

**The 20th International Conference on
Future Information Technology
(FutureTech 2025)**
&
**The 19th International Conference on
Multimedia and Ubiquitous Engineering
(MUE 2025)**

April 23-24, 2025
Zhangjiajie, China

April 25-26, 2025
Changsha, China

Organized by

KCIA & Hunan University of Science and Technology

2025 International Conferences (Sponsored / Technically Sponsored by KCI)

The International Conference on Big data, IoT, and Cloud computing (BIC 2025)

- Aug 13-15, 2025, Phnom Penh, Cambodia
- <http://www.bic-conference.org/2025/>

The 17th International Conference on Computer Science and its Applications (CSA 2025)

- Dec 18-20, 2025, Phu Quoc, Vietnam
- <http://www.csa-conference.org/2025/>

Message from the FutureTech 2025 General Chairs

FutureTech 2025 is the 20th event of the series of international scientific conference. This conference takes place on April 2-26, 2025 in Zhangjiajie & Changsha, China. The aim of the FutureTech 2025 is to provide an international forum for scientific research in the technologies and application of information technology. FutureTech 2025 is the next edition of FutureTech 2024(Chongqing, China), FutureTech 2023(Phnom Penh, Cambodia), FutureTech 2022(Jeju, Korea), FutureTech 2021(Jeju, Korea), FutureTech 2020(Jeju, Korea), FutureTech 2019(Xian, China), FutureTech 2018 (Salerno, Italy), FutureTech 2017 (Seoul, Korea), FutureTech 2016 (Beijing, China), FutureTech 2015 (Hanoi, Vietnam), FutureTech 2014 (Zhangjiajie, China), FutureTech 2013 (Gwangju, Korea), FutureTech 2012 (Vancouver, Canada), FutureTech 2011 (Loutraki, Greece), FutureTech 2010 (Busan, Korea, May 2010) which was the next event in a series of highly successful the International Symposium on Ubiquitous Applications & Security Services (UASS-09, USA, Jan. 2009), previously held as UASS-08 (Okinawa, Japan, Mar. 2008), UASS-07 (Kuala Lumpur, Malaysia, August, 2007), and UASS-06 (Glasgow, Scotland, UK, May, 2006).

The conference papers included in the proceedings cover the following topics: Hybrid Information Technology, High Performance Computing, Cloud and Cluster Computing, Ubiquitous Networks and Wireless Communications, Digital Convergence, Multimedia Convergence, Intelligent and Pervasive Applications, Security and Trust Computing, IT Management and Service, Bioinformatics and Bio-Inspired Computing, Database and Data Mining, Knowledge System and Intelligent Agent, Game and Graphics, and Human-centric Computing and Social Networks. Accepted and presented papers highlight new trends and challenges of future information technologies. We hope readers will find these results useful and inspiring for their future research.

We would like to express our sincere thanks to Steering Chair: James J. (Jong Hyuk) Park (SeoulTech, Korea), Doo-Soon Park(Soonchunhyang University, Korea), Jin Wang(Hunan University of Science and Technology, China). Our special thanks go to the Program Chairs: Ji Su Park(Jeonju University, Korea), Yan Li(Inha University, Korea), Ka Lok Man(Xi'an Jiaotong-Liverpool University, China), S. Vimal(National Engineering College, India), Le Anh Ngoc(Swinburne University of Technology, Vietnam) Xiaoliang Wang(Hunan University of Science and Technology, China), all Program Committee members, and all reviewers for their valuable efforts in the review process that helped us to guarantee the highest quality of the selected papers for the conference.

We cordially thank all the authors for their valuable contributions and the other participants of this conference. The conference would not have been possible without their support. Thanks are also due to the many experts who contributed to making the event a success.

FutureTech 2025 General Chairs

Jungho Kang, Baewha Women's University, Korea(Leading Chair)
Yang Xiao, The University of Alabama, USA
Changhao Piao, Chongqing University of Posts and Telecommunications, China
Laurence T. Yang, St Francis Xavier University, Canada
Wei Liang, Hunan University of Science and Technology, China

Message from the FutureTech 2025 Program Chairs

Welcome to the 19th International Conference on Future Information Technology (FutureTech 2025), which will be held in Zhangjiajie & Changsha, China, on April 2-26, 2025. FutureTech 2025 will be the most comprehensive conference focused on the various aspects of information technologies. It will provide an opportunity for academic and industry professionals to discuss recent progress in the area of future information technologies. In addition, the conference will publish high quality papers which are closely related to the various theories and practical applications in multimedia and ubiquitous engineering. Furthermore, we expect that the conference and its publications will be a trigger for further related research and technology improvements in these important subjects.

