# TAAI 2021

The 26th International Conference on
Technologies and Applications of Artificial Intelligence

hosted by the Chaoyang University of Technology, Taiwan.

# Conference Manual

Nov. 18-20, 2021

# Program-at-a-Glance

| Thursday, November 18 | | | | |
|---|---|---|---|---|
| 9:00-10:00 | Registration | | | (2F) |
| 10:00-10:40 | **TAAI Welcome & Opening Remarks** | | | (Room: Infinite 9F) |
| 10:40-12:00 | **Keynote Speech: Prof. Mark Liao** | | | (Room: Infinite 9F) |
| 12:00-13:30 | Lunch Box | | | (9F) |
| 13:30-15:00 | **Keynote Speech: Prof. Xiaoyi Jiang** | | | (Room: Infinite 9F) |
| 15:00-15:30 | Coffee Break | | | |
| 15:30-17:00 | **Session A1** | **Session B1** | **Session C1** | **Session D1** |
| | International Track-Best Paper Session | Domestic Track-Machine Learning | International Track-Machine Learning | Domestic Track-Intelligence system |
| | **Room: Amour A (2F)** | **Room: Amour B (2F)** | **Room: Amour C (2F)** | **Room: Enjoy (2F)** |
| 17:30 | Boxed Meal | | | (2F) |

| Friday, November 19 | | | | |
|---|---|---|---|---|
| 8:00-9:00 | Registration | | | (2F) |
| 9:00-10:00 | **Keynote Speech: Prof. Yutaka Matsuo** | | | (Room: Infinite 9F) |
| 10:00-10:30 | Coffee Break | | | |
| 10:30-12:00 | **Session A2** | **Session B2** | **Session C2** | **Session D2** |
| | International Track-Data Mining and Knowledge Discovery & Problem Solving and Search | Domestic Track-Best Paper Session | International Track-Special Session S2: Awareness Computing based on Machine Learning Technologies (ACMLT) | International Track-Special Session S1: Intelligent Applications of Data Collection and Analysis for Context Awareness (IADACA) |
| | **Room: Amour A (2F)** | **Room: Amour B (2F)** | **Room: Amour C (2F)** | **Room: Enjoy (2F)** |
| 12:00-13:30 | Lunch Box (2F) / TAAI 2021 general membership meeting | | | (Room: Infinite 9F) |
| 13:30-15:00 | **Session A3** | **Session B3** | **Session C3** | |
| | International Track-Computer Vision / Pattern Recognition & Autonomous Agents and Distributed AI | Domestic Track-Computer Vision / Pattern Recognition | International Track-International Poster (I) | |
| | **Room: Amour A (2F)** | **Room: Amour B (2F)** | **Room: Amour C (2F)** | |
| 15:00-15:30 | Coffee Break | | | |
| 15:30-17:00 | **Session A4** | **Session B4** | **Session C4** | |
| | International Track-Natural Language Processing & Fuzzy Systems and Fuzzy Neural Networks | AI CUP Panel | Domestic Track-Poster | TAAI PhD/Master Thesis Award session |
| | **Room: Amour A (2F)** | **Room: Amour B (2F)** | **Room: Amour C (2F)** | **Room: Enjoy (2F)** |
| 18:00 | **Banquet** | | | (Room: Infinite 9F) |

| Saturday, November 20 | | | | | |
|---|---|---|---|---|---|
| 8:00-9:00 | Registration (2F) | | | | **08:00-17:00**<br><br>TAAI 2021 Computer Game Tournaments<br><br>Place: Chaoyang University of Technology<br>Room E-510<br>Room E-519 |
| 9:00-10:30 | **Session A5**<br>International Track-Reinforcement Learning & Web Intelligence and Social Networks<br>**Room: Amour A (2F)** | **Session B5**<br>Domestic Track-Natural Language<br>**Room: Amour B (2F)** | **Session C5**<br>International Track-International Poster (II)<br>**Room: Amour C (2F)** | | |
| 10:30-10:50 | Coffee Break | | | | |
| 10:50-12:20 | **Session A6**<br>International Track-Special Session S3: Technologies and Applications for Artificial Intelligence and Internet of Things (TAAIoT)<br>**Room: Amour A (2F)** | **Session B6**<br>Domestic Track-Data mining & Knowledge Discovery<br>**Room: Amour B (2F)** | 智慧計算學門成果發表會<br>(Poster)<br>**Room: Amour C (2F)** | **Session D3**<br>Special Session for High School Students<br>**Room: Enjoy (2F)** | |
| 12:20-13:00 | Lunch Box (2F) | | | | |

