No one can fully grasp the truth.

April 21-23, 2022, Sun Moon Lake, Nantou, Taiwan.
Pre-Proceedings

THE 8TH IEEE INTERNATIONAL CONFERENCE ON APPLIED SYSTEM INNOVATION 2022

Editors:
Artde Donald Kin-Tak Lam
Liang-Wen Ji
Siu-Tsen Shen
Stephen Prior
Sheng-Joue Young

International (Taiwanese) Institute of Knowledge Innovation (iTIKI)

2022 IEEE International Conference on Applied System Innovation (IEEE ICASI 2022)
April 21-23, 2022, Sun Moon Lake, Nantou, Taiwan.
http://2022.icasi-conf.net/
2022 IEEE International Conference on Applied System Innovation (IEEE ICASI 2022)

Sun Moon Lake, Nantou, Taiwan.
April 21-23, 2022.

Organized by

Fujian University of Technology
National Quemoy University
National Cheng Kung University
National United University
National Sun Yat-Sen University
Yuang Ze University
National Kaohsiung University of Science & Technology
National Formosa University
Xi’An Technological University
Kun Shan University
National University of Tainan
National Taiwan Normal University
National Penghu University of Science & Technology
Southern Taiwan University of Science & Technology
University of the Ryukyus
Kongju National University
Hannam University
St. Petersburg Royal Peter Polytechnic University
China University of Petroleum
Kyushu Institute of Technology
Institute of Electrical and Electronics Engineers (IEEE)
IEEE Tainan Section
IEEE Tainan Section Sensors Council (IEEE TSSC)
International (Taiwanese) Institute of Knowledge Innovation (iTIKI)
Fujian Information Industry Association
PIN-WEI SCIENCE AND TECHNOLOGY CO., LTD.
2022 IEEE International Conference on Applied System Innovation (IEEE ICASI 2022)

Sun Moon Lake, Nantou, Taiwan.
April 21-23, 2022.

Copyright:
Proceedings of The 2022 IEEE International Conference on Applied System Innovation (IEEE ICASI 2022) Published by International (Taiwanese) Institute of Knowledge Innovation (iTIKI)

IEEE Catalog Number:
Welcome

I am so pleased that the International (Taiwanese) Institute of Knowledge Innovation (iTIKI) are hosting The 2022 International Conference on Applied System Innovation (IEEE ICASI 2022) in the beautiful city of Sun Moon Lake, Nantou, Taiwan, and I would like to express my sincere appreciation to all the participants for taking their time to attend this meeting, especially speakers and moderators for their valuable inputs and contributions to today’s conference. On behalf of organizing committee, I would like to welcome all of you to Sun Moon Lake for the IEEE ICASI 2022. It is my great pleasure in declaring this conference open.

The conference will provide a unified communication platform for researchers in a wide area of topics from information technology, innovation design, communication science & engineering, industrial design, creative design, applied mathematics, computer science, design theory, cultural & creative research, electrical & electronic engineering, mechanical & automation engineering, green technology & architecture engineering, material science and other related fields. Professionals from industry, academia and government are encouraged to discourse on research and development, professional practice, business and management in the information, innovation, information, communication and engineering fields are welcome to participate in the IEEE ICASI 2022. This conference enables interdisciplinary collaboration between science and technologists in the academic and industrial fields as well as networking internationally.

The conference has received 300+ submitted papers, whereby 180+ papers have been selected by the committees to be included within the IEEE ICASI 2022 proceedings. These papers on various topics are divided into 22 sessions (14 Regular Sessions, 8 Invited Sessions) and presented in several parallel sessions in the conference. To all members of the Technical and Organizing Committees, we would like to take this opportunity to thank all of them for their tremendous efforts to organize this conference successfully.

I would like to express my sincere thanks to all the committee members for organizing the conference and program. And I expressed gratitude to the support of the International (Taiwanese) Institute of Knowledge Innovation (iTIKI). The sponsors of Fujian University of Technology, National Quemoy University, National Cheng Kung University, National United University, National Sun Yat-Sen University, Yuan Ze University, National Kaohsiung University of Science & Technology, National Formosa University, Xi’an Technological University, Kun Shan University, National University of Tainan, National Taiwan Normal University, National Penghu University of Science & Technology, Southern Taiwan University of Science & Technology, University of the Ryukyus, Kongju National University, Hannam University, St. Petersburg Royal Peter Polytechnic University, China University of Petroleum, Kyushu Institute of Technology, Institute of Electrical and Electronics Engineers (IEEE), IEEE Tainan Section, IEEE Tainan Section Sensors Council (IEEE TSSC), International (Taiwanese) Institute of Knowledge Innovation (iTIKI), and many other companies are also greatly appreciated. I hope you will find the papers presented at IEEE ICASI 2022 critical and stimulating to your work. Also, I hope that all the attendees will have an enjoyable stay in Sun Moon Lake.

