

2018 IEEE International Conference on Imaging Systems and Techniques (IST 2018)

**Krakow, Poland
16 – 18 October 2018**



**IEEE Catalog Number: CFP18IMG-POD
ISBN: 978-1-5386-6629-6**

**Copyright © 2018 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 republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18IMG-POD
ISBN (Print-On-Demand):	978-1-5386-6629-6
ISBN (Online):	978-1-5386-6628-9
ISSN:	1558-2809

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

Welcome Message from the Chairman	iv
IEEE IST 2018 Organizers.....	v
International School of Imaging: Lecture Series	vii
Tuesday, October 16	viii
Wednesday, October 17	xv
Thursday, October 18	xxii

Tuesday, October 16

12:30 - 13:30

Innovative Imaging Techniques

Ballroom A

Chairs: Michalis Zervakis (Technical University of Crete, Greece)
Mohamed Shehata (University of Louisville, USA)

Space Target Motion Salient Classification using Retina Vision Polarimetric Sensing Principles..... 1

Anthony Beninati (Manhattan College, USA)
Nicolas Douard (Manhattan College, USA)
Gloria Bauman (Manhattan College, USA)
Jonathan Hoogerhyde (Manhattan College, USA)
Zoe Giakos (Florida International University, USA)
Martin Nowak (Manhattan College, USA)
Hussam Eldin Mohamed (Manhattan College, USA)
Michalis Zervakis (Technical University of Crete, Greece)
George Livanos (Technical University of Crete, Greece)
George Giakos (Manhattan College, USA)

A Novel CAD System for Detecting Acute Rejection of Renal Allografts Based on Integrating Imaging-markers and Laboratory Biomarkers 6

Mohamed Shehata (University of Louisville, USA)
Mohammed Ghazal (University of Abu Dhabi, United Arab Emirates)
Fahmi Khalifa (University of Louisville, USA)
Mohamed Abou El-Ghar (Mansoura University, Egypt)
Ashraf Khalil (Abu Dhabi University, United Arab Emirates)
Amy Dwyer (University of Louisville, USA)
Ahmed El-giziri (University of Louisville, USA)
Moumen El-Melegy (Assiut University, Egypt)
Ayman Sabry El-Baz (University of Louisville, USA)

Monitoring and Detection of Combustible Gas Leakage by Using Infrared Imaging 12

Binglu Liu (Tsinghua University, P.R. China)
Haocheng Ma (Tsinghua University, P.R. China)
Xiaoping Zheng (Tsinghua University, P.R. China)
Anshan Xiao (Research Institute of Safety Engineering, P.R. China)
Lihui Peng (Tsinghua University, P.R. China)

EEG based method for the decoding of complex arm motor imagery tasks 18

Zhang Shuailei (Beihang University, P.R. China)
Wang Shuai (Beihang University, P.R. China)
Zheng Dezhi (Beihang University, P.R. China)
Ma Kang (Beihang University, P.R. China)
Zhu Kai (Beihang University, P.R. China)
Na Rui (Beihang University, P.R. China)
Li Dapeng (Beihang University, P.R. China)

12:30 - 13:30

Image Analysis and Processing I

Ballroom B

Chairs: Suman Shrestha (ON Semiconductor, USA)
Katarzyna Heryan (AGH University of Science and Technology, Poland)

A Deep Learning Approach for Analyzing Video and Skeletal Features in Sign Language Recognition 24

Dimitrios Konstantinidis (Centre for Research and Technology Hellas, Greece)
Kosmas Dimitropoulos (Centre for Research and Technology Hellas, Greece)
Petros Daras (Centre for Research and Technology Hellas, Greece)