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# Message from TAAI 2021 General Chairs and Program Chairs

On behalf of the Organizing Committee of the 2021 International Conference on Technologies and Applications of Artificial Intelligence (TAAI), we would like to take this opportunity to appreciate all your contribution to this Conference. TAAI 2021 is the 26th Conference held by Taiwan Association for Artificial Intelligence (a.k.a. TAAI), which brings together researchers, engineers, and practitioners interested in AI to share and exchange ideas, results, and experience. This year, the Conference is organized by Chaoyang University of Technology (CYUT).

TAAI 2021 has a comprehensive program including keynote speeches, technical program, tournament, as well as high school students' session. The three speakers are Distinguished Research Fellow/Prof. Mark Liao from the Academia Sinica, Prof. Xiaoyi Jiang from the University of Münster, and Prof. Yutaka Matsuo from the University of Tokyo.

For the technical program, we received 128 papers (70 from the international track and 58 domestic track). The accepted papers span a broad area in AI and data mining, including deep learning, reinforcement learning, social network, fintech, AIoT, multimedia analysis, data visualization, etc. Received papers went through a rigorous review process, and each paper was reviewed by two or three reviewers. For the international track, we selected 42 papers for oral presentation; additional 16 papers for poster presentation. The international track papers are published with IEEE Conference Publishing Services. For the domestic track, 36 papers were selected as oral presentation and 10 as poster presentation. The accepted domestic papers will be indexed by the TAAI Scholar Search service.

We also want to thank our sponsors, E. Sun Bank, Wavenet Technology, as well as technical co-sponsors, including Taiwan Computer Game Association, the Japanese Society for Artificial Intelligence, and IEEE SPS Tainan Chapter.

The Conference is also co-organized by the College of Informatics, Chaoyang University of Technology, Institute of Information Science, Sinica, Industrial Technology Research Institute (ITRI), AIdea, Center for Information and Technology Innovation (CITI), Sinica, and Ministry of Science and Technology.

We hope our effort this year can bring more cooperation opportunities for participants so as to thank all contributors for sharing their invaluable experience with the participants. We hope you have a stimulating, enjoyable, and fruitful experience at the Conference!

Hung-Yu Kao, National Cheng Kung University, Taiwan
Hsien-Chou Liao, Chaoyang University of Technology, Taiwan

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Yu-Huei Cheng, Chaoyang University of Technology, Taiwan
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Yusuke Nojima, Osaka Prefecture University, Japan

## Keynotes

# How Deep Learning Impact Our Daily Life?

**Mark Liao**
Distinguished Research Fellow/Professor
Academia Sinica
Taiwan

Time: November 18, 10:40-12:00
Room: Infinite 9F

## Biography

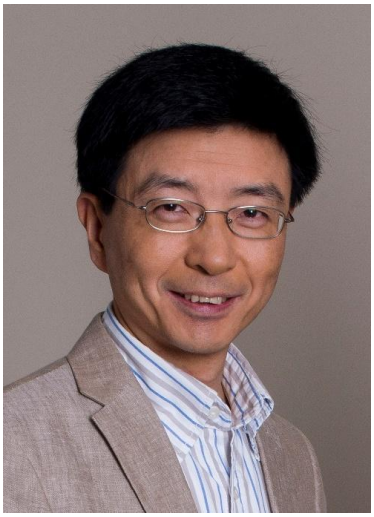
Mark Liao received his Ph.D degree in electrical engineering from Northwestern University in 1990. In July 1991, he joined the Institute of Information Science, Academia Sinica, Taiwan and currently, is a Distinguished Research Fellow and Director. He has worked in the fields of multimedia information processing, computer vision, pattern recognition, multimedia protection, and artificial intelligence for more than 30 years. He was appointed as an Honorary Chair Professor of National Chiao-Tung University from 2016 to 2020. He received the Young Investigators' Award from Academia Sinica in 1998; the Distinguished Research Award from the National Science Council in 2003, 2010 and 2013; the Academia Sinica Investigator Award in 2010, the TECO Award from the TECO Foundation in 2016, and the 64th Academia Award from the Ministry of Education (2020). His professional activities include: President, Image Processing and Pattern Recognition Society of Taiwan (2006-08); Editorial Board Member, ACM Computing Surveys (2018 – present), IEEE Signal Processing Magazine (2010-13); Associate Editor, IEEE Transactions on Image Processing (2009-13), IEEE Transactions on Information Forensics and Security (2009-12) and IEEE Transactions on Multimedia (1998-2001). He has been a Fellow of the IEEE since 2013.