Professor Artde Donald Kin-Tak Lam, Ph.D
Program Chairman of IEEE ICASI 2022
Deputy Dean of Design School, Fujian University of Technology
A. Material Science & Engineering  
B. Communication Science & Engineering  
C. Computer Science & Information Technology  
D. Electrical & Electronic Engineering  
E. Mechanical & Automation Engineering  
F. Green Technology & Architecture Engineering  
G. Internet & IOT Technology  
H. Applied Mathematics  
I. Management Science  
J. Innovation Design & Creative Design  
K. Industrial Design & Design Theory  
L. Cultural & Creative Research  
M. Multimedia Art and Design Foundation (MADF) & Taiwan International Invention and Design Fair (TIIDF)  
N. Others

**Invited IEEE ICASI 2022**

IV1. Renewable Energy Technologies in Power Systems  
IV2. Technology Innovation for Smart Life  
IV3. Railway Vehicle System and Railway Technology  
IV4. AI Application in Optical Engineering  
IV5. Novel Technologies for Electrical and Mechatronic Engineering  
IV6. Architecture and Naval Mechatronic Engineering  
IV7. Frontiers in Material, Device and Energy  
IV8. Offshore Wind Power
Contents

A-3 Welcome
A-4 Topics
A-5 Contents
A-6 Organizers & Sponsors
A-7 Honorary General Chairs
A-8 General Chairs & General Co-Chairs
A-9 Technical Committee Chairs & International Liaison Chairs
A-10 Program Committee
A-11 Keynote Speaker
A-13 Executive Committee
A-16 Expert Committee
A-20 Guidelines
A-21 Conference Agenda
A-22 Oral Session Schedule
A-23 Poster Session Schedule
A-24 On-line Oral & Poster Session Schedule
A-25 Session Chairs
A-26 List (IEEE ICASI 2022)

B-1 Abstract of IEEE ICASI 2022 (e-Print)
Organizers

Fujian University of Technology
National Quemoy University
National Cheng Kung University
National United University
National Sun Yat-Sen University
Yuang Ze University
National Kaohsiung University of Science & Technology
National Formosa University
Xi`An Technological University
Kun Shan University
National University of Tainan
National Taiwan Normal University
National Penghu University of Science & Technology
Southern Taiwan University of Science & Technology
University of the Ryukyus
Kongju National University
Hannam University
St. Petersburg Royal Peter Polytechnic University
China University of Petroleum
Kyushu Institute of Technology
Institute of Electrical and Electronics Engineers (IEEE)
IEEE Tainan Section
IEEE Tainan Section Sensors Council (IEEE TSSC)
International (Taiwanese) Institute of Knowledge Innovation (iTIKI)

Sponsors

Fujian Information Industry Association
PIN-WEI SCIENCE AND TECHNOLOGY CO., LTD.
Fuzhou Cross-Strait Industrial Design Creative Park
Kaoke (Fujian) Industrial Design Co., Ltd.
Honorary General Chairs

Prof. Shoou-Jinn Chang, National Cheng Kung University
Prof. Yan-Kuin Su, National Cheng Kung University
Prof. Huann-Ming Chou, Vice President of Kun Shan University
Prof. Ji-Hwei Horng, Vice President of National Quemoy University
Prof. Ching-Ting Lee, Vice President of Yuan Ze University
Prof. Yu-Cheng Lin, National Cheng Kung University
Prof. Rong-Fong Fung, Vice President of National Kaohsiung University of Science and Technology
Prof. Chun-Yen Chang, National Taiwan Normal University
Prof. Ming-Chuang Ho, National Yunlin University of Science and Technology
Prof. Jui-Che Tu, National Yunlin University of Science and Technology
Prof. Xing Tong, President of Fujian University of Technology
Prof. Guomai Liu, Vice President of Fujian University of Technology
General Chairs

Prof. Artde Donald Kin-Tak Lam, Fujian University of Technology
Prof. Liang-Wen Ji, National Formosa University
Prof. Te-Hua Fang, National Kaohsiung University of Science and Technology
Prof. Stephen Prior, The University of Southampton
Prof. Su-Hua Yang, National Kaohsiung University of Science and Technology
Prof. Siu-Tsen Shen, National Formosa University
Prof. Jenn-Kun Kuo, National Sun Yat-Sen University
Prof.Yaw-Shyan Fuh, National University of Tainan
Prof. I-Tseng Tang, National University of Tainan
Prof. Chang-Tzuoh Wu, National Kaohsiung Normal University
Prof. Jun-Dar Hwang, National Chiayi University
Prof. Shi-Chang Tseng, National Yunlin University of Science and Technology
Prof. Heng-Sheng Lin, National Kaohsiung University of Science and Technology
Prof. Cheng-Tang Pan, National Sun Yat-Sen University

