Table of Contents

Invited speakers

Indexing of compressed video: methods, challenges, applications........................................... 3
Jenny Benois-Pineau, University of Bordeaux, France

Multidimensional Particle Swarm Optimization and Applications in Data Clustering and Image Retrieval................................................................. 5
Moncef Gabbouj, University of Technology, Finland

Distributed Video Coding: Status, Challenges and Outlook......................................................... 6
Frédéric Dufaux, Swiss Federal Institute of Technology (EPFL), Switzerland

Augmented Reality: Issues, Trends and Challenges................................................................. 8
Malik Mallem, University of Evry Val d’Essonne, France

Tutorials

Image and Video Descriptors..................................................................................................... 11
Abdenour Hadid, University of Oulu, Finland

H.264 video watermarking: applications, principles, deadlocks, and future............................ 13
Marc Chaumont, University of Montpellier II, France

Medical image analysis using high-dimensional information theoretic criteria......................... 14
Nicolas Rougon, Institut Telecom SudParis ARTEMIS Department, France

GDR-ISIS Special session on Feature selection and kernel methods for image classification, image segmentation and pattern recognition

Fusion and classification of multi-source images by SVM with selected features in a kernel space................................................................................................. 17
Su Ruan, Nan Zhang, Stéphane Lebonvallet, Qingming Liao and Yuemin Zhu

Feature Subspaces Selection via One-Class SVM: Application to Textured Image Segmentation.................................................................................................. 21
Xiyan He, Pierre Beauséroy and André Smolarz

Adaptive Feature Selection for Heterogeneous Image Databases.............................................. 26
Rostom Kachouri, Khalifa Djemal and Hichem Maaref

Comparison of Feature Selection Schemes for Color Texture Classification.......................... 32
Alice Porebski, Nicolas Vandebroucke and Ludovic Macaire

Connectivity feature extraction for spatio-functional clustering of fMRI data.......................... 38
S. Emeriau, F. Blanchard, JB. Poline, L. Pierot and E. Bittar

Special session on Video Surveillance: Tools and Applications

Audio-Video Surveillance System for Public Transportation..................................................... 47
Quoc-Cuong Pham, Agnès Lapéryronie, Christelle Baudry, Laurent Lucat, Patrick Sayd, Sébastien Ambellouis, David Sodoyer, Amaury Flancquart, Alain-Claude Barcelo, Frédéric Heer, Fabrice Ganansia and Vincent Delcourt

Pedestrian detection based on Adaboost algorithm with a pseudo-calibrated camera.............. 54
Damien Simonnet and Sergio A Velastin
People re-identification by classification of silhouettes based on sparse representation .......... 60
*Dung Nghi Truong Cong, Catherine Achard and Louahdi Khoudour*

A Benchmark for Background Subtraction Algorithms in Monocular Vision: a Comparative Study .............................................................................................................. 66
*Yoann Dhome, Nicolas Tronson, Antoine Vacavant, Thierry Chateau, Christophe Gabard, Yann Goyat and Dominique Gruyer*

Background Subtraction and 3D Localization of Moving and Stationary Obstacles at Level Crossings ........................................................................................................ 72
*Fakhfakh Nizar, Khoudour Louahdi, EL-Koursi El-Miloudi, Bruelle Jean-Luc, Dufaux Alain and Jacot Jacques*

**Special session on Medical Imaging**

Points of Interest Detection in Cervical Spine Radiographs by Polygonal Approximation .......... 81
*Fabian Lecron, Mohammed Benjelloun and Saïd Mahmoudi*

Comparison of Optimization Techniques for Regularized Statistical Reconstruction in X-Ray Tomography ........................................................................................................ 87
*Benoit Hamelin, Yves Goussard and Jean-Pierre Dussault*

Intravascular Ultrasound Image Segmentation: A Helical Active Contour Method ................. 92
*Melissa Jourdain, Jean Meunier, Jean Séqueira, Guy Cloutier and Jean-Claude Tardif*

Automatic Identification of Cell Files in Light Microscopic Images of Conifers Wood .......... 98
*Pol Kennel, gérard Subsol, michaël Guérout and philippe Borianne*

**Coding and Compression**

Spectrogram Image Encoding Based on Dynamic Hilbert Curve Routing ............................. 107
*ChingShun Lin and DaRen Wang*

