

2018 Digital Image Computing: Techniques and Applications (DICTA 2018)

**Canberra, Australia
10-13 December 2018**



**IEEE Catalog Number: CFP18397-POD
ISBN: 978-1-5386-6603-6**

**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:	CFP18397-POD
ISBN (Print-On-Demand):	978-1-5386-6603-6
ISBN (Online):	978-1-5386-6602-9

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

RGB-D Fall Detection via Deep Residual Convolutional LSTM Networks	1
<i>Ahmed Abobakr, Mohammed Hossny, Hala Abdelkader, and Saeid Nahavandi</i>	
Training Region Selector for Gram Stained Slides with Limited Data: A Data Distillation Approach	8
<i>Teng Zhang, Arnold Wiliem, Peter Hobson, Anthony Jennings, and Brian C. Lovell</i>	
Hyperspectral Image Segmentation of Retinal Vasculature, Optic Disc and Macula	14
<i>Azat Garifullin, Peeter Kööbi, Pasi Ylilepsa, Kati Ådgers, Markku Hauta-Kasari, Hannu Uusitalo, and Lasse Lensu</i>	
Classification of White Blood Cells using Bispectral Invariant Features of Nuclei Shape.....	19
<i>Khamael AL-Dulaimi, Vinod Chandran, Jasmine Banks, Inmaculada Tomeo-Reyes, and Kien Nguyen</i>	
Drivers Performance Evaluation using Physiological Measurement in a Driving Simulator	27
<i>Afsaneh Kohestani, Parham Kebria, Abbas Khosravi, and Saeid Nahavandi</i>	
Bone Age Assessment Based on Two-Stage Deep Neural Networks.....	33
<i>Meicheng Chu, Fugen Zhou, Bin Guo, Bo Liu, and Xiangzhi Bai</i>	
Memory and Time Efficient 3D Neuron Morphology Tracing in Large-scale Images.....	39
<i>Heng Wang, Donghao Zhang, Yang Song, Siqi Liu, Rong Gao, Hanchuan Peng, and Weidong Cai</i>	
Left Ventricle Volume Measuring using Echocardiography Sequences	47
<i>Yi Guo, Simon Green, Laurence Park, and Lauren Rispen</i>	
Active Contours based on An Anisotropic Diffusion.....	55
<i>Shafiullah Soomro and Kwang Nam Choi</i>	
Circular Shape Prior in Efficient Graph Based Image Segmentation to Segment Nucleus	61
<i>Ratna Saha, Mariusz Bajger, and Gobert Lee</i>	
DGDI: A Dataset for Detecting Glomeruli on Renal Direct Immunofluorescence	69
<i>Kun Zhao, Yu Ji Jerry Tang, Teng Zhang, Johanna Carvajal, Daniel F. Smith, Arnold Wiliem, Peter Hobson, Anthony Jennings, and Brian C. Lovell</i>	
Strided U-Net Model: Retinal Vessels Segmentation using Dice Loss	76
<i>Toufique A. Soomro, Ahmed J. Afifi, Junbin Gao, Olaf Hellwich, Manoranjan Paul, and Lihong Zheng</i>	
MS-GAN: GAN-based Semantic Segmentation of Multiple Sclerosis Lesions in Brain Magnetic Resonance Imaging	84
<i>Chaoyi Zhang, Yang Song, Sidong Liu, Scott Lill, Chenyu Wang, Zihao Tang, Yuyi You, Yang Gao, Alexander Klistorner, Michael Barnett, and Weidong Cai</i>	
Generative Adversarial Framework for Learning Multiple Clinical Tasks.....	92
<i>Mina Rezaei, Haojin Yang, and Christoph Meinel</i>	
Online Relational Manifold Learning for Multiview Segmentation in Echocardiography	100
<i>Gregg Belous, Andrew Busch, David Rowlands, and Yongsheng Gao</i>	

