

# 5<sup>th</sup> International Symposium on Image and Signal Processing and Analysis, ISPA 2007

Istanbul, Turkey, September 27-29, 2007

## Technical Program

*Thursday, September 27, 2007*

### Oral Sessions

	Track A	Track B	Track C
8:45-9:00	Opening Address		
9:00-10:00	Plenary Lecture: HAL: Human Activity Language Professor Yiannis Aloimonos Computer Vision Laboratory, University of Maryland, USA		
10:00-10:30	Coffee Break		
10:30-12:30	A.1 Biomedical Signal and Image Processing I	B.1 Video and Motion	C.1 Special Session on Advances in Design and Implementation of Multirate Filters and Filter Banks
12:30-13:30	Lunch Break		
13:30-14:30	Plenary Lecture: 3D Video for Entertainment Production Professor Adrian Hilton Centre for Vision Speech and Signal Processing, School of Electronics and Physical Sciences University of Surrey, Guildford, UK		
14:30-16:30	A.2 Biomedical Signal and Image Processing II	B.2 Computer Vision	C.2 Image Segmentation
16:30-17:00	Tea Break		
17:00-19:00	A.3 Speech Processing and Analysis	B.3 Filter Theory and Signal Processing	C.3 Biomedical Signal and Image processing III
20:00	Welcome Reception – Faculty Club of Boğaziçi University		

**Friday, September 28, 2007**

**Oral Sessions**

	Track A	Track B	Track C
9:00-10:00	Plenary Lecture: Support Vector Machines: A Geometric Point of View Professor Sergios Theodoridis Department of Informatics & Telecommunications, University of Athens, Greece		
10:00-10:30	Coffee Break		
10:30-12:30	A.4 Image Enhancement and Restoration	B.4 Image Compression and Coding	C.4 Special Session on Image-based Cardiovascular Modeling and Simulation
12:30-13:30	Lunch Break		
13:30-14:30	Plenary Lecture: Energy-Aware DSP Algorithm Design Professor Lars Wanhammar Division of Electronics Systems, Department of Electrical Engineering Linköping University, Sweden		
14:30-16:30	A.5 Image Processing and Analysis	B.5 Special Session on Digital shape: Analysis and Representation	C.5 Special Session on Mathematical Methods for Medical Image Processing and Analysis
16:30-17:00	Tea Break		
17:00-19:00	A.6 Special Session on Probabilistic Graphical Models for Computer Vision and Pattern Recognition I	B.6 Special Session on Advances and Applications in Bayesian Signal Processing I	C.6 Machine Vision
20:00	Gala Dinner – Bosphorus Cruise Ship		

**Saturday, September 29, 2007**

**Oral Sessions**

	Track A	Track B	Track C
9:00-10:00	Plenary Lecture: Splines and Operators: A Unifying Framework for Continuous-Discrete Signal Processing Professor Michael Unser Biomedical Imaging Group, EPFL, Lausanne, Switzerland		
10:00-10:30	Coffee Break		
10:30-12:30	A.7 Special Session on Advances and Applications in Bayesian Signal Processing II	B.7 Special Session on Medical Image Processing	C.7 Special Session on Probabilistic Graphical Models for Computer Vision and Pattern Recognition II
12:30-13:30	Lunch Break		
13:30	Social Event: Istanbul Sightseeing Tour		

**Thursday, September 27, 2007**

### **Session A.1: Biomedical Signal and Image Processing I**

**Chair: Maria Petrou**

10:30-10:50 Identification of Aortic Stenosis and Mitral Regurgitation by Heart Sound Segmentation on Time-Frequency Domain

*Daoud Boutana,, Mounir Djeddi, and Messaoud Benidir*

---

10:50-11:10 Type-Specific Analysis of Morphometry of Dendrite Spines of Mice

*Elvan Ceyhan, Lisa Fong, Tiffany N. Tasky, Monica K. Hurdal, Mirza F. Beg, Maryanne E. Martone, and John T. Ratnanather*

---

11:10-11:30 Statistical Analysis of Morphometric Measures Based on Labeled Cortical Distance Maps