## Abstract

Deep learning has had a huge impact on the development of artificial intelligence (AI) after 2012. In this keynote speech, I will talk about two examples of applying deep learning technology to daily life. The first example is the use of deep learning neural network to learn to execute automatic concert video mashup. The main purpose of this work is to automatically mashup the video clips grabbed from YouTube that are recorded and uploaded by the audience at the concert with their mobile phones into a complete, non-overlapping, and seamless video. In the process of implementing automatic concert video mashup, we also take into account the language of film rules learned by the music director from either textbook or past experience. Our ultimate goal is to make the mashup results the best. As for the second daily life application, we will use deep learning technology for smart transportation. We will use a deep learning neural network to perform traffic parameter extraction and use these extracted parameters for automatic traffic signal control.

## Keynotes

# Consensus Learning



**Xiaoyi Jiang**
University of Münster
Germany

Time: November 18, 13:30-15:00
Room: Infinite 9F

## Biography

Xiaoyi Jiang studied Computer Science at Peking University and received his PhD and Venia Docendi (Habilitation) degree in Computer Science from University of Bern, Switzerland. He was an associate professor at Technical University of Berlin, Germany. Since 2002 he is a full professor at University of Münster, Germany, and currently the Dean of the Faculty of Mathematics and Computer Science. He was a Principal Investigator and research area leader of the Cluster of Excellence "Cells in Motion" funded by the German Excellence Initiative. He is Editor-in-Chief of International Journal of Pattern Recognition and Artificial Intelligence. In addition, he was/is on the advisory board and editorial board of several other journals, including IEEE Transactions on Medical Imaging (2015-2019), Pattern Recognition (2007-2019), International Journal of Neural Systems (2008-present) and Journal of Big Data (since 2021). Since 2016 he is member of the Governing Board of IAPR. His research interests include image analysis, pattern recognition, machine learning, and biomedical imaging. Dr. Jiang is a Fellow of IAPR and senior member of IEEE.

## Abstract

Combining multiple models into a consensus model helps, amongst others, to reduce the uncertainty in the initial models. Consensus learning can be formulated informally or formally in arbitrary problem domain. This talk focuses on the formal framework of the so-called generalized median computation. The concept of this framework, the related theoretical results, and computation algorithms will be presented. A variety of applications in image analysis and pattern recognition will be shown to demonstrate the usefulness and potential of consensus learning.

## Keynotes

# Deep Learning and Beyond: Integration of Deep Learning and Symbols

**Yutaka Matsuo**
The University of Tokyo
Japan

Time: November 19, 9:00-10:00
Room: Infinite 9F

## Biography

Yutaka Matsuo is a professor at the Graduate School of Engineering, the University of Tokyo. He received his BS, MS, and Ph.D. degrees from the University of Tokyo in 1997, 1999, and 2002. After working at National Institute of Advanced Industrial Science and Technology (AIST) and Stanford University, he has been an associate professor at the Graduate School of Engineering, the University of Tokyo since 2007 and a professor since 2019. At the Japanese Society for Artificial Intelligence (JSAI), he served as Editor-in-Chief from 2012 to 2014, ELSI Committee Chair from 2014 to 2018, and is currently a member of the Board of Directors. He is currently the President of the Japan Deep Learning Association (JDLA) and an outside director of SoftBank Group Corp. His research interests include artificial intelligence, especially deep learning and web mining.

International Track

**Nov. 18, 15:30-17:00**

# Session-A1: Best Paper Session

**Session Chair: Prof. Yung-Fu Chen, Prof. Yen-Ching Chang, Prof. Chia-Feng Juang, Prof. Cheng-Hsiung Hsieh**

**A1-1. FakeCLIP: Multimodal Fake Caption Detection with Mixed Languages for Explainable Visualization**

Christian Nathaniel Purwanto (National Yang Ming Chiao Tung University)*;
Joan Santoso (Institut Sains dan Teknologi Terpadu Surabaya);
Po-Ruey Lei (ROC Naval Academy);
Hui-Kuo Yang (National Yang Ming Chiao Tung University);
Wen-Chih Peng (National Yang Ming Chiao Tung University)

