

2016 Annual Report (June 2015 – May 2016)
Multimedia Systems and Applications Technical Committee
IEEE Circuits and Systems Society

Chairman: Dr. Zicheng Liu
Secretary: Dr. Shao-Yi Chien

TC Activity Summary

In the past year, MSA TC members have shown strong leadership in the multimedia research community. Our members have played key roles (e.g. general chairs/program chairs) in organizing many international conferences on multimedia including ICME2015, ICME2016, ECCV2016, ICCV2017, DSP2015, APSIPA ASC 2016, etc. Our members are also very active in serving as associate editors and EiCs of many IEEE and non-IEEE journals such as TMM, TCSVT, JETCAS, Multimedia Magazine, JVCI, etc. Many members have received prestigious awards and we just name a few here. Prof. Jay Kuo received both the IEEE Computer Society Taylor L. Booth Education Award and the IEEE Circuits and Systems Society John Choma Education Award. Dr. Yong Rui received the IEEE Computer Society Technical Achievement award. Prof. Chang Wen Chen received the Chancellor’s Award for Excellence in Scholarship and Creative Activities in State University of New York. Dr. Nicu Sebe received the best paper award of ACM Multimedia 2015. Dr. Qi Tian received the best paper award of ACM ICMR2015.

MSA TC members have continued to advance the state of the art in multimedia by publishing high quality papers on the top journals and conferences. In the past year, we have seen strong research activities in multimedia content analysis and retrieval, human attention and perception modeling, 3D and depth processing, etc. In content analysis and retrieval, our members have proposed new visual representations and learning techniques for object recognition and search. In human attention and perception modeling, there are works on using focus modeling to improve image acquisition, developing perceptually-aware features for recognition, leveraging user interactions to improve image search, and modifying image content to guide people’s attention. In 3D and depth processing, there is a special session on “3D Imaging for Health monitoring and Interventions”, a tutorial on “3D Video System with Depth-Image-Based Rendering: from multi-view video to depth-based 3D video”, a tutorial on “Perceptual 3D Image/Video Processing”, an overview paper on “Multiview and 3D Extensions of High Efficiency Video Coding”. There are works on leveraging depth sensor to enable novel interactions with a large touch display and enhancing depth sensation for multiple virtual view rendering.

1. TC Activities June 2015 – May 2016:

1.1. New Election Results

- ICME steering committee members: Shipeng Li, Tao Mei
- New members (term: 2015/9~2019/8): Anthony Vetro, Jay Kuo, Homer Chen, Jianfei Cai, Ming-Ting Sun, and Wenwu Zhu, Ce Zhu, Cha Zhang, Ivan Bajic, Marta Mrak, Nicu Sebe, Qi Tian, and Wen-Huang Cheng

1.2. Subcommittees

- TC by-law/P&P sub-committee: Zicheng Liu (Chair), Yen-Kuang Chen, Chia-Wen Lin, Samson Cheung, Joern Ostermann, Anthony Vetro, Yap-Peng Tan
- Technical vision sub-committee: Jian Zhang (Chair), Yen-Kuang Chen, Shao-Yi Chien, JongWon Kim, Yong Rui, Wenjun Zeng
- Membership and election sub-committee: Yap-Peng Tan (Chair), Wenjun Zeng, Enrico Magli, Ying Li
- Award and nomination sub-committee: Anthony Vetro (Chair), Ming-Ting Sun, Ling Guan, Homer Chen, and Pascal Frossard
- T-MM Subcommittee: Ching-Yung Lin (Chair), C.-C. Jay Kuo, Ming-Ting Sun, Yong Rui, Moncef Gabbouj, Anthony Vetro, Pascal Frossard, Wenjun Zeng, Yen-Kuang Chen, Zicheng Liu, Chia-Wen Lin
- On-line community sub-committee:
- TC Newsletters: Shao-Yi Chien

2. Technical Committee Meetings:

The Multimedia Systems and Applications Technical Committee in the IEEE Circuits and Systems Society annually organized two TC meetings, which were held in ISCAS and ICME. The details of TC Meetings are enlisted in the following:

2.1. Upcoming TC Meeting in ISCAS 2016

Date: May 24, 2016
 Time: 12:00—13:00
 Location: Salon 2
 Chairman: Zicheng Liu
 Secretary: Shao-Yi Chien

3. Members submitted Annual Reports:

First Name	Last Name	Affiliation	Email
Zicheng	Liu	Microsoft Research, USA	zliu@microsoft.com
Shao-Yi	Chien	National Taiwan University, Taiwan	sychien@ntu.edu.tw
Yen-Kuang	Chen	Intel Corp., USA	yen-kuang.chen@intel.com
Xian-Sheng Hua	Hua	Alibaba, China	huaxiansheng@gmail.com
Jie	Liang	Simon Fraser University, Canada	jiel@sfu.ca
Tao	Mei	Microsoft Research Asia	tmei@microsoft.com
Junsong	Yuan	Nanyang Technological University, Singapore	jsyuan@ntu.edu.sg
Nicu	Sebe	University of Trento, Italy	sebe@disi.unitn.it
Ying	Li	IBM T.J. Watson Research Center, USA	yingli@us.ibm.com
C.-C. Jay	Kuo	University of Southern California, USA	cckuo@sipi.usc.edu
Homer	Chen	National Taiwan University, Taiwan	homer@ntu.edu.tw
Yong	Rui	Microsoft Research, China	yongrui@microsoft.com
Bin-Da	Liu	National Cheng Kung University	bdliu@mail.ncku.edu.tw
Enrico	Magli	Politecnico di Torino, Italy	Enrico.magli@polito.it
Chia-Wen	Lin	National Tsing Hua University, Taiwan	cwlin@ee.nthu.edu.tw
Meng	Wang	Hefei University of Technology, China	eric.mengwang@gmail.com
Weisi	Lin	Nanyang Technological University, Singapore	wslin@ntu.edu.sg
Ming-Ting	Sun	University of Washington	mts@uw.edu
Jiwen	Lu	Tsinghua University, Beijing, China	lujiwen@tsinghua.edu.cn
Anthony	Vetro	Mitsubishi Electric Research Labs, USA	avetro@merl.com
Sen-ching	Cheung	University of Kentucky, USA	sccheung@ieee.org
Ce	Zhu	University of Electronic Science & Technology of China, China	eczhu@uestc.edu.cn

