

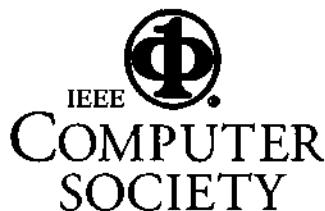
Proceedings

11th International Conference on Image Analysis and Processing

September 26 – 28, 2001
Palermo, Italy

Edited by
Edoardo Ardizzone
Vito Di Gesù

Sponsored by
International Association for Pattern Recognition (IAPR)
University of Palermo
Italian Council of Research (CNR)



Los Alamitos, California

Washington • Brussels • Tokyo

Table of Contents

11th International Conference on Image Analysis and Processing — ICIAP 2001

Foreword	xiii
Conference Committee	xiv
Additional Referees	xv

Session 1: Object and Shape Detection

Automatic Character Location and Segmentation in Color Scene Images	2
<i>H. Wang</i>	
Lip Detection and Tracking	8
<i>A. Caplier</i>	
Recognition of Shape-Changing Hand Gestures Based on Switching Linear Model	14
<i>M. Jeong, Y. Kuno, N. Shimada, and Y. Shirai</i>	
2D Shape Recognition by Hidden Markov Models	20
<i>M. Bicego and V. Murino</i>	

Session 2: Face Recognition

Bayesian Face Recognition with Deformable Image Models.....	26
<i>B. Moghaddam, C. Nastar, and A. Pentland</i>	
Spatial Clustering of Pixels in the Mouth Area of Face Images	36
<i>M. Sadeghi, J. Kittler, and K. Messer</i>	
Eigenspace-Based Recognition of Faces: Comparisons and a New Approach.....	42
<i>P. Navarrete and J. Ruiz-del-Solar</i>	
Integrated 2D and 3D Images for Face Recognition.....	48
<i>Y. Wang, C. Chua, Y. Ho, and Y. Ren</i>	

Session 3: Image Segmentation

Feature Based Merging of Application Specific Regions	56
<i>A. Rydberg and G. Borgefors</i>	
Maximum Likelihood Motion Segmentation Using Eigendecomposition.....	63
<i>A. Robles-Kelly and E. Hancock</i>	
Wavelet-Based Texture Segmentation of Remotely Sensed Images	69
<i>M. Acharyya and M. Kundu</i>	

Invited Talk 1

Visual Grouping and Object Recognition	612
<i>J. Malik</i>	

Session 4: Feature Extraction

Motion Detection with Non-stationary Background	78
<i>Y. Ren, C. Chua, and Y. Ho</i>	
Analysing and Simplifying Histograms Using Scale-Trees.....	84
<i>S. Gibson and R. Harvey</i>	
Vanishing Point Detection: Representation Analysis and New Approaches	90
<i>V. Cantoni, L. Lombardi, M. Porta, and N. Sicard</i>	
A Fast Recursive Algorithm for the Computation of Axial Moments	95
<i>R. Palenichka, M. Zaremba, and C. Valenti</i>	

Poster Session A: Early Vision and Image Analysis

A Modified Fuzzy ART for Image Segmentation	102
<i>L. Cinque, G. Foresti, A. Gumina, and S. Levialdi</i>	
Real-Time Tracking and Reproduction of 3D Human Body Motion	108
<i>C. Colombo, A. Del Bimbo, and A. Valli</i>	
Image Segmentation for Appearance-Based Self-Localisation	113
<i>P. Zingaretti and L. Bossoletti</i>	
Circle Detection Based on Orientation Matching	119
<i>M. Ceccarelli, A. Petrosino, and G. Laccetti</i>	
Concurrent Edge/Region Detection from a Peano Scan	125
<i>G. Seetharaman, S. Bouchafa, and B. Zavidovique</i>	
Increasing Efficiency of Hausdorff Approach for Tracking Real Scenes with Complex Enviroments	131
<i>E. Nielsen, J. Navarro, and M. Tejera</i>	
Remote Sensed Images Segmentation through Shape Refinement.....	137
<i>G. Gallo, G. Grasso, S. Nicotra, and A. Pulvirenti</i>	
Temporal Filtering of Disparity Measurements.....	145
<i>L. Di Stefano, S. Mattoccia, G. Neri, and D. Piccinini</i>	
Clustering Context Properties of Wavelet Coefficients in Automatic Modelling and Image Coding	151
<i>J. Lehtinen and J. Kivijärvi</i>	
Intermediate Representation in Model Based Recognition Using Straight Line and Ellipsoidal Arc Primitives.....	156
<i>S. Nedevschi, T. Marita, and D. Puiu</i>	
Attentive Billboards.....	162
<i>I. Haritaoglu and M. Flickner</i>	