*Elvan Ceyhan, Malini Hosakere, Tomoyuki Nishino, Jim Alexopoulos, Richard D. Todd, Kelly N. Botteron, Michael I. Miller, and John T. Ratnanather*

---

11:30-11:50 A New Approach to Automatic Classification of the Curved Chromosomes

*Mehrsan Javan Roshtkhari, and S. Kamaledin Setarehdan*

### **Session B.1: Video and Motion**

**Chair: Adrian Hilton**

10:30-10:50 FLIR Target Detection and Tracking Basing on Multiscale Morphological Filters

*Hu Xin and Tang Shuo*

---

10:50-11:10 Comparative Study of Block Matching Techniques Used in Video Images Motions Estimation

*Kemal Laidi, M. A. Bailiche, and Mohamed Mehenni*

---

11:10-11:30 Tracking a High Maneuver Target Based on Intelligent Matrix Covariance Resetting

*Mohamad Hasan Bahari, Farzad Nejati Moharrami, Mohammad Ali Ebrahimi Ganjeh, and Ali Karsaz*

---

11:30-11:50 Real Time Motion Tracking by Seismic Wave Analysis

*Juan Pablo Marin Diaz, and Oscar Francisco Reina Hernandez*

---

11:50-12:10 Object Motion in Bayesian Propagation of Ovals

*Zhuhan Jiang and Zhuan Qing Huang*

---

12:10-12:30 Edge Gradient Based Fast Inter Motion Estimation for H.264/AVC

*Zhenyu Liu, Yang Song, Yiqing Huang, Lingfeng Li, Satoshi Goto, and Takeshi Ikenaga*

### **Session C.1: Special Session on Advances in Design and Implementation of Multirate Filters and Filter Banks**

**Chairs: Ljiljana Milić and Tapio Saramäki**

10:30-10:50 An Efficient Method for Designing Low-Delay Nonuniform Oversampled  $M$ -channel Filterbanks

*Robert Bregović, Bogdan Dumitrescu, and Tapio Saramäki*

---

10:50-11:10 Minimum MSE Filter Banks Design Using Correlated Signal Dependent Quantization Noise Model

*Are Hjørungnes*

---

11:10-11:30 Tree-Structured MIMO FIR Filter Banks for Flexible Frequency Reallocation

*Heinz G. Göckler and Mohammed Abdulazim*

---

11:30-11:50 Flexible Frequency-Band Reallocation MIMO Networks for Real Signals

*Amir Eghbali, Håkan Johansson and Per Löwenborg*

---

11:50-12:10 Practical Design of Filter Banks for Automatic Music Transcription

*Filipe Diniz, Luiz Biscainho, and Sergio Netto*

---

12:10-12:30 On the Sensitivity of Two-Channel IIR Filter Banks with Variable Crossover Frequency

*Jelena Čertić and Ljiljana Milić*

## Session A.2: Biomedical Signal and Image Processing II

Chair: Sven Lončarić

- 14:30-14:50 A Fully Automated Method for Segmentation and Thickness Map Estimation of Femoral and Acetabular Cartilages in 3D CT Images of the Hip  
*Ayoub Baniasadipour, Reza A. Zoroofi, Yoshinobu Sato, Takashi Nishii, Katsuyuki Nakanishi, Hisashi Tanaka, Nobuhiko Sugano, Hideki Yoshikawa, Hironobu Nakamura, and Shinichi Tamura*
- 
- 14:50-15:10 Another Approach to Detection of Abnormalities in MR-Images Using Support Vector Machines  
*Ehsan Behnamghader, Reza Dehestani Ardekani, Meysam Torabi, and Emad Fatemizadeh*
- 
- 15:10-15:30 Neural, Fuzzy And Neurofuzzy Approach To Classification Of Normal And Alcoholic Electroencephalograms  
*Ashkan Yazdani, Pedram Ataee, Kamaledin Setarehdan, Caro Lucas, and Babak Nadjar Araabi*
- 
- 15:30-15:50 Genetic Algorithm for Selection of Best Feature and Window Length for a Discriminate Pre-seizure and Normal State Classification  
*Pedram Ataee, Ashkan Yazdani, Kamaledin Setarehdan, and Hossein Ahmadi Noubari*