For FutureTech 2025, we received many paper submissions, after a rigorous peer review process, we accepted only articles with high quality for the FutureTech 2025 proceedings, published by the Springer. All submitted papers have undergone blind reviews by at least two reviewers from the technical program committee, which consists of leading researchers around the globe. Without their hard work, achieving such a high-quality proceeding would not have been possible. We take this opportunity to thank them for their great support and cooperation. Finally, we would like to thank all of you for your participation in our conference, and also thank all the authors, reviewers, and organizing committee members. Thank you and enjoy the conference!

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Ka Lok Man, Xi'an Jiaotong-Liverpool University, China

S. Vimal, National Engineering College, India

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Message from the MUE 2025 General Chairs

MUE 2025 is the 19th event of the series of international scientific conference. This conference takes place on April 23-26, 2025 in Zhangjiajie & Changsha, China. The aim of the MUE 2025 is to provide an international forum for scientific research in the technologies and application of Multimedia and Ubiquitous Engineering. Ever since its inception, International Conference on Multimedia and Ubiquitous Engineering has been successfully held as MUE 2024(Chongqing, China), MUE 2023(Phnom Penh, Cambodia), MUE 2022(Jeju, Korea), MUE 2021(Jeju, Korea), MUE 2020(Jeju, Korea), MUE 2019(Xian, China), MUE 2018 (Salerno, Italy), MUE 2017 (Seoul, Korea), MUE 2016 (Beijing, China), MUE 2015 (Hanoi, Vietnam), MUE 2014 (Zhangjiajie, China), MUE 2013 (Seoul, Korea), MUE 2012 (Madrid, Spain), MUE 2011 (Loutraki, Greece), MUE 2010 (Cebu, Philippines), MUE 2009 (Qingdao, China), MUE 2008 (Busan, Korea), and MUE 2007 (Seoul, Korea).

The conference papers included in the proceedings cover the following topics: Multimedia Modeling and Processing, Multimedia and Digital Convergence, Ubiquitous and Pervasive Computing, Ubiquitous Networks and Mobile Communications, Ubiquitous Networks and Mobile Communications, Intelligent Computing, Multimedia and Ubiquitous Computing Security, Multimedia and Ubiquitous Services, Multimedia Entertainment. Accepted and presented papers highlight new trends and challenges of Multimedia and Ubiquitous Engineering. We hope readers will find these results useful and inspiring for their future research.

We would like to express our sincere thanks to Steering Chair: James J. (Jong Hyuk) Park (SeoulTech, Korea), Doo-Soon Park(Soonchunhyang University, Korea), Jin Wang(Hunan University of Science and Technology, China). Our special thanks go to the Program Chairs: Ji Su Park(Jeonju University, Korea), Yan Li(Inha University, Korea), Ka Lok Man(Xi'an Jiaotong-Liverpool University, China), S. Vimal(National Engineering College, India), Le Anh Ngoc(Swinburne University of Technology, Vietnam) Xiaoliang Wang(Hunan University of Science and Technology, China), all Program Committee members, and all reviewers for their valuable efforts in the review process that helped us to guarantee the highest quality of the selected papers for the conference.

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Message from the MUE 2025 Program Chairs

Welcome to the 18th International Conference on Multimedia and Ubiquitous Engineering (MUE 2025) on April 23-26, 2025. MUE 2025 will be the most comprehensive conference focused on the various aspects of multimedia and ubiquitous engineering. It will provide an opportunity for academic and industry professionals to discuss recent progress in the area of multimedia and ubiquitous environment. In addition, the conference will publish high quality papers which are closely related to the various theories and practical applications in multimedia and ubiquitous engineering. Furthermore, we expect that the conference and its publications will be a trigger for further related research and technology improvements in these important subjects.

For MUE 2025, we received many paper submissions, after a rigorous peer review process, we accepted only articles with high quality for the MUE 2025 proceedings. All submitted papers have undergone blind reviews by at least two reviewers from the technical program committee, which consists of leading researchers around the globe. Without their hard work, achieving such a high-quality proceeding would not have been possible. We take this opportunity to thank them for their great support and cooperation. Finally, we would like to thank all of you for your participation in our conference, and also thank all the authors, reviewers, and organizing committee members. Thank you and enjoy the conference!