Impact of MRI Protocols on Alzheimer's Disease Detection.....	105
<i>Saruar Alam, Len Hamey, and Kevin Ho-Shon</i>	
Deep Learning on Brain Cortical Thickness Data for Disease Classification.....	113
<i>Medhani Menikdiwela, Chuong Nguyen, and Marnie Shaw</i>	
Performance Analysis of an L-SPECT System with Modular Partial Ring Detectors and Multi-pinhole Arrays	118
<i>Manu Francis, Murat Tahtali, Mark R. Pickering, and Tasneem Rahman</i>	
Complexity and Entropy of Knee Kinematics in a Joint Reposition Test: Effect of Strapping and Kinesiology Taping	123
<i>Luke A. Donnan, Manoranjan Paul, Liam Crowley, Kilian Felesimo, and Herbert F. Jelinek</i>	
A Novel Feature Space for Classifying Textures and Objects in Low-Resolution Infrared Images	128
<i>Masood M Khan</i>	
Colour Analysis of Strawberries on a Real Time Production Line	135
<i>Gilbert Eaton, Andrew Busch, Rudi Bartels, and Yongsheng Gao</i>	
<i>In Situ Cane Toad Recognition.....</i>	142
<i>Dmitry A. Konovalov, Simindokht Jahangard, and Lin Schwarzkopf</i>	
Hand Detection using Deformable Part Models on an Egocentric Perspective	149
<i>Sergio R. Cruz and Antoni B. Chan</i>	
Generative Adversarial Network (GAN) based Data Augmentation for Palmprint Recognition	156
<i>Gengxing Wang, Wenxiong Kang, Qiuxia Wu, Zhiyong Wang, and Junbin Gao</i>	
Early Experience of Depth Estimation on Intricate Objects using Generative Adversarial Networks	163
<i>Wai Y. K. San, Teng Zhang, Shaokang Chen, Arnold Willem, Dario Stefanelli, and Brian C. Lovell</i>	
Driving Lane Detection based on Recognition of Road Boundary Situation.....	171
<i>Hiroyuki Komori and Kazunori Onoguchi</i>	
Lane Detection Under Adverse Conditions Based on Dual Color Space	179
<i>Nima Zarbakht and Ju Jia Zou</i>	
Human Ear Surface Reconstruction Through Morphable Model Deformation.....	184
<i>Salah Eddine Kabbour and Pierre-Yves Richard</i>	
Clearing Multiview Structure Graph from Inconsistencies	189
<i>Salah Eddine Kabbour and Pierre-Yves Richard</i>	
Size-Invariant Attention Accuracy Metric for Image Captioning with High-Resolution Residual Attention.....	195
<i>Zongjian Zhang, Qiang Wu, Yang Wang, and Fang Chen</i>	
Image and Encoded Text Fusion for Multi-Modal Classification	203
<i>I. Gallo, A. Calefati, S. Nawaz, and M. K. Janjua</i>	