General Co-Chairs

Prof. Sheng-Joue Young, National United University
Prof. Yu-Jen Hsiao, Southern Taiwan University of Science and Technology
Prof. Fu-Cheng Wang, National Taiwan University
Prof. Cheng-Hsing Hsu, National United University
Prof. Hsi-Wen Yang, National United University
Prof. Cheng-Mu Tsai, National Chung Hsing University
Prof. Yeou-Jiunn Chen, Southern Taiwan University of Science and Technology
Prof. Kuang-Chyi Lee, National Formosa University
Prof. Ying-Shieh Kung, Southern Taiwan University of Science and Technology
Prof. Yih-Ran Sheu, Southern Taiwan University of Science and Technology
Prof. Ming-Chih Chen, National Kaohsiung University of Science and Technology
Prof. Chun-Hung Lai, National United University
Prof. Yuh-Ping Chang, Kun Shan University
Prof. Yue Shen, China University of Petroleum
Prof. Kuo-Hsun Wen, Fujian University of Technology
Technical Committee Chairs

Prof. Chih-Ta Yen, National Taiwan Ocean University
Prof. Walter Water, National Formosa University
Prof. Yong-Nong Chang, National Formosa University
Prof. Ying-Jr Ding, National Formosa University
Prof. Feng-Tsai Weng, National Formosa University
Prof. Yee-Shin Chang, National Formosa University
Prof. Yung-Ming Kuo, National Formosa University
Prof. Chang-Ren Chen, Kun Shan University
Prof. Ping-Chuan Chang, Kun Shan University
Prof. Hon Kuan, Southern Taiwan University of Science and Technology
Dr. Steve Yeng, Sunway Healthcare System Co.
Prof. Hui-Jen Chuang, Kao Yuan University
Prof. Paul Juinn-Bing Tan, National Penghu University of Science and Technology
Prof. Ming-Hung Hsu, National Penghu University of Science and Technology
Prof. Ko-Wei Weng, National Quemoy University
Prof. Chin-Tan Lee, National Quemoy University
Prof. Yu-Feng Huang, Xiamen University

International Liaison Chairs

Prof. Ajit Khosla, Yamagata University, Japan
Prof. Fatih Taşar, Gazi Üniversitesi, Turkey
Prof. Jae-Woong Kim, Kongju National University, South Korea
Prof. Hee-Min Sa, Hannam University, South Korea
Prof. Seungwan Roh, Dankook University, South Korea
Prof. Jose Metrolho, Escola Superior de Tecnologia de Castelo Branco, Portugal
Prof. Mike Bradley, University of Cambridge, UK
Prof. John Wood, Goldsmiths College, University of London, UK
Prof. Anthony Mileham, University of Bath, UK
Prof. Ashley Hall, Royal College of Art, UK
Prof. Eshaa Alkhalifa, Royal University for Women, Bahrain
Prof. Ming Cheung, The University of Adelaide, Australia
Program Committee

Prof. Pi-Chuen Tsai, National Formosa University
Prof. Po-Hsun Lei, National Formosa University
Prof. Day-Shan Liu, National Formosa University
Prof. Wen-Hsiang Hsieh, National Formosa University
Prof. Yu-Fen Chen, National Formosa University
Prof. Jie-Tong Zou, National Formosa University
Prof. Chih-Ming Lin, National Taitung University
Prof. Jui-Ming Hsu, National United University
Prof. Cheng-Liang Hsu, National University of Tainan
Prof. Shih-Chang Shei, National University of Tainan
Prof. Jia-Sheng Hu, National University of Tainan
Prof. Yu-Pei Huang, National Quemoy University
Prof. Shuhn-Shyurng Hou, Kun Shan University
Prof. Lung-Chuan Chen, Kun Shan University
Prof. Ming-Shyan Wang, Southern Taiwan University of Science and Technology
Prof. Pei-Jarn Chen, Southern Taiwan University of Science and Technology
Prof. Kuo-Kuang Fan, National Yunlin University of Science and Technology
Prof. Xiao-Jing Yu, Fuzhou University
Prof. Xiao-Yu Huang, Fuzhou University
Prof. Xiao-Mei Huang, Fuzhou University
Prof. Ye Yuan, Fuzhou University
Prof. Ting-Cheng Chang, Ningde Normal University
Prof. Martin Woolley, Coventry University
Prof. Brian Davies, Imperial College
Prof. Yu Dong, Curtin University
**Keynote Speaker**

**Topic:** Sacred Mountain of Taiwan (護國神山) – Semiconductor industry in Taiwan

**Prof. Shoou-Jinn Chang**

Chair Professor at National Cheng Kung University (NCKU), Tainan, Taiwan

Deputy Director of Advanced Optoelectronic Technology Center (AOTC), NCKU

IEEE Fellow, SPIE Fellow, and OSA Fellow

**Prof. Shoou-Jinn Chang** is currently a Chair Professor at National Cheng Kung University (NCKU), Tainan Taiwan. From August 2008 to July 2011, he was the Director of the Institute of Microelectronics, NCKU. From February 2006 to January 2011, he was the Deputy Director of the Center for Micro/Nano Science and Technology, NCKU.