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Caldelli Roberto, University of Florence, Italy

Invited Speaker



Ubiquitous Computing Power Networks

Yan Zhang

Department of Informatics, University of Oslo, Norway.

Abstract

Firstly, we introduce the concept and model of ubiquitous computing power networks. Then, new and unique scientific research problems in ubiquitous computing power networks are defined and solved, including the optimal allocation of computing resources, computing power collaboration and clustering mechanism, and distributed computing power sharing. Finally, we point out the future scenarios and open questions of ubiquitous computing power networks. Speaker: Yan Zhang, University of Oslo, Norway.

Biography:

Yan Zhang is currently a Full Professor with the Department of Informatics, University of Oslo, Norway. His research interests include next-generation wireless networks leading to 6G, green and secure cyber-physical systems. Dr. Zhang is an Editor for several IEEE transactions/magazine. Since 2018, Prof. Zhang has been listed as a Highly Cited Researcher by Clarivate Analytics (i.e., Web of Science). He is Fellow of IEEE, Fellow of IET, elected member of Academia Europaea (MAE), elected member of the Royal Norwegian Society of Sciences and Letters (DKNVS), and elected member of Norwegian Academy of Technological Sciences (NTVA).

Invited Speaker



Side-Channel Attacks Based on Multi-Loss Regularized Denoising AutoEncoder

Jian Shen

Zhejiang Sci-Tech University

Abstract:

Recently, researchers have leveraged the Denoising AutoEncoder (DAE) to reduce the noise in side-channel acquisitions (a.k.a. traces) that reduces the effectiveness of key recovery. Taking the L2 Loss (Mean Square Error, MSE) as the objective function of the DAE, it only aims to lessen the Euclidean Distance (ED) between the input and output, overlooking the Intra-Data Correlation (IDC) of the trace which includes the timing information. This paper proposes the Multi-Loss Regularized Denoising AutoEncoder (ML-DAE) framework to improve the generalization capability of the DAE. This framework consists of a shared DAE and Multiple Loss (ML) functions that aim to reduce the noise while preserving the excellent IDC of the output. During the training phase, to avoid issues of overfitting and a high number of training parameters, we pre-train the DAE using MSE and then initiate the ML-DAE which contains a multicore Partial Loss (PL) function with parameters transferred from the pre-trained DAE. During the testing phase, the outputs from the multicore PL are fused using an average pooling layer to yield the final predictions. The experiments on highly noisy datasets (XMEGA_ME, DPA_V2, and AES_GPU) and the masked dataset ASCAD demonstrate that ML-DAE achieves an SNR gain of at least four times, hence Deep-Learning based Side-Channel Attacks (DLSCAs) and Template Attacks (TA) with denoising pre-processing reduce of the number of traces needed to recover the key in the attack phase by more than 55%.

Biography:

Dr. Jian Shen (IET Fellow; IEEE Member) is working as the Dean and a professor in School of Information Science and Engineering (School of Cyber Science and Technology) at Zhejiang Sci-Tech University. He received the M.E. and Ph.D. degrees in computer science from Chosun University, South Korea, in 2009 and 2012, respectively. His research interests include cloud computing, data auditing and sharing, deep learning based side channel analysis, and computer networking etc. He has published more than 200 international journal and conference papers, such as IEEE TIFS, TDSC, TPDS, TCAD, ACM DAC etc., including more than 20 highly cited papers. He is the Highly Cited Researcher in the world (Clarivate), the Highly Cited Scholar in China (Elsevier) as well as the World's Top 2% Scientist.

PROGRAM Schedule for FutureTech 2025 & MUE 2025

Day 1, April 23, 2024

Time	Min	HALL A
13:00-13:30	30	Registration
13:30-15:10	100	Session A-1 FutureTech/MUE
15:10-15:30	20	Coffee Break
15:30-17:10	100	Private Session A-2 Workshop
17:10-18:00	50	Break
18:00-20:00	120	Welcome Reception (Only for Invited Member)

Day 2, April 24, 2024

Time	Min	HALL A
10:00-11:40	100	Private Session A-3 Korea-China Workshop
11:40-13:00	80	Lunch
13:00-15:00	120	Organizing Committee Meeting I
15:00-17:00	120	Local Arrangement Committee Meeting I