**A1-2. Trajectory-Based Dynamic Handwriting Recognition Using Fusion Neural Network**

Tzu-An Huang (National Yang Ming Chiao Tung University)*;
Sai-Keung Wong (National Yang Ming Chiao Tung University);
Lan-Da Van (National Chiao Tung University)

**A1-3. Dynamic Span Selection for Mandarin Articles Using Contextual Relations and Orthography**

Yen-Hao Huang (National Tsing Hua University)*;
Tzu-Yun Lee (National Tsing Hua University);
Fernando H. Calderon (National Tsing Hua University);
Yi-Shin Chen (National Tsing Hua University)

**A1-4. Adaptive Ant Colony Optimization with Several Pheromone Updates for Constraint Satisfaction Problems**

Takaaki Toya (Takushoku University)*;
Kazunori Mizuno (Takushoku University);
Shotaro Koike (Takushoku University)

**A1-5. Locally Interpretable One-Class Anomaly Detection for Credit Card Fraud Detection**

Tung-Yu Wu (National Taiwan University)*;
You-Ting Wang (National Taiwan University)

International Track

**Nov. 19, 10:30-12:00**

# Session-A2: Data Mining and Knowledge Discovery & Problem Solving and Search

## Session Chair: Prof. Hsing-Chung Chen

**A2-1. Return-of-Interest Conscious Truth Inference for Crowdsourcing Queries**
Lok-Him Leung (National Cheng Kung University);
Po-An Yang (National Cheng Kung University);
Kun-Ta Chuang (National Cheng Kung University)*

**A2-2. Identifying Non-Intentional Ad Traffic on the Demand-Side in Display Advertising**
Duy-An Ha (National Yang Ming Chiao Tung University);
Thi Thanh An Nguyen (National Yang Ming Chiao Tung University);
Wen-Yuan Zhu (Tenmax AD Tech Lab)*;
Shyan-Ming Yuan (National Yang Ming Chiao Tung University)

**A2-3. TCN-based Futures Prediction Using Financial Indices, Bargain Chips, and Forum Messages**
MIn-Te Sun (National Central University)*;
Kotcharat Kitchat (National Central University);
Li-Chung Hsieh (National Central University)

**A2-4. A Hybrid Deep Learning Network for Long-Term Travel Time Prediction in Freeways**
Chih-Chieh Hung (National Chung Hsing university)*;
Ming Chu Ho (National Chung Hsing University);
Yu-Cing Chen (National Chung Hsing University)

**A2-5. The Paired Restrained-Domination Problem in Supergrid Graphs**
Ruo-Wei Hung (Chaoyang University of Technology)*
Ming-Jung Chiu (Chaoyang University of Technology)

International Track

**Nov. 19, 13:30-15:00**

# Session-A3: Computer Vision / Pattern Recognition & Autonomous Agents and Distributed AI

## Session Chair: Prof. Cheng-Ying Yang, Prof. Chia-Fen Hsieh

**A3-1. Interpolation Based Reversible Hiding Scheme by Using Center Folding Strategy and Adjusting Hiding Operator**
Thanh Nhan Vo (Chaoyang University of Technology);
Tzu Chuen Lu (Chaoyang University of Technology)*;
Somya Agrawal (Chaoyang University of Technology);
Biswapati Jana (Vidyasagar University)

**A3-2. Global Structured Feature Graph Convolutional Network for Skeleton-Based Action Recognition**
Chia-Fen Hsieh (Chaoyang University of Technology)*;
Po-Jen Liao (Chaoyang University of Technology)

**A3-3. Secured Steganographic Scheme Utilizing Fuzzy Threshold with Weighted Matrix**
Sharmistha Jana (Chaoyang University of Technology);
Biswapati Jana (Vidyasagar University);
Tzu-Chuen Lu (Chaoyang University of Technology)*

**A3-4. New Pruning Method Based on DenseNet Network for Image Classification**
Rui-Yang Ju (Tamkang University)*;
Ting-Yu Lin (National Cheng Kung University);
Jen-Shiun Chiang (Tamkang University)

**A3-5. A Hybrid Evaluation of AI Chatbots in Taiwan Agriculture Services**
Eric Tswen Gwo Wang (National Central University);
Abbott Po Shun Chen (Chaoyang University of Technology)*;
Chai Wu Liu (Chaoyang University of Technology)

