0.13μm CMOS Technology 221
M. Malahnejad, F. Raissi, S. Mirzakuchaki:
A Direct Digital Frequency Synthesizer Circuit Based on Dynamic Frequency Management 225
A.F. Yeknami, F. Qazi, J. Dąbrowski, A. Alvanspour:
Design of OTAs for Ultra-Low-Power Sigma-Delta ADCs in Medical Applications 229
F. Qazi, J. Dąbrowski:
IP2 Calibration of ADC for SDR Receiver 233
W. Machowski, S. Kuta, J. Jasielski, W. Kołodziejski:
Broadband quarter-square 4Q analog multiplier based on CMOS inverters 237
J. Konopacki, K. Mościńska:
Comments on linear-phase IIR filter design using weighted LS optimization 241
A. Kuczyński:
Parametric Fault Detection in Analog Circuits Using Polynomial Coefficients in NN learning 249
S. G. Krutchinsky, M. S. Tsybin:
ADC for mixed-signal SoC 253
D. Batas, H. Fiedler:
SCC - A Graphical Tool for Scripted Circuit Sizing of Integrated CMOS-Circuits Based on a General Description of the Sizing Process 257
E. I. Starchenko, A. I. Gavlicky:
Voltage references based on radiation hardened analogous matrix master dice 265
Y. Tomita, Y. Takahashi, T. Sekine:
Adiabatic Array Logic 269
T. Kulej:
Low Voltage Low Transconductance OTA in 50 nm CMOS 273
A. Kukiełka:
Sensitivity Invariants of Overall Transfer Functions of Passive Dual Hybrid Two-Ports 277
G. Caruso:
Power-aware design of MCML logarithmic adders 281
R. T. Wirski:
Synthesis of 2-D State-Space Equations for Orthogonal Separable Denominator Systems 285
P. Jantos, D. Grzechca, J. Rutkowski:
An analogue electronic circuits diagnosis with the use of evolutionary algorithms 289

P. Jantos, D. Grzechca, J. Rutkowski:
An analogue integrated circuits yield optimisation with the use of genetic algorithm 293

A. Wardzińska, W. Bandurski:
Step Response Sensitivity to RLC Parameters of VLSI Interconnect 297

M. Ossowski:
Improving neural network methods for time domain fault analysis of nonlinear analog circuits by feature selection 301

4. ANALOG AND DIGITAL ELECTRONIC SYSTEMS 305

G. Kaddoum, F. Gagnon:
Performance analysis of communication system based on chaotic symbolic dynamics 307

D. Studziński:
Evolutionary Algorithms in Iterative Channel Estimation for MLSD Application 311

P. Dąbal, R. Pełka:
FPGA-based cryptosystem with combined stream-block cipher and digital chaos generator 315

A. Milik, A. Pułka:
Hardware Oriented Optimization of Smith–Waterman Algorithm 319

M. Jessa, M. Jaworski:
Randomness of a Combined TRNG Based on the Ring Oscillator Sampling Method 323

L. F. Albanese, G.-D. Licciardo:
High Speed CAVLC Encoder Suitable for Field Programmable Platforms 327

M. Ayati, H. Khaloozadeh:
Novel Adaptive Impulsive Observer for Synchronization of Uncertain Chaotic Systems 331

A. Platonov:
Principles of Design of Feedback Systems Working at the Shannon's Boundary 335

A. Pułka, A. Milik:
Dynamic Reconfiguration of Threads in Real–Time System Working on Precision Time Regime 339

I. Sobański, W. Sakowski:
Hardware/Software co-design in USB3.0 Mass Storage Application 343

M.K. Saxena, E. Bhatnagar, N. Jaiswal, M. Parab, S. N. Kulkarni:
Reconfigurable Architecture for IP Peripherals 347

A. Chaâbouni, I. Belaïd Dlimi, H. Kallel:
Nonlinear control of permanent magnet synchronous motor with limitations constraints 351

A. Pułka:
System on Chip Verification Strategy Based on FDL Mechanism 355

I. Mrazova, O. Sykora:
When Is Phonetic Search with FPGAs Efficient? 359

P. Brandstetter, P. Chlebis, J. Michalik, J. Vanek:
System for Monitoring and Data Transmission from Mobile Devices 363

S. Aust, A. Ahrens, C. Benavente-Peces:
Modulation-Mode and Power-Assignment for SVD- and GMD-assisted Downlink MIMO Systems 367

R. T. Wirski, B. Strzeszewski, K. Wawryn:
Orthogonal Implementation of Two-Dimensional Separable Denominator Systems 371

A.-M. Calfa, G. Stefan:
Matrix Computation on Connex Parallel Architecture 375

B. Priyo Das, N. Watson, Y. Liu:
Wide Tunable All Pass Filter Using OTA as Active Component 379

Ł. Mik, J. Stępień, M. Jastrząb, W. Kucewicz, M. Sapor:
System for Low Intensity Fluorescence Light Measurement based on Silicon Photomultiplier 383

5. MATHEMATICAL AND COMPUTATIONAL METHODS 387

D. Bellan:
Modeling ADC Jitter Effects in Frequency-Domain Measurements 389

S. Ahmad, J. Dąbrowski:
Cancellation of Spurious Spectral Components in One-Bit Stimuli Generator 393

T. Golonek, D. Grzechca, J. Rutkowski:
Analog IC Fault Diagnosis by Means of Supply Current Monitoring in Test Points Selected Evolutionarily 397

O. Chertov, V. Malchykov, D. Pavlov:
Non-Dyadic Wavelets for Detection of Some Click-Fraud Attacks 401

E.A.El-Badawy, W.A.El-Masry, M. A.Mokhtar, A. S.Hafez:
A New Chaos Advanced Encryption Standard (AES) Algorithm for Data Security 405

M. F. M. Lima, J.A. T. Machado:
Tuning the Windowed Fourier Transform of Robotic Signals in the Perspective of Information Theory 409

D. A. Piętak:
Statistical distribution of the genetic algorithm sampling with Schwefel's F7 objective function 413

6. APPLICATIONS OF ELECTRONIC SYSTEMS 417

P. Barański, M. Polańczyk, P. Strumiłło:
Application of inertial sensors and raster maps for correcting GPS readouts in urban terrain 419

A. Janicki, J. Bloch, K. Taylor:
Visual Speech Synthesis for Polish Using Keyframe Based Animation 423

E. J. Balster, W. F. Turri:
Fast PCRD-Opt Computation in JPEG2000 431

M. Bartkowiak, B. Latanowicz:
Mitigation of Long Gaps in Music Using Hybrid Sinusoidal+Noise Model with Context Adaptation 435

Ł. Mik, M. Jastrząb, W. Kucewicz, M. Sapor, A. Czermak, B. Sowicki:
System for Photon Counting with Silicon Photomultiplier 439

D. Bellan:
Uncertainty Effects of Unequal Noise Levels in Three-Dimensional Fields Measurement 443

7. EDUCATION 447

G. Komori, N. Aikawa, Y. Nishida:
Electric Circuits Exercise and Learning Assessment 449

D. Grzechca, J.Rutkowski:
The Use of FPAA in Signal Processing Laboratory for Biomedical Engineering Students 453

INDEX OF AUTHORS 457