ECBIOS

7th Eurasia Conference on Biomedical Engineering, Healthcare and Sustainability 2025

Cheng Shiu University,
Kaohsiung, Taiwan
October 23-25, 2025

7th Eurasia Conference on Biomedical Engineering, Healthcare and Sustainability 2025

(ECBIOS 2025)

Kaohsiung, Taiwan
October 23–25, 2025

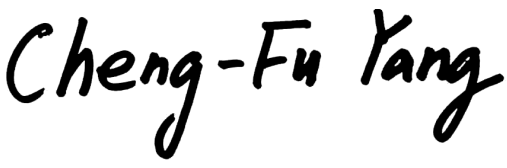
Organized by:

Cheng Shiu University, Taiwan
National University of Kaohsiung, Taiwan
International Institute of Knowledge Innovation and Invention (IIKII)
IEEE Tainan Section Sensors Council

Welcome

Welcome to the 7th Eurasia Conference on Biomedical Engineering, Healthcare and Sustainability 2025 (ECBIOS 2025). This conference is the collaboration between Cheng Shiu University, National University of Kaohsiung, International Institute of Knowledge Innovation and Invention (IIKII), IEEE Tainan Section Sensors Council to organize an interdisciplinary conference in the field of Biomedical Engineering, Healthcare and Sustainability. Recently, Healthcare Biomedical Engineering, Healthcare and Sustainability. Recently, Healthcare is undergoing a sector-wide transformation thanks to advances in computing, networking technologies, big data, and artificial intelligence. Healthcare is not only changing from reactive and hospital-centered to preventive and personalized but is also changing from disease focused to well-being centered. Healthcare systems, as well as fundamental medicine research, are becoming smarter and enabled in Biomedical Engineering. Furthermore, with cutting edge sensors and computer technologies, healthcare delivery could also yield better efficiency, higher quality, and lower cost. However, these innovations often do not bring in sustainability, health, and happiness for all people. Science and technology are to be complemented by arts, humanities, social sciences, and indigenous know-how and wisdom, in order to increase the accessibility of the benefits for the needy across all regions and classes of people. We need ethically aligned and driven health care system and sustainability. Professional practice in the fields of Biomedical Engineering, Healthcare and Sustainability are welcome to participate in ECBIOS 2025. This conference enables interdisciplinary collaboration of science and engineering technologists in the academic and industrial fields, as well as networking internationally. During the conference, there will be substantial time for presentation and discussion. Attendants will find various activities useful in bringing together a diverse group of engineers and technologists across the disciplines for the generation of new ideas, collaboration potential and business opportunities.

ECBIOS 2025 received a total of 131 submissions, with 91 papers finally selected and registered for this conference. 11 countries and regions of participation includes Bangladesh, China, Italy, Japan, Korea, Malaysia, Taiwan, Thailand, The Philippines, The USA, and Vietnam. These papers on various topics are divided into 24 Regular Sessions and 2 Invited Session. We are happy to say that it is a fine starting point for establishing an international network to facilitate future science and engineering technologists in the academic and industrial fields. I would like to express my sincere gratitude to the participants and committee members for making this event possible. I welcome you all to share in this conference, as an opportunity to make new unforgettable learning experiences and colleagues. Friends, welcome to ECBIOS 2025!



Prof. Cheng-Fu Yang, Ph. D.
Conference Chairman of ECBIOS 2025
Department of Chemical and Materials Engineering,
National University of Kaohsiung, Taiwan
October 23, 2025

Conference Topics

Regular

A. Smart Healthcare System Analysis and Design
B. Computer and Human-Machine Interaction of Healthcare System
C. Application of Iot (Internet of Things) on Healthcare System
D. Big Data and Artificial Intelligence Enabled Healthcare Systems
E. Health-Related Aspects of Sustainability
F. Environmental Education and Public Health
G. Environmental Engineering and Biotechnology Rehabilitation Medicine and Physiotherapy
H. Sports Medicine
I. Pediatric and Geriatric Emergency Care
J. Leisure Recreation
K. Health Promotion
L. Nourishment and Health Care
M. Disaster and Health
N. Health and Environment
O. Health Services
P. Occupational Health
Q. Impact of Safety, Security and Disaster Management on Sustainability
R. Sustainability Science
S. Medical Electronics
T. Biomedical Materials
U. Biomedical Diagnostic Techniques
V. Medical Information and Rehabilitation Technology
W. Electrical Engineering
X. Other Relate Topics in Healthcare, Sustainability, Biomedical Engineering