Analysis of the robustness of wavelet-based perceptual signatures ........................................ 112
*Azhar Hadmi, William Puech, Brahim Ait Es Said and Abdellah Ait Ouahman*

Improving Compression Times in Zero-Tree Based Image Coding Procedures .................... 118
*Jonas Valantinas and Deividas Kancelkis*

Hyperspectral Image Compression Based on Tucker Decomposition and Discrete Cosine Transform ............................................................................................................ 122
*Azam Karami, Mehran Yazdi and Alireza Zolghadre Asli*

Fast zonal DCT-based image compression for Wireless Camera Sensor Networks .................. 126
*Leila Makkaoui, Vincent Lecuire and Jean-Marie Moureaux*

**Video Coding**

Memory Requirements and Simulation Platform for the Implementation of the H.264 Encoder Modules ........................................................................................................ 133
*Messaoudi Kamel, Bourennane El-Bay, Toumi Salah, Kerkouche Omar and Labbani Oassila*

Temporal Transcoding of H.264/AVC Video to the H.264/SVC Format .................................. 138
*Hussain Al-Muscati and Fabrice Labeau*

Temporal Error Concealment Algorithm for H.264/AVC Using Omnidirectional Motion Similarity ........................................................................................................... 144
*Changki Min, Soonjong Jin, Hyeongchul Oh, Sang-Jun Park and Jechang Jeong*
Robust Multiple Hypothesis Motion Compensated Prediction within the H.264/AVC Standard... 149
Tamim Haroun and Fabrice Labeau

**Image and Video Processing**

Temporal Video Segmentation Using a Switched Affine Models Identification Technique........ 157
Khaled Boukharouba, Laurent Bako and Stéphane Lecoeuche

Enhancing Perceptual Quality of Watermarked High-Definition Video through Composite Mask................................................................. 161
Tae-Woo Oh, Kyung-Su Kim, Hae-Yeon Lee, Ji-Won Lee and Heung-Kyu Le

Covariance-Based Adaptive Deinterlacing Method using Edge Map................................. 166
Sang-Jun Park, Gwanggil Jeon and Jechang Jeong

Watermarking Ancient Documents Schema Using Wavelet Packets and Convolutional Code... 172
Mohamed Neji Maatouk, Majd Bellaj and Najoua Essoukri Ben Amara

Objective Evaluation of Compressed Video’s Temporal Flickering.................................... 177
Salim Chebbo, Philippe Durieux and Béatrice Pesquet-Popescu

Key Frame-Based Video Super-Resolution Using Bi-Directional Overlapped Block Motion Compensation and Trained Dictionary........................................ 181
Byung Cheol Song, Shin-Cheol Jeong and Yanglim Choi

**Image Reconstruction and Registration**

The 2 and 3 materials scene reconstructed from some line Mojette projections................. 189
Jean-Pierre Guedon and Chuanlin Liu

Edgeworth-based approximation of Mutual Information for medical image registration........ 195
Mathieu Rubeaux, Jean-Claude Nunes, Laurent Albera and Mireille Garreau

Mojette Reconstruction from Noisy Projections.......................................................... 201
Benoît Recur, Pascal Desbarats and Jean-Philippe Domenger

Comparison of Interpolation Methods for Angular Resampling of Diffusion Weighted images 207
Félix Renard, Vincent Noblet, Antoine Grigis, Christian Heinrich and Stéphane Kremer

**Image Enhancement**

Stego image quality: a subjective evaluation.............................................................. 215
Adel Almohammad and Gheorghita Ghinea

Empirical mode decomposition based visual enhancement of underwater images.............. 221
Aysun Tasyapi Celebi and Sarp Erturk

An Adaptive Algorithm for Phase Retrieval from High Intensity Images.......................... 225
Eran Gur and Gilad Avidor

Human Visual System Based Mammogram Enhancement and Analysis............................. 229
Yicong Zhou, Karen Panetta and Sos Agaian

Laplacian Pyramid Decomposition-Type Method for Resolution Enhancement of Ultrasound Images........................................................................ 235
Marie Ploquin, Jean-Marc Girault and Denis Kouamé