Research on Denoising Algorithm of Thoracic Impedance Data for COPD Diagnosis	30
<i>Yixin Ma (Shanghai Jiao Tong University, P.R. China)</i>	
Noise-filtering method for large-scale holographic 3D display	36
<i>Hyun-Eui Kim (Electronics and Telecommunications Research Institute, Korea)</i>	
<i>Jeho Nam (Electronics and Telecommunications Research Institute, Korea)</i>	
<i>Keehoon Hong (Electronics and Telecommunications Research Institute, Korea)</i>	
<i>Jinwoong Kim (Electronics and Telecommunications Research Institute, Korea)</i>	
Renal Vessels Segmentation for Preoperative Planning in Percutaneous Nephrolithotomy	41
<i>Katarzyna Heryan (AGH University of Science and Technology, Poland)</i>	
<i>Dominik Chorągwicki (Specialized Municipal Hospital G. Narutowicz, Poland)</i>	
<i>Marek Sandheim (Specialized Municipal Hospital G. Narutowicz, Poland)</i>	
<i>Jacek Jakubowski (Rydygier Memorial Hospital, Poland)</i>	
<i>Tomasz Drewniak (Specialized Municipal Hospital G. Narutowicz, Poland)</i>	
12:30 - 13:30	
Medical Diagnostic Techniques	
Ballroom C	
Chairs: Jacobs Scharcanski (UFRGS – Federal University of Rio Grande do Sul)	
Adrian Goral (AGH University of Science and Technology, Poland)	
An OCTA Based Diagnosis System Based on a Comprehensive Local Features Analysis for Early Diabetic Retinopathy Detection	47
<i>Nabila Eladawi (Faculty of Computers and Information, Mansoura University, Egypt)</i>	
<i>Mohammed M. Elmogy (Faculty of Computers and Information & Mansoura University, Egypt)</i>	
<i>Luay Fraiwan (Abu Dhabi University, USA)</i>	
<i>Mohammed Ghazal (University of Abu Dhabi, United Arab Emirates)</i>	
<i>Francesco Pichi (Cleveland Clinic, United Arab Emirates)</i>	
<i>Ahmed Aboulfotouh (Mansoura University, Egypt)</i>	
<i>Alaa Riad (Faculty of Computers and Information, Mansoura University, Egypt)</i>	
<i>Robert Keynton (University of Louisville, USA)</i>	
<i>Shlomit Schaal (University of Massachusetts Medical School, USA)</i>	
<i>Ayman Sabry El-Baz (University of Louisville, USA)</i>	
Towards a comprehensive and configurable use of software tools that assist medical image recognition of malicious traces, in capsule endoscopy data collections.....	N/A
<i>Alexios Polydorou (TUC, Greece)</i>	
<i>Eleftheria S Sergaki (TUC, Greece)</i>	
<i>Adreas Polydorou (National and Kapodistrian University of Athens, Greece) George C Giakos (Manhattan College, USA)</i>	
<i>Michalis Zervakis (Technical University of Crete, Greece)</i>	
A New Fast Framework for Early Detection of Prostate Cancer without Prostate Segmentation.....	53
<i>Islam Reda (Mansoura University, Egypt)</i>	
<i>Ahmed Shalaby (University of Louisville, USA)</i>	
<i>Mohammed M. Elmogy (Faculty of Computers and Information & Mansoura University, Egypt)</i>	
<i>Mohammed Ghazal (University of Abu Dhabi, United Arab Emirates)</i>	
<i>Ahmed Aboulfotouh (Mansoura University, Egypt)</i>	
<i>Mohamed Abou El-Ghar (Urology and Nephrology Center, University of Mansoura, USA)</i>	
<i>Adel Elmaghraby (University of Louisville, USA)</i>	
<i>Robert Keynton (University of Louisville, USA)</i>	
<i>Ayman Sabry El-Baz (University of Louisville, USA)</i>	
Challenges for Electronic Displays in Sterile Medical Devices	58
<i>Lukas Boehler (Aesculap AG, Germany & AGH University of Science and Technology, Poland)</i>	
<i>Mateusz Daniol (AGH University of Science and Technology & Aesculap AG, Germany)</i>	
<i>Anton Keller (Aesculap AG, Germany)</i>	
<i>Ryszard Sroka (AGH University of Science and Technology, Poland)</i>	

14:30 – 15:30

Image Segmentation and Reconstruction

Ballroom A

Chairs: Yixin Ma (Shanghai Jiao Tong University, P.R. China)
Wenji Wang (Beihang University, P.R. China)

Real-Time Stereo Vision for Road Surface 3-D Reconstruction 63

Rui Fan (*The Hong Kong University of Science and Technology, Hong Kong*)
Yanan Liu (*Bristol Robotics Laboratory, University of Bristol, United Kingdom (Great Britain)*)
Xingrui Yang (*Visual Information Group, University of Bristol, United Kingdom (Great Britain)*)
Mohammud Junaid Bocus (*University of Bristol, United Kingdom (Great Britain)*)
Naim Dahnoun (*University of Bristol, United Kingdom (Great Britain)*)
Scott Tancock (*University of Bristol, United Kingdom (Great Britain)*)

Real-Time 3D Reconstruction in Minimally Invasive Surgery with Quasi-Dense Matching 69

Georgios Zampokas (*Centre for Research and Technology Hellas, Information Technologies Institute, Greece*)
Konstantinos Tsiolis (*Centre for Research and Technology Hellas - Information Technologies Institute, Greece*)
Georgia Peleka (*Centre for Research & Technology - Hellas, Greece*)
Ioannis Mariolis (*Centre for Research & Technology - Hellas, Greece*)
Sotiris Malassiotis (*Centre for Research and Technology Hellas, Greece*)
Dimitrios Tzovaras (*Information Technologies Institute, Greece*)

Segmentation of Concealed Objects in Active Terahertz Images 75

Zhan Ou (*Tsinghua University, P.R. China*)
Xiao Ping Zheng (*Tsinghua University, P.R. China*)
Haocheng Ma (*Tsinghua University, P.R. China*)

Main Aortic Segmentation from CTA with Deep Feature Aggregation Network 80

Wenji Wang (*Beihang University, P.R. China*)
Haogang Zhu (*Beihang University, P.R. China*)

14:30 – 15:30

Medical Imaging Analysis, Processing and Visualization

Ballroom B

Chairs: Ahmed Shalaby (*University of Louisville, USA*)
Isa Yildirim (*Istanbul Technical University & University of Illinois at Chicago, Turkey*)

Performance and power consumption evaluation in smartphone based image processing for medical applications 85

Mateusz Daniol (*AGH University of Science and Technology & Aesculap AG, Germany*)
Lukas Boehler (*Aesculap AG, Germany & AGH University of Science and Technology, Poland*)
Anton Keller (*Aesculap AG, Germany*)
Ryszard Sroka (*AGH University of Science and Technology, Poland*)