## Session B.2: Computer Vision

Chair: Yiannis Aloimonos

- 14:30-14:50 An Image-Based Measurement System for Quality Control in Civil Engineering  
*Alexander Reiterer and Martin Lehmann*
- 
- 14:50-15:10 Directional Spatial Color Descriptor in a Perceptual Model: Proximity Grids  
*Serkan Kiranyaz, Murat Birinci, and Moncef Gabbouj*
- 
- 15:10-15:30 A Fast Closed-Form Solution for Single-View Pose Determination  
*Ben St. John and Gerald Madlmayr*
- 
- 15:30-15:50 SIFT-CCH: Increasing the SIFT Distinctness by Color Co-occurrence Histograms  
*Cosmin Ancuti*
- 
- 15:50-16:10 Reconstructing Some hv-Convex Binary Images from Three or Four Projections  
*Péter Balázs*
- 
- 16:10-16:30 Real-time Finger Tracking for Interaction  
*Mohamed Abou Zliekha, and Noor Shaker*

## Session C.2: Image Segmentation

Chair: Andreas Uhl

- 14:30-14:50 A Boosted Skin Detection Method based on Pixel and Block Information  
*Hedieh Sajedi and Mehran Najafi*
- 
- 14:50-15:10 Level Set Constrained Segmentation Using Local Curvature  
*Fahima Djabelkhir, Mohammed Khamadja, and Christophe Odet*
- 
- 15:10-15:30 Narrow Band Region Approach for Active Contours and Surfaces  
*Julien Mille, Romuald Boné, Pascal Makris, and Hubert Cardot*
- 
- 15:30-15:50 Hierarchical Mesh Segmentation Using Waterfall and Dynamics  
*Hubert Cardot and Romuald Boné*
- 
- 15:50-16:10 Properties of Natural Ordering Relation for Octogonal Neighborhood Sequences  
*Attila Fazekas, Lajos Hajdu, and Andras Hajdu*
- 
- 16:10-16:30 Towards an Automated Generation of Tree Ring Profiles from CT-Images  
*Andreas Uhl, Karl Entacher, and Dietmar Planitzer*

### **Session A.3: Speech Processing and Analysis**

**Chair: Mohammad Hasan Savoji**

17:00-17:20 An Accuracy Optimization of a Dialog ASR System Utilizing Evolutional Strategies  
*Juraj Kacur and Jan Korosi*

---

17:20-17:40 Nonlinear Speech Coding Using Backward Adaptive Variable-Length Quadratic Filters  
*Ghasem Alipoor and c*

---

17:40-18:00 Improved Hybrid Approach for Bilingual Language Recognition from Text  
*Eniko Beatrice Bilcu and Jaakko Astola*

---

18:00-18:20 A New Hilbert Transformer Based on Parametric Wavelet Kernel: Application to Analytic Signal Decomposition of Speech Sub-bands  
*Milad Omid and Mohommad Hassan Savoji*

### **Session B.3: Filter Theory and Signal Processing**

**Chair: Tapio Saramäki**

17:00-17:20 On the Complexity of Multiplierless Direct and Polyphase FIR Filter Structures  
*Amir Eghbali, Oscar Gustafsson, Håkan Johansson, and Per Löwenborg*

---

17:20-17:40 Synthesis of Circulator-Tree Wave Digital Filters  
*Lars Wanhammar, Baharak Soltanian, Kenny Johansson, and Oscar Gustafsson*

---

17:40-18:00 Low-Complexity Constant Multiplication Using Carry-Save Arithmetic for High-Speed Digital Filters  
*Oscar Gustafsson and Lars Wanhammar*

---

18:00-18:20 A New Two-Stage CIC-Based Decimation Filter  
*Gordana Jovanovic Dolecek and Sanjit Mitra*

---

18:20-18:40 A Practical Review on Higher-Order Statistics Interpretation. Application to Electrical Transients Characterization  
*Juan Jose Gonzalez de la Rosa, Antonio Moreno, and Carlos G. Puntonet*