International Track

**Nov. 19, 15:30-17:00**

# Session-A4: Natural Language Processing & Fuzzy Systems and Fuzzy Neural Networks

## Session Chair: Prof. Chang-Shing Lee

**A4-1.True or False: Does the Deep Learning Model Learn to Detect Rumors?**
Shiwen Ni (National Cheng Kung University)*;
Jiawen Li (National Cheng Kung University);
Hung-Yu Kao (National Cheng Kung University)

**A4-2. HAEE: Question Classification Using Hierarchical Intra-Attention Enhancement Encoder**
Jen-Wei Wang (National Cheng Kung University);
Kai-Hsiang Chen (National Cheng Kung University)*;
Jen-Wei Huang (National Cheng Kung University)

**A4-3. More than Extracting "Important" Sentences: the Application of PEGASUS**
Ting-Hao, Yang (National Tsing Hua University);
Ching-Ching, Lu (National Tsing Hua University)*;
Wen-Lian Hsu (Asia Universityame of organization)

**A4-4. On Gradient Descent for On-Chip Learning**
John Sum (National Chung Hsing University)*;
Janet C.C. Chang (National Chung Hsing University)

International Track

**Nov. 20, 09:00-10:30**

# Session-A5: Reinforcement Learning & Web Intelligence and Social Networks

## Session Chair: Prof. Tsung-Han Lee, Prof. Ying Chieh Liu

**A5-1. Examining the Matthew Effect on YouTube Recommendation System**
Ying Chieh Liu (Chaoyang University of Technology);
Min Qi Huang (Chaoyang University of Technology)*

**A5-2. Local Coordination in Multi-Agent Reinforcement Learning**
Fanchao Xu (The University of Tokyo)*;
Tomoyuki Kaneko (The University of Tokyo)

**A5-3. Reserch on Teaching Effectiveness of Computational Thinking Based on Service Learning**
Bing-Hong Chen (Chaoyang University of Technology);
Tsui-Feng Huang (Chaoyang University of Technology)*;
Sheng-Chieh Chou (National Chengchi University)

**A5-4. Housing Price Prediction by Using Generative Adversarial Networks**
Chia-Fen Hsieh (Chaoyang University of Technology)*;
Tzu-Chieh Lin (Chaoyang University of Technology)

**A5-5. Factors Affecting Vlog Viewers' Behavioral Intentions: An Empirical Study Based on Innovation Diffusion Theory**
Hsiao-Kuang Kao (Chia Nan University of Pharmacy and Science);
Su-Nan Tsai (Chia Nan University of Pharmacy and Science);
Wan-Ling Chang (Chaoyang University of Technology);
Jui-Hsiu Chang (Chaoyang University of Technology)*

International Track

**Nov. 20, 10:50-12:20**

# Session-A6: Special Session S3: Technologies and Applications for Artificial Intelligence and Internet of Things (TAAIoT)

**Session Chair: Prof. Yu-Da Lin, Prof. Yu-Huei Cheng**

**A6-1. Using Digital Image and Curve Regression Model to Classify Air Quality**
Yan-Ting Lin (Chaoyang University of Technology);
Kuan-Yu Chen (Chaoyang University of Technology);
Jiun-Jian Liaw (Chaoyang University of Technology)*;
Jungpil Shin (The University of Aizu)

**A6-2. Performance of C-V2X Communications for High Density Traffic Highway Scenarios**
Teguh Indra Bayu (Chaoyang University of Technology);
Yung-Fa Huang (Chaoyang University of Technology)*;
Jeang-Kuo Chen (Chaoyang University of Technology)

**A6-3. Analyze influence factors in customer's insurance transaction by decision tree model**
Che-Nan Kuo (CTBC Financial Management College);
Yu-Da Lin (National Penghu University of Science and Technology);
Yu-Huei Cheng (Chaoyang University of Technology)*

**A6-4. A Clustering-Based Gauss Chaotic Mapping Particle Swarm Optimization for Auto Labeling in Human Activity Recognition**
Bo-Yan Lin (National Penghu University of Science and Technology);
Che-Nan Kuo (CTBC Financial Management College);
Yu-Da Lin ((National Penghu University of Science and Technology))*

**A6-5. An ICA Approach to Estimate the Q-matrix**
Mengta Chung (Tamkang University)*

Domestic Track

**Nov. 18, 15:30-17:00**

# Session-B1: Machine Learning

## Session Chair: Prof. Show-Jane Yen, Shih-Cheng Horng

### B1-1. 結合地域性之集成學習法於太陽能發電預測

Yu-Wen Wang (CPC Corporation, Taiwan);
Wen-Yang Lin (National University of Kaohsiung)*