Ivan	Bajić	Simon Fraser University, Canada	ibajic@ensc.sfu.ca
Jianfei	Cai	Nanyang Technological University, Singapore	asjfcai@ntu.edu.sg
Maria	Trocan	ISEP, France	maria.trocan@isep.fr
Lap-Pui	Chau	Nanyang Technological University, Singapore	elpchau@ntu.edu.sg
Rongshan	Yu	Institute for Infocomm Research, Singapore	ryu@i2r.a-star.edu.sg
Wen-Hsiao	Peng	National Chiao Tung University, Taiwan	wpeng@cs.nctu.edu.tw
Tian Sheuan	Chang	National Chiao Tung University, Taiwan	tschang@mail.nctu.edu.tw
Marta	Mrak	British Broadcasting Corporation (BBC)	marta.mrak@bbc.co.uk
Nam	Ling	Santa Clara University, USA	nling@scu.edu
Susanto	Rahardja	Northwestern Polytechnical University, Xi'an, China	susanto@nwpu.edu.cn
Qi	Tian	University of Texas at San Antonio	qitian@cs.utsa.edu
Chang Wen	Chen	SUNY-Buffalo, USA	chencw@buffalo.edu
Pau-Choo	Chung	National Cheng Kung University, Taiwan	pcchung@ee.ncku.edu.tw
Gwo Giun (Chris)	Lee	National Cheng Kung University, Taiwan	clee@mail.ncku.edu.tw

4. Accomplished Technical Activities (June 2015 to May 2016)

Conference organizations:

- ISCAS 2016: Zicheng Liu (Track Chair), Jianfei Cai (Track Co-chair), Susanto Rahardja (Technical Track Chair), Ying Li (Area chair), Lin Weisi (RCM), Ce Zhu (RCM), Ivan Bajić (RCM), Wen-Hsiao Peng (Session Chair, Review Committee Member), Tian Sheuan Chang (RCM), Maria Trocan (Area chair), Pau-Choo Chung (Women in CAS Society Committee)
- ICME 2015: Enrico Magli (General Chair), Anthony Vetro (General Chair), Anthony Vetro (General Chair), Tao Mei (TPC Co-chair), Shao-Yi Chien (Area Chair), Jie Liang (Area Chair), Ying Li (Area chair), Jiwen Lu (Area Chair), Sen-ching Cheung (Area Chair), Rongshan Yu (Area Chair), Wen-Hsiao Peng (Area Chair), Qi Tian (Area Chair), Sen-ching Cheung (Special Session Organizer), Homer Chen (award committee), Chia-Wen Lin (Liaison Chair & Publicity Chair), Ivan Bajić (Special Sessions Co-Chair), Maria Trocan (Technical Program Committee member)
- ACM Multimedia 2015: Qi Tian (General Chair), Yong Rui (Brave New Topics Chair), Nicu Sebe (Area Chair), Meng Wang (Area Chair), Zicheng Liu (Area Chair), Chang Wen Chen (Panel Chair)
- MMSP 2015: Tao Mei (TPC Co-chair), Chia-Wen Lin (Finance Chair), Sen-ching Cheung (TPC Member), Ce Zhu (Award Committee Member), Ivan Bajić (Publicity Co-Chair)
- VLSI-DAT 2016: Shao-Yi Chien (Industrial Session Organizer), Gwo Giun (Chris) Lee (TPC for Embedded System Sub-Track)
- ICCE-TW 2015: Shao-Yi Chien (Special Session Organizer)
- VCIP 2015: Junsong Yuan (program Co-Chair), Jie Liang (Track Chair), Yong Rui (Keynote Speaker), Jiwen Lu (Special Session Co-Chair), Wen-Hsiao Peng (Tutorial Speaker), Wen-Hsiao Peng (Area Chair), Wen-Hsiao Peng (Session Chair)
- CISP2015: Jie Liang (Program Co-Chair)
- ChinaSIP 2015: Ce Zhu (Technical Program Chair), Jie Liang (Track Chair), Sen-ching Cheung (Track Chair), Qi Tian (Track Chair)
- ICIP 2015: Tao Mei (Area Chair), Weisi Lin (Area Chair), Sen-ching Cheung (Area Chair), Marta Mrak (area chair), Qi Tian (Area Chair), Maria Trocan (Technical Program Committee member)
- ICCV 2015: Nicu Sebe (Area Chair)
- ISM 2015: Ying Li (Panel co-chair)
- BigMM 2015: Ying Li (Area chair)
- APSIPA ASC 2015: C.-C. Jay Kuo (Advisory Committee Co-Chair)
- ICIG 2015: Yong Rui (General Chair), ICIG 2015: Ce Zhu (Program Committee Chair)
- Pacific-Rim Conf. On Multimedia (PCM), 2015: Weisi Lin (Tutorial Chair)
- ICB 2016: Jiwen Lu (Area Chair)
- WACV 2016: Jiwen Lu (Area Chair)
- WIFS 2015: Sen-ching Cheung (Demo Chair)

- PV 2015: Ce Zhu (Program Co-Chair)
- IEEE IWCIM 2015: Maria Trocan (General Co-Chair)
- ICECS'2015 – 2016: Maria Trocan (Technical and Organizing Committee member)
- IEEE PRIME 2015 – 2016: Maria Trocan (Organizing Committee member)
- IEEE ICASSP 2015: Maria Trocan (Technical Program Committee)
- MISSI 2016: Maria Trocan (Technical Program Committee member -Special Sessions chair)
- IEEE DSP 2015: Lap-Pui Chau (General Co-chairs)
- ICICS 2015: Lap-Pui Chau (General Co-chairs)
- SiPS 2015: Nam Ling (General Chair)
- Umedia 2015: Nam Ling (General Co-Chair)
- ICIEA 2015: Nam Ling (Int'l Advisory Committee)
- IEEE TENSYP 2016: Susanto Rahardja (General Co-Chair)
- EUSIPCO 2015: Susanto Rahardja (Reviewer)
- ACM ICMR 2015: Qi Tian (Workshop Co-Chair)
- IWAIT 2015: Pau-Choo Chung (General Chair)
- IEEE GlobalSIP 2015: Symposium on Signal Processing on Graphics Processing Units and Multicores
Gwo Giun Chris Lee (Invited Session Chair); Panel Discussion entitled "Algorithms vs. Architectures: Opportunities and Challenges in Multicore/GPU DSP". Gwo Giun Chris Lee (Organizer and Moderator).