---

18:40-19:00 Limits on the Resolution of Closely Spaced Multipath Signals  
*Alon Amar and Anthony Weiss*

### **Session C.3: Biomedical Signal and Image Processing III**

**Chair: Andres Santos**

17:00-17:20 PVC Arrhythmia Detection Using Neural Networks  
*Ali Gharaviri, Mohammad Teshnehlab, and Hamid Abrishami Moghaddam*

---

17:20-17:40 Locating Information Maximization Time in EEG Signals Recorded During Mental Tasks  
*Farnaz Abdollahi, Kamaledin Setarehdan, and Ali Nasrabadi*

---

17:40-18:00 Basic Linear Filters in Extracting of Auditory Evoked Potentials  
*Serap Aydin, Buyurman Baykal, and Nevzat Gencer*

---

18:00-18:20 An Assessment of Tikhonov Regularizations to Evoked Brain Signals  
*Serap Aydin, Nevzat Gencer, and Buyurman Baykal*

**Friday, September 28, 2007**

**Session A.4: Image Enhancement and Restoration**

**Chair: Ilkay Ulusoy**

- 10:30-10:50 Generalized Vector Median Filter  
*Bogdan Smolka and Michal Perczak*
- 
- 10:50-11:10 Automatic Removal of Photographic Paper Texture from Digitised Images  
*James Orwell*
- 
- 11:10-11:30 Deblurring of UAV Aerial Images for Civil Structures Inspections Using Mumford-Shah / Total Variation Regularisation  
*Alexandre Hammer*
- 
- 11:30-11:50 A Novel Tone Mapping Method for Image Contrast Enhancement  
*Radu Ciprian Bilcu and Markku Vehviläinen*
- 
- 11:50-12:10 New Scene-Based Nonuniformity Correction Algorithm of Infrared Focal-Plane Arrays  
*Yongjin Liu, Hong Zhu, and Yigong Zhao*
- 
- 12:10-12:30 A Mathematical Model to Estimate Out of Focus Blur  
*Mohsen Ebrahimi Moghaddam*

**Session B.4: Image Compression and Coding**

**Chair: Benedek Nagy**

- 10:30-10:50 Image Compression with Neural Networks Using Complexity Level of Images  
*Hadi Veisi and Mansour Jamzad*
- 
- 10:50-11:10 Color Image Compression Using Block-Based Independent Component Analysis  
*Vrijendra Singh, Sandeep Yadav, Neeraj Singh, and Prem K. Kalra*
- 
- 11:10-11:30 A Lagrange Interpolation Based Error Correction Coding for the Images  
*Hossein Ajorloo, Mohammad-Tagh Manzuri-Shalmani*
- 
- 11:30-11:50 A Kind VLSI Design of Vector Quantization Algorithm for Image Compression  
*Xiang Wang*
- 
- 11:50-12:10 A Robust Indexing and Retrieval Method for Lossy Compressed Color Images  
*Maria Luszczkiewicz and Bogdan Smolka*
- 
- 12:10-12:30 Optimal Neighborhood Sequences on the Hexagonal Grid  
*Benedek Nagy*

**Session C.4: Special Session on Image-Based Cardiovascular Modeling and Simulation**

**Chairs: Bart Bijmens and Alejandro Frangi**

- 10:30-10:50 Assessment of the Regional Myocardial Displacement by a New Method Using Spectral Tissue Doppler Comparing with Tissue Tracking  
*Hassan Moladoust, Manijhe Mokhtari-Dizaji, Zahra Ojaghi-Haghighi, Feridoun Noohi, and Amir Khajavi*
- 
- 10:50-11:10 Analysis of Doppler Ultrasound Outflow Profiles for the Detection of changes in Cardiac Function  
*Hrvoje Kalinić, Sven Lončarić, Maja Čikeš, A. Baltabaeva, C. Parsai, J. Šeparović, I. Čikeš, G. R. Sutherland, and Bart Bijmens*
- 
- 11:10-11:30 An Integrated Framework for the Assessment of Cardiac Function – Description and Illustrated Applications  
*Bart Bijmens, Piet Claus, Chirine Parsai, Maja Čikeš, Sven Lončarić, Lisa Anderson, and George Sutherland*
- 
- 11:30-11:50 Computational Anatomy Atlas of the Heart  
*Sebastian Ordas, Estanislao Oubel, Rafael Sebastian, and Alejandro F. Frangi*