Fast and Energy-efficient Time-of-Flight Distance Sensing Method for 3D Object Tracking	210
<i>Hannes Plank, Gerald Holweg, Christian Steger, and Norbert Druml</i>	
Convolutional 3D Attention Network for Video based Freezing of Gait Recognition	218
<i>Renfei Sun, Zhiyong Wang, Kaylena Ehgoetz Martens, and Simon Lewis</i>	
Absolute and Relative Pose Estimation of a Multi-View Camera System using 2D-3D Line Pairs and Vertical Direction.....	225
<i>Hichem Abdellali and Zoltan Kato</i>	
Image Enhancement for Face Recognition in Adverse Environments.....	233
<i>Dmitri Kamenetsky, Sau Yee Yiu, and Martyn Hole</i>	
Image Analytics for Train Crowd Estimation	239
<i>Choon Giap Goh, Wee Han Lim, Justus Chua, and Indriyati Atmosukarto</i>	
Table Detection in Document Images using Foreground and Background Features	245
<i>Saman Arif and Faisal Shafait</i>	
Automatic Detection of Valves with Disaster Response Robot on Basis of Depth Camera Information	253
<i>Keishi Nishikawa, Jun Ohya, Hiroyuki Ogata, Kenji Hashimoto, Takashi Matsuzawa, and Atsuo Takanishi</i>	
Skeleton Driven Non-rigid Motion Tracking and 3D Reconstruction	259
<i>Shafeeq Elanattil, Peyman Moghadam, Simon Denman, Sridha Sridharan, and Clinton Fookes</i>	
3D Multiview Basketball Players Detection and Localization Based on Probabilistic Occupancy	267
<i>Yukun Yang, Min Xu, Wanneng Wu, Ruiheng Zhang, and Yu Peng</i>	
Data Augmentation using Evolutionary Image Processing	275
<i>Kosaku Fujita, Masayuki Kobayashi, and Tomoharu Nagao</i>	
Enhancing the Effectiveness of Local Descriptor based Image Matching	281
<i>Md Tahmid Hossain, Shyh Wei Teng, Dengsheng Zhang, Suryani Lim, and Guojun Lu</i>	
Structural Edge Detection: A Dataset and Benchmark	289
<i>Weixuan Sun, Shaodi You, Janine Walker, Kunming Li, and Nick Barnes</i>	
Robust CNN-based Gait Verification and Identification using Skeleton Gait Energy Image.....	297
<i>Lingxiang Yao, Worapan Kusakunniran, Qiang Wu, Jian Zhang, and Zhenmin Tang</i>	
Approach for Process Control in Additive Manufacturing Through Layer-Wise Analysis With 3-Dimensional Pointcloud Information	304
<i>Marc Preissler, Chen Zhang, Maik Rosenberger, and Gunther Notni</i>	
Similar Gesture Recognition using Hierarchical Classification Approach in RGB Videos	310
<i>Di Wu, Nabin Sharma, and Michael Blumenstein</i>	
Image Registration via Geometrically Constrained Total Variation Optical Flow.....	317
<i>Mehrdad Shoeiby, Mohammad Ali Armin, and Antonio Robles-Kelly</i>	

Dynamic Saliency Model Inspired by Middle Temporal Visual Area: A Spatio-Temporal Perspective	324
<i>Hassan Mahmood, Syed Omer Gilani, Syed Mohammed Shamsul Islam, and Yasar Ayaz</i>	
Systematic Analysis of Direct Sparse Odometry	332
<i>Florian Particke, Adam Kalisz, Christian Hofmann, Markus Hiller, Henrik Bey, and Jörn Thielecke</i>	
Fast Optical Flow Extraction from Compressed Video	338
<i>Sean I. Young and David Taubman</i>	
Cluster-based Crowd Movement Behavior Detection	346
<i>Meng Yang, Lida Rashidi, Aravinda S. Rao, Sutharshan Rajasegarar, Mohadeseh Ganji, Marimuthu Palaniswami, and Christopher Leckie</i>	
Image Caption Generator with Novel Object Injection	354
<i>Mirza Muhammad Ali Baig, Mian Ihtisham Shah, Muhammad Abdullah Wajahat, Nauman Zafar, and Omar Arif</i>	
Text Detection Techniques in Natural Scene Images: An Empirical Study	N/A
<i>Sidra Razzaq, Muhammad Junaid, Ghulran Ahmed, Shahid Hussain, and Hasan Ali Khattak</i>	
An Exploration of Deep Transfer Learning for Food Image Classification	368
<i>Kh Tohidul Islam, Sudanthi Wijewickrema, Masud Pervez, and Stephen O'Leary</i>	
A Scale-free and Parameter-free Image Edge Strength Measure	373
<i>Guy Smith and Paul Jackway</i>	
A New Method for Removing Asymmetric High Density Salt and Pepper Noise.....	381
<i>Allan Pennings and Imants Svalbe</i>	
Blur Kernel Estimation Model with Combined Constraints for Blind Image Deblurring.....	388
<i>Ying Liao, Weihong Li, Jinkai Cui, and Weiguo Gong</i>	
Image Representation using Bag of Perceptual Curve Features.....	396
<i>Elham Etemad and Qigang Gao</i>	
Deep Bi-Dense Networks for Image Super-Resolution.....	404
<i>Yucheng Wang, Jialiang Shen, and Jian Zhang</i>	
Whitening Pre-Filters with Circular Symmetry for Anomaly Detection in Hyperspectral Imagery	412
<i>Hugh L. Kennedy</i>	
Crack-pot: Autonomous Road Crack and Pothole Detection.....	420
<i>Sukhad Anand, Saksham Gupta, Vaibhav Darbari, and Shivam Kohli</i>	
Preserving Heritage Sites using 3D Modeling and Virtual Reality Technology.....	N/A
<i>Salsabil Ahmed, Raisa Islam, Sadman Shawmik Himalay, and Jia Uddin</i>	
Disparity Guided Texture Inpainting for Light Field View Synthesis	433
<i>Yue Li, Reji Mathew, and David Taubman</i>	
Impulse-Equivalent Sequences and Arrays	440
<i>Matthew Ceko, Mustafa Hamid, Imants Svalbe, Timothy Petersen, and Andrew Tirkel</i>	