Day 3, April 25, 2025			
Time	Min	HALL A	HALL B
09:30-10:00	30	Registration	
10:00-11:40	100	Session A-1 FutureTech	
11:40-13:00	80	Lunch	
13:00-13:40	40	Keynote Speech: Prof. Jian Shen “Side-Channel Attacks Based on Multi-Loss Regularized Denoising AutoEncoder” Chair:	
13:40-13:50	10	Coffee Break	
13:50-15:20	90	Session A-2 FutureTech	Session B-2 MUE
15:20-15:30	10	Coffee Break	
15:30-17:00	90	Session A-3 FutureTech	Session B-4 Korea-China Workshop Chair:
17:00-18:00	60	Break	
18:00-18:30	30	Keynote Speech: Prof. Yan Zhang “Ubiquitous Computing Power Networks”	
18:30-18:50	20	Welcome Speech & Award	
18:50-20:00	80	Banquet (Only for Invited Members)	

Day 4, April 26, 2025			
Time	Min	HALL A	
10:00-12:00	120	Executive Meeting – Organized by FutureTech 2025, MUE 2025	
13:00-15:00	120	Organizing Committee Meeting II	

1. A paper presentation should be made by one of authors of the paper for 15 minutes (10 minutes for the presentation itself and 5 minutes for Q/A).
2. All speakers of each session should meet the session chair at their room 10 minutes before the session begins.
3. Windows 10 PC/laptops running the Adobe Reader and Microsoft Office for paper presentations will be prepared. Please prepare for your presentation.
4. All online sections are played recorded video only.
5. For Q&A in the online section, please email the author.

DETAILED SCHEDULE FOR
The 20th International Conference on Future Information
Technology (FutureTech 2025)
&
The 19th International Conference on
Multimedia and Ubiquitous Engineering
(MUE 2025)

Day 1, April 23, 2025 (Wednesday)

12:00-13:30 Registration

13:30-15:10 On&Offline Session A-1 FutureTech 2025 & MUE 2025
(Chair:)

- 1. Quantum Blockchain-Enabled Trust Architecture for Multi-Tenant Quantum Cloud Services**
Byung Hyun Jo, Abir EL Azzaoui, Jong Hyuk Park
- 2. Federated Quantum Machine Learning over Blockchain-Secured Quantum Cloud Platforms**
Na Yeong Kim, Jungho Kang, Jong Hyuk Park
- 3. MetaAdvisor: An AI-Driven Metahuman System for Personalized Admissions Counseling**
Tung Vu, Phuong Anh Nguyen, Ngoc Le
- 4. Machine Learning Models for Customer Churn Prediction A Case Study of VPBank**
Nguyen Huy Anh, Ngoc Le
- 5. Design and Evaluation of P-GAN for Privacy Protection and Generative AI Regulatory Compliance**
Seo Jeong Min, Ji Su Park, Jin Gon Shon
- 6. KITE-MRE: Knowledge-Infused and Transformer-Enhanced Multimodal Relation Extraction**
Junjie Li, Wenti Huang, Yu He, Xinjie Mo
- 7. UTrace: Forensic Analysis of Poisoning in Private Collaborative Learning**
Yekang Zhao

15:10 - 15:30 Coffee Break

15:30-17:10 **Session A-2 Private Workshop**
(Chair:)

Only for Workshop Member

17:10-18:00 **Break**

18:00-20:00 **Welcome Reception**

Only For Invited Member

Day 2, April 24, 2025 (Thursday)

10:00-11:40 **Session A-3 2 Korea-China Workshop**
(Chair:)

Only for Workshop Member

Korea-China Industry-Academia-Research Large-Scale Project

11:40-13:00 **Lunch**

13:00-15:00 **Local Arrangement Committee Meeting I**

15:00-17:00 **Organizing Committee Meeting I**

Day 3, April 25, 2025 (Friday)

09:30-10:00 **Registration**

10:00-11:40 **Online Session A-1 FutureTech 2025**
(Chair:)