Image Analysis of Crosswalk	168
<i>T. Shioyama, H. Wu, Y. Nishibe, N. Nakamura, and S. Kitawaki</i>	
Noise Filtering of Periodic Image Sequences	174
<i>A. Plebe</i>	
Multiscale Fundamental Forms: A Multimodal Image Wavelet Representation	179
<i>P. Scheunders</i>	
Multivalued Image Segmentation Based on First Fundamental Form.....	185
<i>P. Scheunders</i>	

Session 5: Applications I

Text Enhancement with Asymmetric Filter for Video OCR.....	192
<i>D. Chen, K. Shearer, and H. Bourlard</i>	
Towards Teleconferencing by View Synthesis and Large-Baseline Stereo.....	198
<i>F. Isgrò, E. Trucco, and L. Xu</i>	
Impact of Pixel per Processor Ratio on Embedded SIMD Architectures	204
<i>A. Gentile and D. Wills</i>	
A Neurodynamical Retinal Network Based on Reaction-Diffusion Systems.....	209
<i>M. Keil, G. Cristóbal, and H. Neumann</i>	
3D Biological Object Detection and Labeling in Multidimensional Microscopy Imaging	215
<i>J. Wang, A. Trubuil, and C. Graffigne</i>	

Invited Talk 2

Digital Geometry Fundaments: Application to Plane Recognition.....	622
<i>J. Chassery, F. Dupont, I. Sivignon, and J. Vittone</i>	

Session 6: Image Retrieval

CONTEXT: A Technique for Image Retrieval Integrating CONtour and TEXTure Information	224
<i>R. Distasi, M. Nappi, M. Tucci, and S. Vitulano</i>	
Using Contextual Information for Image Retrieval	230
<i>L. Gregory and J. Kittler</i>	
A Method for Content-Based Similarity Retrieval of Images	
Using Two Dimensional DP Matching Algorithm	236
<i>Y. Liu, H. Emoto, T. Fujii, and S. Ozawa</i>	

Poster Session B: Pattern Recognition and Image Inference

Texture Synthesis Using Image Pyramids and Self-Organizing Maps	244
<i>P. Parada and J. Ruiz-del-Solar</i>	
A Semi-direct Approach to Structure from Motion	250
<i>P. Favaro, H. Jin, and S. Soatto</i>	

Discriminant Basis for Object Classification.....	256
<i>D. Guillamet and J. Vitrià</i>	
A Genetic Algorithm for Image Segmentation.....	262
<i>G. Lo Bosco</i>	
Neural Network Analysis of MINERVA Scene Analysis Benchmark	267
<i>M. Markou, S. Singh, and M. Sharma</i>	
Learning and Caricaturing the Face Space Using Self-Organization and Hebbian Learning for Face Processing	273
<i>A. Pujol, H. Wechsler, and J. Villanueva</i>	
A Probabilistic Model for the Human Skin Color	279
<i>T. Caetano and D. Barone</i>	
View Synthesis from Two Uncalibrated Images	284
<i>F. Dornaika</i>	
A Flexible Algorithm for Image Matching.....	290
<i>F. Odone, E. Trucco, and A. Verri</i>	
Effectiveness Evaluation of Word Characteristics Obtained from 3-D Image Information for Lipreading	296
<i>K. Uda, N. Tagawa, A. Minagawa, and T. Moriya</i>	
Automatic Graph Extraction from Color Images.....	302
<i>T. Lourens, H. Okuno, and H. Kitano</i>	
Using Feature-Vector Based Analysis, Based on Principal Component Analysis and Independent Component Analysis, for Analyzing Hyperspectral Images	309
<i>H. Muhammed, P. Ammenberg, and E. Bengtsson</i>	
Automatic Features Detection for Overlapping Face Images on their 3D Range Models.....	316
<i>R. Lanzarotti, P. Campadelli, and N. Borghese</i>	
Weighted Distance Transforms in Rectangular Grids	322
<i>I. Sintorn and G. Borgefors</i>	
A Hierarchical Framework for Modal Correspondence Matching	327
<i>M. Carcassoni and E. Hancock</i>	

