FME '22: 2nd Workshop on Facial Micro-Expression: Advanced Techniques for Multi-Modal Facial Expression Analysis

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ABSTRACT

Micro-expressions are facial movements that are extremely short and not easily detected, which often reflect the genuine emotions of individuals. Micro-expressions are important cues for understanding real human emotions and can be used for non-contact non-perceptual deception detection, or abnormal emotion recognition. It has broad application prospects in national security, judicial practice, health prevention, clinical practice, etc. However, micro-expression feature extraction and learning are highly challenging because micro-expressions have the characteristics of short duration, low intensity, and local asymmetry. In addition, the intelligent micro-expression analysis combined with deep learning technology is also plagued by the problem of small samples. Not only is micro-expression elicitation very difficult, micro-expression annotation is also very time-consuming and laborious. More importantly, the micro-expression generation mechanism is not yet clear, which shackles the application of micro-expressions in real scenarios. FME'22 is the inaugural workshop in this area of research, with the aim of promoting interactions between researchers and scholars from within this niche area of research and also including those from broader, general areas of expression and psychology research. The complete FME'22 workshop proceedings are available at: https://dl.acm.org/doi/proceedings/10.1145/3552465.

CCS CONCEPTS

• **Computing methodologies** → **Computer vision**; **Artificial intelligence**; • **Applied computing** → *Psychology*.

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KEYWORDS

Micro-Expression, Affective Computing, Spotting, Generation

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1 INTRODUCTION

Micro-expressions, as important non-verbal communication cues, can reveal an individual's true emotional state. In recent years, intelligent micro-expression analysis has drawn much attention in multimedia research fields because it can benefit a wide range of applications, e.g., police interrogation, clinical diagnosis, depression analysis, and business negotiation.

Since 2013, researchers have made numerous research explorations based on a database of spontaneous micro-expressions. Currently, there are 11 published spontaneous ME databases, including CASME series (CASME [14], CASME II [13], CAS(ME)^2 [9], CAS(ME)^3 [4]), SMIC series (SMIC [7], SMIC-E [8], SMIC-E-long [11], 4DME [6]), SAMM series (SAMM [2], SAMM-LV [15]), and MMEW [1].

With the development of imaging devices, FER is not limited to traditional RGB video. New data and research trends are towards combining facial data captured from multiple and various sensors, e.g., depth camera, 3D camera, thermal or near-infrared camera, so that different features from multi-modalities could be fused for the FER task. The workshop addresses emotion understanding and FER with extended preference/emphasis on multi-modality approaches. Furthermore, the workshop concerns various studies about emotion analysis, e.g., combining multi-modalities of depth information or physiological signals, facial expression synthesis, and so on.

This is the inaugural academic activity in this area of research. Our ambition is to conduct micro-expression workshop yearly with continuity. We have held four ME Grand Challenges (MEGC)[1][2][3] in conjunction with FG2018 [16], FG2019 [10], FG2020 [3], and ACMMM2021 [5] and a ME Recognition Challenge (MER2020)[4] [12] in conjunction with ICIP2020.

2 AGENDA

This workshop explores the intelligent analysis of personal emotions through facial expressions, with emphasis on micro-expression analysis. Particularly, the workshop concerns interpreting and synthesizing interactive emotional behaviors, addressing the theme of engaging/connecting people with multimedia. Furthermore, the workshop addresses emotion understanding and FER with extended preference/emphasize on the multi-modality approach. The scope of the workshop is a broad range of original work based on the research of facial expression and especially micro-expression, but not limited to:

- Facial expressions (both micro- and macro-expressions) detection/spotting
- Facial expressions recognition
- Multi-modal micro-expression analysis, combining such as depth information, heart rate signal etc.
- Micro-expression feature representation and computational analysis
- Unified micro-expression spot-and-recognize schemes
- Deep learning techniques for micro-expression spotting and recognition
- New objective classes for micro-expression analysis
- New micro-expression datasets
- Facial expressions data synthesis
- Psychology of micro-expression research
- Facial Action Unit (AU) detection and recognition
- Emotion recognition using AUs
- Micro-expression Applications

The FME'22 article format is full-paper, and the review process is double-blind, with each article being reviewed by two experts in the field. There were five submissions, two of which were accepted: a study of intelligent micro-expression spotting and a study of physiological mechanisms of micro-expression based on electromyographic signals.

