

2016 IEEE Southwest Symposium on Image Analysis and Interpretation (SSIAI 2016)

**Santa Fe, New Mexico, USA
6-8 March 2016**



**IEEE Catalog Number: CFP16401-POD
ISBN: 978-1-4673-9920-3**

**Copyright © 2015 by the Institute of Electrical and Electronic 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 publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP16401-POD
ISBN (Print-On-Demand):	978-1-4673-9920-3
ISBN (Online):	978-1-4673-9919-7

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

SESSION MA1

1: MULTIMODAL FUSION OF BRAIN STRUCTURAL AND FUNCTIONAL IMAGING WITH A DEEP NEURAL MACHINE TRANSLATION APPROACH	1
<i>Md Faijul Amin, Sergey M. Plis, Eswar Damaraju, Devon Hjelm, The Mind Research Network, United States; Kyunghyun Cho, Courant Institute & Center for Data Science, New York University, United States; Vince Calhoun, The Mind Research Network, United States</i>	
2: SEGMENTATION AND EXTRACTION OF THE SPINAL CANAL IN SAGITTAL MR IMAGES	5
<i>Christos Bampis, Alan C. Bovik, Mia Markey, The University of Texas at Austin, United States; Michael Webb, NeuroTexas Institute, St' Davids Medical Institute, United States</i>	
3: TOWARDS AUTOMATIC 3D BONE MARROW SEGMENTATION	9
<i>Chuong Nguyen, Joseph Havlicek, University of Oklahoma, United States; Jennifer Holter Chakrabarty, Quyen Duong, Sara Vesely, University of Oklahoma Health Sciences Center, United States</i>	
4: A THERMOREGULATION MODEL TO DETECT DIABETIC PERIPHERAL NEUROPATHY	13
<i>Carla Agurto, VisionQuest Biomedical LLC, United States; Viktor Chekh, University of New Mexico, United States; Ana Edwards, Zyden Jarry, Simon Barriga, VisionQuest Biomedical LLC, United States; Janet Simon, Foot and ankle associates of New Mexico Clinic, United States; Peter Soliz, VisionQuest Biomedical LLC, United States</i>	
5: ASSESSING CROSS FREQUENCY COUPLING IN EEG COLLECTED FROM SUBJECTS VIEWING VIDEO USING A MODIFIED METRIC	17
<i>Philip Davis, Charles Creusere, Jim Kroger, New Mexico State University, United States</i>	

SESSION MA2

1: VIRTUAL TOP-VIEW CAMERA CALIBRATION FOR ACCURATE OBJECT REPRESENTATION	21
<i>Janice Pan, The University of Texas at Austin, United States; Vikram Appia, Texas Instruments Incorporated, United States; Alan C. Bovik, The University of Texas at Austin, United States</i>	
2: OPTIMAL HEVC ENCODING BASED ON GOP CONFIGURATIONS	25
<i>Gangadharan Esakki, Venkatesh Jatla, Marios Pattichis, University of New Mexico, United States</i>	
3: FLICKER SENSITIVE MOTION TUNED VIDEO QUALITY ASSESSMENT	29
<i>Lark Kwon Choi, Alan C. Bovik, The University of Texas at Austin, Austin, United States</i>	
4: SEM RESOLUTION IMPROVEMENT USING SEMI-BLIND RESTORATION WITH HYBRID L1-L2 REGULARIZATION	33
<i>Youzuo Lin, Los Alamos National Laboratory, United States; Yudhishthir Kandel, Nanojehm, Inc, United States; Matthew Zotta, Eric Lifshin, Colleges of Nanoscale Science and Engineering, SUNY Polytechnic Institute, United States</i>	