Session 7: Early Vision

A System for Tracking Laboratory Animals Based on Optical Flow and Active Contours	334
<i>Z. Kalafatić, S. Ribarić, and V. Stanisavljević</i>	
An Information-Theoretic Approach to Active Vision	340
<i>G. Boccignone, M. Ferraro, and T. Caelli</i>	
Real-Time Disparity Analysis for Applications in Immersive Tele-Conference Scenarios: A Comparative Study	346
<i>O. Schreer, N. Brandenburg, and P. Kauff</i>	

Invited Talk 3

Integrated Tracking with Vision and Sound	354
<i>A. Blake, M. Gangnet, P. Perez, and J. Vermaak</i>	

Session 8: Video Processing

Detecting Objects, Shadows and Ghosts in Video Streams by Exploiting Color and Motion Information.....	360
<i>R. Cucchiara, C. Grana, M. Piccardi, and A. Prati</i>	
Detection and Description of Human Running Behaviour in Sports Video Multimedia Database	366
<i>F. Cheng, W. Christmas, and J. Kittler</i>	
Model Tracking for Video-Based Virtual Reality	372
<i>A. Valinetti, A. Fusielo, and V. Murino</i>	

Poster Session C: Visual Processing for Communication

RF*IPF: A Weighting Scheme for Multimedia Information Retrieval.....	380
<i>J. Wang and Y. Du</i>	
Classifying Audio of Movies by a Multi-Expert System.....	386
<i>M. De Santo, G. Percannella, C. Sansone, and M. Vento</i>	
A World Wide Web Region-Based Image Search Engine.....	392
<i>I. Kompatsiaris, E. Triantafyllou, and M. Strintzis</i>	
Texture Classification for Content-Based Image Retrieval	398
<i>R. Pirrone and M. La Cascia</i>	
Effective Moving Cast Shadow Detection for Monocular Color Image Sequences	404
<i>G. Fung, N. Yung, G. Pang, and A. Lai</i>	
Quantitative Assessment of Qualitative Color Perception in Image Database Retrieval	410
<i>M. Albanesi, S. Bandelli, and M. Ferretti</i>	
Adaptive Color Image Compression Based on Visual Attention.....	416
<i>N. Ouerhani, J. Bracamonte, H. Hügli, M. Ansorge, and F. Pellandini</i>	
Comparison and Combination of Adaptive Query Shifting and Feature Relevance Learning for Content-Based Image Retrieval	422
<i>G. Giacinto, F. Roli, and G. Fumera</i>	
Minimum Entropy Transform Using Gabor Wavelets for Image Compression.....	428
<i>S. Fischer and G. Cristóbal</i>	
Interactive Texture Synthesis.....	434
<i>P. Parada, J. Ruiz-del-Solar, M. Köppen, and W. Plagges</i>	
A Local Color Descriptor for Efficient Scene-Object Recognition	440
<i>E. Bigorgne, C. Achard, and J. Devars</i>	

Session 9: Classification and Modeling

Modeling Dense Range Images through Fast Polygonal Approximations	448
<i>H. Pedrini</i>	
A Method for Error Rejection in Multiple Classifier Systems.....	454
<i>G. Fumera, F. Roli, and G. Vernazza</i>	
Global Optimization of Deformable Surface Meshes Based on Genetic Algorithms	459
<i>J. Tohka</i>	
A Robust Eigendecomposition Framework for Inexact Graph-Matching	465
<i>B. Luo and E. Hancock</i>	