Efficient Reconstruction Algorithm for Low Dose CT Imaging

Isa Yildirim (*Istanbul Technical University & University of Illinois at Chicago, Turkey*)
Esra Sümer (*Abdullah Gül University, Turkey*)

Computer-Aided Diagnosis of Prostate Cancer on Diffusion Weighted Imaging: A Technical Review 90

Ahmed Shalaby (*University of Louisville, USA*)
Hassan Hajjdiab (*Abu Dhabi University, United Arab Emirates*)
Mohammed Ghazal (*University of Abu Dhabi, United Arab Emirates*)
Islam Reda (*Mansoura University, Egypt*)
Mohammed M. Elmogy (*Faculty of Computers and Information & Mansoura University, Egypt*)
Ahmed Aboulfotouh (*Mansoura University, Egypt*)
Ali Mahmoud (*Alexandria University, Egypt*)
Ahmed El-giziri (*UofL, USA*)
Adel Elmaghraby (*University of Louisville, USA*)
Ayman Sabry El-Baz (*University of Louisville, USA*)

14:30 – 15:30

Computational Imaging Techniques

Ballroom C

Chairs: Andrzej Skalski (AGH University of Science and Technology, Poland)

Tomasz Rymarczyk (Research and Development Center Netrix S.A./University of Economics and Innovation in Lublin, Poland)

Analysis of Leaks in Flood Embankments Using Deterministic Methods and Computational Intelligence

Algorithms 96

Tomasz Rymarczyk (Research and Development Center Netrix S.A./University of Economics and Innovation in Lublin, Poland)

Grzegorz Kłosowski (Lublin University of Technology, Poland)

Paweł Tchórzewski (Research and Development Center Netrix S.A., Poland)

Generative deep deconvolutional neural network for increasing and diversifying training data 102

Runnan Qin (Beihang University, P.R. China)

Rui Wang (Beihang University, P.R. China)

Artificial database expansion based on hand position variability for palm vein biometric system 108

Andrzej Skalski (AGH University of Science and Technology, Poland)

Maciej Stanuch (AGH University of Science and Technology, Poland)

Mutual Structure Model for improving vessel quality in X-ray angiography 114

Shaoyan Xia (Beihang University, P.R. China)

Haogang Zhu (Beihang University, P.R. China)

15:30 – 16:30

Image Classification and Feature Extraction

Ballroom A

Chairs: Lijun Xu (Beihang University, P.R. China)

Li Lei (Beihang University, P.R. China)

A Cortical Based Diagnosis System for MCI Based on sMRI Features Fusion 120

Fatma El-Zahraa El-Gamal (Faculty of Computers and Information, Mansoura University, Mansoura, Egypt)

Mohammed M. Elmogy (Faculty of Computers and Information & Mansoura University, Egypt)

Hassan Hajdiab (Abu Dhabi University, United Arab Emirates)

Mohammed Ghazal (University of Abu Dhabi, United Arab Emirates)

Hassan Soliman (Faculty of Computers and Information, Mansoura University, Egypt)

Ahmed Atwan (Faculty of Computers and Information, Mansoura University, Egypt)

Robert Keynton (University of Louisville, USA)

Ayman Sabry El-Baz (University of Louisville, USA)

Gregory Barnes (University of Louisville Autism Center, USA)

Weld Classification Using Gray Level Co-Occurrence Matrix and Local Binary Patterns 126

Philip Valentin (NNE, Denmark)

Tsampakos Kounalakis (Aalborg University, Denmark)

Lazaros Nalpantidis (Aalborg University Copenhagen, Denmark)

A deep residual networks classification algorithm of fetal heart CT images 132

Li Lei (Beihang University, P.R. China)

Haogan Zhu (Beihang University, P.R. China)

Yuxin Gong (Beihang University, P.R. China)

Qian Cheng (Beihang University, P.R. China)

Application of ANN and ANFIS for detection of a brain tumor from MRI using DWT and GLCM texture analysis	136
<i>Eleftheria S Sergaki (TUC, Greece)</i> <i>Georgios Spiliotis (TUC, Greece)</i> <i>Ioannis O Vardiambasis (Technological Educational Institute of Crete & School of Applied Sciences, Greece)</i> <i>Theodoros Kapetanakis (Technological Educational Institute of Crete & University of Peloponnese-Telecommunication Sciences and Technology, Greece)</i> <i>Antonios Krasoudakis (General Hospital Agios Georgios Chania, Greece)</i> <i>George C Giakos (Manhattan College, USA)</i> <i>Michalis Zervakis (Technical University of Crete, Greece)</i> <i>Alexios Polydorou (TUC, Greece)</i>	
15:30 – 16:30 Novel Imaging Systems Ballroom B Chairs: Claudio Estatico (University of Genoa, Italy) Marcin Kopaczka (RWTH Aachen University, Germany)	
A combined modular system for face detection, head pose estimation, face tracking and emotion recognition in thermal infrared images.....	142
<i>Marcin Kopaczka (RWTH Aachen University, Germany)</i> <i>Justus Schock (RWTH Aachen University, Germany)</i> <i>Jan Nestler (RWTH Aachen University, Germany)</i> <i>Kevin Kielholz (RWTH Aachen University, Germany)</i> <i>Dorit Merhof (RWTH Aachen University, Germany)</i>	
A low-cost multi-finger vein verification system.....	148
<i>Raghavendra Ramachandra (Norwegian University of Science and Technology (NTNU), Norway)</i> <i>Sushma Venkatesh (NTNU, Norway)</i> <i>Kiran B. Raja (Norwegian University of Science and Technology (NTNU), Norway)</i> <i>Christoph Busch (NTNU - Gjøvik, Norway)</i>	
Particle Measurement Volume and Light Intensity in a Shadowgraph Imaging System	154
<i>Staffan Rydholm (Mid Sweden University, Sweden)</i> <i>Benny Thörnberg (Mid Sweden University, Sweden)</i>	
A comprehensive virtual reality system for tunnel surface documentation and structural health monitoring. 158	
<i>Leanne Attard (University of Malta, Malta)</i> <i>Carl J. Debono (University of Malta, Malta)</i> <i>Gianluca Valentino (University of Malta, Malta)</i> <i>Mario Di Castro (CERN, Switzerland)</i> <i>John Osborne (CERN, Switzerland)</i> <i>Luigi Scibile (CERN, Switzerland)</i> <i>Manuel Ferre (Universidad Politecnica de Madrid, Spain)</i>	