### B1-2. 應用 GRU 與 Attention 機制結合技術指標於股票交易策略可行性之研究-以台積電為例

Ming-Che Lee (Ming Chuan University)*;
Ru -Jiun Shiu (Ming Chuan University);
Xu-Ming Chen (Ming Chuan University)

### B1-3. 應用於製造業之誤差補償模型及動態更新方法

Jia-Ling Zheng (National Cheng Kung University);
Pei-Yu Chao (National Cheng Kung University)*;
Wei-Ann Lin (National Cheng Kung University);
Ping-Yang Chen (National Cheng Kung University)

### B1-4. 大腦區域功能性連結分析之思覺失調症自動判別

Chang-Hao Chen (National Central University);
Rou-An Chen (National Central University);
Lung-Hao Lee (National Central University)*;
Wan-Chen Chang (Taipei Veterans General Hospital);
Tung-Ping Su (Taipei Veterans General Hospital);
Pei-Chi Tu (Cheng Hsin General Hospital)

### B1-5. 基於投票機制整合多深度模型之自動瑕疵檢測

鄭文昌, 洪佑銓 (朝陽科技大學)*

### B1-6. 改善集成學習方法以提升分類效能之研究

羅元澤 (Ming Chuan University);
Yue-Shi Lee (Ming Chuan University);
Show-Jane Yen (Ming Chuan University)*

Domestic Track

**Nov. 19, 10:30-12:00**

# Session-B2: Best Paper Session

**Session Chair: Prof. Lieu-Hen Chen, Prof. Der-Fa Chen, Prof. H.W. Milton Wang, Prof. Shih-Hung Wu**

### B2-1. Fake Profile Detection on Social Media Based on User Preferences

Ching-Huai Chen (National Chengchi University)*;
Man-Kwan Shan (National Chengchi University)

### B2-2. 基於監督離散雜湊之張量資料模型

Pin-Han Wu (National Sun Yat-sen University)*;
Bo-Wei Chen (National Sun Yat-sen University)

### B2-3. 利用棄牌資訊強化策略改良麻將程式

Zong-Han Lin (National Taiwan Normal University)*;
林猷琛 (National Taiwan Normal University);
Shun-Shii Lin (NTNU)

### B2-4. A Pairwisely Probing Approach to Solving Nonogram Puzzles

Kuo-Chan Huang (National Taichung University of Education)*;
Tzung-Shuan Tsai (National Taichung University of Education)

### B2-5. 跨語句式語言模型於對話式語音辨識重新評分之研究

Bi-Cheng Yan (National Normal Taiwan University)*;
Pei-Chun Tsai (National Normal Taiwan University);
Shih-Hsuan Chiu (National Normal Taiwan University);
王馨偉 (National Taiwan Normal University);
邱炫盛 (中華電信研究院);
Ber-Lin Chen (National Taiwan Normal University)

### B2-6. Subsolid Nodules Detection in 2D Lung CT Images With Modified YOLOv4

Jin-Yi Wu (National Cheng Kung University)*;
Pei-Shan Yang (National Cheng Kung University);
Chao-Chun Chang (National Cheng Kung University Hospital);
Chia-Ying Lin (National Cheng Kung University Hospital);
Yau-Lin Tseng (National Cheng Kung University Hospital);
Shu-Mei Guo (National Cheng Kung University);
Jenn-Jier James Lien (National Cheng Kung University)

Domestic Track

**Nov. 19, 13:30-15:00**

# Session-B3: Computer Vision / Pattern Recognition

## Session Chair: Prof. Chia-Hsin Cheng, Prof. Wen-Chang Cheng

### B3-1. 數值標籤為基底之深度學習物件辨識系統-以速食餐廳為例

Yen-Chiu Chen (Chung Hua University)*;
Hao-Chun Chiang (Chung Hua University);
Ssu-Yu Wang (Chung Hua University);
Tzu-Yuan Wang (Chung Hua University);
Jia-Sheng Song (Chung Hua University);
Shih-Hsin Lo (Chung Hua University)

### B3-2. 基於輕量化離散餘弦轉換之純頻域深度網路

吳柏逸 (電機工程系 國立台灣科技大學);
Ching-Hu Lu (NTUST)*;
張涵茵 (電機工程系 國立台灣科技大學)