Poster Session D: Applications

From Cross-Country Autonomous Navigation to Intelligent Deep Space Communications: Visual Sensor Processing at JPL.....	472
<i>R. Manduchi, L. Matthies, and F. Pollara</i>	
Similarity-Based Approach to Earthenware Reconstruction	478
<i>M. Kanoh, S. Yasuhara, S. Kato, and H. Itoh</i>	
Knowledge Based Reconstruction of Buildings	484
<i>I. Suveg and G. Vosselman</i>	
Recognition Driven Burst Transmissions in Distributed Third Generation Surveillance Systems.....	490
<i>F. Oberti, G. Ferrari, and C. Regazzoni</i>	
Representing Volumetric Vascular Structures Using Curve Skeletons	495
<i>I. Nyström, G. Sanniti di Baja, and S. Svensson</i>	
IMAGENCIES: Network Image Services for Telemedicine Applications.....	501
<i>V. Roberto and V. Della Mea</i>	
A Genetic Algorithm for Scratch Removal in Static Images	507
<i>D. Tegolo and F. Isgrò</i>	
A Naive Approach to Compose Aerial Images in a Mosaic Fashion.....	512
<i>D. Tegolo and C. Valenti</i>	
Classification of Cat Ganglion Retinal Cells and Implications for Shape-Function Relationship.....	517
<i>R. Coelho, C. Valenti, J. Tanaka, and L. Costa</i>	
ISAR Image Analysis by Subspace Method: Automatic Extraction and Identification of Ship Profile	523
<i>A. Maki, K. Fukui, K. Onoguchi, and K. Maeda</i>	
A Neural Network-Based Image Processing System for Detection of Vandal Acts in Unmanned Railway Environments	529
<i>C. Sacchi, C. Regazzoni, and G. Vernazza</i>	
A Taxonomy for Image Authentication Techniques and its Application to the Current State of the Art	535
<i>M. Albanezi, M. Ferretti, and F. Guerrini</i>	

Analysis of Pixel-Level Algorithms for Video Surveillance Applications.....	541
<i>L. Di Stefano, G. Neri, and E. Viarani</i>	
Efficient Methods for Scratch Removal in Image Sequences.....	547
<i>L. Maddalena</i>	
Material Determination from Reflectance Properties in Aerial Urban Images.....	553
<i>A. Carrilero, M. Maître, and M. Roux</i>	
A Vision Agent for Mobile Robot Navigation in Time-Variable Environments.....	559
<i>A. Chella, S. Vitabile, and R. Sorbello</i>	
Goal Distance Estimation in Soccer Game	565
<i>A. Branca, E. Stella, N. Ancona, and A. Distante</i>	

Session 10: Applications II

Road Signs Recognition Using a Dynamic Pixel Aggregation Technique in the HSV Color Space.....	572
<i>S. Vitabile, G. Pollaccia, G. Pilato, and F. Sorbello</i>	
Grey-Level Morphology Based Segmentation of MRI of the Human Cortex	578
<i>R. Hult</i>	
Improved Minimum Distance Classification with Gaussian Outlier Detection for Industrial Inspection.....	584
<i>D. Toth and T. Aach</i>	
Root Growth Analysis in Physiological Coordinates.....	589
<i>N. Kirchgesner, H. Spies, H. Scharr, and U. Schurr</i>	

Session 11: Image Compression

Contextual Color Quantization Algorithm.....	596
<i>M. Yu and K. Lo</i>	
Psychovisual and Statistical Optimization of Quantization Tables for DCT Compression Engines	602
<i>S. Battiato, M. Mancuso, A. Bosco, and M. Guarnera</i>	
Detection of Blocking Artifacts of Compressed Still Images	607
<i>G. Triantafyllidis, D. Tzovaras, and M. Strintzis</i>	

Index of Authors	637
-------------------------------	------------