16:45 – 17:45

Image Sensors Assessment and Applications

Ballroom A

Chairs: Andrzej Skalski (AGH University of Science and Technology, Poland)
Adrian Goral (AGH University of Science and Technology, Poland)

Robust Estimation of Product Amount on Store Shelves from a Surveillance Camera for Improving On-Shelf Availability 164

Kyota Higa (NEC Corporation, Japan)
Kota Iwamoto (NEC Corporation, Japan)

A Temporal Tone Mapping Adaptation: An Application using Logarithmic Camera 170

Cedric Walbrecq (IMT mines d'Alès, France)
Baptiste Magnier (Ales School of Mines, France)
Isabelle Marc (IMT mines alès, France)

A Quick Algorithm to Detect LED Array from the Background in Image Sensor Based Visible Light Communication 175

Peng Liu (North China Electric Power University, P.R. China)
Xin Chen (North China Electric Power University, P.R. China)
Yue Li (North China Electric Power University, P.R. China)
Jiang Liu (Waseda University, Japan)

Extraction of Disparity Information Using Pixels with Integrated Apertures 180

Byoung-Soo Choi (Kyungpook National University, Korea)
Sang-Hwan Kim (Kyungpook National University, Korea)
Jimin Lee (Kyungpook National University, Korea)
Seunghyuk Chang (Center for Integrated Smart Sensors, Korea)
JongHo Park (Center for Integrated Smart Sensors, Korea)
Sang-Jin Lee (Center for Integrated Smart Sensors, Korea)
Jang-Kyoo Shin (Kyungpook National University, Korea)

16:45 – 17:45

Imaging System: Design and Implementation

Ballroom B

Chairs: Katarzyna Heryan (AGH University of Science and Technology, Poland)
Tsampikos Kounalakis (Aalborg University, Denmark)

A Robotic System Employing Deep Learning for Visual Recognition and Detection of Weeds in Grasslands 185

Tsampikos Kounalakis (Aalborg University, Denmark)
Lazaros Nalpantidis (Aalborg University Copenhagen, Denmark)
Georgios Triantafyllidis (Aalborg University Copenhagen, Denmark)
Michał Jerzy Malinowski (Zürcher Hochschule für Angewandte Wissenschaften (ZHAW), Switzerland)
Leandro Chelini (Zürcher Hochschule für Angewandte Wissenschaften (ZHAW), Switzerland)

Intelligent Navigation and Control of a Prototype Autonomous Underwater Vehicle for Automated Inspection of Aquaculture net pen cages 191

George Livanos (Technical University of Crete, Greece)
Vaggelis Chalkiadakis (Hellenic Centre for Marine Research, Greece)
Michalis Zervakis (Technical University of Crete, Greece)
Konstantia Moirgiorgiou (Technical University of Crete, Greece)
George C Giakos (Manhattan College, USA)
Nikos Papandroulakis (Hellenic Centre for Marine Research, Greece)

OpenCL Superpixel Implementation on a General Purpose Multi-core CPU	197
<i>Hana Haseljic (University of Sarajevo, Bosnia and Herzegovina)</i>	
<i>Emir Cogo (University of Sarajevo, Bosnia and Herzegovina)</i>	
<i>Irfan Prazina (University of Sarajevo, Bosnia and Herzegovina)</i>	
<i>Razija Turcinhodzic (University of Sarajevo, Bosnia and Herzegovina)</i>	
<i>Emir Buza (University of Sarajevo, Bosnia and Herzegovina)</i>	
<i>Amila Akagic (University of Sarajevo, Bosnia and Herzegovina)</i>	
Design of Folded Cascode Amplifier for SCL 180 nm Technology Node for Low Power Applications.....	N/A
<i>Rajiv Ranjan Thakur (National Institute of Technology Mizoram)</i>	
<i>Chaitali Koley (National Institute of Technology, Mizoram, India)</i>	
<i>Pragati Singh (National Institute of Technology, Mizoram, India)</i>	

Wednesday, October 17

10:00 - 11:00

Breast Imaging Techniques

Ballroom A

Chairs: Suman Shrestha (ON Semiconductor, USA)
Kanchan Kashyap (VIT University Bhopal, India)