1. CLASSIFICATION OF DISEASES OF BEAN LEAVES USING DATA AUGMENTATION AND DEEP NEURAL NETWORKS

Phong Bui, Ngoc Le, Tran Dang Quyet

2. **Classification of waste bottles using image processing and deep neural networks**
Phong Bui, Nguyen Van Son
3. **Integrating NLP Platform to Build a Chatbot in the Hospitech System**
Trung Tran, Thang Ta Quoc, Khoai Vu Tien, Huyen Trinh Thi Thu, Thuy Nguyen Thu, Thai Nguyen Dinh, Hanh Nguyen Thi Phuong
4. **A Comparative Study of LGPMA and Table Transformer In Table Structure Recognition**
Tang Nguyen
5. **An Assessment of Formative and Reflective Constructs in Ethnic Consumer Behavior Research**
Tang Nguyen
6. **Identity Security Authentication Scheme for VANETs Based on Vehicle-Side Blockchain**
Qiaosong Chen, kecheng wu, Changhao Piao, Rui Zeng
7. **Rumor Detection Method Based on Multi-modal Mixture of Experts and Cross-modal Enhancement**
Jianyong Yu, Xiuyu Li
8. **Soft porn identification based on social media – User engagement perspective**
Yongjun Ren, Xinyi Yang, Jinbin Hu, Jin Wang

10:00-11:40 Online Session B-1 FutureTech 2025 & MUE 2025
(Chair:)

1. **POTHOLE DETECTION AND CLASSIFICATION USING YOLO MODELS**
Thien Thanh Tran, Tien-Thanh Do, Ngoc Anh Le, Nhung Vuong, Ngoc Thanh Pham, Doan-Dong Nguyen
2. **Hierarchical Aggregation-Based Privacy-Preserving Federated Learning**
Huachang Su, Xuepeng Xu, Xiaofeng Yu
3. **Federated Learning for Greenhouse Temperature Prediction: A Privacy-Preserving Approach Using N-BEATS**
Ha Trang, Phuong Anh Nguyen, Tung Vu, Ngoc Le
4. **Non-Fungible Token Verification Scheme Based on Core Peripheral Sharding**
Zijuan Chen, Jianyong Yu, Yulong Wang
5. **A Lightweight Data Indexing Mechanism with Low Query and Maintenance Overhead**
Jingyu Zhang, Di Lan
6. **A Novel PSO-Based Adaptive Container Scheduling Strategy for Edge Computing**
Jingyu Zhang, Hanbo Jiang
7. **A Tree-Based Pipeline Consensus with High Scalability and Throughput**
Jingyu Zhang, Sheng Jiang
8. **DeepWaste: Deep Learning-based Waste Classification**
Duc-Kien Bui, Tien-Thanh Do, Ngoc Thanh Pham, Ngoc Anh Le, Dinh-Thai Kim, Phuong-Thao Le, Phuong-Thao Nguyen, Minh Quan Vu

11:40-13:00 Lunch

13:00-13:40 Keynote Speech
(Chair: Yan Li)

Prof. Jian Shen
“Side-Channel Attacks Based on
Multi-Loss Regularized Denoising AutoEncoder”

13:40-13:50 Coffee Break

13:50-15:30 Session A-2 FutureTech 2025
(Chair:)

- 1. An Efficient Data Auditing Scheme for Multi-Cloud Multi-Replica Environments**
Haiyan Yu, Yuxin Cui, Chen Wang
- 2. Congestion-Aware Semi-Lossless Transport in Datacenter networks**
Jinbin Hu, Siyao Li, Jin Wang
- 3. H-Sketch: Top-k Traffic Inspection with High-precision and High-throughput in High-speed Networks**
Jin Wang, Menghuan Du, Jinbin Hu
- 4. Merger: Inversion-Free and Practical Programmable Packet Scheduler**
Jinbin Hu, Zhao Zhang, Jin Wang
- 5. Wetland vegetation identification model based on improved Deeplabv3+ and contrastive learning**
Xiuhe Yuan, Han Li, Guoqing Ni, Zitong Liu, Sheng Miao, Chao Liu
- 6. Lightweight anonymous identity authentication assisted by blockchain**
Shishu Chen

13:50-15:20 On-Offline Session B-2 MUE 2025
(Chair: Byeong-Seok Shin)

- 1. PolyDiffusion: Controlled generation of multi-instance object image based on decoupled contour representation**
chen yixuan, xiaoliang wang, Kuan-Ching Li, yuzhen liu
- 2. Nonlinear SVM Classification using Homomorphic Encryption**
Yunsoo Park, Mun-Kyu Lee
- 3. Federated Unlearning: Efficient Data Removal Strategies and Challenges in Privacy-Preserving Machine Learning**
Qingyu Tan, YAN LI, Byeong-Seok Shin
- 4. Object detection dataset LCFFUD and model YOLO-Starfish for underwater complex scenes**
Jihan Xu, Hui He, Peng Jian, DENG YONG Zhang