A General Approach to Segmentation in CT Grayscale Images using Variable Neighborhood Search	447
<i>Thanongchai Siriapisith, Worapan Kusakunniran, and Peter Haddawy</i>	
Image Restoration based on Deep Convolutional Network in Wavefront Coding Imaging System	454
<i>Haoyuan Du, Liquan Dong, Ming Liu, Yuejin Zhao, Wei Jia, Xiaohua Liu, Mei Hui, Lingqin Kong, and Qun Hao</i>	
Inter-subject Image Registration of Clinical Neck MRI Volumes using Discrete Periodic Spline Wavelet and Free Form Deformation.....	462
<i>Abdulla Al Suman, Md. Asikuzzaman, Alexandra Louise Webb, Diana M. Perriman, and Mark R. Pickering</i>	
EPD Similarity Measure and Demons Algorithm for Object-Based Motion Estimation.....	467
<i>Md. Asikuzzaman, Abdulla Al Suman, and Mark R. Pickering</i>	
Virtual View Quality Enhancement using Side View Temporal Modelling Information for Free Viewpoint Video	474
<i>D. M. Motiur Rahaman, Manoranjan Paul, and Nusrat Jahan Shoumy</i>	
Massively Parallel Implementation of a Fast Resource Efficient White Light Interferometry Algorithm.....	480
<i>Tobias Scholz, Maik Rosenberger, and Gunther Notni</i>	
Memory Optimized Deep Dense Network for Image Super-resolution	486
<i>Jialiang Shen, Yucheng Wang, and Jian Zhang</i>	
Histogram Alternation Based Digital Image Compression using Base-2 Coding.....	492
<i>Md. Atiqur Rahman, Syed Mohammed Shamsul Islam, Jungpil Shin, and Md. Rashedul Islam</i>	
Face Recognition with Multi-channel Local Mesh High-order Pattern Descriptor and Convolutional Neural Network	500
<i>M. Daud Abdullah Asif, Yongsheng Gao, and Jun Zhou</i>	
Bay Lobsters Moulting Stage Analysis Based on High-Order Texture Descriptor	507
<i>M. Daud Abdullah Asif, Yongsheng Gao, and Jun Zhou</i>	
Asymmetric Recursive Gaussian Filtering for Space-variant Artificial Bokeh	514
<i>Tuan Q. Pham</i>	
Road Trail Classification using Color Images for Autonomous Vehicle Navigation	522
<i>Kh Tohidul Islam, Sudanthi Wijewickrema, Masud Pervez, and Stephen O'Leary</i>	
Accurate Shift Estimation Under One-Parameter Geometric Distortion using the <i>brosc</i> Filter	527
<i>Peter A. Fletcher, Matthew R. Arnison, and Eric W. Chong</i>	
Using Edge Position Difference and Pixel Correlation for Aligning Stereo-Camera Generated 3D Scans.....	535
<i>Deepak Rajamohan, Mark Pickering, and Matthew Garratt</i>	
Binarization of Color Character Strings in Scene Images using Deep Neural Network.....	540
<i>Wenjiao Bian, Toru Wakahara, Tao Wu, He Tang, and Jirui Lin</i>	

