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# Welcome Message from the Chairs

We are delighted to welcome you to the 17th edition of the IEEE International Symposium on Haptic Audio-Visual Environments and Games (HAVE), hosted by Sunway University in Sunway City, Selangor, Malaysia. Similar to the previous editions, HAVE 2019 is a truly international event bringing together members of the IEEE Instrumentation and Measurement Society (IEEE IMS) and the Haptics community from all over the world. It promises to be an exciting and comprehensive symposium covering aspects of multimodal haptics, audio/visual virtual reality technologies, augmented reality and tele-haptics, distributed collaborative environments and gaming, novel tactile stimulation technologies, and all their related applications.

Like the edition of previous years, IEEE HAVE 2019 is the result of dedicated effort by a large number of volunteers. First of all, we would like to thank Sunway University in Sunway City, Selangor, Malaysia for hosting the event, and in particular for both financially and logistically supporting it. We wish to express our appreciation and thanks to all the individuals who have contributed to its success. Special thanks are extended to our colleagues in the Program Committee for their thorough review of all the submissions, which is vital to the success of this conference. We received initially 37 submissions out of which only 19 made it to the final program (51.4%). We must also extend our thanks to all the members in the Organizing Committee and our volunteer students who have dedicated their time and efforts in promoting, organizing and helping the conference. Last but not least, our special thanks go to all the authors for contributing their research work, and to the participants in making HAVE 2019 a memorable event. Thank you and wish you a great conference and enjoyable visit in Sunway City and Kuala Lumpur.

## **HAVE 2019 General Chairs**

Kian Meng Yap, *Sunway University, Malaysia*  
Abdulmotaleb El Saddik, *University of Ottawa, Canada*

# IEEE HAVE 2019 Organizers

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Abdulmotaleb El Saddik, University of Ottawa, Canada  
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Abu Dhabi, United Arab Emirates

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University Malaysia, Malaysia

Xin Yang, Dalian University of  
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Zaharin Yusoff, Sunway University,  
Malaysia

## Conference Management

Conference Catalysts, LLC, USA

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# Thursday, October 3

**8:30 - 9:00**

**Registration: Lecture Theater 5, University Building, Level 1**

**9:00 - 9:10**

**Opening Remarks by Vice Chancellor of Sunway University  
Lecture Theater 5, University Building, Level 1**

**9:10 - 9:20**

**Opening Remarks by General Chair  
Lecture Theater 5, University Building, Level 1**

**9:20 - 11:20**

**Morning Session: Haptic-Audio-Visual Systems and Applications  
Venue: Function Room 3, University Building, Level 1  
Session Chair: Ms. Chit Su Mon**

**9:20      Requirements Analysis and Preliminary Development of SwingBeats: A Real-Time Haptic Beat Tracking System for Dance Education**

*Navid Shaghghi (Santa Clara University, USA)*

*Yu Yang Chee (Santa Clara University, USA)*

*Lawrence Howser (Santa Clara University, USA)*

*Richard Mora (Morafamily, USA)*

**9:40      Evaluation of 3DOHA enhanced Virtual Edutainment Application for Visually Impaired Users: A Pilot Study**

*Chit Su Mon (Sunway University & UCSI University, Malaysia)*

*Kian Meng Yap (Sunway University, Malaysia)*

*Azlina Ahmad (Universiti Kebangsaan Malaysia, Malaysia)*

**10:00    Evaluation of Multi-Point Dynamic Pressure Reproduction Using Microphone-Based Tactile Sensor Array**

*Emiri Sakiyama (The University of Tokyo, Japan)*

*Daichi Matsumoto (The University of Tokyo, Japan)*

*Masahiro Fujiwara (The University of Tokyo, Japan)*

*Yasutoshi Makino (The University of Tokyo, Japan)*

*Hiroyuki Shinoda (The University of Tokyo, Japan)*

**10:20    Development of a Haptic Feedback Actuator for an Endovascular Interventions Simulator Interface**

*Hafiz Rashidi Ramli (Universiti Putra Malaysia, Malaysia)*

*Norhisam Misron (Universiti Putra Malaysia, Malaysia)*

*M Iqbal Saripan (Universiti Putra Malaysia, Malaysia)*

*Fernando Bello (Division of Surgery, Oncology, Reproductive Biology and Anaesthetics, United Kingdom)*

**10:40    Design of Low-Profile Tactile Actuator with Rich Vibrotactile Stimulation For Wearable Applications**

*Georgios Korres (New York University Abu Dhabi, United Arab Emirates)*

*Mohamad Eid (NYU, USA)*

**11:00    Pseudorandom Proxy Testing of Internal Haptic Perception in Touch Styluses Intended for the Visually Impaired**

