

# **11th IASTED International Conference on Signal and Image Processing 2009**

**(SIP 2009)**

**Honolulu, Hawaii  
17-19 August 2009**

**ISBN: 978-1-61567-755-9**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2009) by ACTA Press  
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact ACTA Press  
at the address below.

ACTA Press  
B6 Suite 101  
2509 Dieppe Avenue SW  
Calgary, Alberta T3E 7J9  
Canada

Phone: (403) 288-1195  
Fax: (403) 247-6851

[www.actapress.com](http://www.actapress.com)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## SESSION 1 FILTER, PROCESSING, AND APPLICATIONS

<b>Nonlinear Analysis of the Costas Loop and Phase-Locked Loop with Squarer</b> .....	1
<i>N.V. Kuznetsov, G.A. Leonov, S.M. Seledzhi</i>	
<b>Robust and Fast Design of Optimal Comb FIR Filters</b> .....	8
<i>P. Zahradnik, M. Vlcek</i>	
<b>Chaotic Communications using Nonlinear Filtering</b> .....	13
<i>X. Wang, E.E. Yaz</i>	
<b>Application of Wavelet Transform in Analysing Vibration Signals Acquired for Vehicle Speed Measurement</b> .....	20
<i>H. Wei, W. Xu</i>	
<b>Channel Estimation using Adaptive Filtering in OFDM System</b> .....	25
<i>M.G. Zia</i>	
<b>On-Line Writer Identification System Characterizing Velocity and Areal Velocity in Handwriting Process</b> .....	28
<i>T. Matsuura, P. Thumwarin</i>	

## SESSION 2 COMPUTER VISION, CODING, AND DECODING

<b>Directional Balloon Snake Model based on Curvature Dependent Magnitude</b> .....	35
<i>Y. Li, S. Luo, Q. Zou</i>	
<b>A Fast Tree-Structured Search Procedure for Multistage Vector Quantization of LSF Parameters</b> .....	42
<i>M. Djamah, D. O'Shaughnessy</i>	
<b>Fusion of Images from Heterogeneous Top-Down Cameras</b> .....	47
<i>F. Yao, A. Sekmen</i>	
<b>A Fused Fuzzy Voting Approach to the Monitoring of Parking Availability</b> .....	55
<i>D.M. Keathly, T.-I. Yang, Y. Wan</i>	

## SESSION 3 DIGITAL IMAGE AND PROCESSING

<b>A Speeding Up of Image Processing Utilized GPUs</b> .....	63
<i>T. Hayashi, S. Enokida, T. Ejima</i>	
<b>A Simple Matched Filter Approach to Demodulating AIS Signals in Co-Channel Interference</b> .....	71
<i>D.C. Smith, D.J. Nelson</i>	
<b>Toward Automated Detection of Oil Drops in Images of Multiphase Dispersions</b> .....	77
<i>A. Rojas Domínguez, G. Corkidi</i>	
<b>Embedded Vision-based Collision Warning System for Monitoring the Blind Spot Area</b> .....	84
<i>C.-C. Lin, C.-W. Lin</i>	
<b>Automated Hybrid Temporal Image Registration using Radon Transform</b> .....	90
<i>J.N. Sarvaiya, S.S. Patnaik</i>	
<b>Temporal Image Registration using GCPs and Bivariate Polynomial Estimation</b> .....	95
<i>J.N. Sarvaiya, S.S. Patnaik, S. Bombaywala</i>	
<b>Fast Exact Pairwise-Nearest-Neighbor Algorithm using Groups and Clusters Rejection Criteria</b> .....	101
<i>Y.-C. Liaw, J.-F. Lin, S.-C. Tai, J.Z.C. Lai</i>	
<b>Contrast-Enhancement with Contrast-Stretching Dynamic Histogram-Equalization</b> .....	105
<i>K.S. Sim, W.Z. Wan Ismail, L.W. Thong, W.K. Lim, H.Y. Ting</i>	
<b>Measurement of the Required Depth Map Accuracy for Depth of Field Reduction Algorithms</b> .....	111
<i>T. Jaeger</i>	
<b>A Method to Enhance Multi-Modal Biometrics Fusion using Neural Networks and Genetic Algorithms at a Decision Level</b> .....	118
<i>F. Alsaade, A. Rahmoun, A. Ech-Cherif</i>	
<b>A Quantization Scheme for Modeling and Coding of Noisy Texture in Natural Images</b> .....	125
<i>J. Ballé, M. Wien</i>	

<b>A Single Field Interlaced to Progressive Format Conversion using Edge Map in the Image Block</b> .....	132
<i>K. Kang, G. Jeon, J. Jeong</i>	
<b>Optimal Bit Allocation for Subband Image/Video Coding</b> .....	138
<i>R. Atta</i>	