SESSION MP1

1: CONVOLUTIONAL LAPLACIAN SPARSE CODING	133
<i>Xiyang Luo, University of California, Los Angeles, United States; Brendt Wohlberg, Los Alamos National Laboratory, United States</i>	
2: FROM LINE SEGMENTS TO MORE ORGANIZED GESTALTS.....	137
<i>Boshra Rajaei, ESPCI ParisTech University, France; Rafael Grompone von Gioi, Jean-Michel Morel, CMLA, ENS Cachan, France</i>	
3: AN UNSUPERVISED OBJECT-LEVEL IMAGE SEGMENTATION METHOD BASED	141
ON FOREGROUND AND BACKGROUND PRIORS <i>Chunlai Wang, Bin Yang, University of Stuttgart, Germany</i>	
4: CLINICAL UTILIZATION OF AUTOMATED IMAGE ANALYSIS SOFTWARE FOR	145
IMPROVING RETINAL READER'S PERFORMANCE <i>Vinayak Joshi, Carla Agurto, Eduardo Simon Barriga, Sheila Nemeth, Peter Soliz, VisionQuest Biomedical LLC, United States</i>	
5: VIDEO FORGERY DETECTION AND LOCALIZATION USING NORMALIZED	149
CROSS-CORRELATION OF MOMENT FEATURES <i>Mareeta Mathai, Deepu Rajan, Nanyang Technological University, Singapore; Sabu Emmanuel, Kuwait University, Kuwait</i>	
6: VOLCANIC ASH CLOUD EXTRACTION FOR RS IMAGE BY COMBINING PCA, ICA	153
AND SVM METHODS <i>Fei Liu, Cheng-fan Li, Shanghai University, China; Jing-yuan Yin, Earthquake Administration of Shanghai Municipality, China</i>	
7: ADAPTIVE APPLICATION OF SPATIAL FILTERS ON RAW CT IMAGES	157
<i>Nisarg Patel, Ralf Schneider, Uwe Kuester, High Performance Computing Center, Germany</i>	
8: INDOOR ASSISTANCE FOR VISUALLY IMPAIRED PEOPLE USING A RGB-D	161
CAMERA <i>Michiel Vlamincx, Hiep Quang Luong, Ghent University, Belgium; Hoang Van Nam, Hai Vu, Hanoi University of Science and Technology, Viet Nam; Peter Veelaert, Wilfried Philips, Ghent University, Belgium</i>	
9: A MULTISTAGE DATAFLOW IMPLEMENTATION OF A DEEP CONVOLUTIONAL	165
NEURAL NETWORK BASED ON FPGA FOR HIGH-SPEED OBJECT RECOGNITION <i>Ning Li, Shunpei Takaki, Tokyo University of Agriculture and Technology, Japan; Yoichi Tomioka, University of Aizu, Japan; Hitoshi Kitazawa, Tokyo University of Agriculture and Technology, Japan</i>	
10: DIFFERENCE IMAGE AND FUZZY C-MEANS FOR DETECTION OF RETINAL	169
VESSELS <i>Temitope Mapayi, Jules-Raymond Tapamo, University of KwaZulu-Natal, South Africa</i>	
11: INCORPORATING SKIN COLOR FOR IMPROVED FACE DETECTION AND	173
TRACKING SYSTEM <i>Bhuvan Dahal, Abeer Alsadoon, P.W.C. Prasad, Charles Sturt University, Australia; Amr Elchouemi, Hewlett Packard Enterprise, United States</i>	

12: FACE RECOGNITION TEMPLATE IN PHOTO INDEXING: A PROPOSAL OF	177
HYBRID PRINCIPAL COMPONENT ANALYSIS AND TRIANGULAR APPROACH (PCAATA)	
<i>Long Giao Vu, Abeer Alsadoon, P.W.C. Prasad, Charles Sturt University, Australia; A. Monem, University of Technology, Iraq; Amr Elchouemi, Hewlett Packard Enterprise, United Arab Emirates</i>	

SESSION MP2

1: NUCLEI SEGMENTATION OF FLUORESCENCE MICROSCOPY IMAGES BASED	37
ON MIDPOINT ANALYSIS AND MARKED POINT PROCESS	
<i>Neeraj Gadgil, Purdue University, United States; Paul Salama, Indiana University-Purdue University, United States; Kenneth Dunn, Indiana University, United States; Edward Delp, Purdue University, United States</i>	
2: DEEP SEGMENTATION NETWORKS USING “SIMPLE” MULTI-LAYERED	41
GRAPHICAL MODELS	
<i>Reid Porter, Kitware Inc., United States; Beate Zimmer, Texas A&M University – Corpus Christi, United States</i>	
3: GENERIC TARGET RESPONSE AS A MEASURE OF REGRESSION ACCURACY IN	45
MULTISPECTRAL BACKGROUND ESTIMATION	
<i>James Theiler, Los Alamos National Laboratory, United States</i>	
4: DISTINCTIVE INTEREST POINT SELECTION FOR EFFICIENT NEAR-DUPLICATE	49
IMAGE RETRIEVAL	
<i>Burak Yildiz, Turgut Ozal University, Turkey; M. Fatih Demirci, TOBB University of Economics and Technology, Turkey</i>	
5: DUAL MARCHING SQUARES: DESCRIPTION AND ANALYSIS	53
<i>Sui Gong, Timothy Newman, University of Alabama in Huntsville, United States</i>	