*Hong Jian Wong (Sunway University, Malaysia)*

*Kian Meng Yap (Sunway University, Malaysia)*

11:20 - 11:40

Coffee Break

11:40 - 12:30

**Keynote Presentation I: Prof. Dr. Yen Ching Chiuan (National University of Singapore)**

**Venue: Lecture Theatre 5, University Building, Level 1**

12:30 - 1:30

Lunch

1:30 - 3:30

**Afternoon Session: Human Computer Interaction and Mid-air Haptics Applications**

**Venue: Function Room 3**

**Session Chair: Dr. Teck Min Chin**

**1:30 Mid-Air Haptic Algorithms for Rendering 3D Shapes**

*Orestis Georgiou (Ultrahaptics & University of Cyprus, United Kingdom)*

*Jonatan Martinez (Ultrahaptics, United Kingdom)*

*Adam Harwood (Ultrahaptics, United Kingdom)*

*Hannah Limerick (Ultrahaptics, United Kingdom)*

*Rory Clark (Ultrahaptics, United Kingdom)*

**1:50 Thresholds of Haptic and Auditory Perception in Midair Facial Stimulation**

*Saya Mizutani (The University of Tokyo, Japan)*

*Masahiro Fujiwara (The University of Tokyo, Japan)*

*Yasutoshi Makino (The University of Tokyo, Japan)*

*Hiroyuki Shinoda (The University of Tokyo, Japan)*

**2:10 Displaying Pain Sensation in Midair by Thermal Grill Illusion**

*Nakajima Mitsuru (The University of Tokyo & Graduate School of Frontier Science, Japan)*

*Yasutoshi Makino (Keio University, Japan)*

*Hiroyuki Shinoda (The University of Tokyo, Japan)*

**2:30 Using Ultrasonic Mid-air Haptic Patterns in Multi-Modal User Experiences**

*Damien F G Ablart (University of Sussex & SCHI Lab, Creative Technology Research Group. School of Engineering and Informatics, United Kingdom)*

*William Frier (Ultrahaptics, United Kingdom)*

*Hannah Limerick (Ultrahaptics, United Kingdom)*

*Orestis Georgiou (Ultrahaptics & University of Cyprus, United Kingdom)*

*Marianna Obrist (University of Sussex & SCHI Lab, Creative Technology Research Group. School of Engineering and Informatics, United Kingdom)*

**2:50 A Posture Recognition Model Dedicated for Differentiating between Proper and Improper Sitting Posture with Kinect Sensor**

*Chun Kai Chin (Tunku Abdul Rahman University College, Malaysia)*

*Kok Seng Eu (Sunway University, Malaysia)*

*Kian Meng Yap (Sunway University, Malaysia)*

*Tee Tiong Tay (Tunku Abdul Rahman University College, Malaysia)*

*Choe Yung Teh (Senior Lecturer, Malaysia)*

**3:10 Developing Automatic Markerless Sign Language Gesture Tracking and Recognition System**

*Serge Demidenko (Sunway University, Malaysia)*

*Donald G. Bailey (Massey University & School of Food and Advanced Technology, New Zealand)*

*Gourab Sen Gupta (Massey University, New Zealand)*

*Nuwan Gamage (Monash University, Malaysia)*

*Rini Akmeliawati (The University of Adelaide, Australia)*

*Ye Chow Kuang (University of Waikato & Monash University, New Zealand)*

*Shujjat Khan (Massey University, New Zealand)*

*Sara Bilal (Whitireia, New Zealand)*

*Melanie Ooi (University of Waikato, New Zealand)*

**3:40 - 4:00**

**Coffee Break + Visit of H.O.M.E Lab, University Building, Level 3**

**4:00 - 6:00**

**Meeting Point: Foyer, University Building, Level UG**

**City Tour**

*4:00: Leaving Sunway University*

*4:30: Pass by Masjid Jamek*

*4:35: Take Photos at Dataran Merdeka*

*4:50: Sight Seeing at Central Market*

*6:00: Leave Central Market to KLCC*

**6:30 - 8:30**

**Gala Dinner**

**8:30 - 9:00**

**KLCC Tour**

# Friday, October 4

8:30 - 9:00

Registration: Lecture Theater 5, University Building, Level 1

9:00 - 9:50

Keynote Presentation 2: Assoc. Prof. Dr. Melanie Ooi (University of Waikato)

Venue: Lecture Theatre 5, University Building, Level 1

9:50 - 10:10

Coffee Break

10:10 - 12:10

Morning Session: Haptic Game Interfaces, Tele-haptics and Tele-operation, and Visual Computing

Venue: Function Room 3, University Building, Level 1

Session Chair: Ms. Woan Ning Lim

**10:10 Can we deploy Tactile Internet Applications over Wi-Fi, 3G and WiMAX: a Comparative Study based on Riverbed modeler**

*Hikmat Adhami (University of Ottawa, Canada & OGERO Telecom, Lebanon)*  
*Mohammad Aljaafreh (University of Ottawa & School of Electrical Engineering and Computer Science, Canada)*

*Abdulmoteleb El Saddik (University of Ottawa, Canada)*

**10:30 Towards Standardization of Haptic Handshake for Tactile Internet: A WebRTC-Based Implementation**

*Ken Iiyoshi (New York University Abu Dhabi, United Arab Emirates)*  
*Mahrukh Tauseef (New York University Abu Dhabi, United Arab Emirates)*  
*Ruth Gebremedhin (New York University Abu Dhabi, United Arab Emirates)*  
*Vineet Gokhale (Delft University of Technology, The Netherlands)*  
*Mohamad Eid (New York University Abu Dhabi, United Arab Emirates)*

**10:50 Exploring the Feasibility of Computer Games in Mathematics Education**

*Su Ting Yong (The University of Nottingham Malaysia, Malaysia)*  
*Peter Gates (The University of Nottingham, Malaysia)*  
*Andy Chan (The University of Nottingham, Malaysia)*  
*Chien Sing Lee (Sunway University, Malaysia)*  
*Reginamary Matthews (The University of Nottingham Malaysia, Malaysia)*  
*Kung Ming Tiong (The University of Nottingham Malaysia, Malaysia)*

**11:10 Augmented Reality 3D Cubes Puzzle Bingo Game for the Elderly**

*Woan Ning Lim (Sunway University, Malaysia)*  
*Yunli Lee (Sunway University, Malaysia)*  
*Ivan Anggoro (Sunway University, Malaysia)*

**11:30 Design of Virtual Reality Simulation-based Safety Training Workshop**

*Zheng Hong Sim (Sunway University, Malaysia)*  
*Yvonne Chook (Sunway University, Malaysia)*  
*Muhammad Amir Hakim (Sunway University, Malaysia)*  
*Woan Ning Lim (Sunway University, Malaysia)*  
*Kian Meng Yap (Sunway University, Malaysia)*

**11:50 GMSD-based Perceptually Motivated Non-local Means Filter for Image Denoising**

*Mohtashim Baqar (Sunway University, Malaysia)*  
*Sian Lun Lau (Sunway University, Malaysia)*  
*Mansoor Ebrahim (Iqra University, Pakistan)*



**12:10 - 2:30**  
**Lunch Break & Friday Prayers**

**2:30 - 3:00**  
**Closing Remarks**

# Keynote Speakers

## Yen Ching Chiuan



**Yen Ching Chiuan, National University of Singapore**

### **BIOGRAPHY**

Associate Professor Yen Ching Chiuan is the Co-Director of Keio-NUS CUTE Center, Deputy Director of NUS Centre for Additive Manufacturing and was the founding Head of Division of Industrial Design (DID) at the National University of Singapore (NUS). His research interests lie in methodologies for design, and he champions a pluralistic dimension of design study and research, in particular, in the area of design for healthcare and medicine. He has worked with renowned companies including: ABBOT, ASUS, BMW Designwork USA, Coca Cola, DELL, Estee Lauder, OSIM, National University Hospital, Samsung, Swarovski, Tupperware, and VISA. He has successfully secured over S\$30M grant money as PI/Co-PI/Collaborator from government agencies, research institutions and industries. His supervision in design is highly regarded and has received more than 50 top international or regional design awards, including the Stanford Longevity Technology Prize 2015, Braunprize 2007, Luminary, red-dot award: design concept 2006, ACM CHI Student Competition 2016 and QS Reimaging Education: ASIA-PACIFIC AWARD 2017/8.

## Keynote Speakers (continued)

### Melanie Ooi



**Melanie Ooi, University of Waikato**

#### **BIOGRAPHY**

Melanie Ooi is an engineering specialist in Electrical and Electronic Engineering as well as Computer Engineering and Computational Intelligence. She is currently an Associate Professor at the University of Waikato, and was previously the Head of Engineering at Unitec Institute of Technology, New Zealand. While working in close collaboration with several leading multinational electronics companies, she has developed new testing techniques and test data processing methodologies that have been adopted by the industry partners. In the recent years she has also successfully researched on new measurement uncertainty evaluation approaches and frameworks with application to a multitude of science and technology areas (medical research, structural design, mechanical systems modelling, etc.). Her work has been adopted by the South African National Accreditation System (the national body responsible for conformity assessment) in their guidelines document TG 50-02.

She has been acknowledged by several prestigious international awards including the 2017 Mike Sargeant Career Achievement Award from Institution of Engineering and Technology U.K., Outstanding Young Engineer Award of the Year 2014 from the IEEE Instrumentation and Measurement Society, 2014 Excellence Award from the International Education Association of Australia, 2011 Citation for Outstanding Contributions to Student Learning from the Australian Learning and Teaching Council.

She is the youngest female Fellow appointed to the Institution of Engineering and Technology, and is a U.K. Chartered Engineer. Melanie is currently the "Future Trends" column writer for the IEEE Instrumentation and Measurement Magazine which is an ISI-rated magazine with a distribution list of over a thousand members of the Society. She is a Senior Member of the IEEE, a guest editor for the IEEE Transactions in Instrumentation and Measurement, an Administrative Committee Member of the IEEE Instrumentation & Measurement Society (I&MS) as well as Secretary and Member of the Technical Committee on Fault Tolerant Measurement Systems (TC-32) of the IEEE I&MS.

# Notes