



IST 2006[®]

Proceedings of the

2006 IEEE International Workshop on Imaging Systems and Techniques

**Minori, Italy
29 April 2006**

*Organized and sponsored by the TC-19 Technical Committee on Imaging Systems in
collaboration with the IEEE Instrumentation and Measurement Society.*

**Copyright © 2006 by The Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republications permission, write to IEEE Copyrights Manager, IEEE Operations Center, 445 Hoes Lane, Piscataway, New Jersey USA 08854. All rights reserved.

IEEE Catalog Number: 06EX1335
ISBN: 1-4244-0250-6
Library of Congress: 2006921528

Additional Copies of This Publication Are Available from:

IEEE Service Center
445 Hoes Lane
Piscataway, NJ 08854
IEEE Service Center
445 Hoes Lane
Piscataway, NJ 08854
Phone: (800) 678-IEEE
 (732) 981-1393
Fax: (732) 981-9667
E-mail: customer-service@ieee.org

Table of Contents

Message From The Chairmen.....	v
Enhanced Robotic Rover Imaging Sensors for Space Exploration	1
<i>G.C. Giakos, L. Fraiwan, S. Sumrain, S. Sukumar, P. Bathini, D. Wagenar, S. Atreya Paturi, V. Adya, M. Reddy, K. Ambadipudi, K. Valluru, D. B. Sheffer</i>	
Programmable Vision Sensors with On-chip Real-time Image Processing	6
<i>M. Gottardi, N. Massari, A. Simoni</i>	
Inverse Electromagnetic Scattering by Using a Semi-analytical Approach. First Step: Reconstruction of the Radiating Currents.....	10
<i>M. Chiappe, G. L. Gragnani</i>	
Neural Network Mapping and Clustering of Elastic Behavior from Tactile and Range Imaging for Virtualized Reality Applications	16
<i>Ana-Maria Cretu, Emil M. Petriu, Pierre Payeur</i>	
Efficient Computation of Orthogonal Moments by Suppressing the Factorial Terms.....	22
<i>G.A. Papakostas, Y.S. Boutalis, D.A. Karras, B.G. Mertzios</i>	
Comparative Study of Adaptive Segmentation Techniques for Gesture Analysis in Unconstrained Environments	27
<i>Martin Côté, Pierre Payeur, Gilles Comeau</i>	
Exploiting XML Documents to Watermark JPEG Images.....	33
<i>F. Frattolillo, S. D'Onofrio</i>	
Processing of Interference Fringe Patterns to obtain highly localized Strain	39
<i>Bernd R. Armingier, Bernhard G. Zagar</i>	
DIAGNOSIS: A Telematics Enabled System for Medical Image Archiving, Management and Diagnosis Assistance	42
<i>S.G. Mougikakou, I. Valavanis, N.A. Mouravliansky, A. Nikita, K.S. Nikita</i>	
An Adaptive Visual Tracking Method Based on Multiple Features	48
<i>A. De Stasio, M. Ceccarelli</i>	
Unsupervised Change Detection in Multispectral Images based on Independent Component Analysis	53
<i>M. Ceccarelli, A. Petrosino</i>	
GPR Data Processing Using the Component-Separation Methods PCA and ICA	59
<i>Fawzy Abujarad, Abbas Omar</i>	
A SAR-Based Algorithm for Imaging of Landmines with GPR.....	64
<i>Vsevolod Kovalenko, Alexander Yarovoy, Leo P. Ligthart</i>	
On the Interpolation of Echographic Images Exploiting Band-Pass Signals	70
<i>Simone Curletto, Andrea Trucco</i>	
Color Restoration of Scanned Book Images for Various Background Colors and Specular Reflections	75
<i>Hiroyuki Ukida, Tadashi Araki, Keiji Kojima, Yasuko Nagai, Maki Shinoda</i>	
Novel 3D Reconstruction Method for Mandibular Distraction Planning.....	81
<i>Gabriella Tognola, Marta Parazzini, Giorgio Pedretti, Paolo Ravazzani, Ferdinando Grandori, Alessandro Pesatori, Michele Norgia, Cesare Svelto</i>	
3-D Underwater Acoustic Imaging by an Efficient Frequency Domain Beamforming	85
<i>Maria Palmese, Giovanni De Toni, Andrea Trucco</i>	
Length Measurement of a Rough Surface by Correlating Consecutive Range Images.....	90
<i>Juha Junttila, Anssi Mäkyänen</i>	
Automated Assessment of Aortic Regurgitation using 2D Doppler Echocardiogram.....	94
<i>N.V.Kiruthika, B.Prabhakar, M.Ramasubba Reddy</i>	