His current research interests include semiconductor physics, optoelectronic devices, and nanotechnology. So far he has published near 1000 SCI journal papers. He is a Fellow of the Optical Society of America (OSA), the International Society for Optical Engineers (SPIE) and Institute of Electrical and Electronics Engineers (IEEE). He received the Outstanding Research Award from the National Science Council, Taiwan, in 2004 and 2014.
Keynote Speaker

Prof. Yan-Kuin Su

Prof. Yan-Kuin Su is currently a Dean of Academy of Innovative Semiconductor and Sustainable Manufacturing at National Cheng Kung University (NCKU). He is also a Director of Green Energy Technology Research Center, supported by Ministry of Education Taiwan. He even served as President of KSU from 2007 to 2018. He also even worked as Chairman of Department of Electrical Engineering NCKU from 1989 to 1993. From 1995 to 1998 and 2001 to 2007 he served as Dean of Research and Development and Dean of Academic Affairs, NCKU respectively.

His research interests are in the semiconductor and optoelectronic devices. So far he has published own 750 SCI journal papers and got over 80 patents in Taiwan and United States. He is an IEEE Life Fellow since 2018 and IEEE Fellow in 2007 for great contributions to optoelectronics and nanophotonics research and education.

He is also a SPIE Fellow since 2012 and an OSA Fellow since 2013. In 1993, he was a visiting Professor in Stuttgart University, Germany, a member of technical staff (MTS) in AT&T Bell Laboratories, US in 1986, and an Adjunct Professor of State University of New York, Binghamton, US during 1991–1997. He has got many prizes and medals during his research career including four times of excellent research awards from National Science Council (NSC), Taiwan.

Topic: The Development and Applications of Third Category of Semiconductors

Prof. Yan-Kuin Su
Honorary Chair Professor at National Cheng Kung University (NCKU), Tainan, Taiwan
Dean of Academy of Innovative Semiconductor and Sustainable Manufacturing, NCKU
IEEE Life Fellow, SPIE Fellow, and OSA Fellow
Executive Committee

General Chairman
Prof. Artde Donald Kin-Tak Lam, Ph.D

Professor & Deputy Dean of Design School & Straits College of Engineering, Fujian University of Technology.

Secretary-General of International (Taiwanese) Institute of Knowledge Innovation (iTIKI)

Dr. Artde D.K.T. Lam received the B.S. degree in mechanical engineering from National Cheng Kung University (NCKU), Tainan, Taiwan, in 1987, and the Ph.D. degree in mechanical engineering (in field of mechanical design) from National Sun Yat-Sen University (NSYSU), Kaohsiung, Taiwan, in 1993. Currently, he is a Professor and the Deputy Dean & academic leader of the School of Design, Fujian University of Technology, Fuzhou, P.R. China. His current research interests include nanotechnology, innovation design, creative design and Fractal Theory.

General Chairman
Prof. Stephen D. Prior, Ph.D

Faculty of Engineering and the Environment, Aeronautics, Astronautics and Computational Engineering, The University of Southampton, UK.

Fellow & Honorary President, International (Taiwanese) Institute of Knowledge Innovation (iTIKI).

Dr. Prior is a drone expert, engineer and educationalist who leads a multidisciplinary research group at the University of Southampton. His innovative work on drone design builds on his personal experience as an engineer and scientist. Stephen has built an unorthodox and creative team of aeronautical engineers, design engineers and robotic experts. Stephen has an international profile as an academic and conference chair. He publishes widely and speaks frequently at national and international events. He is especially interested in collaborative research at the intersections between traditional disciplinary boundaries and brings his considerable knowledge and insight to thinking on unmanned systems and the future of aircraft.
Executive Committee

General Chairman
Prof. Liang-Wen Ji, Ph.D

Professor, Institute of Electro-Optical and Materials Science, National Formosa University.

Fellow & Vice President of International (Taiwanese) Institute of Knowledge Innovation (iTIKI)

Dr. Liang-Wen Ji received the B.S. degree in physics, the M.S. degree in material science, and the Ph.D. degree in electrical engineering from National Cheng Kung University (NCKU), Tainan, Taiwan. In 2005, he became an Associate Professor with the Institute of Electro-Optical and Materials Science, National Formosa University (NFU), Yunlin, Taiwan, and was promoted to Full Professor in 2007. His current research interests include semiconductor physics, optoelectronics, and nanotechnology. He is a iTIKI Fellow. He is also a member of IEEE.

General Chairman
Prof. Siu-Tsen Shen, Ph.D

Professor, Department of Multimedia Design, National Formosa University.

Council Member & Deputy Secretary-General, International (Taiwanese) Institute of Knowledge Innovation (iTIKI).