### B3-3. 植基於卷積神經網路之行人再識別

Chih-Chin Lai (National University of Kaohsiung)*

### B3-4. Tool Measurement Using Foreground Segment Network

Bor-Haur Lin (NCKU CSIE);
Lo-Hsuan Chang (NCKU CSIE);
Jung-Chung Yeh (TONGTAI MACHINE & TOOL CO., LTD.);
Hsin-Ting Shih (TONGTAI MACHINE & TOOL CO., LTD.);
Tzu-Yu Fu (TONGTAI MACHINE & TOOL CO., LTD.);
Jin-Yi Wu (National Cheng Kung University);
Jenn-Jier James Lien (National Cheng Kung University)*

### B3-5. Multi-Dots SiamRPN++ Tracking for Pronated Foot Analysis in PSMNet Stereo Space

Chen-Hsun Lee (National Cheng Kung University Department of Computer Science and Information Engineering);
Dong-Cheng Shi (National Cheng Kung University Department of Computer Science and Information Engineering);
Ming-Dong Huang (National Cheng Kung University Hospital);
Cheng-Feng Lin (National Cheng Kung University Department of Physical Therapy);
Jin-Yi Wu (National Cheng Kung University);
Jenn-Jier James Lien (National Cheng Kung University)*

### B3-6. Face De-identification using Face Processing Methods

Wen-Chieh Fang (National Chiayi University)*;
Pei-Hsin Hsieh (National Chiayi University)

**Nov. 19, 15:30~17:00**

# Session-B4: AI CUP Panel

**Session Chair: Prof. Richard Tzong-Han Tsai, Prof. Shih-Hung Wu**

**主題：**

AI CUP 如何培養 AI 人才並連結就業市場

參加競賽對學生個人實力的提升

業界怎麼看有 AI 競賽成績的應徵者

## AI Contest Panel

### Panelist:

1. 駱宏毅研究工程師(中國鋼鐵公司)
   Hung-Yi Lo (China Steel Co.)
2. 張智星科技長(玉山金控)
   Roger Jyh-Shing Jang (E.SUN Financial Holding Co., Ltd.)
3. 蔡明順校務長（台灣人工智慧學校）
   Richie Tsai (Taiwan AI Academy)

### Panel Co-host：

1. 蔡宗翰教授(國立中央大學)
   Richard Tzong-Han Tsai (National Central University)
2. 林守德首席機器學習科學家
   Shou-De Lin (Appier)

**主辦**

教育部人工智慧技術及應用人才培育計畫之子計畫三：教育部人工智慧競賽與標註資料蒐集計畫(AI CUP)

Domestic Track

**Nov. 20, 09:00-10:30**

# Session-B5: Natural Language

## Session Chair: Prof. Ho-Lung Hung, Prof. Alex Long-Sheng Chen

### B5-1. 常見問題檢索使用有效的孿生神經網路

Wan-Ting Tseng (National Taiwan Normal University)*;
Chin-Ying Wu (National Taiwan Normal University);
Yung-Chang Hsu (EZ-AI);
Ber-Lin Chen (National Taiwan Normal University)

### B5-2. 利用關係記憶核及獎勵調整改善序列生成對抗網路之研究

蔡沅信 (國立中正大學)*;

劉立頌 (國立中正大學);

Wei-Hsiang Wang (Chung Cheng University)"

### B5-3. 利用語意文件檢索及多步推理於開放式問答系統之研究

鄭博元 (國立中正大學);

劉立頌 (國立中正大學);

李俊宏 (國立中正大學);

翁士勛 (國立中正大學)*

### B5-4. 從常見問答集自動產生客服問答機器人

Ting-Yun Ou (中央大學);
Hung-Hsuan Chen (National Central University)*;
Kuan-Ling Chou (National Central University)

### B5-5. 探索異質圖和中心性資訊於語音文件摘要

Tien-H Lo (National Taiwan Normal University)*;

宋曜廷 (國立臺灣師範大學);

Ber-Lin Chen (National Taiwan Normal University)

### B5-6. 利用 BERT 意圖判斷優化 GPT-2 對話生成的客服輔助對話機器人

Zi-Yan Zhao (National Kaohsiung University of Science and Technology)*;

Chun-Chih Lo (國立高雄科技大學);

Mong-Fong Horng (National Kaohsiung University of Science and Technology);
Chin-Shiuh Shieh (National Kaohsiung University of Science and Technology);
Kun-Mu Tu (EverGuard Technology Co. Ltd.)