**Image Segmentation and Detection**
Co-parent selection for fast region merging in pyramidal image segmentation ........................................ 243
Milos Stojmenovic, Andres Solis Montero and Amiya Nayak

Estimation of uncertainty for Harris corner detector ......................................................................................... 249
Marc Bertrand, Frédéric Bouchara and Sofiane Ramdani

Wavelet-Based Acoustic Seabed Discrimination System .................................................................................. 253
Reza Javidan

A new Descriptor for Textured Image Segmentation based on Fuzzy Type-2 Clustering Approach .................. 258
Lotfi Tlig, Mounir Sayadi, Farhat Fnaiech

Rooftop Detection using a Corner-Leaping based Contour Propagation Model .............................................. 264
Masoud S. Nosrati and Parvaneh Saeedi

A Markov Random Field description of fuzzy color segmentation ............................................................... 270
Angela D’Angelo and Jean-Luc Dugelay

Medical Image Segmentation and Detection

Contiguity-constrained Hierarchical Clustering for Image Segmentation ....................................................... 279
Eduardo R. Concepcion Morales and Yosu Yurramedi Mendizabal

Graph cut segmentation technique for MRI brain tumor extraction ............................................................ 284
Victor Chen and Su Ruan

A New Segmentation Technique for Brain and Head from High Resolution MR Image Using Unique Histogram Features .................................................................................................................. 288
Somojit Saha, Sarit Kumar Das and Avijit Kar

New Feature-Based Detection of Blood Vessels and Exudates in Color Fundus Images ................................ 294
Doaa Youssef, Nahed Solouma, Amr El-dib, Mai Mabrouk and Abu-Bakr Youssef

A Fast Geodesic Active Contour Model For Medical Images Segmentation using Prior Analysis .................. 300
S. Al-Sharif, M. Deriche and N. Maalej

Atlas-based Segmentation of Brain MR Images Using Least Square Support Vector Machines ...................... 306
Keyvan Kasiri, Kamran Kazemi, Mohammad Javad Dehghani and Mohammad Sadegh Helfroush

Image Classification and Categorization

Improved Modified Suppressed Fuzzy C-Means ................................................................................................. 313
Mohamed Fadhel SAAD and Adel M. ALIMI

Image Modeling Using Statistical Measures for Visual Object Categorization ........................................... 319
Huanzhang Fu, Alain Pujol, Emmanuel Dellandréa and Liming Chen

Support Vector Machine Fusion of Multisensor Imagery in Tropical Ecosystems ....................................... 325
Robin Pouteau, Benoît Stoll and Sébastien Chabrier

Texture classification for multi-spectral images using spatial and spectral gray level differences .................. 330
Riad Khelifi, Mounoud Adel and Salah Bourennane

Image Database Categorization using Robust Modeling of Finite Generalized Dirichlet Mixture ................. 334
Image Indexing and Retrieval

Query-by-Sketch based Image Retrieval using Diffusion Tensor Fields
Sang Min Yoon and Arjan Kuijper

Multi-Level Visual Alphabets
Menno Israel, Jetske van der Schaar, Egon L. van der Broek, Marten den Uyl and Peter van der Putten

Stroke feature extraction for lettrine indexing
Giap Nguyen, Mickaël Coustaty and Jean-Marc Ogier

Motion Estimation and Tracking

Modular Ensemble Tracking
Thomas Penne, Christophe Tilmant, Thierry Château and Vincent Barra

Improved Two-bit Transform-based Motion Estimation via Extension of Matching Criterion
Changryoul Choi and Jechang Jeong

The computation of the Bhattacharyya distance between histograms without histograms
Séverine Dubuisson

Full motion detection system with post-processing
Lounis Douadi, Louahdi Khoudour, Anis Chaari and Jacques Boonaert

Eye Tracking for Foveation Video Coding and Simple Scene Description
Mauritz Panggabean, Stig Salater and Leif Arne Rønningen

Particle filtering with fuzzy spatial relations for object tracking
Nicolas Widynski, Séverine Dubuisson and Isabelle Bloch

Shape and Objects Recognition

Volume estimation of 3D particles with known convex shapes from its projected areas
Benoît Presles, Johan Debayle, Ana Cameirao, Gilles Févotte and Jean-Charles Pinoli