Invited

IV1. Innovations and Challenges in Healthcare and Rescue
IV2. Bio-Inspired Adhesive Materials and AI-Driven Robotics for Sustainable Intelligent Systems

Content

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National University of Kaohsiung, Taiwan

International Institute of Knowledge Innovation and Invention (IIKII)

IEEE Tainan Section Sensors Council

Sponsor

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Sessions

Regular Sessions

A. Smart Healthcare System Analysis and Design
B. Computer and Human-Machine Interaction of Healthcare System
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Invited Session

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IV2. Bio-Inspired Adhesive Materials and AI-Driven Robotics for Sustainable Intelligent Systems

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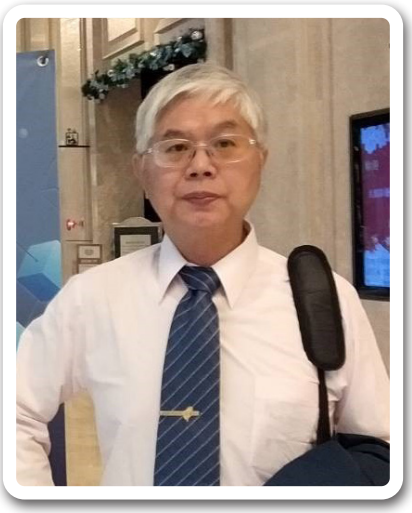

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Keynote Speaker

Chi-Cheng Cheng, Ph. D.

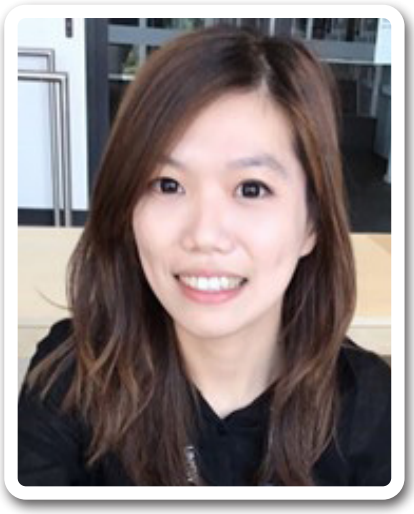
Professor,
Department of Mechanical and Electro-Mechanical Engineering,
National Sun Yat-sen University, Taiwan

A Smart Assistive Guidance System for Visually Impaired Pedestrians Crossing the Road

Visually impaired people always experience inconvenience to manage many issues in their daily life. Crossing the road without tactile paving becomes a great challenge to the blind. Based on this motivation, this research aims to develop a wearable assistive guiding system using cutting edge techniques of machine vision and artificial intelligence to direct the visually impaired people walking on the central area of the crosswalks while crossing the road. Both safety and autonomy of visually impaired people can therefore be improved. This research incorporates image processing and machine learning approaches to locate the central position of the crosswalks even affected by occlusion of pedestrians and interference of shadow. In addition, statistical approaches are also applied to reduce the influence of fault detection. A wearable device with vibration wristbands is then employed to provide information of guidance for the visually impaired people. Crossing-the-road experiments were conducted to examine performance of the proposed center-line detection algorithm and guidance of vibration strategy. In order to include all possible appearances of crosswalks in real world, different environmental conditions including head-on and oblique directions as well as without and with occlusion were examined. Finally, the presented assistive guiding system demonstrates promising performance to direct healthy human subjects with both eyes fully covered successfully accomplishing the task of passing through the road by walking in the middle along the crosswalk.

Keywords: artificial intelligence, image processing, machine learning, machine vision, pedestrian crosswalks, visually impaired people, wearable device.

Keynote Speaker



Wen-Fan Chen, Ph. D.