Dr. Siu-Tsen Shen has studied widely, gaining her Master degree in Industrial Design Research from the Design Academy of Eindhoven, and her PhD in Design from Goldsmiths College, University of London. She has been a visiting professor at UCL and Middlesex University, UK and is currently a Professor in Multimedia Design at the National Formosa University. Her research interests lie in the areas of HCI, User-Centred Design, Cross-Cultural Research, User Interface Design, and Design Team Formation using Personality Type. She has taught on a number of different programmes including Introduction to Multimedia Design, Creative Thinking & Design Methods, Cognitive Psychology and Emerging Technology. She is an associate editor in Journal of Cultural and Creative Industries Research since 2011.
Executive Committee

Honorary General Chairman
Prof. Shoou-Jinn Chang, Ph.D

Chair Professor, Department of Electrical Engineering,
National Cheng Kung University

Fellow & President, International (Taiwanese) Institute of
Knowledge Innovation (iTIKI)

Dr. Shoou-Jinn Chang received the B.S. degree from the National Cheng Kung University (NCKU), Tainan, Taiwan in 1983, the M.S. degree from the State University of New York, Stony Brook in 1985 and the Ph.D. degree from the University of California, Los Angeles in 1989, all in electrical engineering. From 1989 to 1992, he was a Research Scientist at Nippon Telegraph and Telephone (NTT) Basic Research Laboratories, Musashino, Japan. He joined the Department of Electrical Engineering, NCKU in 1992 as an Associate Professor, where he was promoted to Full Professor in 1998. Professor Chang is the recipient of the outstanding research award from the National Science Council, Taiwan in 2004. He is an IEEE Fellow, an OSA Fellow, an SPIE Fellow and an iTIKI Fellow.

Award Chairman
Prof. Sheng-Joue Young, Ph.D

Associate Professor, Department of Electronic Engineering, National United University

Council Member & Deputy Secretary-General,
International (Taiwanese) Institute of Knowledge Innovation (iTIKI)

Dr. Sheng-Joue Young received his B.S. degree from Department of Physics, National Changhua University of Education, Changhua, Taiwan in 2003, M.S. and Ph.D. degree from Institute of Electro-Optical Science and Engineering and Institute of Microelectronics, National Cheng Kung University (NCKU), Taiwan in 2005 and 2008, respectively. He became an Associate Professor with the Department of Electronic Engineering, National United University, Taiwan. His current research interests include semiconductor physics, optoelectronic devices and nanotechnology. He has published more than 100 SCI and EI papers in recent years.
Expert Committee

Name: Yu-Cheng Lin, Distinguished Professor of the Department of Engineering Science, National Cheng Kung University, Tainan, Taiwan Fellow of the Royal Society of Chemistry; Fellow of the International Society for Optics and Photonics (SPIE); Fellow of the Institution of Engineering and Technology (IET)
Educations: Ph.D. in Electrical Engineering from the University of Illinois at Chicago
Research: MEMS, biotechnology
E-mail: yuclin@mail.ncku.edu.tw

Name: Huann-Ming Chou, Professor/Vice President/Dean of College of Engineering, Kun Shan University
Educations: Ph.D., Mechanical Engineering, National Cheng Kung University, Taiwan
Research: Thermal Science, Energy Technology
E-mail: hmchou@mail.ksu.edu.tw

Name: Te-Hua Fang, Chair Professor/Chair of Department of Mechanical Engineering, National Kaohsiung University of Science and Technology; IET Fellow, CSME Fellow
Educations: Ph.D., Mechanical Engineering, National Cheng Kung University, Taiwan
Research: Mechanical Engineering, Nanotechnology
E-mail: fang@nkust.edu.tw

Name: Yaw-Shyan Fu, Professor of Department of Greenergy, National University of Tainan
Educations: Ph.D., Department of Chemistry of National Chung Cheng University, Taiwan
Research: Nanomaterials, Green energy
E-mail: ysfu@mail.nutn.edu.tw

Name: I-Tseng Tang, Professor of Department of Greenergy, National University of Tainan
Educations: Ph.D., Institute of Microelectronics of National Cheng Kung University, Taiwan
Research: Green energy, Energy electronmechanical System
E-mail: tit@mail.nutn.edu.tw
Expert Committee

Name: Su-Hua Yang, Professor of Department of Electronic Engineering, National Kaohsiung University of Science and Technology
Educations: Ph.D., Department of Electrical Engineering of National Cheng Kung University, Taiwan
Research: Nanomaterials, Optoelectronic device
E-mail: shya@nkust.edu.tw

Name: Chih-Ta Yen, Professor of Department of Electrical Engineering, National Taiwan Ocean University
Educations: Ph.D., Department of Electrical Engineering of National Cheng Kung University, Taiwan
Research: Machine Learning, Deep Learning, Communication System and Embedded System Design
E-mail: ctyen@mail.ntou.edu.tw

Name: Ing-Jr Ding, Professor of Department of Electrical Engineering, National Formosa University
Educations: Ph.D., Department of Computer Science and Information Engineering, National Chiao Tung University, Taiwan
Research: Speech Processing and Recognition, Artificial Intelligence, Multimedia Technique
E-mail: ingjr@nfu.edu.tw

Name: Yeou-Jiunn Chen, Professor of Department of Electrical Engineering, Southern Taiwan University of Science and Technology
Educations: Ph.D., Department of Computer Science and Information Engineering, National Cheng Kung University, Taiwan
Research: Speech communication assistive technology, Biomedical signal processing, AI
E-mail: chenyj@stust.edu.tw

Name: Jun-Dar Hwang, Distinguished Professor of Department of Electrophysics, National Chiayi University
Educations: Ph.D., Department of Electrical Engineering, National Cheng Kung University, Taiwan
Research: Optoelectronic Devices, Solar cell, Semiconductor processing and technology, Semiconductor Devices
E-mail: jundar@mail.ncku.edu.tw
Expert Committee

Name: Shi-Chang Tseng, Professor of Department of Mechanical Engineering, National Yunlin University of Science and Technology
Education: Ph.D., Mechanical Engineering University of Wisconsin at Madison, U.S.A.
Research: Polymer Rheology, Thermo-Viscoelasticity, Plastic/Composite Materials Processing
E-mail: tsengsc@yuntech.edu.tw

Name: Yu-Jen Hsiao, Professor of Department of Mechanical Engineering, Southern Taiwan University of Science and Technology
Education: Ph.D., Department of Materials Science and Engineering, National Cheng Kung University, Taiwan
Research: MEMS sensor, nanomaterials
E-mail: yujen@stust.edu.tw

Name: Fu-Cheng Wang, Professor of Department of Mechanical Engineering, National Taiwan University
Education: Ph.D., University of Cambridge in Control Engineering
Research: Automatic Control, Robust Control, Inserter Research, Vibration Control, Energy System, Medical Engineering, Artificial Intelligent
E-mail: fcw@ntu.edu.tw

Name: Hsi-Wen Yang, Distinguished Professor of Department of Materials Science and Engineering, National United University
Education: Ph.D., Institute of Mining, Metallurgy and Materials of National Cheng Kung University
Research: Special purpose glass and optical fiber, thin film engineering, magnetic materials, ceramic engineering, nanotechnology
E-mail: hwyang@nuu.edu.tw

Name: Cheng-Mu Tsai, Professor of Graduate Institute of Precision Engineering, National Chung-Hsing University
Education: Ph.D., Department of Electrical Engineering, National Cheng Kung University, Taiwan, Taiwan
Research: Optical System Design, Fourier Optics, Fiber-Optic communication, Image Processing
E-mail: jmutsai@email.nchu.edu.tw
Expert Committee

Name: Chun-Hung Lai, Professor of Department of Electronic Engineering, National United University
Education: Ph.D., Department of Electronic Engineering, National Chiao Tung University
Research: Thin film technology, Memory
E-mail: brandon@nuu.edu.tw

Name: Chang-Tzuoh Wu, Professor of Department of Industrial Design, National Kaohsiung Normal University
Education: Ph.D., Mechanical Engineering, National Cheng Kung University, Taiwan
Research: Computer Aided Design and Manufacturing, Quality Design, Innovative Design, Perceptual Image Design
E-mail: ctwu@nknu.edu.tw

Name: Cheng-Hsing Hsu, Professor of Department of Electrical Engineering, National United University
Education: Ph.D., Department of Electrical Engineering, National Cheng Kung University, Taiwan
Research: materials, electronics
E-mail: hsuch@nuu.edu.tw

Name: Jenn-Kun Kuo, Professor of Department of Mechanical and Electro-Mechanical Engineering, National Sun Yat-Sen University
Education: Ph.D., Department of Mechanical Engineering, National Cheng Kung University, Taiwan
Research: Hydrogen Energy and Fuel Cell
E-mail: jenn.kun@mail.nsysu.edu.tw

Name: Hsin-Chia Yang, Associate Professor of Department of Electronic Engineering, Minghsin University of Science and Technology
Education: PhD, in Physics, Univ of Oregon, U.S.A.
Research: Semiconductor Process, Semiconductor Equipments, Communication System
E-mail: hcyang@must.edu.tw
Guidelines

1. Official Languages
   The official languages of IEEE ICASI 2022 are used only in English. All presentations including Q&A should be delivered in English.

2. Guideline for Participants
   2.1 Registration
   Time of Early Registration: April 21, 2022 6:00pm~8:00pm (Reception Hall)
   
   2.2 Conference Kit
   Conference kit, which contains final program, name badge, banquet, official receipt, will be provided to participants during check in at the Registration/Information Desk.

3. Guideline for Presenters
   1) The presenters and session chairs are asked to keep to the paper sequence as shown in the Final Program. By following this predefined schedule, participants can switch between sessions without missing the particular papers of interest.
   
   2) The presentation time for each presenter is 15 minutes. The session chairs should allow the presenter for a 10 minutes presentation and leave 5 minutes for discussions (up to 15 slides for oral presentation is recommended).
   
   3) The presentation language of IEEE ICASI 2022 papers is only used in English.
   
   4) Notebook PCs and LCD projectors will be available in every session room. Presenters are urged to prepare their files in MS PowerPoint format on a USB and copy the Conference into the PC at session room before the session begins. Our session aids will assist the presenters to copy the file. If you wish to use your own notebook PC, please open the file before your presentation time.
   
   5) For unexpected events that cannot be handled on the spot, you may request through session chairs, session aids or make a direct notification to the Conference Secretary Desk.
   
   6) Poster size: A2 (420mm×594mm).
## Conference Agenda

**Venue:** Fuli Hot Spring Resort, Sun Moon Lake, Nantou, Taiwan.  
**Language:** English

### Pre-Conference Schedule

**April 21, 2022**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 pm</td>
<td>Sponsor Showcase (Grand Ballroom)</td>
</tr>
<tr>
<td>6:00 pm</td>
<td>Early Conference Registration (Reception Hall)</td>
</tr>
</tbody>
</table>

### Main-Conference Schedule

**April 22, 2022**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:20 am</td>
<td>Conference Registration and Conference Information Collection</td>
</tr>
<tr>
<td>9:00 am</td>
<td>Opening Ceremony (International Conference Room)</td>
</tr>
<tr>
<td>9:30 am</td>
<td>Tea Break (International Conference Room)</td>
</tr>
<tr>
<td>9:40 am</td>
<td>Keynote Speech 1 (International Conference Room)</td>
</tr>
<tr>
<td>10:30 am</td>
<td>Tea Break (International Conference Room)</td>
</tr>
<tr>
<td>10:50 am</td>
<td>Keynote Speech 2 (International Conference Room)</td>
</tr>
<tr>
<td>11:40 am</td>
<td>Lunch &amp; Free Time</td>
</tr>
<tr>
<td>1:00 pm</td>
<td>Breakout Session of A1-2, B1-2, C1-2, D1-2 (Board Room)</td>
</tr>
<tr>
<td>5:30 pm</td>
<td>Poster Session of P1 (Poster Room)</td>
</tr>
<tr>
<td>6:00 pm</td>
<td>Conference Banquet (Ballroom)</td>
</tr>
</tbody>
</table>

**April 23, 2022**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 am</td>
<td>Sponsor Showcase (Grand Ballroom), Closing Ceremony</td>
</tr>
</tbody>
</table>
Oral Session Schedule

Venue: Fuli Hot Spring Resort, Sun Moon Lake, Nantou, Taiwan.
Language: English

Breakout Session of IEEE ICASI 2022 A1, B1, C1, D1 (Board Room)
1:00 pm - 3:00 pm, Friday, April 22, 2022.

<table>
<thead>
<tr>
<th>Oral A1</th>
<th>Oral B1</th>
<th>Oral C1</th>
<th>Oral D1</th>
</tr>
</thead>
<tbody>
<tr>
<td>J220070 A</td>
<td>J220014 C</td>
<td>J220040 D</td>
<td>J220010 E</td>
</tr>
<tr>
<td>J220121 A</td>
<td>J220015 C</td>
<td>J220048 D</td>
<td>J220023 E</td>
</tr>
<tr>
<td>J220230 A</td>
<td>J220080 C</td>
<td>J220049 D</td>
<td>J220276 E</td>
</tr>
<tr>
<td>J220238 A</td>
<td>J220174 C</td>
<td>J220050 D</td>
<td>J220051 F</td>
</tr>
<tr>
<td>J220278 A</td>
<td>J220178 C</td>
<td>J220113 D</td>
<td>J220053 F</td>
</tr>
<tr>
<td>J220095 H</td>
<td>J220233 C</td>
<td>J220143 D</td>
<td>J220059 F</td>
</tr>
<tr>
<td>J220103 (IV6)</td>
<td>J220239 C</td>
<td>J220146 D</td>
<td>J220131 F</td>
</tr>
<tr>
<td>J220104 (IV6)</td>
<td>J220240 C</td>
<td>J220148 D</td>
<td>J220241 F</td>
</tr>
<tr>
<td>J220105 (IV6)</td>
<td>J220247 C</td>
<td>J220159 D</td>
<td>J220261 (IV8)</td>
</tr>
<tr>
<td>J220106 (IV6)</td>
<td>J220304 C</td>
<td>J220171 D</td>
<td>J220292 (IV8)</td>
</tr>
<tr>
<td>J220176 (IV6)</td>
<td>J220187 D</td>
<td>J220192 D</td>
<td></td>
</tr>
</tbody>
</table>

Breakout Session of IEEE ICASI 2022 A2, B2, C2, D2 (Board Room)
3:30 pm - 5:30 pm, Friday, April 22, 2022.