Recognition of Objects in Various Situations from Two Dimensional Images
Yuexing Han, Hideki Koike, Bing Wang and Masanori Idesawa

Shape representation and analysis of 2D compact sets by shape diagrams
Severine Rivollier, Johan Debayle and Jean-Charles Pinoli

Binary Pattern Matching from a Local Dissimilarity Measure
Frédéric Morain-Nicolier, Jérôme Landré and Su Ruan

A New Combining Learning Method for Color Constancy
Tara Akhavan and Mohsen Ebrahimi Moghaddam

Visual Object Recognition using Local Binary Patterns and Segment-based Feature
Chao Zhu, Huanzhang Fu, Charles-Edmond Bichot, Emmanuel Dellandrea and Liming Chen

Face and Iris Detection and Recognition

Hybrid Super Resolution using Refined Face Logs
Kamal Nasrollahi and Thomas B. Moeslund

Vision Based Human Interaction System for Disabled
Saurav Kumar, Atul Rai, Akhilesh Agarwal and Nisha Bachani
Bayesian Regularized Nonnegative Matrix Factorization Based Face Features Learning........ 447

Xueyi Zhao
Relevance analysis of 3D curvature-based shape descriptors on interest points of the face........................................................................................................................................... 452

Alexander Ceron, Augusto Salazar and Flavio Prieto
Localization of noncircular iris boundaries using Morphology and arched Hough transform.... 458

Hamed Ghodrati, Mohammad Javad Dehghani, Mohammad Sadegh Helfroush and Kamran Kazemi
An Algorithm for Iris Extraction.................................................................................................................. 464

Tomas Fabian, Jan Gaura and Petr Kotas

Remote Sensing Applications
Multidimensional Image Processing for Remote Sensing Anomaly Detection.................. 471
Dalton Rosario and Joao Romano

Improvement of the Space Resolution of the Optical Remote Sensing Image By the Principle of
CCD Imaging............................................................................................................................................... 477

Qing Liu, Sun'an Wang, XiaoHui Zhang and Yun Hou
Detecting Potential Human Activities Using Coherent Change Detection.......................... 482

Nada Milisavljevic, Damien Closson and Isabelle Bloch

Augmented and Virtual Reality Techniques and Applications
Virtual Domotic Systems: a 3D Interaction Technique to Control Virtual Building Devices Using
Residential Gateways...................................................................................................................................... 489

Francisco Pedro Luque, Francisco Javier Luque, Carmen Lastres, Asunción Santamaría, Iris
Galloso and Jordi Muria

SURF applied in Panorama Image Stitching.............................................................................................. 495
Luo Juan and Gwun Oubong

SPIDAR Calibration using Support Vector Regression............................................................................. 500

Pierre Boudoin, Hichem Maaref, Samir Otmane and Malik Mallem

Measurement of laboratory fire spread experiments by stereovision...................................................... 506

Lucile Rossi, Thierry Molinier, Moulay Akhloufi and Yves Tison

A visual attention focusing system using an active stereoscopic vision sensor.............................. 511
Yann Ducrocq, Shahram Bahrami, Luc Duvieubourg and François Cabestaing

Validation of a virtual agronomic image modelling.................................................................................. 517
Gawain Jones, Christelle Gee, Sylvain Villette and Frédéric Truchetet

Image Processing Tools
Embedded System for Real-Time Human Motion Detection............................................................... 523
Mohammad Mayya, Nizar Zarka and Mhd. Soubhi Alkadi

 Exploration of an adaptive NoC architecture on FPGA dedicated to multi and hyperspectral
algorithm for art authentication.................................................................................................................. 529
Virginie Fresse, Junyan Tan and Frederic Rousseau
Automatic Generation of Analog Hardware Description Language (AHDL) Code from Cell Culture Images

Alberto Yufera and Estefania Gallego

Implementation of a Reticle Seeker Missile Simulator for Jamming Effect Analysis

Ga-Young Kim, Byoung-Ik Kim, Tae-Wuk Bae, Young-Choon Kim, Sang-Ho Ahn and Kyu-Ik Sohng

An efficient vision system to measure granule velocity and mass flow distribution in fertiliser centrifugal spreading

Sylvain Villette, Christelle Gee, Emmanuel Piron, Richard Martin, Denis Miclet and Michel Paindavoine

Author index