SESSION TA1

1: CONVOLUTIONAL SPARSE REPRESENTATION OF COLOR IMAGES	57
<i>Brendt Wohlberg, Los Alamos National Laboratory, United States</i>	
2: ANALYSIS-FORM SPARSE PHASE RETRIEVAL USING VARIABLE-SPLITTING	61
<i>Daniel Weller, University of Virginia, United States</i>	
3: ESTIMATING HEAD POSE ORIENTATION USING EXTREMELY LOW	65
RESOLUTION IMAGES	
<i>Jiawei Chen, Jonathan Wu, Kristi Richter, Janusz Konrad, Prakash Ishwar, Boston University, United States</i>	
4: IMAGE SUPER-RESOLUTION USING GRAPH REGULARIZED BLOCK SPARSE	69
REPRESENTATION	
<i>Sundaresh Ram, Jeffrey J. Rodriguez, The University of Arizona, United States</i>	
5: LEARNING PHASE-RICH FEATURES FROM STREAMING AUDITORY IMAGES	73
<i>Mohit Dubey, Oberlin College and Conservatory, New Mexico Consortium, United States; Peter Schultz, New Mexico Consortium, United States; Garrett Kenyon, New Mexico Consortium, Los Alamos National Laboratory, United States</i>	

SESSION TA2

1: LOCAL SPECTRAL UNMIXING FOR TARGET DETECTION.....77

Amanda Ziemann, Los Alamos National Laboratory, United States

2: HYPERSPECTRAL ENDMEMBER CLASS EXTRACTION USING CLUSTERING AND81 VALIDITY INDEXES

Maria C. Torres-Madronero, Instituto Tecnológico Metropolitano, Colombia; Miguel Velez-Reyes, The University of Texas at El Paso, United States

3: LAND COVER CLASSIFICATION IN FUSED MULTISENSOR MULTISPECTRAL85 SATELLITE IMAGERY

Daniela I. Moody, Descartes Labs, United States; Dana Bauer, Planet Labs, United States; Steven P. Brumby, Eric D. Chisolm, Michael S. Warren, Samuel W. Skillman, Ryan Keisler, Descartes Labs, United States

4: RELATING SPATIAL AND SPECTRAL MODELS OF ORIENTED BANDPASS NATURAL89 IMAGES

Zeina Sinno, Alan C. Bovik, The University of Texas at Austin, United States

SESSION TP1

1: DILATION-3 PR QMF FOR IMAGE PROCESSING.....93

Jian-ao Lian, Yonghui Wang, Cajetan Akujuobi, Prairie View A&M University, United States

2: CONTENT BASED IMAGE RETRIEVAL SYSTEM USING WAVELET97 TRANSFORMATION AND MULTIPLE INPUT MULTIPLE TASK DEEP AUTOENCODER

Xiangyuan Zhao, Brian Nutter, Texas Tech University, United States

3: A FILTERBANK METHOD TO DETERMINE OCEAN WAVE FREQUENCY101

Kyle Bailey, Peter Tay, H. Bora Karakaya, Western Carolina University, United States

4: RECONSTRUCTION WITH DICTIONARY LEARNING FOR ACCELERATED105 PARALLEL MAGNETIC RESONANCE IMAGING

Daniel Weller, University of Virginia, United States

5: A STATE VECTOR AUGMENTATION TECHNIQUE FOR INCORPORATING109 INDIRECT VELOCITY INFORMATION INTO THE LIKELIHOOD FUNCTION OF THE SIR VIDEO TARGET TRACKING FILTER

Jesyca Fuenmayor Bello, Joseph Havlicek, University of Oklahoma, United States

SESSION TP2

1: HISTOGRAM ORIENTED GRADIENTS AND MAP SEEKING CIRCUITS PATTERN113 RECOGNITION WITH COMPRESSED IMAGERY

Kathy Newtonson, Johns Hopkins University Applied Physics Lab, United States; Charles Creusere, New Mexico State University, United States

2: PROPAGATION BASED TRACKING WITH UNCERTAINTY MEASUREMENT IN117 AUTOMOTIVE APPLICATION

Nolang Fanani, Rudolf Mester, Goethe-University of Frankfurt, Germany

3: SPARSE ENCODING OF BINOCULAR IMAGES FOR DEPTH INFERENCE	121
<i>Sheng Lundquist, Portland State University, United States; Dylan Paiton, University of California, Berkeley, United States; Peter Schultz, New Mexico Consortium, United States; Garrett Kenyon, Los Alamos National Laboratory, United States</i>	
4: A PERFORMANCE COMPARISON OF AUTOMATIC DETECTION SCHEMES IN125	
WIDE-AREA AERIAL IMAGERY	
<i>Xin Gao, Sundaresh Ram, Jeffrey J. Rodriguez, The University of Arizona, United States</i>	
5: LAWECO: ACTIVE REGION DETECTION IN NON-UNIFORMLY SAMPLED DATA129	
USING LAPLACIAN-WEIGHTED COVARIANCE	
<i>Tamal Batabyal, Andrea Vaccari, Scott T. Acton, University of Virginia, United States</i>	