<table>
<thead>
<tr>
<th>Oral A2</th>
<th>Oral B2</th>
<th>Oral C2</th>
<th>Oral D2</th>
</tr>
</thead>
<tbody>
<tr>
<td>J220030 J</td>
<td>J220093 B</td>
<td>J220031 (IV1)</td>
<td>J220045 (IV2)</td>
</tr>
<tr>
<td>J220034 J</td>
<td>J220096 B</td>
<td>J220032 (IV1)</td>
<td>J220062 (IV2)</td>
</tr>
<tr>
<td>J220077 J</td>
<td>J220130 B</td>
<td>J220047 (IV1)</td>
<td>J220069 (IV2)</td>
</tr>
<tr>
<td>J220249 J</td>
<td>J220076 G</td>
<td>J220090 (IV1)</td>
<td>J220092 (IV2)</td>
</tr>
<tr>
<td>J220275 J</td>
<td>J220152 G</td>
<td>J220091 (IV1)</td>
<td>J220286 (IV2)</td>
</tr>
<tr>
<td>J220307 J</td>
<td>J220253 G</td>
<td>J220097 (IV1)</td>
<td>J220204 L</td>
</tr>
<tr>
<td>J220164 K</td>
<td>J220123 (IV3)</td>
<td>J220185 (IV1)</td>
<td>J220214 L</td>
</tr>
<tr>
<td>J220166 K</td>
<td>J220125 (IV3)</td>
<td>J220011 N</td>
<td>J220219 L</td>
</tr>
<tr>
<td>J220177 K</td>
<td>J220126 (IV3)</td>
<td>J220248 L</td>
<td></td>
</tr>
<tr>
<td>J220181 K</td>
<td>J220242 (IV3)</td>
<td>J220303 L</td>
<td></td>
</tr>
</tbody>
</table>
Poster Session Schedule

Venue: Fuli Hot Spring Resort, Sun Moon Lake, Nantou, Taiwan.
Language: English

<table>
<thead>
<tr>
<th>Poster Session of IEEE ICASI 2022 P1 (Board Room)</th>
<th>1:30 pm - 5:00 pm, Friday, April 22, 2022.</th>
</tr>
</thead>
<tbody>
<tr>
<td>J220037 A</td>
<td>J220046 A</td>
</tr>
<tr>
<td>J220134 A</td>
<td>J220151 A</td>
</tr>
<tr>
<td>J220309 A</td>
<td>J220072 I</td>
</tr>
<tr>
<td>J220041 C</td>
<td>J220115 C</td>
</tr>
<tr>
<td>J220133 C</td>
<td>J220170 C</td>
</tr>
<tr>
<td>J220209 C</td>
<td>J220295 C</td>
</tr>
<tr>
<td>J220027 D</td>
<td>J220082 D</td>
</tr>
<tr>
<td>J220141 D</td>
<td>J220145 D</td>
</tr>
<tr>
<td>J220196 D</td>
<td>J220197 D</td>
</tr>
<tr>
<td>J220269 D</td>
<td>J220270 D</td>
</tr>
<tr>
<td>J220288 E</td>
<td>J220293 E</td>
</tr>
<tr>
<td>J220063 F</td>
<td>J220112 F</td>
</tr>
<tr>
<td>J220144 I</td>
<td>J220156 J</td>
</tr>
<tr>
<td>J220189 B</td>
<td>J220265 N</td>
</tr>
<tr>
<td>J220182 (IV2)</td>
<td>J220042 (IV4)</td>
</tr>
<tr>
<td>J220200 (IV5)</td>
<td>J220158 (IV7)</td>
</tr>
<tr>
<td>J220203 (IV7)</td>
<td>J220258 (IV7)</td>
</tr>
</tbody>
</table>
On-line Oral & Poster Session Schedule

Venue: Fuli Hot Spring Resort, Sun Moon Lake, Nantou, Taiwan.
Language: English

### On-Line Oral Session of IEEE ICASI 2022 Google Meet A~B
1:00 pm - 3:00 pm, Friday, April 22, 2022.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>J220136 A</td>
<td>J220183 D</td>
<td>J220075 (IV5)</td>
</tr>
<tr>
<td>J220184 B</td>
<td>J220020 G</td>
<td>J220101 (IV5)</td>
</tr>
<tr>
<td>J220018 C</td>
<td>J220067 G</td>
<td>J220114 (IV5)</td>
</tr>
<tr>
<td>J220088 C</td>
<td>J220188 I</td>
<td>J220137 (IV5)</td>
</tr>
<tr>
<td>J220107 C</td>
<td>J220168 J</td>
<td>J220139 (IV5)</td>
</tr>
<tr>
<td>J220132 C</td>
<td>J220243 J</td>
<td>J220155 (IV5)</td>
</tr>
<tr>
<td>J220153 C</td>
<td>J220005 K</td>
<td>J220167 (IV5)</td>
</tr>
<tr>
<td>J220173 C</td>
<td>J220016 N</td>
<td>J220205 (IV5)</td>
</tr>
<tr>
<td>J220198 C</td>
<td>J220290 N</td>
<td>J220208 (IV5)</td>
</tr>
<tr>
<td>J220221 C</td>
<td>J220127 (IV3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>J220154 (IV4)</td>
</tr>
</tbody>
</table>

### On-Line Poster Session of IEEE ICASI 2022 P1 (Board Room)
1:00 pm - 5:30 pm, Friday, April 22, 2022.

<table>
<thead>
<tr>
<th>J220147 A</th>
<th>J220179 A</th>
<th>J220237 A</th>
<th>J220213 B</th>
</tr>
</thead>
<tbody>
<tr>
<td>J220019 B</td>
<td>J220073 C</td>
<td>J220244 C</td>
<td>J22003 D</td>
</tr>
<tr>
<td>J220057 K</td>
<td>J220285 L</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>