IEEE and Other Journal Editorships:

- IEEE Transactions on Multimedia: EiC: Chang Wen Chen; Steering committee members: Wenwu Zhu, and Zicheng Liu; AEs: Tao Mei, Enrico Magli, Sen-ching Cheung, Ivan Bajić, Qi Tian; Best Paper Committee: Qi Tian (co-chair)
- IEEE Multimedia Magazine: EiC: Yong Rui; AE: Chia-Wen Lin
- IEEE Transactions on Circuits & Systems for Video Technology: Deputy EiC: Shipeng Li; AEs: Shao-Yi Chien, Jie Liang, Junsong Yuan, Enrico Magli, Meng Wang, Ce Zhu, Lap-Pui Chau, Tian Sheuan Chang, Qi Tian; Best Paper Award Selection Committee: Yen-Kuang Chen, Weisi Lin
- IEEE Transactions on Circuits and System I: AEs: Bin-Da Liu
- IEEE Transactions on Circuits and Systems-II: AEs: Bin-Da Liu, Lap-Pui Chau
- IEEE Journal on Emerging and Selected Topics in Circuits and Systems: EiC: Yen-Kuang Chen; Deputy EiC.; Senior Editors: Anthony Vetro; Guest Editors: Wen-Hsiao Peng
- IEEE Journal of Selected Topics in Signal Processing: Senior Editors: Susanto Rahardja
- IEEE Transactions on Image Processing: AEs: Jie Liang, Junsong Yuan, Weisi Lin, Jianfei Cai
- IEEE Signal Processing Letters: AEs: Jie Liang, Weisi Lin, Ce Zhu
- Signal Processing: Image Communication: Area Editors: Jie Liang, Ce Zhu, Marta Mrak
- EURASIP Journal on Image and Video Processing: AEs: Jie Liang
- ACM Trans. on Multimedia Computing, Communications, and Applications: AEs: Tao Mei
- ACM Transactions on Intelligent Systems and Technology: AE: Nicu Sebe
- International Journal of Human Computer Studies: AE: Nicu Sebe
- Computer Vision and Image Understanding: AE: Nicu Sebe
- Journal of Multimedia: Associate Editor: AE: Nicu Sebe, Qi Tian
- Machine Vision and Applications: AE: Nicu Sebe
- Image and Vision Computing: AE: Nicu Sebe
- IEEE Transactions on Big Data: Special Issue Guest Editor: Nicu Sebe
- Journal of Visual Communications and Image Representation (JVCI): Editor-in-Chief: Ming-Ting Sun, Zicheng Liu; AEs: C.-C. Jay Kuo, Ying Li, Weisi Lin, Susanto Rahardja; Best Paper Award Selection Committee Member: Susanto Rahardja
- International Journal of Multimedia Information Retrieval (IJMIR): AEs: Ying Li
- Springer LNCS Transactions on Data Hiding and Multimedia Security: C.-C. Jay Kuo
- IEEE Journal of Selected Topics on Signal Processing: Senior Editors: C.-C. Jay Kuo; Guest Editors: Enrico Magli
- ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM): AEs: Yong Rui, Qi Tian
- IEEE Transactions on Knowledge and Data Engineering: AEs: Meng Wang
- IEEE Access: AEs: Jiwen Lu, Rongshan Yu
- Pattern Recognition Letters: AEs: Jiwen Lu

- Neurocomputing: AEs: Jiwen Lu
- Machine Vision and Applications journal, AE: Zicheng Liu
- IEEE Transactions on Information Forensics and Security: AEs: Sen-ching Cheung
- IEEE Transactions on Broadcasting: AEs: Ce Zhu, Lap-Pui Chau
- IEEE Signal Processing Magazine: AEs: Ivan Bajić
- IEEE Transactions on Speech, Audio and Language Processing: AE: Rongshan Yu
- Springer Journal on Signal, Image and Video Processing: AEs: Maria Trocan
- The Visual Computer: AEs: Lap-Pui Chau
- Multidimensional Systems and Signal Processing (Springer): AE: Nam Ling
- Human-centric Computing and Information Sciences (Springer): AE: Nam Ling
- Multimedia Systems Journal (MMSJ): AEs: Qi Tian
- Journal of Machine Vision and Applications (MVA) : AEs: Qi Tian
- IEEE Journal on Selected Areas in Communications (J-SAC): Senior Editor: Chang Wen Chen
- IEEE Transactions on Biomedical Circuits and Systems: AEs: Pau-Choo Chung
- IEEE Transactions on Signal Processing: AE: Gwo Giun (Chris) Lee

Distinguished Lecturer:

- Lexin Xie (CAS, 2016—2017)
- Yen-Kuang Chen (CAS, 2016—2017)
- Weisi Lin (CAS, 2016—2017)
- Enrico Magli (CAS, 2015-2016)
- Ce Zhu, “Towards Global Rate Distortion Optimization in Video Coding” (DL talk), Seoul, Korea, September 21, 2015 (organized by IEEE BTS Seoul Chapter and IEEE Seoul Section)
- Lap-Pui Chau (IEEE Broadcast Technology Society)
- Nam Ling (APSIPA)

Keynote Speeches:

- C.-C. Jay Kuo, “Reflection on Image/Video Coding: Where Do We Go from Here?” the 10th International Conference on Information, Communications and Signal Processing, Singapore, December 2-4, 2015.
- C.-C. Jay Kuo, “Perceptual coding: hype or hope?” Keynote Speech at the Bay Area Multimedia Forum (BAMMF), San Jose, CA, November 5, 2015.
- C.-C. Jay Kuo, “Is there anything left in video coding?” IEEE China Summit and International Conference on Signal and Information Processing (ChinaSIP), Chengdu, China, July 12-15, 2015.
- Liang-Gee Chen, “Design and Implementation of Stereo Matching for Depth Estimation in Computer Vision Applications,” IEEE VCIP2015, Singapore, Dec. 13-16, 2015.
- Yong Rui, “Computer Vision: From Recognition to Understanding,” IEEE VCIP2015, Singapore, Dec. 13-16, 2015.
- Enrico Magli, (9TH IEEE INTERNATIONAL SYMPOSIUM ON INTELLIGENT SIGNAL PROCESSING, 2015)
- Weisi Lin, Keynote Speech, International Workshop on Learning Semantics for Multimedia Big Data (LSMBD), in 3rd Asian Conference on Pattern Recognition (ACPR2015), 3-6 Nov 2015.
- Ce Zhu, "Visual Distortion Detection and Reduction in 3D Video," 11th International Conference on Intelligent Information Hiding and Multimedia Signal Processing (IIH-MSP 2015), Adelaide, Australia, September 2015
- Lap-Pui Chau, Computer Graphics International (CGI 2015)
- Rongshan Yu, From $O(n)$ to $O(1)$: When Large Scale Similarity Search Meets Near to Data Computing, Industrial talk at MMSP 2015
- Qi Tian, “Large-scale Visual Search”, VALSE 2015, Chengdu, May 8-10, 2015
- Chang Wen Chen, MMSP2015 Keynote: Media Recommendation in the New Era of Mobile Social Environments, October 2015.
- Chang Wen Chen, IEEE GlobalSIP2015 Keynote: DASH Video Streaming in the New Era of Cloud and Mobile Environments: Challenges and Solutions, December 2015.
- Chang Wen Chen, MMM2016 Multimedia Modeling 2016 Keynote: Media Recommendation in the New Era of Mobile Social Environments, January 2016.

- Chang Wen Chen, Electronic Imaging 2016 Keynote: Browsing heterogeneous multimedia social networks contents on mobile devices, February 2016.

Other IEEE services (e.g., CAS BoG, Region presidents, VP, ...) :

- CAS BoG: Maria Trocan
- Enrico Magli, chair of MMSP-TC (SPS)
- CAS Fellow Evaluation Committee: Anthony Vetro
- IEEE Signal Processing Society: Vancouver Chapter Chair (Ivan Bajić)
- CAS R8 representative: Maria Trocan
- IEEE France Student Activities VP: Maria Trocan
- Marta Mrak, TC MMSP (Committee Member)
- Chang Wen Chen, IEEE CASS Vice President for Finance and Administrative Activities, 2016-2017
- Pau-Choo Chung : IEEE CIS VP for Members Activities
- Gwo Giun (Chris) Lee: IEEE Tainan Section BoG:

Awards and Honors (e.g., Fellow, best paper awards, outstanding services, etc...):

- New IEEE Fellow (Class of 2016) : Qi Tian, Xian-Sheng Hua, Weisi Lin
- Jay kuo: 2016 Taylor L. Booth Education Award
- Yong Rui: IEEE Computer Society Technical Achievement award
- Xian-Sheng Hua: ACM Distinguished Scientist 2015
- Nicu Sebe: Best Paper Award of ACM Multimedia 2015
- C.-C. Jay Kuo: IEEE Circuits and Systems Society John Choma Education Award
- C.-C. Jay Kuo: IEEE Computer Society Taylor L. Booth Education Award
- C.-C. Jay Kuo: USC Associates Award for Excellence in Teaching
- Meng Wang: PCM 2015 Best Paper Award
- Nam Ling, Sanfilippo Family Chair Professor, Santa Clara University, USA (re-appointed).
- Nam Ling, Cuiying Chair Professor, Lanzhou University, China (re-appointed).
- ACM ICMR Best Paper: L. Xie, R. Hong, B. Zhang, and **Q. Tian**, "Image Classification and Retrieval are ONE," ACM International Conference on Multimedia Retrieval (ICMR), Best Paper Award, pp. 3-10, June 23-26, 2015, Shanghai, P. R. China.
- Best Student Paper Candidate, the IEEE International Conference on Multimedia and Expo (ICME), July 28-July 2, 2015. J. Cai, R. Hong, M. Wang and **Qi Tian**, "Exploring Feature Space with Semantic Attributes," oral, Best Student Paper Candidate, IEEE International Conference on Multimedia and Expo (ICME), pp. 1-6, June 29-July 3, 2015, Torino, Italy.
- Chang Wen Chen, Chancellor's Award for Excellence in Scholarship and Creative Activities in State University of New York

Upcoming Event and Future Conference Activities

- ICME 2016: Ming-Ting Sun (General Chair), Anthony Vetro (Technical Program Co-Chair), Lap-Pui Chau (Program chairs), Lexing Xie (Tutorial Co-Chair), Yen-Kuang Chen (Sponsorship Chair), Shao-Yi Chien (Social Media Chair), Jie Liang (Web Chair), Jie Liang (Area Chair), Tao Mei (Area Chair), Sen-ching Cheung (Area Chair), Sen-ching Cheung (Workshop Organizer), Chia-Wen Lin (Publication Chair), Junsong Yuan (Publication Co-Chair), Ying Li (Finance Co-Chair), Weisi Lin (Area Chair), Zicheng Liu (Local Chair), Ivan Bajić (Student Program Co-Chair)
- VCIP 2016: Xian-Sheng Hua (Program Co-Chair), Jianfei Cai (TPC Co-chair), Weisi Lin (Tutorial Chair), Wen-Hsiao Peng (Area Chair)
- MMSP 2016: Jianfei Cai (Area Chair), Marta Mrak (area chair)
- MMM 2016, Nicu Sebe (General Chair), Qi Tian (General Chair)
- ECCV 2016: Nicu Sebe (Program Chair), Qi Tian (Area Chair)
- ACM ICMR 2017: Nicu Sebe (General Chair)
- IEEE ICCV 2017: Nicu Sebe (Program Chair)
- VCIP 2017: Ying Li (General Co-Chair), Weisi Lin (Technical Program Co-Chair), Zicheng Liu (Adviser)
- APSIPA ASC 2016: C.-C. Jay Kuo (Conference Co-Chair)
- ACM Multimedia 2016: Meng Wang (Publicity Co-Chair), Qi Tian (Area Chair)