5. **LCFFUD: A Large-scale Chinese Freshwater Fish Underwater Dataset**
Jihan Xu, Hui He, Peng Jian, DENG YONG Zhang
6. **DFRE-Net: a Dual-Branch Cross-Feature Fusion with Regional Enhancement Network for Image Inpainting**
Ronghao Luo, Nuo Fu, Rongrong Gong, DENG YONG Zhang
7. **PDT-Net: Parallel Dual-Branch Learnable Transformer Network for Image Inpainting**
Ronghao Luo, Nuo Fu, Rongrong Gong, DENG YONG Zhang

15:20-15:30 Coffee Break

15:30-17:00 On-Offline Session A-3 FutureTech 2025
(Chair:)

1. **Secure Dynamic Auditing for Coded Cache Data in Cyber-Physical-Social Systems**
Jiaxi Wang
2. **Integrating TCM Constitution Theory with Deep Learning for Tongue Image Analysis**
Zixuan Chen, xiaoliang wang
3. **Intelligent Pulse Diagnosis in Traditional Chinese Medicine: Signal Processing and Deep Learning for Health Status Classification**
Zixuan Chen, xiaoliang wang
4. **NormSoftmax Attention: Improving Transformer Model Performance**
Phuong Anh Nguyen, Ngoc Le
5. **Probabilistic Transformer Model for Uncertainty-Aware Learning**
Phuong Anh Nguyen, Ngoc Anh Le

17:00-18:00 Break

18:00-18:30 Keynote Speech
(Chair: Yan Li)

Prof. Yan Zhang
“Ubiquitous Computing Power Networks”

18:30-18:50 Welcome Speech & Award

18:30-20:00 Banquet

Day 4, April 26, 2025 (Saturday)

10:00-12:00 Executive Meeting – Organized by FutureTech 2025, MUE 2025

12:00-13:00 Lunch

13:00-15:00 Organizing Committee Meeting II

Conference Venue

1. Zhangjiajie Venue

Blue Bay Hotel Zhangjiajie

Site: <http://www.lanwanboge.com/en/>

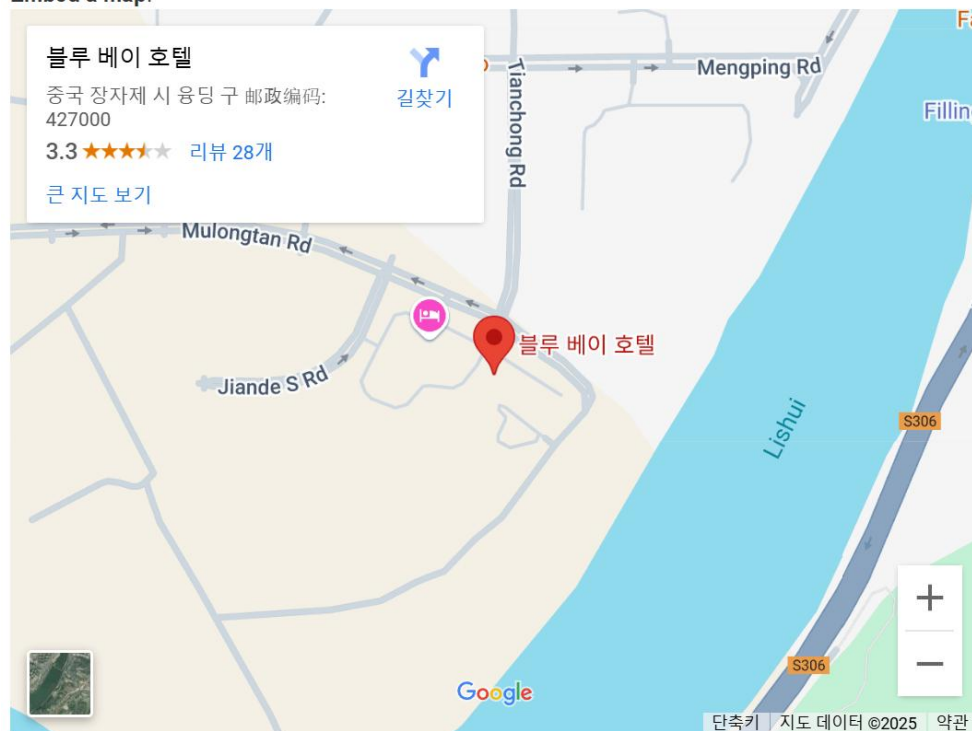
Phone: +86 744 883 7777

FAX: 0744 8856999

Address: Intersection of Tianchong Road and Hehua Road, Yongding District, Zhangjiajie, Hunan, 427000, China



