Table of Contents

Invited Talks

Recent Advances in Kernel Machines ........................................... 1  
*Stéphane Canu*

Design of Pattern Classifiers Using Optimum-Path Forest with  
Applications in Image Analysis ............................................. 2  
*Alexandre X. Falcão*

Vision-Based Control of Robot Motion ........................................ 3  
*Seth Hutchinson*

Soft Computing, f-Granulation and Pattern Recognition .................. 4  
*Sankar K. Pal*

Computational Illumination .................................................. 5  
*Matthew Turk*

Color, Shape and Texture

Color Texture Analysis and Classification: An Agent Approach Based  
on Partially Self-avoiding Deterministic Walks .......................... 6  
*André Ricardo Baches, Alexandre Souto Martinez, and Odemir Martinez Bruno*

Characterizing 3D Shapes Using Fractal Dimension ........................ 14  
*André Ricardo Baches, Danilo Modeiros Eler, Rosane Minghim, and Odemir Martinez Bruno*

Multiresolution Histogram Analysis for Color Reduction ................ 22  
*Giovanna Ramella and Gabriella Sanniti di Baja*

Graphs and Hypergraphs

Graph of Words Embedding for Molecular Structure-Activity  
Relationship Analysis .......................................................... 30  
*Jaume Gibert, Eruest Valveny, and Horst Bunke*

A Hypergraph Reduction Algorithm for Joint Segmentation and  
Classification of Satellite Image Content ................................ 38  
*Alain Bretto, Aurélien Ducournau, and Soufiane Rital*

A Static Video Summarization Method Based on Hierarchical  
Clustering ........................................................................... 46  
*Sérgio Jamil F. Guimarães and Willer Gomes*
# Table of Contents

## Biomedical Imaging

Histopathological Image Classification Using Stain Component Features on a pLSA Model
Gloria Díaz and Eduardo Romero

Modified Expectation Maximization Algorithm for MRI Segmentation
Romiro Donoso, Alejandro Veloz, and Héctor Allende

Generation of Synthetic Multifractal Realistic Surfaces Based on Natural Model and Lognormal Cascade: Application to MRI Classification
Mohamed Khider, Abdelmalik Taleb-Ahmed, and Boualem Haddad

## Retrieval, Mining and Learning

Content-Based Emblem Retrieval Using Zernike Moments
EsseQUIel Cura, Mariano Tepper, and Marta Mejail

A New Algorithm for Training SVMs Using Approximate Minimal Enclosing Balls
Emanuele Frandi, Maria Grazia Gasparo, Stefano Lodi, Ricardo Ánculef, and Claudio Sartori

A Hybrid Face Recognition Approach Using GPUMLib
Noel Lopes and Bernardete Ribeiro

## Learning, Recognition and Clustering

Self-training for Handwritten Text Line Recognition
Volkanar Frinken and Horst Bunke

Improving the Dynamic Hierarchical Compact Clustering Algorithm by Using Feature Selection
Reynaldo Gil-García and Aurora Pons-Porrata

Background Division, A Suitable Technique for Moving Object Detection
Walter Izquierdo-Guerra and Edel García-Reyes

## Bayesian and Statistical Methods

Concept Formation Using Incremental Gaussian Mixture Models
Paulo Martins Engel and Milton Roberto Heinen
Integrating Phonological Knowledge in ASR Systems for Spanish Language

Javier Mike Olaso and María Inés Torres

Inference of Restricted Stochastic Boolean GRN’s by Bayesian Error and Entropy Based Criteria

David Correia Martins Jr., Evaldo Araújo de Oliveira, Vitor Hugo Louzada, and Ronaldo Fumio Hashimoto

Coding and Compression, Video, Tracking

Grid Smoothing: A Graph-Based Approach

Guillaume Noel, Karim Djouani, and Yskandar Hamam

A Quality Analysis on JPEG 2000 Compressed Leukocyte Images by Means of Segmentation Algorithms

Alexander Falcón-Ruiz, Juan Paz-Viera, Alberto Taboada-Crispi, and Hichem Sahli

Comments on Matrix-Based Secret Sharing Scheme for Images

Essam Elsehemy and A. Ben Hamza

A Very Low Bit-Rate Minimalist Video Encoder Based on Matching Pursuits

Vitor de Lima and Helio Pedrini

An Unified Transition Detection Based on Bipartite Graph Matching Approach


A New Dissimilarity Measure for Trajectories with Applications in Anomaly Detection

Dustin L. Espinosa-Isidró and Edel B. García-Reyes

Modelling Postures of Human Movements

Djamila Medjehed Ganas, Houssem Eddine Gueziri, and Nazim Haouchine

Detection and Tracking of Driver’s Hands in Real Time

Raúl Crespo, Isaac Martín de Diego, Cristina Conde, and Enrique Cabello

Speech, Natural Language, Document

Speaker Verification in Noisy Environment Using Missing Feature Approach

Dayana Ribas, Jesus A. Vázquez, Eduardo Leiva, and José R. Calvo
# Table of Contents

**Fast k-NN Classifier for Documents Based on a Graph Structure** ........................................ 228  
*Fernando José Artigas-Fuentes, Reynaldo Gil-García, José Manuel Badía-Conielles, and Aurora Pons-Porrata*

**Comparative Analysis between Wavelets for the Identification of Pathological Voices** ................................................................. 236  
*Náthalie Cavalcanti, Sandro Silva, Adriano Bresolin, Heliana Bezerra, and Ana Maria G. Guerreiro*

**Comparison of HMM and DTW for Isolated Word Recognition System of Punjabi Language** ...................................................... 241  
*Kumar Ravinder*