3 KEYNOTE SPEAKER

The keynote speaker of FME'22 is Dr. Hu Han.

Hu Han is a researcher at Key Laboratory of Intelligent Information Processing, Institute of Computing Technology (ICT), Chinese Academy of Sciences (CAS). Before joining the Faculty at ICT, CAS, in 2015, he has been a Research Associate with the PRIP Laboratory, Department of Computer Science and Engineering, Michigan State University, and a Visiting Researcher with Google in Mountain View. He is currently an Associate Professor with ICT, CAS. He has authored or coauthored over 60 articles in refereed journals and conferences, including IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Image Processing, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Medical Imaging, IEEE Transactions on Biometrics, Behavior, and Identity Science, CVPR, ECCV, NeurIPS, and MICCAI. His research interests include computer vision, pattern recognition, and image processing, with applications to biometrics and medical image analysis. He was a recipient of the IEEE Signal Processing Society Best Paper Award (2020), the IEEE FG 2019 Best Poster Presentation Award, and the CCBR 2016/2018 Best Student/Poster Awards.

4 ORGANISATION COMMITTEE

Jingting Li is currently an associate researcher at the Institute of Psychology (IP), Chinese Academy of Sciences (CAS). She received her PhD degree in in Signal, Image, Vision from CentraleSupélec in 2019, and worked as a postdoc with IP, CAS from March 2020 to June 2022. She has published several papers related to micro-expressions in IEEE TPAMI, TAC, TIP and other national and international journals and conferences. Her current research interests include image processing, computer vision and pattern recognition, especially facial micro-expression analysis.

Moi Hoon Yap is the Lead contributor of the SAMM dataset. She is a Professor of Image and Vision Computing at the Manchester Metropolitan University and a Royal Society Industry Fellow with Image Metrics Ltd. She received her PhD in Computer Science from Loughborough University in 2009. Her research is funded by Royal Society, EU funding, EPSRC, Cancer Research UK, Innovate UK and industries. Her research expertise is in computer vision, deep learning, image/video processing on face and gesture analysis and medical image analysis.

Wen-Huang Cheng is Distinguished Professor with the Institute of Electronics, National Yang Ming Chiao Tung University (NYCU), Hsinchu, Taiwan. He is also Jointly Appointed Professor with the Artificial Intelligence and Data Science Program, National Chung Hsing University (NCHU), Taichung, Taiwan. Before joining NYCU, he led the Multimedia Computing Research Group at the Research Center for Information Technology Innovation (CITI), Academia Sinica, Taipei, Taiwan, from 2010 to 2018. His current research interests include multimedia, artificial intelligence, computer vision, and machine learning. He has actively participated in international events and played important leading roles in prestigious journals and conferences and professional organizations, like Associate Editor for IEEE Transactions on Multimedia, General co-chair for IEEE ICME (2022) and ACM ICMR (2021), Chair-Elect for IEEE MSA technical committee, governing board member for IAPR. He has received numerous research and service awards, including the 2018 MSRA Collaborative Research Award, the 2017 Ta-Yu Wu Memorial Award from Taiwan's Ministry of Science and Technology (the highest national research honor for young Taiwanese researchers under age 42), the 2017 Significant Research Achievements of Academia Sinica, the Top 10% Paper Award from the 2015 IEEE MMSP, and the K. T. Li Young Researcher Award from the ACM Taipei/Taiwan Chapter in 2014. He is IET Fellow and ACM Distinguished Member.