DCE-MRI radiomics features for predicting breast cancer neoadjuvant therapy response203

Eleftherios Kontopodis (FORTH, Greece)
Georgios C. Manikis (Foundation for Research and Technology, Greece)
Iraklis Skepasianos (Technological Educational Institute of Crete, Greece)
Konstantinos Tzagkarakis (Technological Educational Institute of Crete, Greece)
Katerina Nikiforaki (Foundation for Research and Technology – Hellas (FORTH), Greece)
Georgios Papadakis (Foundation for Research and Technology Hellas, Greece)
Thomas Maris (Medical School of Crete University Hospital, Greece)
Efrosini Papadaki (University of Crete, Greece)
Apostolos Karantanas (Medical School of Crete University Hospital, Greece)
Kostas Marias (FORTH, Greece)

The effect of sound-speed-image resolution on phase aberration correction for ultrasound computed tomography.....209

Xiaolei Qu (Beihang University, P.R. China)
Shangchun Fan (Beihang University, P.R. China)
Takashi Azuma (The University of Tokyo, Japan)
Zisheng Yao (Beihang University, P.R. China)
Shuo Gao (Beihang University, P.R. China)
Jiangtao Sun (Beihang University, P.R. China)
Zhang Shuailei (Beihang University, P.R. China)

Classification of Breast Tissue Density.....N/A

Kanchan Kashyap (VIT University Bhopal, India)

Fractional Order Savitzky-Golay Differentiator based Approach for Mammogram Enhancement.....N/A

Koushlendra Kumar Singh (PDPM IIITDM Jabalpur, India)
Binod Singh (National Institute of Technology, India)
Manish Bajpai (IIITDM Jabalpur, India)

10:00 – 11:00

Imaging Informatics and Artificial Intelligence

Ballroom B

Chairs: Antonios Gasteratos (Democritus University of Thrace, Greece)
Tomasz Rymarczyk (Research and Development Center Netrix S.A./University of Economics and Innovation in Lublin, Poland)

Pose Invariant Face Recognition Using Principal Component Analysis.....N/A

Akash Krishna Srivastava (National Institute of Technology Jamshedpur, India)
S Hariharan (National Institute of Technology Jamshedpur, India)
Diksha Sinha (National Institute of Technology Jamshedpur, India)
Koushlendra Kumar Singh (PDPM IIITDM Jabalpur, India)
Binod Singh (National Institute of Technology, India)

Vision-Based Product Tracking Method for Cyber-Physical Production Systems in Industry 4.0.....214

Fotios Konstantinidis (Democritus University of Thrace, Greece)
Antonios Gasteratos (Democritus University of Thrace, Greece)
Spyridon G. Mouroutsos (Democritus University of Thrace, Greece)

Object Analysis Using Machine Learning to Solve Inverse Problem in Electrical Impedance Tomography	220
<i>Tomasz Rymarczyk (Research and Development Center Netrix S.A./University of Economics and Innovation in Lublin, Poland)</i>	
<i>Edward Kozłowski (Lublin University of Technology, Poland)</i>	
<i>Grzegorz Kłosowski (Lublin University of Technology, Poland)</i>	
DOSeqSLAM: Dynamic On-line Sequence Based Loop Closure Detection Algorithm for SLAM	226
<i>Konstantinos A. Tsintotas (Democritus University of Thrace, Greece)</i>	
<i>Loukas Bampis (Democritus University of Thrace, Greece)</i>	
<i>Antonios Gasteratos (Democritus University of Thrace, Greece)</i>	

10:00 – 11:00

Robotic Vision Systems

Ballroom C

Chairs: Andrzej Skalski (AGH University of Science and Technology, Poland)
Zhan Yang (Shanghai Jiao Tong University, P.R. China)

Interpolation Kernels in Fully Convolutional Networks and their Effect in Robot Vision Tasks	232
---	------------

Angelos Amanatiadis (Democritus University of Thrace, Greece)
Vasileios Kaburlasos (Technological Educational Institute of Eastern Macedonia and Thrace, Greece)
Elias Kosmatopoulos (Democritus University of Thrace (DUTH) Center for Research and Technology Hellas (CERTH), Greece)

A Coaxial Vision Assembly Algorithm for Un-centripetal Holes on Large-scale stereo Workpiece Using Multiple-DOF Robot	237
--	------------

Zhan Yang (Shanghai Jiao Tong University, P.R. China)
Weiwen Liu (Shanghai Jiao Tong University, P.R. China)
Hongbing Li (Shanghai Jiao Tong University, P.R. China)
Zheng Li (The Chinese University of Hong Kong, P.R. China)

Human-Machine Interface for Remote Training of Robot Tasks	243
---	------------

Jordi Rhett Spranger (Aalborg University Copenhagen, Denmark)
Roxana Buzatoiu (Aalborg University Copenhagen, Denmark)
Athanasios Polydoros (University of Innsbruck, Austria)
Lazaros Nalpantidis (Aalborg University Copenhagen, Denmark)
Evangelos Boukas (A. C. Meyers Vænge 15 & Aalborg University Copenhagen, Denmark)

An RGB-D video-based wire detection tool to aid robotic arms during machine alignment measurement	248
--	------------

Leanne Attard (University of Malta, Malta)
Carl J. Debono (University of Malta, Malta)
Gianluca Valentino (University of Malta, Malta)
Mario Di Castro (CERN, Switzerland)
Maria Laura Baiguera Tambutti (CERN, Switzerland)

11:20 - 12:20

Novel Tomographic Imaging Techniques

Ballroom A

Chairs: Andrzej Skalski (AGH University of Science and Technology, Poland)
Marek Wodzinski (AGH University of Science and Technology, Poland)

Development of an "iTomography" infrastructure for non-destructive documentation of cultural

Heritage objects..... 254

Georgios Karagiannis (ORMYLIA Foundation, Greece)
Theodosios Karamanos (ORMYLIA Foundation, Greece)
Emmanouil Athanasopoulos (FEAQUS, Cyprus)
Konstantinos Panayiotou (ORMYLIA Foundation, Greece)
Stamatios A. Amanatiadis (ORMYLIA Foundation, Greece)
Georgios Apostolidis (ORMYLIA Foundation, Greece)

A novel method to explore intrarenal arterial tree using micro-CT260

Katarzyna Heryan (AGH University of Science and Technology, Poland)
Janusz Skrzat (Jagiellonian University, Poland)
Jacek Tarasiuk (AGH University of Science and Technology, Poland)
Sebastian Wroński (AGH University of Science and Technology, Poland)

Dual-modality four-wire electrical capacitance and resistance tomography266

Marco Antonio Rodriguez Frias (University of Manchester, United Kingdom (Great Britain))
Wuqiang Yang (The University of Manchester, United Kingdom (Great Britain))

Artificial CT Data Generation Method with Known Ground-Truth for Image Registration with Missing Data271

Marek Wodzinski (AGH University of Science and Technology, Poland)
Andrzej Skalski (AGH University of Science and Technology, Poland)

11:20 – 12:20

Efficient Imaging Detection Techniques

Ballroom B

Chairs: Lijun Xu (Beihang University, P.R. China)
Andreas Alk (AGH University of Science and Technology, Poland)

Color ultrasound imaging and detection technique based on nonlinear spectra.....276

Jianguo Ma (Beihang University, P.R. China)
Zhun Xie (Beihang University, P.R. China)
Min Wei (Beihang University, P.R. China)
Lijun Xu (Beihang University, P.R. China)
Boya Chen (Beijing Anzhen Hospital of Capital Medical University, P.R. China)
Yulin Li (Beijing Anzhen Hospital of Capital Medical University, P.R. China)
Jie Du (Beijing Anzhen Hospital of Capital Medical University, P.R. China)
Zijie Fang (Beihang University, P.R. China)

Multiple Lane Detection Algorithm Based on Optimised Dense Disparity Map Estimation.....	281
<i>Han Ma (School of Mechanical Engineering, Tsinghua University, P.R. China)</i>	
<i>Yixin Ma (Shanghai Jiao Tong University, P.R. China)</i>	
<i>Jianhao Jiao (The Hong Kong University of Science and Technology, Hong Kong)</i>	
<i>M Usman Maqbool Bhutta (The Hong Kong University of Science and Technology, Hong Kong)</i>	
<i>Mohammud Junaid Bocus (University of Bristol, United Kingdom (Great Britain))</i>	
<i>Lujia Wang (Chinese Academy of Sciences, P.R. China)</i>	
<i>Ming Liu (The Hong Kong University of Science and Technology, Hong Kong)</i>	
<i>Rui Fan (The Hong Kong University of Science and Technology, Hong Kong)</i>	
Application of Single Image Super-Resolution in Human Ear Recognition Using Eigenvalues	286
<i>Matthew Zarachoff (Leeds Beckett University, United Kingdom (Great Britain))</i>	
<i>Akbar Sheikh-Akbari (Leeds Beckett University, United Kingdom (Great Britain))</i>	
<i>Dorothy Monekosso (Leeds Beckett University, United Kingdom (Great Britain))</i>	
Influence of External and Internal Parameters to Accuracy of a Mobile Tracking System Based on an iPhone 7	292
<i>Andreas Alk (Aesculap AG, Germany & AGH University of Science and Technology, Poland)</i>	
<i>Tobias Martin (Aesculap AG, Germany & AGH University of Science and Technology, Poland)</i>	
<i>Josef Kozak (Aesculap AG, Germany)</i>	
11:20 – 12:20	
Applications of Imaging in Medicine and Biology	
Ballroom C	
Chairs: Lihui Peng (Tsinghua University, P.R. China)	
Anna Korzynska (Nalecz Institute of Biocyberntics and Biomedical Engineering Polish Academy of Sciences, Poland)	
Assessment of a Markerless Optical Tracking Technique for Computer-Assisted Hip Surgery.....	296
<i>Adrian Goral (AGH University of Science and Technology, Poland)</i>	
Novel Superparamagnetic Nanoparticles as Contrast Agents for Cancer Imaging.....	N/A
<i>Isa Yildirim (Istanbul Technical University & University of Illinois at Chicago, Turkey)</i>	
<i>Esra Sümer (Abdullah Gül University, Turkey)</i>	
<i>Celaletdin Ergun (Istanbul Technical University, Turkey)</i>	
Pre-operative AR-ultrasound application for determination of individual hip posture	302
<i>Tobias Martin (Aesculap AG, Germany & AGH University of Science and Technology, Poland)</i>	
<i>Andreas Alk (Aesculap AG, Germany & AGH University of Science and Technology, Poland)</i>	
<i>Josef Kozak (Aesculap AG, Germany)</i>	
The analysis of the movement of the genetically modified human skin fibroblasts in culture	306
<i>Anna Korzynska (Nalecz Institute of Biocyberntics and Biomedical Engineering Polish Academy of Sciences, Poland)</i>	
<i>Krzysztof Siemion (Nalecz Institute of Biocyberntics and Biomedical Engineering PAS, Poland)</i>	
<i>Jakub Zak (Nalecz Institute of Biocyberntics and Biomedical Engineering Polish Academy of Sciences, Poland)</i>	
<i>Lukasz Roszkowiak (Nalecz IBBE PAS, Poland)</i>	
<i>Agnieszka Wencel (Nalecz Institute of Biocyberntics and Biomedical Engineering PAS, Poland)</i>	
<i>Krzysztof Pluta (Nalecz Institute of Biocyberntics and Biomedical Engineering PAS, Poland)</i>	
<i>Dorota Pijanowska (Nalecz IBBE PAS, Poland)</i>	

12:20 - 13:20

Feature Extraction and Pattern Recognition

Ballroom A

Chairs: Yixin Ma (Shanghai Jiao Tong University, P.R. China)
Akbar Sheikh-Akbari (Leeds Beckett University, United Kingdom)

Understanding Deep Convolutional Networks through Gestalt Theory..... 312

Angelos Amanatiadis (Democritus University of Thrace, Greece)
Vasileios Kabilas (Technological Educational Institute of Eastern Macedonia and Thrace, Greece)
Elias Kosmatopoulos (Democritus University of Thrace (DUTH) and CEnter for Research and Technology Hellas (CERTH), Greece)

Colour Constancy for Image of Non-Uniformly Lit Scenes 318

Md Akmol Hussain (Leeds Beckett University, United Kingdom (Great Britain))
Akbar Sheikh-Akbari (Leeds Beckett University, United Kingdom (Great Britain))

CMR motion artifact correction using generative adversarial nets.....N/A

Ji-Jiang Yang (Tsinghua University, P.R. China)
Yunxuan Zhang (Research Institute of Information Technology, Tsinghua University, Beijing, P.R. China)
Xiuyu Chen (MRI Center, Fuwai Hospital, Chinese Academy of Medical Science, P.R. China)
Weiliang Zhang (Automation School, Beijing University of Posts and Telecommunications, P.R. China)

2D Multi-Band PCA and its Application for Ear Recognition 324

Matthew Zarachoff (Leeds Beckett University, United Kingdom (Great Britain))
Akbar Sheikh-Akbari (Leeds Beckett University, United Kingdom (Great Britain))
Dorothy Monekosso (Leeds Beckett University, United Kingdom (Great Britain))

12:20 - 13:20

Image Analysis and Processing II

Ballroom B

Chairs: Jacobs Scharcanski (UFRGS - Federal University of Rio Grande do Sul)
Kostas Marias (FORTH, Greece)

Elitism in intensity-based image registration 329

Constantinos Spanakis (Technical University of Crete & Foundation for Research and Technology-Hellas, Greece)
Emmanuel Mathioudakis (Technical University of Crete, Greece)
Nikos Kampanis (Foundation for Research and Technology, Greece)
Manolis Tsiknakis (FORTH/ TEI CRETE, Greece)
Kostas Marias (FORTH, Greece)

Design Techniques for Incremental Non-Regular Image Sampling Patterns334

Simon Grosche (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany)
Jurgen Seiler (University of Erlangen-Nuremberg, Germany)
Andre Kaup (University of Erlangen-Nuremberg, Germany)

Image Restoration Method for Non-Uniform Blurred Images340

Tomio Goto (Nagoya Institute of Technology, Japan)
Hiroki Senshiki (Nagoya Institute of Technology, Japan)
Masanao Sawada (Nagoya Institute of Technology, Japan)
Haifeng Chen (EIZO Corporation, Japan)
Reo Aoki (EIZO Corporation, Japan)

A Novel MRA-Based Framework For Detecting Correlation Between Cerebrovascular Changes and Mean Arterial Pressure 346

Heba Kandil (University of Louisville, USA)
Ahmed Soliman (University of Louisville, USA)
Mohammed Ghazal (University of Abu Dhabi, United Arab Emirates)
Ali Mahmoud (University of Louisville, USA)
Ahmed ElTanboly (University of Louisville, USA)
Samineh Mesbah (University of Louisville, USA)
Ali Aslantas (University of Louisville, USA)
Ahmed Shalaby (University of Louisville, USA)
Guruprasad Giridharan (University of Louisville, USA)
Adel Elmaghraby (University of Louisville, USA)
Ayman Sabry El-Baz (University of Louisville, USA)

16:30 - 17:30

Electromagnetic Imaging Systems and Techniques

Ballroom A

Chairs: Claudio Estatico (University of Genoa, Italy)
Emanuele Tavanti (University of Genoa, Italy)

An Imaging Technique for Brain Stroke Monitoring at Microwaves352

Igor Bisio (University of Genoa, Italy)
Claudio Estatico (University of Genoa, Italy)
Alessandro Fedeli (University of Genoa, Italy)
Fabio Lavagetto (University of Genoa, Italy)
Matteo Pastorino (University of Genoa, Italy)
Andrea Randazzo (University of Genoa, Italy)
Andrea Sciarrone (University of Genoa, Italy)
Emanuele Tavanti (University of Genoa, Italy)

A Newton-Conjugate-Gradient Method in L_p Banach Spaces for Three-Dimensional Microwave Imaging357

Claudio Estatico (University of Genoa, Italy)
Alessandro Fedeli (University of Genoa, Italy)
Matteo Pastorino (University of Genoa, Italy)
Andrea Randazzo (University of Genoa, Italy)
Emanuele Tavanti (University of Genoa, Italy)

Skin Cancer Detection through Microwaves: Validation on Phantom Measurements362

Banafsheh Khalesi (London South Bank University, United Kingdom (Great Britain))
Gianluigi Tiberi (UBT - Umbria Bioengineering Technologies, Spin off of University of Perugia, Italy & London South Bank University, United Kingdom (Great Britain))
Navid Ghavami (UBT - Umbria Bioengineering Technologies, Spin off of University of Perugia, Italy)
Mohammad Ghavami (London South Bank University, United Kingdom (Great Britain))
Sandra Dudley (London South Bank University, United Kingdom (Great Britain))

16:30 - 17:30

Electrical Tomography

Ballroom B

Chairs: Wuqiang Yang (The University of Manchester (United Kingdom (Great Britain)))
Marek Wodzinski (AGH University of Science and Technology, Poland)

Medical applications of electrical tomography 368

Wuqiang Yang (The University of Manchester, United Kingdom (Great Britain))
Zhen Ren (University of Manchester, United Kingdom (Great Britain))
Masahiro Takei (Chiba University, Japan)
Jiafeng Yao (Chiba University, Japan)

Compensation for fringe effect of electrical resistance tomography sensor by multiple-plane sensor	
Scheme.....	374
<i>Wenbin Tian (Beihang University, P.R. China)</i>	
<i>Jiangtao Sun (Beihang University, P.R. China)</i>	
<i>Wuqiang Yang (The University of Manchester, United Kingdom (Great Britain))</i>	
<i>Shuo Gao (Beihang University, P.R. China)</i>	
<i>Lijun Xu (Beihang University, P.R. China)</i>	
Level measurement of separator by using electrical tomography sensor	380
<i>Shui Liu (Graduate School at Shenzhen, Tsinghua University, P.R. China)</i>	
<i>Yi Li (Tsinghua University, P.R. China)</i>	
<i>Haigang Wang (University of Manchester, United Kingdom (Great Britain))</i>	
An Integrated ECT and Electrostatic Sensor for Particulate Flow Measurement.....	386
<i>Jun Long (Beijing Institute of Control Engineering, P.R. China)</i>	
<i>Marco Antonio Rodriguez Frias (University of Manchester, United Kingdom (Great Britain))</i>	
<i>Khursiah Zainal Mokhtar (The University of Manchester, United Kingdom (Great Britain))</i>	
<i>Wuqiang Yang (The University of Manchester, United Kingdom (Great Britain))</i>	

Thursday, October 18

09:00 – 10:30

Advanced in Imaging

Ballroom A

Chair: Ahmed Shalaby (University of Louisville, USA)

Haigang Wang (University of Manchester, United Kingdom)

Power Transmission Lines Inspection using Properly Equipped Unmanned Aerial Vehicle (UAV) 391

Konstantia Moirogiorgou (Technical University of Crete, Greece)

Alexandros Zormpas (Technical University of Crete, Greece)

Kostas Kalaitzakis (Technical University of Crete, Greece)

George Plokamakis (Hellenic Electricity Distribution Network, Chania, Crete, Greece)

Panayotis Partsinevelos (Technical University of Crete, Greece)

George C Giakos (Manhattan College, USA)

Michalis Zervakis (Technical University of Crete, Greece)

Virtual Video Synthesis for Personalized Training 396

Konstantia Moirogiorgou (Technical University of Crete, Greece)

Filippos Markolefas (Technical University of Crete, Greece)

George C Giakos (Manhattan College, USA)

Michalis Zervakis (Technical University of Crete, Greece)

Intra-Operative 3D Registration of MIS Reconstructed Surfaces to Pre-Operative Models 402

Georgia Peleka (Centre for Research & Technology - Hellas, Greece)

Georgios Zampokas (Centre for Research and Technology Hellas, Information Technologies Institute, Greece)

Ioannis Mariolis (Centre for Research & Technology - Hellas, Greece)

Sotiris Malassiotis (Centre for Research and Technology Hellas, Greece)

Dimitrios Tzovaras (Information Technologies Institute, Greece)

A Fast Way to Get Sensitivity Map of Wire-Mesh 408

Kai Sun (Tsinghua University, P.R. China)

Haigang Wang (University of Manchester, United Kingdom (Great Britain))

Yi Li (Tsinghua University, P.R. China)

Measurement of External-Solids Circulation Flux in a Circulating Fluidized Bed by Electrical Capacitance Tomography and Microwave Doppler Radar 414

Haigang Wang (University of Manchester, United Kingdom (Great Britain))

Wuqiang Yang (The University of Manchester, United Kingdom (Great Britain))

Zhipeng Wu (University of Manchester, United Kingdom (Great Britain))

Author Index 419