Bi-Modal Content Based Image Retrieval using Multi-class Cycle-GAN	546
<i>Girraj Pahariya</i>	
Improving Supervised Microaneurysm Segmentation using Autoencoder-Regularized Neural Network.....	553
<i>Rangwan Kasantikul and Worapan Kusakunniran</i>	
Kernel Support Vector Machines and Convolutional Neural Networks.....	560
<i>Shihao Jiang, Richard Hartley, and Basura Fernando</i>	
Descriptor-driven Keypoint Detection	567
<i>Andrzej Śluzek</i>	
Image Processing for Traceability: A System Prototype for the Southern Rock Lobster (SRL) Supply Chain	575
<i>Son Anh Vo, Joel Scanlan, Luke Mirowski, and Paul Turner</i>	
Deep Learning Models for Facial Expression Recognition	583
<i>Atul Sajjanhar, ZhaoQi Wu, and Quan Wen</i>	
DeepParse: A Trainable Postal Address Parser.....	589
<i>Nosheen Abid, Adnan ul Hasan, and Faisal Shafait</i>	
Feature-Level Fusion using Convolutional Neural Network for Multi-Language Synthetic Character Recognition in Natual Images	597
<i>Asghar Ali and Mark Pickering</i>	
Diagnosing Convolutional Neural Networks using their Spectral Response.....	603
<i>Victor Stamatescu and Mark D. McDonnell</i>	
Heuristic Evaluations of Cultural Heritage Websites.....	611
<i>Duyen Lam and Atul Sajjanhar</i>	
Adversarial Context Aggregation Network for Low-Light Image Enhancement.....	617
<i>Yong-Goo Shin, Min-Cheol Sagong, Yoon-Jae Yeo, and Sung-Jea Ko</i>	
Information Enhancement for Travelogues via a Hybrid Clustering Model	622
<i>Lu Zhang, Jingsong Xu, Jian Zhang, and Yongshun Gong</i>	
Human Brain Tissue Segmentation in fMRI using Deep Long-Term Recurrent Convolutional Network.....	630
<i>Sui Paul Ang, Son Lam Phung, Mark Matthias Schira, Abdesselam Bouzerdoum, and Soan Thi Minh Duong</i>	
Prediction and Localization of Student Engagement in the Wild	637
<i>Amanjot Kaur, Aamir Mustafa, Love Mehta, and Abhinav Dhall</i>	
A Single Hierarchical Network for Face, Action Unit and Emotion Detection	645
<i>Shreyank Jyoti, Garima Sharma, and Abhinav Dhall</i>	
Combining Deep and Handcrafted Image Features for Vehicle Classification in Drone Imagery	653
<i>Xuesong Le, Yufei Wang, and Jun Jo</i>	