Associate Professor,
Institute of Medical Science and Technology,
National Sun Yat-sen University, Taiwan

3D Printed Bionic Ceramic Scaffolds for Bone Repair Applications - From Novel Materials to 3D Printing Technology

Each year, tens of thousands of patients worldwide undergo bone graft surgeries due to fractures caused by excessive physical activity, traffic accidents, or osteoporosis in the elderly. Although autografts are considered the gold standard for bone grafting, their clinical application is limited by the finite availability of donor tissue and the need for multiple surgical procedures. Allografts, on the other hand, pose risks such as disease transmission and reduced biological activity following sterilization. Currently used medical materials, including metals and polymers, also face several clinical limitations, such as imaging artifacts, excessive stiffness leading to stress shielding and bone overload, allergic reactions, neurotoxicity from metal ions, poor osseointegration, and insufficient mechanical strength of polymer-based materials. To address these challenges, our team aims to develop a next-generation bone substitute that combines high mechanical strength, enhanced bioactivity, and therapeutic functionality. Our research focuses on three main areas: (1) Novel Bioceramic Material Synthesis - Development of a new bioactive ceramic based on diopside ($CaMgSi_2O_6$), known for its biocompatibility and osteoconductivity; (2) Advanced 3D Printing Techniques - Fabrication of biomimetic scaffolds with patient-specific architecture by optimizing printing slurry composition, equipment parameters, and sintering conditions to meet diverse anatomical and clinical needs; and (3) Magnetic Nanoparticle Integration – Incorporation of magnetic nanoparticles into the scaffold to enable localized magnetothermal therapy for the elimination of pathological cells near the implantation site. By integrating these innovations, our team aims to create a biodegradable, mechanically robust, and highly bioactive scaffold with therapeutic capabilities, offering a promising solution for the treatment of critical-sized bone defects in clinical settings.

Keynote Speaker

Pramod Koshy, Ph. D.

Associate Professor,
School of Materials Science & Engineering,
The University of New South Wales Sydney, Australia

Designing Ce-Based Nanostructures for Diverse Biomedical Applications

There has been increased research into nanoceria (CeO_2) owing to its unique chemical and defect characteristics which has created interest in its use for several advanced environmental, energy, and biomedical applications. The potential use of nanoceria for biomedical applications is linked to its intrinsic defect characteristics, which arise from the pH-dependent reversible switching between the Ce^{3+} and Ce^{4+} oxidation states and the resulting alteration of the surface oxygen vacancy characteristics. This can enable nanoceria to be used in cell protective anti-oxidant applications where reactive oxygen species (ROS) are removed or as a cell destructive pro-oxidant where ROS is generated.

This gives nanoceria the ability to be used in cancer treatment, where the cancer cell microenvironment is slightly acidic in comparison to the basic physiological pH in regular cells. Additionally, this capability can be harnessed to develop nanoparticle solutions for theranostics (therapy + diagnostics) and anti-bacterial biomedical applications and also to design nanostructured films/coatings to improve osseointegration.

The present work discusses research into nanoceria, its key characteristics, typical fabrication and design routes, property-morphology characteristics resulting from these processes, functionalisation approaches to improve specificity for different applications, as well as strategies such as doping, morphology tailoring, and vacancy alteration to enhance its surface and chemical characteristics for biomedical applications. The results can help to improve understanding of issues affecting the widespread use of these nanoparticles as well as guide possible design and development strategies to overcome these limitations and enable the successful use of these unique materials.

Guidelines

1. Official Languages

The official language of ECBIOS 2025 is English. All presentations including Q&A should be delivered in English.

2. Guideline for Participants

2.1. Conference Venue

Cheng Shiu University, Taiwan
(No.840, Chengqing Rd., Niaosong Dist., Kaohsiung City, Taiwan)

2.2. Registration

Time of Registration:
09:00~ 13:00, October 23, 2025 (UTC/GMT +8 Taipei)

2.3. Conference Kit

Conference kit, which contains final program and name badge, will be provided to participants during check-in at the Registration/Information Desk.

3. Guidelines for Presenters

3.1. 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 any particular papers of interest.

3.2. The presentation time for each oral presenter is 15 minutes. The session chairs will allow the presenter 12 minutes for presentation and 3 minutes for discussion. Presentation time for each poster presenter is 60 minutes.

3.3. It is required that the presentation language of ECBIOS 2025 papers is in English.

3.4. 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 the session room before the session begins. Our session aids will assist the presenters to copy any relevant files. If you wish to use your own notebook PC, please be prepared to open the file before your presentation time.

3.5. Please contact the Conference Secretary Desk, the session chairs, or any of the session aids if there are any special requests which might require special and unexpected attention.

Conference Agenda

Venue: **Cheng Shiu University, Kaohsiung, Taiwan** **Language**: **English**

Main Conference

Thursday, October 23, 2025

08:30	09:00	Conference Registration
09:00	09:10	Opening Ceremony
09:10	10:00	1st Keynote Speech
10:00	10:20	Coffee Break
10:20	11:10	2nd Keynote Speech
11:10	12:00	3rd Keynote Speech
		12:00- 13:00 Lunch Break
13:00	17:00	Oral Paper Presentation & Poster Paper Presentation
15:30	16:00	Coffee Break
18:00	20:30	Conference Banquet

Main Conference

Friday, October 24, 2025

08:30	17:30	Technical Visit & Communication

Main Conference

Saturday, October 25, 2025

08:30	17:30	Technical Visit & Communication & Closing

Venue

Adminstration Building, Cheng Shiu University

No.840, Chengqing Rd., Niaosong Dist., Kaohsiung City 833, Taiwan

Oral Paper Schedule

Thursday, October 23, 2025

Onsite Oral Paper Sessions
(Cheng Shiu University, Kaohsiung, Taiwan)
UTC/GMT +8 hours

14:00—15:00	15:00—16:00	16:00—17:00
Session A		
A1	A2	A3
EC250064-D	EC250042-S	EC250119-S
EC250090-D	EC250070-S	EC250045-T
EC250102-D	EC250080-S	EC250050-T
	EC250094-S	
Session B		
B1	B2	B3
EC250067-H	EC250054-W	EC250088-X
EC250062-L	EC250106-W	EC250093-X
EC250068-L	EC250043-X	EC250095-X
	EC250047-X	
Session C		
C1	C2	
EC250048-A	EC250038-IV1	EC250073-IV1
EC250017-B	EC250060-IV1	EC250120-IV1
EC250103-B	EC250061-IV1	
EC250104-B	EC250069-IV1	

Online (Remote) Oral Paper Sessions
(ZOOM Meetings) UTC/GMT +8 hours

13:00—14:00	14:00—15:00	15:00—16:00
Session D		
D1	D2	D3
EC250083-B	EC250075-R	EC250096-U
EC250100-D	EC250082-R	EC250022-V
EC250004-E	EC250077-S	EC250007-X
EC250079-O	EC250081-S	EC250009-X

Poster Paper Schedule

Thursday, October 23, 2025

Onsite Poster Paper Sessions

(Cheng Shiu University, Kaohsiung, Taiwan) UTC/GMT +8 hours

13:00—14:00	14:00—15:00	15:00—16:00	16:00—17:00
EC250046-A	EC250128-IV2	EC250011-Q	EC250030-X
EC250056-A	EC250129-IV2	EC250049-Q	EC250040-X
EC250065-A	EC250130-IV2	EC250122-Q	EC250085-X
EC250076-A	EC250131-IV2	EC250013-S	EC250012-W
EC250039-G	EC250132-IV2	EC250063-S	EC250014-W
EC250109-IV1	EC250133-IV2	EC250026-U	EC250028-W
EC250023-W	EC250092-N	EC250066-U	EC250044-W
EC250037-J	EC250105-P	EC250078-U	EC250059-W
EC250126-C			EC250125-X

Online (Remote) Poster Paper Sessions

UTC/GMT +8 hours

13:00—14:00	14:00—15:00	15:00—16:00	16:00—17:00
EC250116-B	EC250031-A	EC250033-M	EC250015-W
EC250034-C	EC250036-D	EC250101-M	EC250124-W
EC250035-C	EC250099-D	EC250121-R	EC250018-X
EC250074-C	EC250027-D	EC250032-S	EC250053-X
	EC250071-K		

Paper Abstracts

https://www.ecbios.asia/abstract

Contact us

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