## Session A.5: Image Processing and Analysis

Chair: Andreas Uhl

- 14:30-14:50 The Use of Top-View Finger Image for Personal Identification  
*Panyayot Chaikan and Montri Karnjanadecha*
- 
- 14:50-15:10 A Reference Point Detection Algorithm for Top-View Finger Image Recognition  
*Panyayot Chaikan and Montri Karnjanadecha*
- 
- 15:10-15:30 Face Detection Using AdaBoosted RVM-based Component Classifier  
*Alireza Bayesteh, Abolghasem Sayadiyan, and Seyyed Majid Valiollahzadeh*
- 
- 15:30-15:50 Feature Extraction for Face Recognition using Recursive Bayesian Linear Discriminant  
*Dong Huang, Cheng Xiang, and Shuzhi Ge*
- 
- 15:50-16:10 Effective Image Fusion Rules of Multi-scale Image Decomposition  
*Youzhi Zheng, Xiaodong Hou, Tiantian Bian, and Zheng Qin*
- 
- 16:10-16:30 Pseudo Multivariate Morphological Operators based on Alpha-trimmed Lexicographical Extrema  
*Erchan Aptoula and Lefevre Sebastien*

## Session B.5: Special Session on Digital Shape: Analysis and Representation

Chair: Natasa Sladoje and Joakim Lindblad

- 14:30-14:50 Defuzzification by Feature Distance Minimization Based on DC Programming  
*Joakim Lindblad, Tibor Lukic, and Natasa Sladoje*
- 
- 14:50-15:10 Minimal Cost-Path for Path-Based Distances  
*Robin Strand, Filip Malmberg, and Stina Svensson*
- 
- 15:10-15:30 Adaptive Mesh Simplification using Distance to Focus of Attention for Multiple Points of View  
*Susana Mata, Luis Pastor, Angel Rodriguez*
- 
- 15:30-15:50 Theory of Neighborhood Sequences on Hexagonal Grids  
*Benedek Nagy*
- 
- 15:50-16:10 Shape Representation with Maximal Path-Points for Path-Based Distances  
*Robin Strand*

## Session C.5: Special Session on Mathematical Methods for Medical Image Processing and Analysis

Chairs: Patrick Clarysse and Andres Santos

- 14:30-15:10 Recent Technical Developments of Image Guided Interventions in XMR Suites  
*Invited presentation by Cengizhan Ozturk*
- 
- 15:10-15:30 SOM Based Diffusion Tensor MR Analysis  
*Dilek Goksel Duru and Mehmed Ozkan*
- 
- 15:30-15:50 3-D Vascular Tree Segmentation Using Level-Set Deformable Model  
*Kresimir Dekanić and Sven Lončarić*
- 
- 15:50-16:10 Alignment of 3D DCE-MRI Abdominal Series for Optimal Quantification of Kidney Function  
*Rosario Sance, Maria J. Ledesma-Carbayo, Arvid Lundervold, and Andres Santos*

## **Session A.6: Special Session on Probabilistic Graphical Models for Computer Vision and Pattern Recognition I**

**Chair: Ilkay Ulusoy**

17:00-17:40 Invited lecture: Generative Image Models and Jigsaws

*John Winn, Microsoft Research, Cambridge, UK*

---

17:40-18:00 Image Processing in Polarimetric SAR Images Using a Hybrid Entropy Decomposition and Maximum Likelihood (EDML)

*Chue Poh Tan, Ka Sing Lim, and Hong Tat Ewe*

---

18:00-18:20 Generative Model for Human Motion Recognition

*David Excell, A. Taylan Cemgil, and William Fitzgerald*

---

18:20-18:40 Comparison of Human and Automatic Facial Emotions and Emotion Intensity Levels Recognition