John See is currently an Associate Professor at the School of Mathematical and Computing Sciences, Heriot-Watt University (Malaysia

[1] http://www2.docm.mmu.ac.uk/STAFF/m.yap/FG2018Workshop.htm
[2] https://facial-micro-expressiongc.github.io/MEGC2019/
[3] https://megc2020.github.io/
[4] https://2020.ieeeicip.org/challenge/micro-expression-recognition-challenge/

Campus). He received his PhD in Computer Science, MEngSc and BEng degrees from Multimedia University (MMU), Malaysia where he had previously led the Visual Processing Laboratory under the Centre for Visual Computing. From 2017 to 2019, he was a Visiting Research Fellow to Shanghai Jiao Tong University, China. Dr. See has published more than 90 articles in reputable journals and conferences such as IEEE T-PAMI, T-AC, IEEE T-MM, CVPR, ECCV, ICCV, and AAAI and is also served as chair of several workshops and special sessions in various international computer vision and signal processing conferences. He is currently an Associate Editor of EURASIP JIVP, IEEE Access and Frontiers in Signal Processing, and is a committee member for IEEE Technical Committees for multimedia areas (MSA and MMSP). His research interests cover a diverse range of topics in computer vision and pattern recognition, particularly in the emerging fields of facial micro-expressions, affective computing, computational aesthetics and deep learning.

Xiaopeng Hong is currently a professor at Harbin Institute of Technology (HIT), P. R. China. He had been a distinguished investigator at Xi'an Jiaotong University, P. R. China until Oct. 2021 , and a senior researcher/adjunct professor with the Center for Machine Vision and Signal Analysis, University of Oulu, Finland until Feb. 2019. Xiaopeng has (co-)authored over 40 articles in peer-reviewed journals and conferences such as IEEE T-PAMI, IEEE T-IP, CVPR, ICCV, and IJCAI. International media have reported his research about micro-expression analysis like MIT Technology Review and Daily Mail. Xiaopeng has served as a reviewer for a few top-tier journals and conferences and has been ranked as an 'Outstanding reviewer' for two Elsevier journals: Pattern Recognition and Neurocomputing. His current research interests include intelligent security, micro-expression analysis, and visual surveillance, etc.

Xiaobai Li is currently working as an assistant professor in the Center for Machine Vision and Signal Analysis (CMVS) of University of Oulu. She received her B.Sc degree in Psychology from Peking University, M.Sc degree in Biophysics from the Chinese Academy of Science, and Ph.D. degree in computer science from CMVS, University of Oulu. She was funded as an Academy postdoctoral researcher by the Academy of Finland in 2019. Her research interests include facial expression recognition, micro-expression recognition, remote physiological signal measurement and related applications such as emotion understanding, remote healthcare, and biometrics. Dr. Xiaobai Li published more than 50 papers on international conferences and journals which were cited 4149 times with an H-index of 27 according to Google scholar. She is an IEEE member, and is currently serving as an Associate Editor for IEEE Transactions on Circuits and Systems for Video Technology.

Sujing Wang is an Associate Researcher at the IP, CAS. He received the Ph.D degree from the College of Computer Science and Technology of Jilin University in 2012. He was a postdoctoral researcher at IP, CAS from 2012 to 2015. Since July 2015, he has joined the Chinese Academy of Sciences. His current research interests include pattern recognition and machine learning, especially the micro-expression analysis. He has published more than 50 scientific papers in several important national and international journals and conferences, including IEEE TPAMI, TAC, TIP, TNN, and ECCV etc. Since 2014, he has served as an associate editor of Neurocomputing (Elsevier). He won the first prize of the 8th Wu Wenjun Artificial Intelligence Science and Technology Award in 2018. He was called as Chinese Hawking by the Xinhua News Agency. And he was selected as one of the top 2% of scientists in the world in 2020 for "Impact of the Year".

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