Embed a map:



2. Changsha Venue

Hunan University of Science and Technology

Site: <https://english.hnust.edu.cn/index.htm>

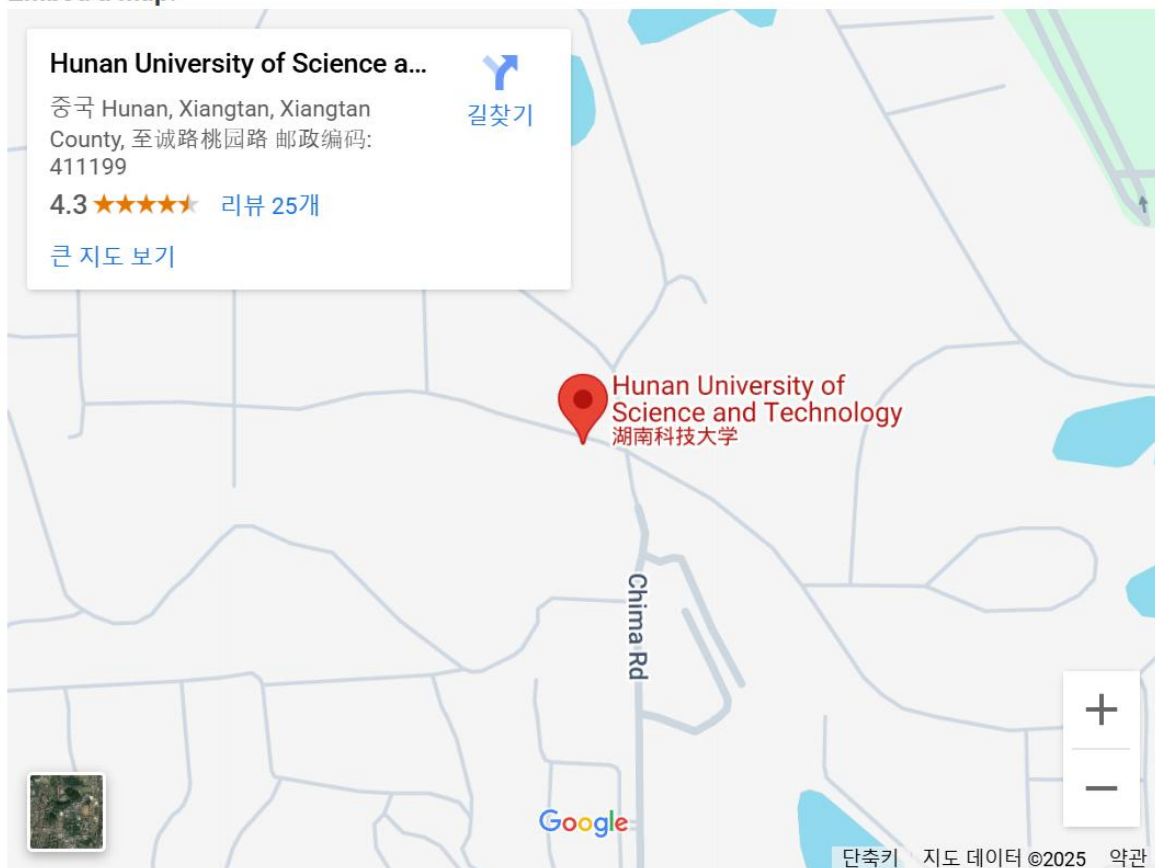
Phone: 0731 58290011

Email: nic@hnust.edu.cn

Address: Hunan Xiangtan Taoyuan Road, Xiangtan, 411201, China



◦ Embed a map:



3. Banquet

Home2 Suites by Hilton Xiangtan Jiuhua

Address: No.11, Kaiyuan Road, Xiangtan, 411100, China

Phone: +86 731 52188888



o Banquet Location:

