DICTA 2016

2016 International Conference on Digital Image Computing: Techniques and Applications

30 November – 2 December 2016
Gold Coast, Australia

Mantra on View Hotel, Surfers Paradise, Queensland, Australia

Message from the General Chairs

Welcome to the 18th International Conference on Digital Image Computing: Techniques and Applications (DICTA 2016) in Gold Coast, Australia!

DICTA is the main Australian Conference on computer vision, image processing, pattern recognition, and related areas. Established in 1991 as the premier conference of the Australian Pattern Recognition Society (APRS), DICTA has been successfully held in major cities in Australia and New Zealand during the past 25 years. This is the first time that DICTA comes to the Gold Coast. DICTA 2016 is technically sponsored by the Institute of Electrical and Electronics Engineers (IEEE) and the International Association for Pattern Recognition (IAPR).

DICTA 2016 offers an outstanding technical program thanks to the dedicated work of Technical Program Chairs, Technical Program Committee members, and reviewers. We are honoured to have keynote presentations from four distinguished researchers, including Prof. Zhi-Hua Zhou from Nanjing University, Prof. Andreas Dengel from the German Research Center for Artificial Intelligence, Prof. Jocelyn Chanussot from Grenoble Institute of Technology, and Prof. Yanxi Liu from Pennsylvania State University. The technical program also consists of eight oral sessions, two poster sessions, and one tutorial.

This event could not be possible without the time and efforts from the Technical Program Chairs, Local Arrangement Chairs, Proceedings Chair, Publicity Chair, Treasurer, Web Chair and the Advisory Committee. There are also a number of administrative staff and student volunteers who have provided ongoing support to make the conference run smoothly. During the conference preparation stage, Norma Swain from the Gold Coast Tourism Corporation gave us lots of help. We are grateful for their great contribution. We also thank all authors for submitting high quality papers to DICTA 2016.

As the general chairs, we would like to thank the long term support from our sponsors, the Defence Science and Technology (DST) group, CiSRA, APRS, IAPR, and the IEEE. Their support is an essential part of the program. Particular thanks go to Griffith University who provided financial sponsorship, as well as services in finance, conference registration, tutorial arrangements, and staff hours.

Finally, we would like to thank all DICTA 2016 attendees for taking the time to travel to the Gold Coast. Besides attending the conference, we hope you enjoy the wonderful beach in Surfers Paradise and the many tourist attractions offered at the Gold Coast.

We hope you have a nice time!

Jun Zhou, Yongsheng Gao, Michael Blumenstein
General Chairs for DICTA 2016

Message from the Technical Program Chairs

It is with great pleasure that we welcome you to DICTA 2016!

This year, a total of 179 papers were received for consideration. To ensure the quality of the conference, every paper underwent rigorous double-blind review with at least 3 reviews solicited before a decision was made. From these, 114 papers (63.7%) were accepted. It is noteworthy that almost half of the accepted papers (51 out of 114) are contributed by authors from outside Australia, i.e. they come from over 20 countries spanning across Asia, Europe, US, and South America, even though DICTA is considered a predominantly Australian conference.

Among the accepted papers, 35 papers (19.6%) were chosen for oral presentation, and 79 papers (44.1%) were assigned for the poster sessions. The ratio of accepted papers with student first author vs non-student first author is 88 to 26. The proceedings of DICTA 2016 will be published by the IEEE and permanently archived in the IEEE Explore digital library.

Besides the formal technical program, we have also put together a pre-conference tutorial session on the topic of "Deep Learning and Its Applications in Computer Vision" on Tuesday 29 November. The tutorial will cover the basic concept and models in deep learning and discuss their applications in computer vision, and will be of great interest for students and researchers working on this topic.

As per DICTA tradition, the organising committee will nominate three of the accepted papers for the APRS and IAPR Best Paper Award, the APRS and CiSRA Best Student Paper Award, and the DSTG Best Contribution to Science Award. The winners of these awards will be announced during the conference banquet on 1 December.

Finally, it would not be possible to put together a quality program without the help of the technical program committee members and the many reviewers that dedicated hours and even days of their free time in evaluating the suitability of the submitted papers for DICTA 2016. To all the 111 technical program committee members and reviewers, we would like to express our sincere thanks for your effort in the paper review process.

We hope you will enjoy the technical program in DICTA 2016 and once again, Welcome!

Alan Wee-Chung Liew, Brian Lovell, Clinton Fookes
Technical Program Chairs for DICTA 2016
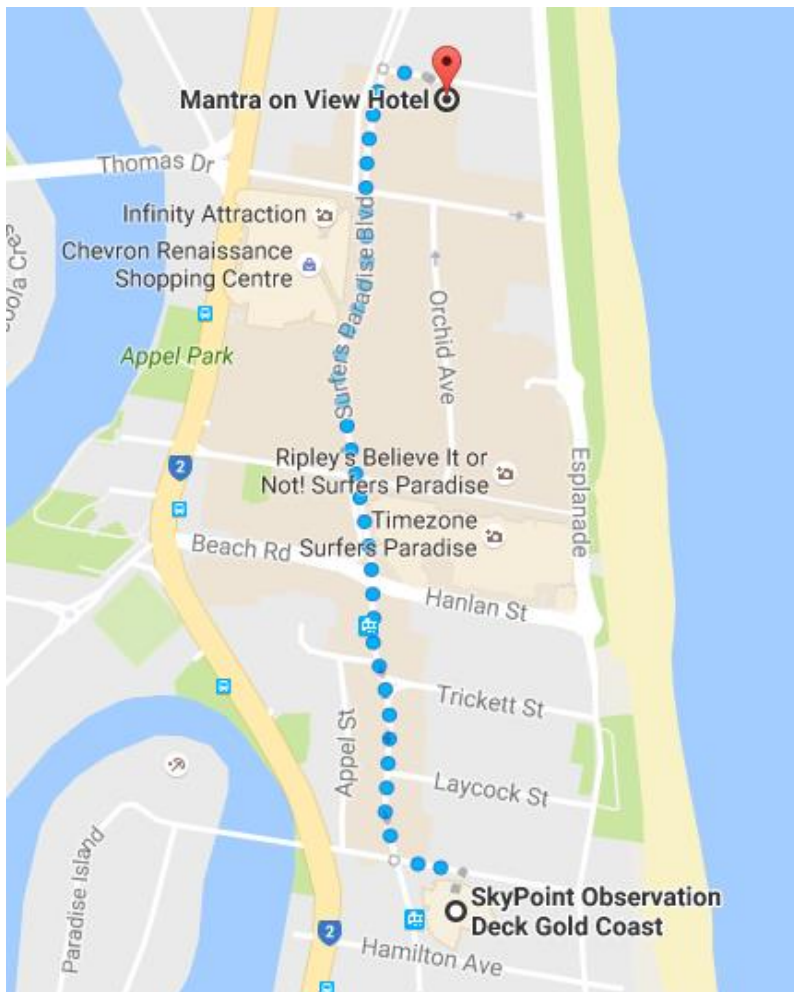
Conference Venue