- PCM 2016: Meng Wang (Program Co-Chair)
- ACCV 2016: Jiwen Lu (Workshop Co-Chair)
- BTAS 2016: Jiwen Lu (Area Chair)
- ACM ICMI 2015: Zicheng Liu (Local Chair)
- FG 2017, Zicheng Liu (Area Chair)
- ICIP 2016: Ce Zhu (Area Chair), Jianfei Cai (area chair), Qi Tian (Area Chair)
- CCECE 2016: Ivan Bajić (Tutorials Co-Chair)
- IEEE IWCIM 2016: Maria Trocan (Program Chair)
- WF-IoT 2016: Rongshan Yu (TPC co-chair)
- ICIP 2019: Wen-Hsiao Peng (Publication Chair, Confirmed)
- MMSP 2017: Marta Mrak (Industry Liaison)
- Umedia 2016: Nam Ling (General Co-Chair)
- ICIEA 2016: Nam Ling (Int'l Advisory Committee)
- ICASSP 2017: Nam Ling (Exhibit Chair), Susanto Rahardja (Publicity Chair)
- ICPR 2016: Qi Tian (Area Chair)
- AAPCAS 2016: Gwo Giun (Chris) Lee (Special Session Co-Chair)
- ICCE-TW 2016: Gwo Giun (Chris) Lee (Special Session Organizer),

5. TC Significant Activities List

[Please list your 2 (or less) most significant activities in the past year (March 2015--May 2016), including paper, special session, special issue, workshop, conference, award, important position, etc]

[Editor-in-Chief] **Yen-Kuang Chen** serves as the Editor-in-Chief IEEE Journal on Emerging and Selected Topics in Circuits and Systems, 2016-2017

The IEEE Journal on Emerging and Selected Topics in Circuits and Systems publishes special issues on emerging and selected topics that cover the entire scope of the IEEE Circuits and Systems (CAS) Society, namely the theory, analysis, design, tools, and implementation of circuits and systems, spanning their theoretical foundations, applications, and architectures for signal and information processing.

[Distinguished Lecturer] **Yen-Kuang Chen** is selected as the Distinguished Lecturer, IEEE Circuits and Systems Society, 2016-2017

In the future, digital sensing, communication, and processing capabilities will be ubiquitously embedded into everyday objects, turning them into the Internet of Things (IoT). This seminar aims to discuss the technical trends and challenges of circuits and systems on Internet of Things.

[Paper] Yu-Jung Chen, Chao-Hsien Hsu, Chung-Yao Hung, Chia-Ming Chang, Shan-Yi Chuang, Liang-Gee Chen, and **Shao-Yi Chien**, "A 130.3 mW 16-core mobile GPU with power-aware pixel approximation techniques," *IEEE Journal of Solid-State Circuits*, vol. 50, no. 9, pp. 2212-2223, Sep. 2015

50-word summary: Approximate rendering, a whole new perspective of low power design for GPU, is proposed in this paper. It can trade-off between power consumption and visual quality to provide power-aware capability. The implementation results with TSMC 45nm technology show that 52.32% of the power consumption of the shader processors can be reduced.

[Tutorial] **Shao-Yi Chien**, Perceptual 3D Image/Video Processing, **Tutorial in International Display Manufacturing Conference and 3D Systems and Applications (IDMC/3DSA) 2015**.

50-word summary: IDMC/3DSA is an important international industry event about 3D display. In this tutorial, circuits and systems for 3D image/video processing are introduced to audiences from the industry. The topics cover human perception, sense of reality, visual comfort, and processing techniques for 3D image/video acquisition and display.

[Invited Speaker] **Lexing Xie** was one of the invited speakers in the Multimedia Frontiers Workshop, Oct 2015, Brisbane, this workshop “celebrates rising leadership in the multimedia community”, and was “exclusively reserved to highlight invited talks by rising stars who have received PhD degree within the last 10 years and demonstrated exceptional potential in multimedia research.” http://sigmm.org/news/sigmm_workshop_mf

[IEEE ComSoc MMTC Best Journal Paper Award] Suman Deb Roy, **Tao Mei**, Wenjun Zeng, and Shipeng Li, “Towards Cross-Domain Learning for Social Video Popularity Prediction”, IEEE Transactions on Multimedia, vol. 15, no. 6, pp. 1255-1267, October 2013

50-word summary: This paper presents the first work using social media as a sensor to predict online video popularity.

[Paper] Jingjing Meng, **Junsong Yuan**, Jiong Yang, Yap-Peng Tan, Gang Wang, “Object Instance Search in Videos via Spatio-Temporal Trajectory Discovery,” IEEE Trans. on Multimedia (T-MM), 2016

50-word summary: This work targets at searching for small visual object in large-scale videos. It explores the use of spatio-temporal cues to improve the quality of object instance search from videos. A new dataset, NTU-VOI, for video object instance search is presented in this paper. Experimental results on a 73-hour video dataset demonstrate that the advantages of the proposed approach.

[Paper] Das Sreyasee, **Junsong Yuan**, Yap-Peng Tan, Ling-Yu Duan, “Query-adaptive Small Object Search using Object Proposals and Shape-aware Descriptors,” IEEE Trans. on Multimedia (T-MM), 2016

50-word summary: This work targets at small visual object search in large-scale image dataset. It explores the recent object proposals for object search. Both appearance and edge features are used to locate the object instances. The performance on benchmark dataset shows competitive results of using the proposed method.

[Paper] G. Zen, L. Porzi, E. Sangineto, E. Ricci, and **N. Sebe**, Learning Personalized Models for Facial Expression Analysis and Gesture Recognition, IEEE Transactions on Multimedia, 18(4):775-788, April 2016.

50-word summary: In this work, we present a framework for personalizing classification models which does not require labeled target data. Personalization is achieved by devising a novel transfer learning approach. We evaluate our approach for pain recognition and action unit detection using visual data and gestures classification using inertial measurements.

[Paper] 11. W. Wang, Y. Yan, S. Winkler, and **N. Sebe**, Category Specific Dictionary Learning for Attribute Specific Feature Selection, IEEE Transactions on Image Processing, 25(3):1465-1478, March 2016

50-word summary: In this work, we propose a label-constrained dictionary learning approach combined with a multilayer filter. The feature selection is implemented at dictionary level, which can better preserve the structural information. A multilayer filter is developed to discover the representative and robust attribute specific bases.

[Paper] **Ying Li**, A. Sheopuri, “CREATIVE DESIGN OF COLOR PALETTES FOR PRODUCT PACKAGING”, ICME 2015, top 15% paper

50-word summary: This work explores the creativity of computers in assisting humans tackling design tasks. Specifically, we developed a system that can create color designs which are not only novel and visually appealing, but also conveying specific messages or emotions to be perceived by consumers, for a given product and brand.

This work has been applied to assist Marchesa (a top fashion design studio) design its dress for the Met

Gala 2016 (the lavish annual fashion event hosted by Vogue), as part of the partnership between Marchesa and IBM Watson. This whole new idea of fusing technology and fashion together has attracted a lot of media attention. See some media reports here: <http://www.wired.com/2016/05/ibms-watson-helped-design-karolina-kurkovas-light-dress-met-gala/>, <http://nymag.com/thecut/2016/04/met-gala-dress-designed-by-marchesa-ibm-watson-c-v-r.html>.

[Award] IEEE Circuits and Systems Society John Choma Education Award (C.-C. Jay Kuo)

50-word summary: The IEEE CAS John Choma Education Award honors the individual with exceptional contributions to education in a field within the scope of the CAS Society. Contributions are quantifiable by publication of textbooks, research supervision of both graduate and undergraduate students, short course development and personal participation in continual education within the field. The award is based on quality, continuity and originality of contribution.

[Award] IEEE Computer Society Taylor L. Booth Education Award (C.-C. Jay Kuo)

50-word summary: This award is given to individuals who have an outstanding record in computer science and engineering education, as established by some of the following criteria: achieving recognition as a teacher of renown in a relevant and applicable course; writing an influential text; leading, inspiring, or providing significant educational content during the creation of a curriculum in the field; and inspiring others to a career in computer science and engineering education.

[Paper] D.-C. Tsai and **H. H. Chen**, “Focus profile modeling,” *IEEE Trans. Image Process.*, vol. 25, no. 2, pp. 818-828, Feb. 2016.

50-word summary: Focus profile modeling is important to many imaging tasks. We develop an approach that entails a transformation to convert the representation of a focus profile to quadratic form. It makes the search of in-focus lens position a mathematically tractable problem and improves the efficiency and accuracy of image acquisition.

[paper] J Yu, D Tao, M Wang, **Y. Rui**, Learning to rank using user clicks and visual features for image retrieval, *Cybernetics*, IEEE Transactions on

50-word summary: Visual features and click features are simultaneously utilized to obtain the ranking model. Specifically, the proposed approach is based on large margin structured output learning and the visual consistency is integrated with the click features through a hypergraph regularizer term. In accordance with the fast alternating linearization method, we design a novel algorithm to optimize the objective function.

[Conference] Organization of ICME 2015 conference

50-word summary: Enrico Magli served as lead general chair of the IEEE ICME 2015 conference, which was held in Torino, Italy between June and July 2015. ICME is one of the main venues for multimedia research. The conference was successfully organized and provided more-than-expected surplus to IEEE.

[Paper] D. Valsesia, G. Coluccia, T. Bianchi, **E. Magli**, “Large-Scale Image Retrieval Based on Compressed Camera Identification,” *IEEE Transactions on Multimedia*, v. 17, n. 9, pp. 1439-1449, 2015.

50-word summary: This paper introduces a new paradigm whereby images are searched “by device” instead of “by content”. A compressed sensor fingerprint format is developed, along with suitable storing and search procedures, enabling retrieval of all images shot by a given device from a very large database.

[Paper] Li-Wei Kang, Chih-Chung Hsu, Boqi Zhuang, **Chia-Wen Lin**, and Chia-Hung Yeh, “Learning-based joint super-resolution and deblocking for a highly compressed image,” *IEEE Trans. Multimedia*, vol. 17, no. 7, pp. 921–934, July 2015.

50-word summary: This paper proposes a novel learning-based framework to learn image sparse representations for modeling the relationship between low- and high-resolution image patches in terms of the learned dictionaries for image patches with and without blocking artifacts, respectively. As a

result, image SR and deblocking can be simultaneously achieved via sparse representation and morphological component analysis based image decomposition.

[Paper & Award] Chao Zhou and **Chia-Wen Lin**, “A Markov decision based rate adaption approach for dynamic HTTP streaming,” in *Proc. IEEE Visual Communication and Image Processing (VCIP) Conf.*, Dec. 2015, Singapore. **(Best Paper Award)**

50-word summary: This work proposes a Markov decision-based rate adaptation scheme for maximizing the quality of user experience of video streaming in MPEG-DASH under time-varying channel conditions. It received IEEE VCIP 2015 Best Paper Award selected from 274 submissions

[Paper] Gaze Shifting Kernel: Engineering Perceptually- Aware Features for Scene Categorization, PCM 2015. (Best Paper Award)

50-word summary: This paper introduces a novel gaze shifting kernel for scene image categorization, focusing on discovering the mechanism of humans perceiving visually/semantically salient regions in a scene. Human-gaze-shifting-mimicked paths are encoded into an image kernel for discriminating different sceneries. Experiments have demonstrated the effectiveness of the approach on different datasets.

[Distinguished Lecturer], Weisi Lin is selected as Distinguished Lecturer IEEE Circuits and Systems Society, 2016-2017

Perception-driven Visual Signal Processing: Different perceptually-inspired signal processing techniques will be presented for signal acquisition, enhancement, communication, retrieval/search, adaptation and understanding. Much of the materials will be drawn upon the substantial experience in related academic and industrial projects, including opportunities enabled by the emerging big data and cloud media.

Ming-Ting Sun is the General Chair of IEEE ICME 2016

Ming-Ting Sun is the Honorary Chair of IEEE VCIP 2015

Jiwen Lu serves as the Leading Guest Editor, Pattern Recognition Special Issue on Distance Metric Learning for Pattern Recognition, 2016-2017

Jiwen Lu serves as the Guest Editor, Computer Vision and Image Understanding Special Issue on Language in Vision, 2016-2017

[Tutorial] **Jiwen Lu**, Distance Metric Learning for Visual Recognition, Tutorial in IEEE Conference on Pattern Recognition and Computer Vision (CVPR) 2015.

[Paper] Yucheng Wang, Jian Zhang, **Zicheng Liu**, Qiang Wu, Philip Chou, Zhengyou Zhang, Yunde Jia, “Handling Occlusion and Large Displacement through Improved RGB-D Scene Flow Estimation,” *IEEE Transactions on Circuits and Systems for Video Technology*, accepted, 2015.

50-word summary: How to handle occlusion and large displacement motion in scene flow estimation is an open problem in computer vision. This paper makes a significant stride in this direction. The key idea is to model the occlusion explicitly and simultaneously estimate the flow and the occlusion.

[Paper] Yinpeng Chen, **Zicheng Liu**, Phil Chou, Zhengyou Zhang, “VTouch: Vision-Enhanced Interaction for Large Touch Displays,” *IEEE International Conference on Multimedia and Expo*, 2015.

This paper demonstrates how visual understanding can be leveraged to enable novel interactions for large touch displays. By developing a polished working system and performing rigorous user studies, the paper shows that such a system is feasible in practice and people love it.

[Conference] Anthony Vetro: ICME 2015 was successfully held in July 2015 in Torino with strong leadership and contribution from many MSATC members (may reference above list of OC members). With more than 500 submissions, the conference featured 157 papers (30% acceptance), as well as a

rich workshop program and tutorial sessions. MSATC members are also actively contributing to the technical program of ICME 2016, which will be held in Seattle this July.

[Paper] G. Tech, Y. Chen, K. Müller, J.-R. Ohm, **A. Vetro**, Y.-K. Wang, "Overview of the Multiview and 3D Extensions of High Efficiency Video Coding," IEEE Transaction on Circuits & Systems for Video Technology," Vol. 26, No. 1, pp. 35-49, September 2015.

[Paper] **Cheung, S.-C.** 2015. Integrating Multimedia into Autism Intervention. IEEE Multimedia Magazine, vol. 22, issue 4, pp.4-10.

This is an invited article describing the progress of a 4-year project at University of Kentucky on developing multimedia-based instruction and intervention for autism. From the use of augmented reality to novel mirror displays, this article underlines the significance of applying multimedia technology to help individuals with autism.

[Special Session] ICME 2015 Special Session on "3D Imaging for Health Monitoring and Interventions," co-organized with **Cheung, S.-C.**, Gene Cheung, Vladimir Stankovic, and Ju Shen

This special session aims to provide a survey of the emerging health-related applications using commodity depth sensors, which offer the unique advantage of being non-intrusive and robust against environmental changes. Four papers were selected in the final program covering non-contact heart rate measurement, wellness assessment to autism intervention.

[Paper] S. Li, **C. Zhu**, Y.B. Gao, Y.M. Zhou, F. Dufaux, M.T. Sun, "Lagrangian Multiplier Adaptation for Rate-Distortion Optimization with Inter-frame Dependency," IEEE Transactions on Circuits and Systems for Video Technology, vol. 26, no. 1, pp. 117-129, Jan. 2016. (SPECIAL ISSUE ON HEVC EXTENSIONS AND EFFICIENT HEVC IMPLEMENTATIONS)

50-word summary: It addresses the longstanding dependent rate-distortion optimization (RDO) problem in video coding. We have formulated the sophisticated rate-distortion relationship of temporally dependent coding units under high-rate assumption, and proposed an effective and efficient solution via Lagrangian multiplier adaptation. Experimental results demonstrate superior performance over the latest HEVC standard codec.

[Tutorial] **C. Zhu**, "3D Video System with Depth-Image-Based Rendering: from multi-view video to depth-based 3D video", **Half-day tutorial at ISCAS 2015, Lisbon, Portugal, May 2015.**

50-word summary: It provides a basic coverage of the depth-based 3D video system, a complete chain ranging from 3D video content generation, view synthesis, to coding, transmission, visualization and quality evaluation. Some selected topics are touched in more details, such as virtual view synthesis of high quality and depth map coding.

[Journal Paper] V. A. Mateescu and **I. V. Bajić**, "Visual attention retargeting," IEEE MultiMedia, vol. 23, no. 1, pp. 82-91, Jan.-Mar. 2016

50-word summary: The paper formulates the problem of visual attention retargeting – modifying the properties or content of an image in order to guide viewers' attention to the desired position – and reviews the existing work on the topic.

[Conference Paper] S. H. Khatoonabadi, N. Vasconcelos, **I. V. Bajić**, and Y. Shan, "How many bits does it take for a stimulus to be salient?," Proc. IEEE CVPR'15, pp. 5501-5510, Boston, MA, Jun. 2015.

50-word summary: This paper introduces a new feature called operational block description length, and shows how it can be used to estimate saliency in video. The feature is simple to extract from the compressed bitstream, yet surprisingly accurate in predicting human fixations in video.

[paper] H. Zhu, F. Meng, **J. Cai** and S. Lu, "Beyond pixels: a comprehensive survey from bottom-up to semantic image segmentation and cosegmentation", Elsevier Journal of Visual Communications and Image Representation, vol. 34, Jan. 2016.

50-word summary: Jianfei and his students have recently written a comprehensive survey paper to summarize the recent advance on segmentation and co-segmentation including unsupervised, semi-supervised and fully supervised methods.

[Conference] **Jianfei Cai** is serving as the TPC Co-chair for VCIP 2016. He is actively promoting the conference. The conference is at very good situation, receiving more than 250 submissions.

[Paper] A. Akbari, **M. Trocan**, B. Granado, A Robust Image Transmission Scheme Over Lossy Channels using Data Hiding, in proc. of IEEE 23rd Telecommunications Forum TELFOR, 2015 – top 10% papers.

The paper addresses a novel robust image transmission scheme based on data partitioning and data hiding.

[Special Issue] Elena Blokhina, Nathalie Deltimple, **Maria Trocan**, Yann Deval, Ricardo Reis, Hervé Barthélemy, Introduction to the special issue on ICECS 2014, Analog Integrated Circuits and Signal Processing Journal, Volume 87, Issue 2, Pages 101-10, Publisher Springer US.