*Marián Beszédeš, Phil Culverhouse*

## **Session B.6: Special Session on Advances and Applications in Bayesian Signal Processing I**

**Chair: Taylan Cemgil**

17:00-17:20 Bayesian Generalized Linear Models in a Terabyte World

*Onno Zoeter*

---

17:20-17:40 Non-Linear Variable Selection in a Regression Context

*Simon Hill*

---

17:40-18:00 Output Grouping using Dirichlet Mixtures of Linear Gaussian State-Space Models

*Silvia Chiappa and David Barber*

---

18:00-18:20 Separating Solo and Orchestra from Monaural Audio Using Mixture Models

*Christopher Raphael and Yushen Han*

## **Session C.6: Machine Vision**

**Chair: Aytul Ercil**

17:00-17:20 A Machine Vision System with an Irregular Imaging Function

*Zhenwei Su, Jinwei Wang, Mingfei Huang, Chunhua Gao, and Maria Petrou*

---

17:20-17:40 Improved Non-parametric Subtraction for Detection of Wafer Defect

*Hye Won Kim and Suk In Yoo*

---

17:40-18:00 Rotation Angle Estimation Algorithms for Textures and Their Real-Time Implementation on the FU-SmartCam

*Onur Toker*

---

18:00-18:20 The Evaluation of Performances of Automatic Method for the Object Detection in GPR Images

*Mikhail Golovko*

---

18:20-18:40 Application of Discrete Wavelet Transform (DWT) in Combustion Failure Detection of IC Engines

*Farzad Shirazi and Mohammad Mahjoob*

---

18:40-19:00 A New Spatio-Temporal Fast Motion Estimation Algorithm

*Vassilis Fotopoulos and Athanassios Skodras*

**Saturday, September 29, 2007**

**Session A.7: Special Session on Advances and Applications in Bayesian Signal Processing II**

**Chair: Taylan Cemgil**

10:30-10:50 Graphical Model-based Approaches to Target Tracking in Sensor Networks: An Overview of Some Recent Work and Challenges  
*Murat Üney and Müjdat Çetin*

---

10:50-11:10 Simultaneous Localization and Tracking in Sensor Networks  
*Sumeetpal S. Singh, Nikolaos Kantas, and Arnaud Doucet*

---

11:10-11:30 Models and Algorithms for Detection and Tracking of Coordinated Groups  
*Simon Godsill, Jun-Feng Li, and Sze Kim Pang*

---

11:30-11:50 Auxiliary Particle Implementation of the Probability Hypothesis Density Filter  
*Nick Whiteley, Sumeetpal S. Singh, and Simon Godsill*

**Session B.7: Special Session on Medical Image Processing**

**Chair: Andrew Todd-Pokropek**

10:30-10:50 Comparison of k-NN, SVM, and NN in Pit Pattern Classification of Zoom-Endoscopic Colon Images using Co-Occurrence Histograms  
*Andreas Uhl*

---

10:50-11:10 Spermatozoon Segmentation Towards an Objective Analysis of Human Sperm  
*Henry Carrillo*

---

11:10-11:30 Iterative Preconditioned Steepest Descent Reconstruction using Blob-Based Basis Functions  
*Edward Ho and Andrew Todd-Pokropek*

---

11:30-11:50 Elimination of RF Inhomogeneity Effects in Segmentation  
*Onur Agus, Mehmed Ozkan, Kubilay Aydin*

---

11:50-12:10 Automatic Segmentation of Low Resolution Fetal Cardiac Data Using Snakes With Shape Priors  
*Irving Dindoyal, Tryphon Lambrou, Jing Deng, and Andrew Todd-Pokropek*

**Session C.7: Special Session on Probabilistic Graphical Models for Computer Vision and Pattern Recognition II**

**Chair: Ilkay Ulusoy**

10:30-10:50 Graph Partition Based Scene Boundary Detection  
*Ufuk Sakarya and Ziya Telatar*

---

10:50-11:10 A Robust Facial Feature Point Tracker using Graphical Models  
*Serhan Cosar, Mujdat Cetin, and Aytul Ercil*