**A Combination of Classifiers for the Pronominal Anaphora Resolution in Basque** ............................................................ 253  
*Ana Zeloia Jauregi, Basilio Sierra, Olatz Arregi Uriarte, Klara Ceberio, Amantza Díaz de Ilarraza, and Iakes Goenaga*

**Text Segmentation by Clustering Cohesion** ....................................................... 261  
*Rael Abella Pérez and José Eladio Medina Pagola*

**Multiple Clues for License Plate Detection and Recognition** ............................. 269  
*Pablo Negri, Mariano Tepper, Daniel Acevedo, Julio Jacobo, and Marta Mejail*

## Image Filtering and Segmentation

**Non Local Image Denoising Using Image Adapted Neighborhoods** ........... 277  
*Alvaro Pardo*

**A Quantitative Evaluation of Fixed-Pattern Noise Reduction Methods in Imaging Systems** .................................................. 285  
*Pablo Meza, César San Martín, Esteban Vera, and Sergio Torres*

**Vessel Centerline Tracking in CTA and MRA Images Using Hough Transform** ................................................................. 295  
*Maysa M.G. Macedo, Choukri Mekkaoui, and Marcel P. Jackowski*

**Automatic Image Segmentation Optimized by Bilateral Filtering** ............. 303  
*Javier Sanchez, Estibaliz Martinez, Agueda Arquero, and Diego Renza*

**Pansharpening of High and Medium Resolution Satellite Images Using Bilateral Filtering** ........................................ 311  
*Diego Renza, Estibaliz Martinez, Agueda Arquero, and Javier Sanchez*
# Table of Contents

Color Image Segmentation by Means of a Similarity Function.............. 319  
Rodrigo Alvarez-Cervantes, Edgardo M. Felipe-Riveron, and  
Luis P. Sanchez-Fernandez

Image Segmentation Using Quadtree-Based Similarity Graph and  
Normalized Cut ....................................................................... 329  
Marco Antonio Garcia de Carvalho,  
Anselmo Castelo Branco Ferreira, and Andre Luis Costia

A Genetic-Algorithm-Based Fusion System Optimization for 3D Image  
Interpretation ......................................................................... 338  
Lionel Valet, Beatriz S.L.P. de Lima, and Alexandre G. Evsukoff

## Feature Extraction, Shape, Texture, Geometry and  
Morphology

Quaternion Atomic Function Wavelet for Applications in Image  
Processing ................................................................................ 346  
E. Ulises Moya-Sánchez and Eduardo Bagro-Corrochano

A Complex Network-Based Approach for Texture Analysis ............... 354  
André Ricardo Backes, Delcimar Casanova, and  
Odemir Martinez Bruno

Enhancing Gabor Wavelets Using Volumetric Fractal Dimension ...... 362  
Alvaro Gomez Zuniga and Odemir Martinez Bruno

Comparison of Shape Descriptors for Mice Behavior Recognition ...... 370  
Jonathan de Andrade Silva, Wesley Nunes Goncalves,  
Bruno Brandoli Machado, Hemerson Pistori,  
Albert Schiaveto de Souza, and Kleber Padovani de Souza

Ridge Linking Using an Adaptive Oriented Mask Applied to Plant  
Root Images with Thin Structures ........................................... 378  
Talita Perciano, Roberto Hirata Jr., and Lúcio André de Castro Jorge

Parameter Estimation for Ridge Detection in Images with Thin  
Structures .............................................................................. 386  
Talita Perciano, Roberto Hirata Jr., and Lúcio André de Castro Jorge

Experimental Comparison of Orthogonal Moments as Feature  
Extraction Methods for Character Recognition ............................ 394  
Miguel A. Duval, Sandro Veiga-Pons, and Eduardo Garcia

## Face Segmentation and Recognition, Biometry

Improving Face Segmentation in Thermograms Using Image  
Signatures ............................................................................... 402  
Silvio Felipe and Luis A. Alexandre
Acrosol Optical Thickness Retrieval from Satellite Observation Using Support Vector Regression .................................................. 492
  Thi Nhat Thanh Nguyen, Simone Mantovani, Piero Campolani, Mario Canicchi, and Maurizio Bottoni

An Overproduce-and-Choose Strategy to Create Classifier Ensembles with Tuned SVM Parameters Applied to Real-World Fault Diagnosis ... 500
  Estefahan Dazzi Wandeloke, Flávio M. Varejão, and Thomas W. Rauker

Multi-Objective Semi-Supervised Feature Selection and Model Selection Based on Pearson’s Correlation Coefficient ............................... 509
  Frederico Coelho, Antonio Padua Braga, and Michel Verleysen

Introducing ROC Curves as Error Measure Functions: A New Approach to Train ANN-Based Biomedical Data Classifiers ................. 517
  Raül Ramos-Polkán, Miguel Ángel Guerra-López, and Eugénio Oliveira

Partition Selection Approach for Hierarchical Clustering Based on Clustering Ensemble ................................................................. 525
  Sandro Vega-Pous and José Ruiz-Shulcloper

The Imbalanced Problem in Morphological Galaxy Classification .......... 533
  Jorge de la Calleja, Gladis Huerta, Olac Fuentes, Antonio Benítez, Eduardo López Domínguez, and Ma. Auxilio Medina

Exploiting Contextual Information for Image Re-ranking .................... 541
  Daniel Carlos Guimarães Pedronette and Ricardo da S. Torres

Assessing the Role of Spatial Relations for the Object Recognition Task ...................................................................................... 549
  Annette Morales-González and Edel García-Reyes

Automatic Representation of Semantic Abstraction of Geographical Data by Means of Classification ..................................................... 557
  Rainer Lorin Fonseca and Eduardo Gómez Llano

Author Index ........................................................................................................................................ 569