This Special Issue consists of the expanded version of selected contributions originally presented at the 21st IEEE International Conference on Electronics, Circuits, and Systems, IEEE ICECS 2014, held in Marseille, France in December 2014.

[Conference] General Co-chairs IEEE DSP 2015: Lap-Pui Chau

2015 IEEE International Conference on Digital Signal Processing (DSP) was initiated by Imperial College, London in 1968. DSP 2015 addresses the theory and application of filtering, coding, transmitting, estimating, detecting, analysing, recognising, synthesising, recording, and reproducing signals by means of digital devices or techniques. The conference attracted 300 delegates from all over the world.

[Conference] General chairs ICICS 2015: Lap-Pui Chau

The International Conference on Information, Communications and Signal Processing (ICICS) was initiated by Nanyang Technological University since 1997. The conference provided an opportunity for researchers around the world to exchange ideas and latest research results in areas such as multimedia systems, information systems, signal processing, communications, networking and related fields.

[Journal Editor] Wen-Hsiao Peng: Lead Guest Editor, IEEE Journal on Emerging and Selected Topics in Circuits and Systems, Special Issue on Screen Content Video Coding and Applications, Dec. 2016
This special issue, to be published in December 2016, presents the recent technical advances in emerging technologies for screen content video coding and applications. It includes several introductory papers on the newly published video coding standards, such as ISO/IEC and ITU-T HEVC Screen Content Coding Extensions and Video Electronics Standards Association (VESA) Display Stream Compression (DSC). Papers with topics addressing machine learning, quality assessment, applications and system implementations related to screen content video are also included to provide a comprehensive overview of this field.

[Tutorial] Wen-Hsiao Peng, Tutorial on HEVC Screen Content Coding (SCC) – Standardization and Technologies, Visual Communications and Image Processing (VCIP) Conference, 2015

This tutorial provides a timely introduction to the new ISO/IEC and ITU-T international standard, HEVC Screen Content Coding Extensions. Specifically, it covers (1) an overview of SCC standardization activities for HEVC and its extensions, (2) the challenges and issues in designing SCC algorithms, (3) the core technologies in this new standard, as well as (4) the recent implementations of SCC systems/applications.

[Technology transfer] Tian Sheuan Chang: Display compression IP to Novatek, Taiwan

[Book editor]

Book title: “High Dynamic Range Video: From Acquisition, to Display and Applications”

Editors: Frédéric Dufaux, Patrick Le Callet, Rafal Mantiuk, **Marta Mrak**

<http://store.elsevier.com/High-Dynamic-Range-Video/isbn-9780081004128/>

[Special session] Marta Mrak:

IWSSIP 2015, London, UK; Special session co-chair “PROVISION - Perceptually Optimised Video Compression”

Special session chairs: **Marta Mrak** (BBC R&D) and Karsten Müller (Fraunhofer HHI)

[Papers]

Yang Zhang; Matteo Naccari; Dimitris Agrafiotis; **Marta Mrak**; David R. Bull, “High Dynamic Range Video Compression Exploiting Luminance Masking,” *IEEE Transactions on Circuits and Systems for Video Technology*, Year: 2016, Volume: 26, Issue: 5, Pages: 950 - 964, DOI: 10.1109/TCSVT.2015.2426552

Thiow Keng Tan; Rajitha Weerakkody; **Marta Mrak**; Naeem Ramzan; Vittorio Baroncini; Jens-Rainer Ohm; Gary J. Sullivan, “Video Quality Evaluation Methodology and Verification Testing of HEVC Compression Performance,” *IEEE Transactions on Circuits and Systems for Video Technology*, Year: 2016, Volume: 26, Issue: 1, Pages: 76 - 90, DOI: 10.1109/TCSVT.2015.2477916

[Event Presentation]

Presentation at SMPTE (Society of Motion Picture & Television Engineers) event

Event topic: “World leading collaborative research – the work of BBC R&D”, 28 April 2016, London, UK

Lecture “Video coding R&D in collaborative projects” by **Marta Mrak**

[Conference] **Nam Ling**, General Chair, 2015 IEEE Workshop on Signal Processing Systems (SiPS), Hangzhou, China, October 14 - 16, 2015.

50-word summary: SiPS is the premier forum for the latest advances in embedded signal and image processing systems, from both the research and the development perspectives. SiPS 2015 attracted close to 150 participants and was hosted by Zhejiang University, Fudan University, and Hangzhou Dianzi University, with major themes including Internet of Things.

[Paper] Jianjun Lei, Cuicui Zhang, Yuming Fang, Zhouye Gu, **Nam Ling**, and Chunping Hou, “Depth Sensation Enhancement for Multiple Virtual View Rendering,” *IEEE Transactions on Multimedia*, Vol. 17, No. 4, pp. 457 – 469, April 2015.

50-word summary: In this paper, we propose a novel depth sensation enhancement method to address the problems in multiple virtual view rendering. The method is extended to video applications with a newly designed energy function with energy term of temporal consistency preservation.

[Paper] H.L. Tan, C.C. Ko and **S. Rahardja**, “Fast Coding Quad-Tree Decisions using Prediction Residuals Statistics for High Efficiency Video Coding (HEVC)”, *IEEE Transactions on Broadcasting*, Vol. 62, No. 1, pp. 128-133, Mar. 2016.

[Award] Pau-Choo Chung: 2015 APICTA Research and Development (R&D) Merit Award

50-word summary: The Asia Pacific ICT Alliance Awards is an international awards program organized by Asia Pacific ICT Alliance (APICTA). Our works on Video Synopsis, which was built using the combination of history table and the maximum a posteriori estimation to achieve the real time performance in object placement, has won 2015 APICTA Research and Development (R&D) Merit Award

[Panel] Gwo Giun Lee: IEEE GlobalSIP 2015 Panel Discussion entitled “Algorithms vs. Architectures: Opportunities and Challenges in Multicore/GPU DSP”. Organizer and Moderator.

[Technology Transfer] Gwo Giun Lee: Technology transfer of two IP/patent’s on analytics architecture based on Algorithm/Architecture Co-design to Inform Genomics Inc. for processing of big genomics data in Precision Medicine.