Long-Term Recurrent Predictive Model for Intent Prediction of Pedestrians via Inverse Reinforcement Learning.....	659
<i>Khaled Saleh, Mohammed Hossny, and Saeid Nahavandi</i>	
Fine-Grained Categorization by Deep Part-Collaboration Convolution Net.....	667
<i>Qiyu Liao, Min Xu, Dadong Wang, and Hamish holewa</i>	
Enhanced Colour Image Retrieval with Cuboid Segmentation	675
<i>Manzur Murshed, Priyabrata Karmakar, Shyh Wei Teng, and Guojun Lu</i>	
Animal Call Recognition with Acoustic Indices: Little Spotted Kiwi as a Case Study	683
<i>Hongxiao Gan, Michael Towsey, Yuefeng Li, Jinglan Zhang, and Paul Roe</i>	
Evaluation of Graph Topological Features in Digitized Mammogram for Microcalcification Cluster Classification	691
<i>Nashid Alam and Reyer Zwiggelaar</i>	
Learning Orientation-Estimation Convolutional Neural Network for Building Detection in Optical Remote Sensing Image	698
<i>Yongliang Chen, Weiguo Gong, Chaoyue Chen, and Weihong Li</i>	
A New Approach using Characteristic Video Signals to Improve the Stability of Manufacturing Processes	706
<i>Frederic Ringsleben, Maik Benndorf, Thomas Haenselmann, Romana Boiger, Manfred Mücke, Matthias Fehr, and Dirk Mothes</i>	
2D Gabor-based Sparse Representation Classification for Hyperspectral Imagery	713
<i>Kuilin Wu and Sen Jia</i>	
Spectral Super-resolution for RGB Images using Class-based BP Neural Networks.....	721
<i>Xiaolin Han, Jing Yu, Jing-Hao Xue, and Weidong Sun</i>	
Demodulation of Multi-Level Data using Convolutional Neural Network in Holographic Data Storage	728
<i>Yutaro Katano, Tetsuhiko Muroi, Nobuhiro Kinoshita, and Norihiko Ishii</i>	
Multi-Class Recognition using Noisy Training Data with a Self-Learning Approach.....	733
<i>Amir Ghahremani, Egor Bondarev, and Peter H.N. de With</i>	
Automated Military Vehicle Detection From Low-Altitude Aerial Images	741
<i>Farrukh Kamran, Muhammad Shahzad, and Faisal Shafait</i>	
Optimization of a Principal Component Analysis Implementation on Field-programmable Gate Arrays (FPGA) for Analysis of Spectral Images.....	749
<i>Mathias Schellhorn, and Gunther Notni</i>	
IGTMPP: A Hybrid Method to Predict Missing Pixels of Remote Sensing Images using Geo-Temporal Properties	755
<i>Thaer F. Ali and Alan Woodley</i>	
Railway Infrastructure Defects Recognition using Fine-grained Deep Convolutional Neural Networks	763
<i>Huaxi Huang, Jingsong Xu, Jian Zhang, Qiang Wu, and Christina Kirsch</i>	

Classifier-free Extraction of Power Line Wires from Point Cloud Data	771
<i>Mohammad Awrangjeb, Yongsheng Gao, and Guojun Lu</i>	
Ensemble Classification Technique for Water Detection in Satellite Images.....	778
<i>Rabiul Islam Jony, Alan Woodley, Aishvarya Raj, and Dimitri Perrin</i>	
Combination of Supervised Learning and Unsupervised Learning Based on Object Association for Land Cover Classification	786
<i>Na Li, Arnaud Martin, and Rémi Estival</i>	
Mapping of Rice Varieties with Sentinel-2 Data via Deep CNN Learning in Spectral and Time Domains.....	794
<i>Yiqing Guo, Xiuping Jia, and David Paull</i>	
Satellite Multi-vehicle Tracking under Inconsistent Detection Conditions by Bilevel K-shortest Paths Optimization.....	801
<i>Junpeng Zhang, Xiuping Jia, Jiankun Hu, and Kun Tan</i>	
Detecting Splicing and Copy-Move Attacks in Color Images	809
<i>Mohammad Manzurul Islam, Gour Karmakar, Joarder Kamruzzaman, Manzur Murshed, Gayan Kahandawa and Nahida Parvin</i>	
Strategies for Merging Hyperspectral Data of Different Spectral and Spatial Resolution	816
<i>Raik Illmann, Maik Rosenberger, and Gunther Notni</i>	
Band Weighting Network for Hyperspectral Image Classification	823
<i>Jing Wang and Jun Zhou</i>	
Object Classification using Deep Learning on Extremely Low-Resolution Time-of-Flight Data.....	831
<i>Ana Daysi Ruvalcaba-Cardenas, Tony Scoleri, and Geoffrey Day</i>	