#### **SESSION 4 SIGNAL PROCESSING AND APPLICATIONS**

<b>HRV Estimation using Pulse Wave and Human Sensibility Evaluation</b> .....	144
<i>D.-J. Kim, H.-M. Lee, K.-S. Kim, J.-W. Lee</i>	
<b>Complex Multilayer Perceptron based Blind Equalizer for Constant Modulus Modulations</b> .....	148
<i>C.-H. Chang</i>	
<b>Non-Uniform Array Antenna Pattern Sensitivity Analysis</b> .....	154
<i>A. Eshraghi, S. Shahriari, Y. Choi, H.K. Hwang, Z. Aliyazicioglu</i>	
<b>Adaptive Predistortion of Wiener and Hammerstein Systems using Spectral Magnitude Matching</b> .....	160
<i>E. Abd-Elrady</i>	
<b>Digital Predistortion of Memory Polynomial Systems using Direct and Indirect Learning Architectures</b> .....	166
<i>L. Gan, E. Abd-Elrady</i>	

#### **SESSION 5 DETECTION, IDENTIFICATION, AND RECOGNITION**

<b>Texture Classification by Functional Analysis of Size Distributions</b> .....	172
<i>I. Epifanio, J. Domingo, G. Ayala</i>	
<b>L<sub>2</sub> Norm Length-based Image Similarity Measures: Concrescence of Image Feature Histogram Distances</b> .....	178
<i>H. Fashandi, J.F. Peters, S. Ramanna</i>	
<b>Hand Movement Recognition based on Empirical Mode Decomposition</b> .....	186
<i>R.D. Pinzón-Morales, Á.Á. Orozco-Gutierrez, K. Baquero-Duarte, V.H. Grisales-Palacio</i>	
<b>Image Processing Algorithm for Automated Detection of Annual Ring Orientation on Wood Shingles Cross Section</b> .....	192
<i>M. Fournier, Y. Lemay</i>	
<b>Iris Feature Extraction using Wavelet Transform</b> .....	198
<i>S. Minhas, M.Y. Javed, A. Basit</i>	
<b>Vegetation Extraction from LiDAR Raw Points using Surface Flatness</b> .....	204
<i>M.Y. Belkhouche, B.P. Buckles, L.J. Steinberg</i>	

#### **SESSION 6 VIDEO PROCESSING AND CODING**

<b>Efficient Coding of Underwater Video using Wavelet-based Algorithm</b> .....	209
<i>Q.-Z. Li, W.-J. Wang, J.-X. Liu, A.-Y. Zang</i>	
<b>Automatic Texture-Detection Algorithm for Texture Synthesis in Video Compression</b> .....	214
<i>M. Panggabean, S. de Waele, G. de Haan, L.A. Rønningen</i>	
<b>Probability Analysis for Macroblock Types in Spatial Enhancement Layers for SVC</b> .....	221
<i>S. Van Leuven, K. De Wolf, P. Lambert, R. Van de Walle</i>	
<b>Video Analytics for Indexing, Summarization and Searching of Video Archives</b> .....	228
<i>H.E. Trease, L. Trease</i>	
<b>Low-Complexity Computation of IDCT Efficiently Adapted to End-of-Block Points</b> .....	236
<i>M.-L. Hsia, O.T.-C. Chen</i>	

#### **SESSION 7 IMAGE AND SIGNAL PROCESSING APPLICATIONS**

<b>Invariant Texture-based Image Analysis and Retrieval</b> .....	241
<i>M.R. Hejazi</i>	
<b>Adaptive-Threshold Blanking for Impulsive Noise Reduction in OFDM-based Power Line Communications</b> .....	249
<i>K.S. Al-Mawali, Z.M. Hussain</i>	
<b>Dynamic Laser MIDI Controller</b> .....	255
<i>M. Kimbrough, J. Fulwood, S. Sukittanon</i>	

<b>Comparison of Matched Filter and Wavelet based Blood Vessel Enhancement .....</b>	<b>260</b>
<i>M.U. Akram, S. Nasir, S.A. Khan</i>	
<b>Stabilization of Uncertain Hopfield Neural Networks with Dead-Zone and Disturbance Input .....</b>	<b>265</b>
<i>C.-J. Cheng, C.-B. Cheng</i>	
<b>Lidar Remote Sensing for Atmospheric Characterization at UPRM.....</b>	<b>270</b>
<i>H. Parsiani, J. Mèndez-Rodríguez, A. Lizarraga</i>	
<b>Real-Time Spectral Imaging System .....</b>	<b>276</b>
<i>T. Arnold, M. De Biasio, G. Lodron, R. Leitner</i>	

**SESSION 8 ADDITIONAL PAPER**

<b>Discrete Fractional Fourier Transform Applied to Fingerprint Encryption.....</b>	<b>282</b>
<i>J.M. Vilardy O., C.O. Torres M., L. Mattos V.</i>	
<b>Author Index</b>	