Table of Contents

Image Restoration for Security Cameras with Dirty Lens under Oblique Illumination.....	99
<i>Yusaku Fujii, Naoya Ohta, Tadashi Ito, Saburoou Saitoh, Tsutomu Matsuura, Takao Yamamoto</i>	
Elimination of Gridlines in X-ray Imaging for Mammography	103
<i>Toshinori Maruyama, Hideki Yamamoto</i>	
Photon Counting Imager using CMOS Compatible Photodetectors.....	109
<i>Ville Nieminen, Juha Kostamovaara, Anssi Mäkynen</i>	
Fast Face Recognition Technique for Small and Portable Devices	113
<i>Naser Zaeri, Farzin Mokhtarian, Abdallah Cherri</i>	
Adjustment of Computer Input Device for Patient with Tetraplegia by using the Mouse Cursor Locus Image.....	118
<i>Yoshio Tanimoto, Yasuhiko Rokumyo, Kazunari Furusawa, Akihiro Tokuhiro, Hiroyuki Ukida, Hideki Yamamoto</i>	
Experimental Assessment of Image Enhancement and Object Detection Methods Applied to Mechanically Scanned Sonar Systems.....	124
<i>S. Repetto, V. Ayala, M. Garofalo, M. Scarpa, A. Trucco</i>	
Carotid Artery Motion Estimation from Sequences of B-mode Ultrasound Images: Effect of Dynamic Range and Persistence.....	130
<i>John Stoitsis, Spyretta Golemati, Dimitris Perakis, Anastasia Alexandridi, Constantinos Davos, Konstantina S. Nikita</i>	
An Inexact-Newton Algorithm for Tomographic Microwave Imaging	136
<i>G. Bozza, C. Estatico, A. Massa, M. Pastorino, A. Randazzo</i>	
Synthesis of Metamaterial Coatings for Cylindrical Structures by an Ant-Colony Optimization Algorithm	142
<i>G. Bozza, M. Pastorino, M. Raffetto, A. Randazzo</i>	
A New Microwave Axial Tomograph for the Inspection of Dielectric Materials.....	147
<i>Andrea Salvadè, Matteo Pastorino, Ricardo Monleone, Andrea Randazzo</i>	
Imaging Systems and Algorithms for the Numerical Characterization of 3D Shapes of Particle Aggregates	153
<i>Patrick Giordano Jr., Daniel Barrot, Jonathan Corriveau, Shreekanth Mandayam, Beena Sukumaran</i>	
Morphological Processing of Electromagnetic Scattering Data for Enhancing the Reconstruction Accuracy of the Iterative Multi-Scaling Approach.....	156
<i>Davide Franceschini, Andrea Rosani, Massimo Donelli, Andrea Massa, Matteo Pastorino</i>	
Enhancement in Defect Detection, Location and Sizing in Hollow Axis Rotors, an Innovative Method to Improve Ultrasonic Image Quality: the Multi-FT & Multi-Probe Approach.....	162
<i>Enrico Pignone, Paolo Stanchi</i>	
Enhanced Detectability of Targets in Opaque Media.....	168
<i>G.C. Giakos, S. Sukumar, P. Bathini, S.Atreya Paturi, K. Ambadipudi, D. Wagenar, V. Adya, M. Reddy, S. Sumrain, L. Fraiwan, D. B. Sheffer</i>	
A Second Order Spread Spectrum Watermarking Scheme Using Multi-Threshold Wavelet Codec	173
<i>Imran Khan, Syed Wajahat Raza, Dimitrios A. Karras, Mussarat Abdullah, Faisal Shafique Butt</i>	
Robust Defect Detection Using Improved Higher Order Wavelet Descriptors and Support Vector Machines for Visual Inspection Systems.....	179
<i>Dimitrios A. Karras</i>	
Optimization of 2D to-3D Reconstruction Technique for Maxillo-Facial Surgery Applications.....	185
<i>Gabriella Tognola, Marta Parazzini, Giorgio Pedretti, Paolo Ravazzani, Ferdinando Grandori, Alessandro Pesatori, Michele Norgia, Cesare Svelto</i>	
Diode Laser Stroboscopy in High Speed Imaging.....	189
<i>Petteri Immonen, Anssi Mäkynen</i>	
Improved MRI Restoration by Integrating Bayesian formalism and Support Vector Machines in a Time Delayed priors Framework.....	192
<i>D. A. Karras, B.G Mertzios</i>	