Mantra on View Hotel
22 View Ave, Surfers Paradise QLD 4217

Banquet Venue

Skypoint Observation Deck
3/3003 Surfers Paradise Blvd, Surfers Paradise QLD 4217

DICTA 2016 Keynote Speeches

From AdaBoost to Optimal Margin Distribution Machines

Zhi-Hua Zhou
Nanjing University, China

Abstract

AdaBoost is a famous mainstream ensemble learning approach that has greatly influenced machine learning and related areas. A well-known mystery of Adaboost lies in the phenomenon that it seems resistant to overfitting, which has inspired a lot of theoretical investigations. In this talk, we will briefly introduce the margin theory that has a long history of debating but recently defensed. We will show how the theoretical findings provide inspiration for Optimal margin Distribution Machines (ODM), a promising direction of designing powerful learning algorithms.

Biography

Zhi-Hua Zhou is a Professor and Founding Director of the LAMDA Group at Nanjing University. His main research interests are in artificial intelligence, machine learning and data mining. He authored the book "Ensemble Methods: Foundations and Algorithms", and published more than 100 papers in top-tier international journals and conference proceedings. His work have received more than 20,000 citations, with a h-index of 71. He also holds 14 patents and has good experiences in industrial collaborations. He has received various awards, including the National Natural Science Award of China (premium science award in China), the PAKDD Distinguished Contribution Award, the Microsoft Professorship Award, 12 international journal/conference paper/presentation/competition awards, etc. He serves as the Executive Editor-in-Chief of Frontiers of Computer Science, Associate Editor-in-Chief of Science China, and Associate Editor of ACM TIST, IEEE TNNLS, etc. He founded ACML (Asian Conference on Machine Learning) and served as General co-chair of IEEE ICDM 2016, Program co-chair IJCAI 2015 Machine Learning track, etc. He also serves as the Chair of the IEEE CIS Data Mining and Big Data Analytics Technical Committee, the CCF Artificial Intelligence Technical Committee, etc. He is a Fellow of the AAAI, IEEE, IAPR, IET/IEE and CCF, and ACM Distinguished Scientist.

Augmenting human mind by gaze-based technologies

Andreas Dengel
German Research Center for Artificial Intelligence, Germany

Abstract

In the age of digitalization we are confronted with an overwhelming data and process complexity. As a consequence the cognitive load of knowledge workers is continuously increasing and we are lacking in extensions, which augment our mind helping us to perceive, increasing our understanding, enhancing our problem solving capacity, or complementing our skills. This is not a new phenomenon but recent advances in eye tracking technologies allow to use the eyes both as a source for understanding cognitive states but also as a means for interacting with objects and subjects in the real world. Such new options are of increasing interest for developing "electronic information butlers and amplifiers" that are able to anticipate what may be required in a given context and offer us all relevant information. In this talk I like to address the various aspects of augmenting human mind by gaze-based technologies. I will propose and discuss a bunch of approaches and technologies aiming at a more-rapid and better comprehension of human activities as well as their support by learning from gaze behavior. I will demonstrate experimental results from the office field, from medicine as well as from physics education, and further show some applications in the area of infotainment.

Biography

Andreas Dengel is a Managing Scientific Director at the German Research Center for Artificial Intelligence (DFKI GmbH) in Kaiserslautern. In 1993, he became a Professor at the Computer Science Department of the University of Kaiserslautern where he holds the chair "Knowledge-Based Systems" and since 2009 he is appointed Professor at the Department of Computer Science and Information Systems at the Osaka Prefecture University. He received his Diploma in CS from the University of Kaiserslautern and his PhD from the University of Stuttgart. He also worked at IBM, Siemens, and Xerox Parc. Andreas is member of several international advisory boards, chaired major international conferences, and founded several successful start-up companies. Moreover, he is co-editor of international computer science journals and has written or edited 12 books. He is author of more than 350 peer-reviewed scientific publications and supervised more than 200 PhD and master theses. Andreas is a IAPR Fellow and received prominent international awards. His main scientific emphasis is in the areas of Pattern Recognition, Document Understanding, Information Retrieval, Multimedia Mining, Semantic Technologies, and Social Media.

Challenges and opportunities in hyperspectral image analysis

Jocelyn Chanussot
Grenoble Institute of Technology, France

Abstract

Expanding and refining the concepts of colour and multispectral imaging, hyperspectral sensors record the reflectance information of each point on the ground in hundreds of narrow and contiguous spectral bands. The spectral information is instrumental for the accurate analysis of the physical component present in one scene. But, every rose has its thorns: most of the traditional signal and image processing algorithms fail when confronted to such high dimensional data (each pixel is represented by a vector with several hundreds of dimensions).

In this talk, I will start by a general presentation of the challenges and opportunities offered by hyperspectral imaging systems in a number of applications. I will then explore these issues with a hierarchical approach, briefly illustrating the problem of spectral unmixing and of super-resolution, then moving on to pixel-wise classification (purely spectral classification and then including contextual features). Eventually, I will focus on the extension to hyperspectral data of a very powerful image processing analysis tool: the Binary Partition Tree (BPT), providing a generic hierarchical representation of images. Results and illustrations are presented on various hyperspectral images.

Biography

Jocelyn Chanussot (M'04–SM'04–F'12) received the M.Sc. degree in electrical engineering from the Grenoble Institute of Technology (Grenoble INP), Grenoble, France, in 1995, and the Ph.D. degree from the Université de Savoie, Annecy, France, in 1998. In 1999, he was with the Geography Imagery Perception Laboratory for the Delegation Generale de l'Armement (DGA - French National Defense Department). Since 1999, he has been with Grenoble INP, where he was an Assistant Professor from 1999 to 2005, an Associate Professor from 2005 to 2007, and is currently a Professor of signal and image processing. He is conducting his research at the Grenoble Images Speech Signals and Automatics Laboratory (GIPSA-Lab). His research interests include image analysis, multicomponent image processing, nonlinear filtering, and data fusion in remote sensing. He has been a visiting scholar at Stanford University (USA), KTH (Sweden) and NUS (Singapore). Since 2013, he is an Adjunct Professor of the University of Iceland. In 2015-2017, he is a visiting professor at the University of California, Los Angeles (UCLA).

Dr. Chanussot is the founding President of IEEE Geoscience and Remote Sensing French chapter (2007-2010) which received the 2010 IEEE GRS-S Chapter Excellence Award. He was the co-recipient of the NORSIG 2006 Best Student Paper Award, the IEEE GRSS 2011 and 2015 Symposium Best Paper Award, the IEEE GRSS 2012 Transactions Prize Paper Award and the IEEE GRSS 2013 Highest Impact Paper Award. He was a member of the IEEE Geoscience and Remote Sensing Society AdCom (2009-2010), in charge of membership development. He was the General Chair of the first IEEE GRSS Workshop on Hyperspectral Image and Signal Processing, Evolution in Remote sensing (WHISPERS). He was the Chair (2009-2011) and Cochair of the GRS Data Fusion Technical Committee (2005-2008). He was a member of the Machine Learning for Signal Processing Technical Committee of the IEEE Signal Processing Society (2006-2008) and the Program Chair of the IEEE International Workshop on Machine Learning for Signal Processing, (2009). He was an Associate Editor for the IEEE Geoscience and Remote Sensing Letters (2005-2007) and for Pattern Recognition (2006-2008). Since 2007, he is an Associate Editor for the IEEE Transactions on Geoscience and Remote Sensing. He was the Editor-in-Chief of the IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (2011-2015). In 2013, he was a Guest Editor for the Proceedings of the IEEE and in 2014 a Guest Editor for the IEEE Signal Processing Magazine. He is a Fellow of the IEEE and a member of the Institut Universitaire de France (2012-2017).

Are you a human or a robot?

Yanxi Liu
Pennsylvania State University, USA

Abstract

Regularities with varying form and scale pervade our natural and manmade world. From insects to mammals, the ability to sense regular patterns has a neurobiological basis and has been observed in many levels of intelligence and behavior. From Felix Klein's Erlanger program, D'Arcy Thompson's Growth-and-Form, to the Gestalt principles of perception, much of our understanding of the world is based on the perception and recognition of repeated patterns, generalized by the mathematical concept of symmetry and symmetry groups. Given the ubiquity of symmetry in both the physical and the digital worlds, a computational model for symmetry-based regularity perception is especially pertinent to computer vision, computer graphics, robotics and machine intelligence in general, where an intelligent being (e.g. a robot) seeks to perceive, reason and interact with the chaotic world in the most effective and efficient manner. Surprisingly, we have limited knowledge on how humans perceive regular patterns and little progress has been made in computational models for noisy, albeit near-regular patterns in real data. In this talk, I present parallels as well as differences between machine perception and human perception of visual regularity. I shall report our recent results on understanding human perception of wallpaper patterns using neuroimaging (EEG, fMRI) and crowdsourcing, and our successful attempt at building a symmetry-based Turing test to tell humans and robots apart: a symmetry reCAPTCHA.

Biography

Yanxi Liu received her Ph.D. degree in computer science for group theory applications in robotics from University of Massachusetts (Amherst, MA, USA) and her postdoctoral training in robotics fine motion planning at LIFIA/IMAG (France). With an NSF research-education fellowship award, Dr. Liu spent one year at DIMACS (NSF center for Discrete Mathematics and Theoretical Computer Science) before joining the Robotics Institute (RI) of Carnegie Mellon University for ten years. She is currently a full professor in the Computer Science Engineering and Electrical Engineering departments of Penn State University, where she co-directs the Lab for Perception, Action and Cognition (LPAC). From 2013-2014, Yanxi took an 18-month-leave visiting Stanford University (Palo Alto, CA), Google (Mountain View, CA) and Microsoft (Sunnyvale, CA).

Dr. Liu's research interests span a wide range of applications in computer vision, computer graphics, robotics, human perception and computer aided diagnosis in

medicine, with two central themes: computational regularity and discriminative subspace learning. In year 2000, Dr. Liu coined the term "Computational Symmetry" in a book-chapter on Symmetry, and is the lead author of a 2010 survey 200 pages) on "Computational Symmetry in Computer Vision and Computer Graphics" (Foundations and Trends® in Computer Graphics and Vision). During CVPR 2011 and CVPR 2013, Dr. Liu led two US NSF and industry funded competitions on "Symmetry Detection from Real World Images" (http://vision.cse.psu.edu/research/symComp13/index.shtml), and is leading a continuous effort in creating and maintaining the widely used CMU/PSU Near Regular Texture Database. She has also chaired the first ICCV 2005 workshop on Computer Vision for Biomedical Image Applications: Current Techniques and Future Trends, and edited the associated book (Springer, 563 pages). In 2012, Dr. Liu is the PI of an US NSF grant and the co-director for an interdisciplinary summer school held in Shanghai (Fudan University) on Vision, Learning and Pattern Recognition (VLPR).

Currently, Dr. Liu is an associate editor for IEEE Transaction of Pattern Analysis and Machine Intelligence (PAMI) and Computer Vision and Image Understanding (CVIU) Journal. Dr. Liu served as an area chair/organizing committee member for CVPR/MICCAI/ACCV, and will serve as a program co-chair for CVPR 2017.

DICTA 2016 Program Overview

	Room G42 1.04, Gold Coast Campus of Griffith University	
Tutorial Tuesday 29/11	12:00	Registration
	13:00	Session 1
	14:45	Afternoon Tea
	15:15	Session 2

	Mantra on View Hotel	
Main Conference Day 1 Wednesday 30/11	8:00	Registration
	8:50	Conference Opening
	9:00	**Keynote 1** – Professor Zhi-Hua Zhou
	10:00	Morning Tea
	10:30	**Oral Session 1** – Image Processing and Application
	12:10	Lunch
	13:30	**Keynote 2** – Professor Andreas Dengel
	14:30	Afternoon Tea
	14:30	**Poster Session 1**
	16:00	**Oral Session 2** – Face and Action Recognition

Main Conference Day 2 Thursday 1/12	8:30	Registration
	9:00	**Keynote 3** – Professor Jocelyn Chanussot
	10:00	Morning Tea
	10:30	**Oral Session** 3 – Object Tracking and Classification
	12:10	Lunch
	13:30	**Oral Session 4** – Machine Learning
	14:30	Afternoon Tea
	14:30	**Poster Session 2**
	16:00	**Oral Session 5** – Medical Imaging
	17:00	**APRS AGM**
	18:00	**Skypoint Tour + Welcome Drink**
	18:45	**Conference Banquet**

Main Conference Day 3 Friday 2/12	8:30	Registration
	9:00	**Keynote 4** – Professor Yanxi Liu
	10:00	Morning Tea
	10:30	**Oral Session 6** – Detection and Geometry
	12:10	Lunch
	13:30	**Oral Session 7** – Image Retrieval and Applications
	15:10	Afternoon Tea
	15:40	**Oral Session 8** – Image Segmentation

Tutorial

Tuesday, 29 November

Location: Room G42 1.04, Gold Coast Campus, Griffith University

Deep Learning and Its Applications in Computer Vision

Lingqiao Liu, University of Adelaide; Guosheng Li, University of Adelaide; Qi Wu, University of Adelaide; Vijay Kumar, University of Adelaide

12:00-13:00 Registration

13:00-14:45 Session 1

Part 1 – Basic concept of deep learning

Part 2 - Deep learning in semantic segmentation or pixel labelling

14:45-15:15 Afternoon Tea

15:15-17:00 Session 2

Part 3 - Joint modeling of image and language

Part 4 - Unsupervised feature learning

Conference Program

Wednesday, 30 November

Location:
Boulevard 2 & 3 (Oral Session),
Boulevard 1 & Foyer (Poster Session)

8:00-9:00   Registration

8:50-9:00   Conference Opening

9:00-10:00 Keynote 1

From AdaBoost to Optimal Margin Distribution Machines

Professor Zhi-Hua Zhou, Nanjing University, China

Session Chair: Lei Wang, University of Wollongong

10:00-10:30 Morning Tea

10:30-12:10 Oral Session 1 – Image Processing and Application

Session Chair: Manoranjan Paul, Charles Sturt University

1. Hierarchical Mutual Nearest Neighbour Image Segmentation

SM Abdullah, Monash university; Peter Tischer, Monash University; Sudanthi Wijewickrema, The University of Melbourne; Andrew Paplinski, Monash University.

2. Lossless Hyperspectral Image Compression Using Binary Tree Based Decomposition

Shampa Shahriyar, Monash University; Manoranjan Paul, Charles Sturt University; Manzur Murshed, Federation university; Mortuza Ali, Federation University

3. Image Descriptors from ConvNets: Comparing Global Pooling Methods for Image Retrieval

Ian Comor, University of Wollongong; Yan Zhao, University of Wollongong; Zhimin Gao, University of Wollongong; Luping Zhou, University of Wollongong; Lei Wang, University of Wollongong

4. Image Multi-Thresholding to Characterise the Mechanical Stability of Rubber Latex Concentrate

Weng Kin Lai, Tunku Abdul Rahman University College; Zee Him Phoon, Tunku Abdul Rahman University College; Khoon Hee Chew, Tunku Abdul Rahman University College; Kam Meng Goh, Tunku Abdul Rahman University College; Ping Yong Chua, Kingsley Education Group

5. Spatial Shape Constrained Fuzzy C-Means (FCM) Clustering for Nucleus Segmentation in Pap Smear Images

Ratna Saha, Flinders University; Mariusz Bajger, Flinders University; Gobert Lee, Flinders University

12:10-13:30   Lunch

13:30-14:30   Keynote 2

Augmenting Human Mind by Gaze-Based Technologies

Professor Andreas Dengel, German Research Center for Artificial Intelligence, Germany

Session Chair: Michael Blumenstein, University of Technology Sydney

14:30-15:00   Afternoon Tea

14:30-16:00 Poster Session 1

Session Chair: Simon Williams, Flinders University

Recognition and Detection

1. Extended Robust Feature-based Visual Navigation System for UAVs

Anastasiia Volkova, University of Sydney; Peter Gibbens, University of Sydney

2. Understanding Data Augmentation for Classification: When to Warp?

Sebastien Wong, Defence Science and Technology Group; Adam Gatt, Australian Defence Force; Victor Stamatescu, University of South Australia; Mark McDonnell, University of South Australia

3. Double Constrained NMF for Partial Multi-View Clustering

Bin Qian, Nanjing University of Science and Technology; Xiaobo Shen, Nanjing University of Science and Technology; Yanyang Gu, Griffith University; Zhenmin Tang, Nanjing University of Science and Technology; Yuhua Ding, Nanjing University of Science and Technology

4. Copy-Move Forgery Detection Using Color Space and Moment Invariants-Based Features

Rafsanjany Kushol, Islamic University of Technology; Md Sirajus Salekin, Islamic University of Technology; Md. Hasanul Kabir, Islamic University of Technology; Ashraful Alam Khan, Islamic University of Technology

5. Affine Invariant Matching Method for Image Contains Repetitive Patterns

Yunshu Wang, Nanjing University of Aeronautics and Astronautics; Jianye Liu, Nanjing University of Aeronautics and Astronautics; Qinghua Zeng, Nanjing University of Aeronautics and Astronautics

6. Neural Networks for Page Stream Segmentation and Classification

Ignazio Gallo, University of Insubria; Lucia Noce, University of Insubria; Alessandro Zamberletti, University of Insubria; Alessandro Calefati, University of Insubria

7. Automated Image Analysis on Insect Soups

Changming Sun, CSIRO; Paul Flemons, Australian Museum; Yongsheng Gao, Griffith University; Dadong Wang, CSIRO; Nicole Fisher, Australian National Insect Collection; John La Salle, Atlas of Living Australia

8. Based Pattern-Context-Aware Stereo Analysis and Its Applications

Charles Liu, Macquarie University; Manolya Kavakli, Macquarie University

9. Circle Detection Based on Arc Search Using a Table of Virtual Circle

Makoto Odagiri, Hirosaki University; Kazunori Onoguchi, Hirosaki University

10. USM Sharpening Detection Based on Sparse Coding

Yuzhou Gu, Shanghai Jiao Tong University; Shilin Wang, Shanghai Jiao Tong University; Xiang Lin, Shanghai Jiao Tong University; Tangfeng Sun, Shanghai Jiao Tong University

11. Motion Similarity (JMS)-Based Human Action Recognition using Kinect

Jiawei Li, Nanjing University of Posts and Telecommunications; Jianxin Chen, Nanjing University of Posts and Telecommunications; Linhui Sun, Nanjing University of Posts and Telecommunications

12. Vertical Axis Detection for Sport Video Analytics

Rui Zeng, Queensland University of Technology; Ruan Lakemond, Imagination Technologies; Simon Denman, Queensland University of Technology; Sridha Sridharan, Queensland University of Technology; Clinton Fookes, Queensland University of Technology; Stuart Morgan, Australian Institute of Sport

13. A New Building Mask Using the Gradient of Heights for Automatic Building Extraction

Fasahat Siddiqui, Monash University; Mohammad Awrangjeb, Griffith University; Shyh Teng, Federation University Australia; Guojun Lu, Federation University Australia

14. A Two-Stage Outdoor-Indoor Scene Classification Framework: Experimental Study for the Outdoor Stage

Mana Shahriari, Université Laval; Robert Bergevin, Université Laval

15. Multiscale Crossing Representation Using Combined Feature of Contour and Venation for Leaf Image Identification

Xiaohan Yu, Wuhan University of Technology; Shengwu Xiong, Wuhan University of Technology; Yongsheng Gao, Griffith University; Yang Zhao, Wuhan University of Technology; Xiaohui Yuan, Wuhan University of Technology

16. Towards Extending Bag-of-Words-Models using Context Features for an 2D Inverted Index

Daniel Manger, Fraunhofer IOSB; Christian Herrmann, Fraunhofer IOSB; and Dieter Willersinn, Fraunhofer IOSB

17. Document Image Retrieval Based on Texture Features: A Recognition-Free Approach

Fahimeh Alaei, Griffith University; Alireza Alaei, Griffith University; Umapada Pal, India Statistical Institue; Michael Blumenstein, University of Technology Sydney

18. Hashing with Non-linear Manifold Learning

Cheng Yan, Beihang University; Yanzhen Liu, Beihang University; Xiao Bai, Beihang University; Jing Wang, Griffith University; Jun Zhou, Griffith University

19. Pyramid Match Kernel and Spatial Pyramid for Image Classification

Priyabrata Karmakar, Federation University Australia; Shyh Wei Teng, Federation University Australia; Dengsheng Zhang, Federation University Australia; Ying Liu, Xi'an University of Posts and Telecommunications; Guojun Lu, Federation University Australia

20. Add-on Strategies for Fine-grained Pedestrian Classification

Yoshihito Kokubo, Nagoya University; Yu Wang, Nagoya University; Jien Kato, Nagoya University; Guanwen Zhang, Northwestern Ploytechnical University; Kenji Mase, Nagoya University

21. A Novel Region-Based Method for Moving Shadow Detection

Mosin Russell, Western Sydney University; Ju Jia Zou, Western Sydney University; Gu Fang, Western Sydney University

22. Anomaly Detection for Quaternion-valued Traffic Signals

Li-Li Wang, Hong Kong Baptist University; Henry Y.T. Ngan, Hong Kong Baptist University; Wei Liu, University of Sheffield; Nelson H.C. Yung, The University of Hong Kong

23. Sparse Wavelet Auto-Encoders for Image classification

Salima Hassairi, REGIM-Lab; Ridha Ejbali, REGIM-Lab; Mourad Zaied, REGIM-Lab

24. Convolutional Recurrent Neural Networks for Better Image Understanding

Alexis Vallet, Kyushu University; Hiroyasu Sakamoto, Kyushu University

25. Deep Learning based Computer Vision Technique for Automatic Heat Detection in Cows

Sujan Chowdhury, Central Queensland University; Brijesh Verma, Central Queensland University; Jessica Roberts, Central Queensland University; Nicholas Corbet, Central Queensland University; Dave Swain, Central Queensland University

26. Constrained Smoothness Cost in Markov Random Field Based Stereo Matching

Ba Thai, La Trobe University; Mukhalad Al-nasrawi, La Trobe University; Guang Deng, La Trobe University; Robert Ross, La Trobe University; and Phat Huynh, La Trobe University

27. Foreign Object Debris Detection on Airfield Pavement Using Region Based Convolution Neural Network

Xiaoguang Cao, Beihang University; Guoping Gong, Beihang University; Miaoming Liu, Beihang University; Jun Qi, Beihang University

28. An Automatic Off-line Short Answer Assessment System using Novel Hybrid Features

Hemmaphan Suwanwiwat, James Cook University; Umapada Pal, Indian Statistical Institute; Michael Blumenstein, University of Technology Sydney

29. Can Contextual Information Improve Scene Classification Performance?

Mana Shahriari, Université Laval; Robert Bergevin, Université Laval

Segmentation

30. Model-Guided Segmentation of Liver in CT and PET-CT Images of Child Patients Based on Statistical Region Merging

Jiri Sedlar, Academy of Sciences of the Czech Republic; Mariusz Bajger, Flinders University of South Australia; Martin Caon, Flinders University of South Australia; Gobert Lee, Flinders University of South Australia

31. Maximum Pseudolikelihood Estimation for Mixture-Markov Random Field Segmentation of the Brain

Amy Chan, The University of Queensland; Ian A. Wood, The University of Queensland; Jurgen Fripp, CSIRO Health and Biosecurity Flagship

32. A Local Scale Selection Scheme for Multiscale Area Integral Invariants

Bin Wang, Nanjing University of Finance and Economics; Yongsheng Gao, Griffith University; Changming Sun, CSIRO Data61; Michael Blumenstein, University of Technology Sydney; John La Salle, CSIRO National Research Collections Australia

33. Robust Lip Region Segmentation Based on Competitive FCM Clustering

Jian-Wen Fu, Shanghai Jiaotong University; Shi-Lin Wang, Shanghai Jiaotong University; Xiang Lin, Shanghai Jiaotong University

Video

34. A Centroid Algorithm for Stabilization of Turbulence-Degraded Underwater Videos

Kalyan Kumar Halder, The University of New South Wales; Manoranjan Paul, Charles Sturt University; Murat Tahtali, The University of New South Wales; Sreenatha Anavatti, The University of New South Wales; Manzur Murshed, Federation University

35. Video Summarization Using Geometric Primitives

Md Musfequs Salehin, Charles Sturt University; Manoranjan Paul, Charles Sturt University

36. Interactive Atmospheric Turbulence Mitigation

Dmitri Kamenetsky, DST Group; Michael Zucchi, SwordFish Computing Pty Ltd; Geoff Nichols, DST Group; David Booth, DST Group; Andrew Lambert, The University of New South Wales

37. Adaptive Fast Mode Decision for HEVC Intra Coding

Rui Tian, Beihang University; Yongfei Zhang, Beihang University; Rui Fan, Beihang University; Gang Wang, Beihang University

38. An Efficient Energy Model for Human Gait Recognition

Mohammad Hossein Ghaeminia, Iran University of Science and Technology; Ali Badiezadeh, Iran University of Science and Technology; Shahriar Baradaran Shokouhi, Iran University of Science and Technology

Optimization

39. Efficient GPU Computing Framework of Cloud Filtering in Remotely Sensed Image Processing

Jing Ke, University of New South Wales & CSIRO; Arcot Sowmya, University of New South Wales; Yi Guo, Western Sydney University; Tomasz Bednarz, CSIRO; Michael Buckley, CSIRO

40. Reversible SMVQ Image Hiding Using Adaptive Search Order Coding

Cheng-Ta Huang, Oriental Institute of Technology; Chia-Ling Wu, National Taipei University; Jen-Chun Chang, National Taipei University; Yu-Lun Wan, National Taipei University; Shiuh-Jeng WANG, Central Police University

16:00-17:40 Oral Session 2 – Face and Action Recognition

Session Chair: Ajmal Mian, University of Western Australia

1. Low-quality Video Face Recognition with Deep Networks and Polygonal Chain Distance

Christian Herrmann, Fraunhofer IOSB; Dieter Willersinn, Fraunhofer IOSB; Jürgen Beyerer, Fraunhofer IOSB.

2. Affine Invariant Point-set Matching Using Convex Hull Bisection

Yue Li, Griffith University; Bin Wang, Griffith University; Yongsheng Gao, Griffith University; Jun Zhou, Griffith University

3. Fast Binary-Based Video Descriptors for Action Recognition

Roberto Leyva, University of Warwick; Victor Sanchez, University of Warwick; Chang Tsun-Li, University of Warwick

4. Towards Large-scale 3D Face Recognition

Syed Zulqarnain Gilani, University of Western Australia; Ajmal Mian, University of Western Australia

5. Boosting Radial Strings for 3D Face Recognition with Expressions and Occlusions

Xun Yu, Griffith University; Yongsheng Gao, Griffith University; Jun Zhou, Griffith University

Conference Program

Thursday, 1 December

Location:
Boulevard 2 & 3 (Oral Session),
Boulevard 1 & Foyer (Poster Session)

8:30-9:00 Registration

9:00-10:00 Keynote 3

Challenges and Opportunities in Hyperspectral Image Analysis

Professor Jocelyn Chanussot, Grenoble Institute of Technology, France

Session Chair: Jun Zhou, Griffith University

10:00-10:30   Morning Tea

10:30-12:10   Oral Session 3 – Object Tracking and Classification

Session Chair: Changming Sun, CSIRO

1. Exploiting Temporal Information for DCNN-based Fine-Grained Object Classification
ZongYuan Ge, Queensland University of Technology; Chris McCool, Queensland University of Technology; Conrad Sanderson, CSIRO and University of Queensland; Peng Wang, University of Queensland; Lingqiao Liu, University of Adelaide; Ian Reid, University of Adelaide; Peter Corke, Queensland University of Technology

2. Robust and Real-time Object Tracking Using Scale-Adaptive Correlation Filters
Qingyong Hu, National University of Defense Technology; Yulan Guo, National University of Defense Technology; Zaiping Lin, National University of Defense Technology; Wei An, National University of Defense Technology; Hongwei Cheng, National University of Defense Technology

3. Modeling 2D Appearance Evolution for 3D Object Categorization

Hasan Firdaus Mohd Zaki, University of Western Australia; Ajmal Mian, University of Western Australia; Faisal Shafait, National University of Sciences and Technology

4. Faster R-CNN Scene Specialization with a Sequential Monte-Carlo Framework

Ala Mhalla, University of Sousse; Houda Maamatou, University of Sousse; Thierry Chateau, Blaise Pascal University; Sami Gazzah, University of Sousse; Najoua Essoukri Ben Amara, University of Sousse

5. 3D Scanning System for Automatic High-Resolution Plant Phenotyping

Chuong Nguyen, Australian National University; Jurgen Fripp, CSIRO Health and Biosecurity; David Lovell, Queensland University of Technology; Robert Furbank, Australian National University; Peter Kuffner, CSIRO Agriculture and Food; Helen Daily, CSIRO Agriculture and Food; Xavier Sirault, CSIRO Agriculture and Food

12:10-13:30   Lunch

13:30-14:30   Oral Session 4 – Machine Learning

Session Chair: Alan Liew, Griffith University

1.   A Novel Online Bayes Classifier

Thi Thu Thuy Nguyen, Griffith University; Tien Thanh Nguyen, Griffith University; Xuan Cuong Pham, Water Resource University; Alan Wee-Chung Liew, Griffith University; Yongjian Hu, South China University of Technology; Tiancai Liang, GRG Banking Equipment Co. Ltd.; Chang-Tsun Li, University of Warwick

2. Depth Dropout: Efficient Training of Residual Convolutional Neural Networks

Jian Guo, The Australian National University; Stephen Gould, The Australian National University

3. Online-Offline Extreme Learning Machine with Concept Drift Tracking for Time Series Data

Lihua Guo, School of Electronic Information Engineering, South China University of Technology; Alan Wee-Chung Liew, Griffith University

14:30-15:00   Afternoon Tea

14:30-16:00   Poster Session 2

Session Chair: Zhiyong Wang, The University of Sydney

3D Computer Vision

1. A Coarse-to-fine Algorithm for Registration in 3D Street-View Cross-Source Point Clouds

Xiaoshui Huang, University of Technology Sydney; Jian Zhang, University of Technology Sydney; Qiang Wu, University of Technology Sydney; Lixin Fan, Nokia Technologies; Chun Yuan, Tsinghua University

2. Simultaneous Correspondences Estimation and Non-rigid Structure Reconstruction

Yuchao Dai, Australian National University; Hongdong Li, Australian National University

3. View Invariant 3D Video Watermarking using Depth Based Embedding

Shuvendu Rana, Indian Institute of Technology Guwahati; Sibaji Gaj, Indian Institute of Technology Guwahati; Arijit Sur, Indian Institute of Technology Guwahati

4. Object Depth Estimation from a Single Image Using Fully Convolutional Neural Network

Ahmed J. Afifi, Technical University Berlin; Olaf Hellwich, Technical University Berlin

5. View Synthesised Prediction with Temporal Texture Synthesis for Multi-View Video

D M Motiur Rahaman, Charles Sturt University; Manoranjan Paul, Charles Sturt University

Applications

6. Image Aesthetic Evaluation Using Parallel Deep Convolution Neural Network

Lihua Guo, South China University of Technology; Fudi Li, South China University of Technology; Alan Wee-Chung Liew, Griffith University

7. A Robust Watermarking Scheme against Frame Blending, Projection and Content Adaptation Attacks

Sibaji Gaj, IIT Guwahati; Shuvendu Rana, IIT Guwahati; Arijit Sur, IIT Guwahati; Prabin Bora, IIT Guwahati

8. Characteristics of Color Digital Image Correlation for deformation measurement in geomechanical structures

Ghulam Mubashar Hassan, The University of Western Australia; David Hang, The University of Western Australia; Cara MacNish, The University of Western Australia; Arcady Dyskin, The University of Western Australia

9. Content Authoring Using Single Image in Urban Environments for Augmented Reality

Nan-Hung Cho, University of Technology Sydney; Qiang Wu, University of Technology Sydney; Jingsong Xu, University of Technology Sydney; Jian Zhang, University of Technology Sydney

Computational Photography

10. Efficient Feature Selection and Nearest Neighbour Search for Hyperspectral Image Classification

Alan Woodley, Queensland University of Technology; Timothy Chappell, Queensland University of Technology; Shlomo Geva, Queensland University of Technology; Richi Nayak, Queensland University of Technology

11. The Algorithm of the Roundwood Volume Measurement via Photogrammetry

Artem Kruglov, Ural Federal University

12. Integrating recursive Bayesian estimation with support vector machine to map probability of flooding from multispectral Landsat data

Chandrama Sarker, Queensland University of Technology; Luis Mejias, Queensland University of Technology; Alan Woodley, Queensland University of Technology

Face and Gesture

13. Deep Learning-based Fast Hand Gesture Recognition using Representative Frames

Vijay John, Toyota Technological Institute; Ali Boyali, Toyota Technological Institute; Seiichi Mita, Toyota Technological Institute; Masayuki Imanishi, Nippon Soken; Norio Sanma, Nippon Soken

14. Robust Approaches for Multi-label Face Classification

Ahmed Mohammed, Deakin University; Atul Sajjanhar, Deakin University

Low level vision and Image Processing

15. A Quantitative Analysis of Tilt in The Café Wall Illusion: a Bioplausible Model for Foveal and Peripheral Vision

Nasim Nematzadeh, Flinders University; David. M.W. Powers, Flinders University

16. Saliency Optimization Based on Compactness and Background-Prior

Yu Zheng, Beihang University; Lu Li, Beihang University; Xiangzhi Bai, Beihang University; Fugen Zhou, Beihang University

17. A Consistent, Real-Time Image Segmentation for Object Tracking

Xuesong Le, Griffith University; Ruben Gonzalez, Griffith University

18. Parametric Learning of Texture Filters by Stacked Fisher Autoencoders

Arash Shahriari, Australian National University

19. A Vignetting Correction Algorithm for Bright-field Microscopic Images of Activated sludge

Muhammad Burhan Khan, Universiti Tunku Abdul Rahman; Humaira Nisar, Universiti Tunku Abdul Rahman; Choon Aun Ng, Universiti Tunku Abdul Rahman; Po Kim Lo, Universiti Tunku Abdul Rahman

20. Characterising 3D structure of cancellous bone

Amelia Gontar, Flinders University; Simon Williams, Flinders University; Murk J. Bottema, Flinders University

21. Less-Visible Contrast Enhancement Based on Non-Linear Scaling Function and Singular Value Decomposition

Suthum Keerativittayanun, Japan Advanced Institute of Science and Technology; Kazunori Kotani, Japan Advanced Institute of Science and Technology; Toshiaki Kondo, Sirindhorn International Institute of Technology; Teera Phatrapornnant, National Electronics and Computer Technology Center; Jessada Karnjana, National Electronics and Computer Technology Center

22. Optimal Design of Digital IIR and FIR Filters Using Complex Flatness Constraints: A Unified Approach

Hugh Kennedy, Technical Knockout Systems Pty. Ltd

23. Impact of Automatic Feature Extraction in Deep Learning Architecture

Fatma Shaheen, Central Queensland University; Brijesh Verma, Central Queensland University; Md Asafuddoula, Central Queensland University

Medical and Biological Image Analysis

24. Image Super-resolution Reconstruction via L1/2 and S1/2 Regularizations

Liang-Yong Xia, Macau University of Science Technology; Xu-Xin Lin, Macau University of Science and Technology; Yong Liang, Macau University of Science and Technology; Hong-kun Jiang, Macau University of Science and Technology; Hua Chai, Macau University of Science and Technology; Hai-Hui Huang, Macau University of Science and Technology

25. A Multiview Joint Sparse Representation with Discriminative Dictionary for Melanoma Detection

Tingting Yao, Hefei University of Technology; Zhiyong Wang, The University of Sydney; Zhao Xie, Hefei University of Technology; Jun Gao, Hefei University of Technology; David Dagan Feng, The University of Sydney

26. Segmenting Neuronal Growth Cones Using Deep Convolutional Neural Networks

Jackson Huang, The University of Queensland; Nicholas Hughes, The University of Queensland; Geoffrey Goodhill, The University of Queensland

27. A Role of Image Contrast Enhancement Technique for Ophthalmologist as Diagnostic Tool for Diabetic Retinopathy

Toufique Ahmed Soomro, Charles Sturt University; Junbin Gao, The University of Sydney; Mohammad A. U Khan, Effat University; Tariq M Khan, Macquarie University; Manoranjan Paul, Charles Sturt University

28. utomated Plant and Leaf Separation: Application in 3D Meshes of Wheat Plants

Kirill Frolov, CSIRO Health and Biosecurity; Jurgen Fripp, CSIRO Health and Biosecurity; Chuong V. Nguyen, Australian National University; Robert Furbank, Australian National University; Geoff Bull, CSIRO Agriculture and Food; Peter Kuffner, CSIRO Agriculture and Food; Helen Daily, CSIRO Agriculture and Food; Xavier Sirault, CSIRO Agriculture and Food

29. Classification of Infection and Fluid Regions in Chest X-Ray Images

Wan Siti Halimatul Munirah Wan Ahmad, Multimedia University; Mohammad Faizal Ahmad Fauzi, Multimedia University; Wooi Haw Tan, Multimedia University; Wan Mimi Diyana Wan Zaki, Universiti Kebangsaan Malaysia

30. Automatic Retinal Vessel Extraction Algorithm

Toufique Ahmed Soomro, Charles Sturt University; Mohammad A. U Khan, Effat University; Junbin Gao, The University of Sydney; Tariq M Khan, Macquarie University; Manoranjan Paul, Charles Sturt University; Nighat Mir, Effat University

31. Hippocampus Segmentation Based on Orientation-Scale Descriptor and Sparse Coding

Ying Liu, Southern Medical University; Minghui Zhang, Southern Medical University; Wei Yang, Southern medical university; Zhentai Lu, Southern Medical University; Qianjin Feng, Southern Medical University

32. Surface Shape Morphometry for Hippocampal Modeling in Alzheimer's Disease

Shantanu H Joshi, University of California Los Angeles; Qian Xie, Florida State University; Sebastian Kurtek, The Ohio State University; Anuj Srivastava, Florida State University; Hamid Laga, Murdoch University

Motion and Tracking

33. Bullet-proof Robust Real-time Ball Tracking

Daniel G Cardenas, Universidad Tecnica Federico Santa Maria; Marcos D Zuniga, Universidad Tecnica Federico Santa Maria

34. Parallel Bin-Occupancy Filter for Image Observation

Ran Zhu, National University of Defense Technology; Yunli Long, National University of Defense Technology; Jungang Yang, National University of Defense Technology; Wei An, National University of Defense Technology

Statistics and Learning

35. Plant Classification from Leaf Textures

Schubert R. Carvalho, Vale Institute of Technology; Ana C. Siravenha, Vale Institute of Technology

36. An Improved Extreme Learning Machine with Parallelized Feature Mapping Structures

Lihua Guo, School of Electronic and Information Engineering, South China University of Technology; Alan Wee-Chung Liew, Griffith University

37. Kangaroo Vehicle Collision Detection Using Deep Semantic Segmentation Convolutional Neural Network

Khaled Saleh Deakin University; Mohammed Hossny, Deakin University; Saeid Nahavandi, Deakin University

38. Kangaroo Vehicle Collision Detection Using Deep Semantic Segmentation Convolutional Neural Network

Khaled Saleh Deakin University; Mohammed Hossny, Deakin University; Saeid Nahavandi, Deakin University

39. A Simple Parallel EM Algorithm for Statistical Learning via Mixture Models

Sharon X. Lee, University of Queensland; Kaleb L. Leemaqz, University of Queensland; Geoffrey J. McLachlan, University of Queensland

40. MLE-Based Learning on Grassmann Manifolds

Muhammad Ali, Charles Sturt University; Junbin Gao, The University of Sydney; Michael Antolovich, Charles Sturt University

16:00-17:00   Oral Session 5 – Medical Imaging

Session Chair: Brian Lovell, University of Queensland

1.   Finite Radial Reconstruction for Magnetic Resonance Imaging: A Theoretical Study

Shekhar Chandra, University of Queensland; Ramitha Archchige, University of Queensland; Gary Ruben, CSIRO; Jin Jin, University of Queensland; Mingyan Li, University of Queensland, Andrew Kingston, Australian National University, Imants Svalbe, Monash University, and Stuart Crozier, University of Queensland

2.   A novel Graph-based Segmentation method for Breast Ultrasound Images

Yaozhong Luo, South China University of Technology; Shaojuan Han, Affiliated Hospital of South China University of Technology; Qinghua Huang, South China University of Technology

3. Coherence Analysis of Compressive Sensing Based Magnetic Resonance Imaging Reconstruction

Kai Zhu, Swinburne University of Technology, Australia; Cishen Zhang, Swinburne University of Technology; Jingxin Zhang, Swinburne University of Technology

17:00-18:00   APRS AGM
Location: Boulevard 1

18:00-18:45   Skypoint Tour and Welcome Drink

18:45-22:00   Conference Banquet

Conference Program

Friday, 2 December
Location:
Boulevard 2 & 3 (Oral Session)

8:30-9:00   Registration

9:00-10:00   Keynote 4

Are You a human or a Robot?

Professor Yanxi Liu, Penn State University, USA

Session Chair: Yongsheng Gao, Griffith University

10:00-10:30   Morning Tea

10:30-12:10   Oral Session 6 – Detection and Geometry

Session Chair: Murk Bottema, Flinders University

1.   Complex Event Detection Using Joint Max Margin and Semantic Features

Iman Abbasnejad, Carnegie Mellon University; Queensland University of Technology; Sridha Sridharan, Queensland University of Technology; Simon Denman, Queensland University of Technology; Clinton Fookes, Queensland University of Technology; Simon Lucey, Carnegie Mellon University

2.   Decomposition of 3D Binary Objects into Rectangular Blocks

Cyril Höschl, Institute of Information Theory and Automation of the CAS; Jan Flusser, Institute of Information Theory and Automation of the CAS

3. An Effective Multi-Chord Corner Detection Technique

Naurin Afrin, Swinburne University of Technology; Nabeel Mohammed, University of Liberal Arts Bangladesh; Wei Lai, Swinburne University of Technology

4.   Efficient Vanishing Point Estimation for Unstructured Road Scenes

Linh Nguyen, University of Wollongong; Son Lam Phung, University of Wollongong; Abdesselam Bouzerdoum, University of Wollongong

5.   Evaluation of the Viewpoint Shift for a Fisheye Lens Based on Stereo Geometry

Nobuyuki Kita, National Institute of Advanced Industrial Science and Technology

12:10-13:30   Lunch

13:30-15:10   Oral Session 7 – Image Retrieval and Applications

Session Chair: Jun Zhou, Griffith University

1.   SLNSW-UTS: A Historical Image Dataset for Image Multi-Labeling and Retrieval

Junjie Zhang, University of Technology Sydney; Jian Zhang, University of Technology Sydney; Jianfeng Lu, Nanjing University of Science and Technology; Chunhua Shen, University of Adelaide; Kate Curr, State Library of New South Wales; Robin Phua, State Library of New South Wales; Richard Neville, State Library of New South Wales; Elise Edmonds, State Library of New South Wales

2.   Semi-supervised Weight Learning for the Spatial Search Method in ConvNet-based Image Retrieval

Yan Zhao, University of Wollongong; Lei Wang, University of Wollongong; Zhimin Gao, University of Wollongong; Ian Comor, University of Wollongong; Weichen Zhang, University of Sydney

3.   Automatic Eye Type Detection in Retinal Fundus Image Using Fusion of Transfer Learning and Anatomical Features *Pallab Kanti Roy, IBM Research Australia; Rajib Chakravorty, IBM Research Australia; Suman Sedai, IBM Research Australia; Dwarikanath Mahapatra, IBM Research Australia; Rahil Garnavi, IBM Research, Australia*

4. A Fast and Accurate Image-Registration Algorithm Using Prior Knowledge

Jan Kallwies, University of the Bundeswehr Munich; Torsten Engler, University of the Bundeswehr Munich; and Hans-Joachim Wuensche, University of the Bundeswehr Munich

5. An Optimized and Fast Scheme for Real-time Human Detection Using Raspberry Pi

Mubashir Noman, University of Engg. & Tech. Taxila; Muhammad Haroon Yousaf, University of Engg. & Tech. Taxila; Sergio A Velastin, Universidad Carlos III de Madrid

15:10-15:40 Afternoon Tea

15:40-17:00 Oral Session 8 – Image Segmentation

Session Chair: Yongsheng Gao, Griffith University

1. MR Brain Image Segmentation Based on Unsupervised and Semi-Supervised Fuzzy Clustering Methods

Hayat Al-Dmour, University of Technology Sydney; Ahmed Al-Ani, University of Technology Sydney

2. Flexible Mixture Models for Colour Image Segmentation of Natural Images

Thorsten Wilhelm, TU Dortmund; Christian Wöhler, TU Dortmund

3. White Blood Cell Nuclei Segmentation Using Level Set Methods and Geometric Active Contours

Khamael Al-Dulaimi, QUT; Inmaculada Tomeo-Reyes, Queensland University of Technology; Jasmine Banks, Queensland University of Technology; Vinod Chandran, Queensland University of Technology

4. Segmentation of the Left Ventricle in Echocardiography Using Contextual Shape Model

Gregg Belous, Griffith University; Andrew Busch, Griffith University; David Rowlands, Griffith University; Yongsheng Gao, Griffith University

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