Domestic Track

**Nov. 20, 10:50-12:00**

# Session-B6: Data mining & Knowledge Discovery

## Session Chair: Prof. Ching-Mu Chen, Prof. Yung-Fa Huang

### B6-1. 無人船先導研究：海上船舶避碰行為學習與軌跡預測

Po-Ruey Lei (ROC Naval Academy)*;
Pei-Rong Yu (National Chiao Tung University);
Wen-Chih Peng (National Chiao Tung University)

### B6-2. KNIME 數據整合分析平台於資料探勘之應用

洪士程 (朝陽科技大學)*;

李琦勝 (朝陽科技大學)

### B6-3. 整合深度學習預測模型於股票投資策略

Fu-Chen Lu (Chung Yuan Christian University );
Yi-Hung Wu (Chung Yuan Christian University)*

### B6-4. 一個從封閉頻繁序列還原頻繁序列的高效能方法

Cheng-Wei Wu (National Ilan University)*;
Yen-Fu Lin (National Ilan University);
Yun-Wei Lin (National Ilan University);
Ji-Hong Cheng (National Ilan University)

### B6-5. 一個從高效益封閉項目集還原高效益項目集的高效能方法

Cheng-Wei Wu (National Ilan University)*;
Yun-Wei Lin (National Ilan University);
Sheng Wei Ciou (National Ilan University);
Yen Fu Lin (National Ilan University);
Ji-Hong Cheng (National Ilan University)

### B6-6. 應用強化式學習探勘活動來源網頁

Yu-Ching Liao (National Central University);
Chia-Hui Chang (National Central University)*

International Track

**Nov. 18, 15:30-17:00**

# Session-C1: Machine Learning

## Session Chair: Prof. John Sum, Prof. Yung-Fa Huang

### C1-1. FOCM: Faster Octave Convolution Using Mix-scaling

Kuan-Hsian Hsieh (National Tsing Hua University);
Erh-Chung Chen (National Tsing Hua University)*;
Che-Rung Lee (National Tsing Hua University)

### C1-2. Ammonia Gas Detection Based on CNN with Heatmap and Transfer Learning

Kun-Wei Lin (Chaoyang University of Technology);
Ren-Hong Wang (Choyang University of Technology);*
I-Ping Liu (Department of Material Technology,Green Technology Research Institute CPC Corporation);
Shun-Hao Hu (Choyang University of Technology)

### C1-3. MLNN: A Novel Network Intrusion Detection Based on Multilayer Neural Network

Chia-Fen Hsieh (Chaoyang University of Technology)*;
Che-Min Su (Chaoyang University of Technology)

### C1-4. Data Collection Framework on Menus satisfying both Preferences and Nutritional Balance

Yoko Nishihara (Ritsumeikan University)*;
Takumi Ohata ( Ritsumeikan University);
Ryosuke Yamanishi (Kansai University)

### C1-5. A Machine-Learning-based Approach for Parameter Control in Bee Colony Optimization for Traveling Salesman Problem

Chong Gee Tan (School of Computer Sciences, Universiti Sains Malaysia);
Shin Siang Choong (School of Computer Sciences, Universiti Sains Malaysia);
Li-Pei Wong (School of Computer Sciences, Universiti Sains Malaysia)*

International Track

Nov. 19, 10:30-12:00

# Session-C2: Special Session S2: Awareness Computing based on Machine Learning Technologies (ACMLT)

## Session Chair: Prof. Tzung-Pei Hong, Prof. Hsien-Chou Liao

### C2-1. Multi-class Sentiment Analysis

Show-Jane Yen (Ming Chuan University)*;
Yue-Shi Lee (Ming Chuan University);
Chung-Ken Lee (Ming Chuan University)

### C2-2. A stochastic logistic sigmoid regression using convex programming and clustering

Tran Anh Tuan (Hanoi University of Science and Technology);
Tran Ngoc Thang (Hanoi university of Science and Technology);
Vu Viet Hoang (Hanoi University of Science and Technology);
Do Manh Dung (Hanoi University of Science and Technology);
Nguyen Thi Ngoc Anh (Hanoi University of Science and Technology)*

### C2-3. A Fast Algorithm for Deriving Frequent Itemsets

Cheng-Wei Wu (National Ilan University)*;
Yun-Wei Lin (National Ilan University);
Ming-Ta Chen (National Ilan University);
Ji-Hong Cheng (National Ilan University)

### C2-4. Music Genre Classification Based On Visualize Spectrogram

Yu-Huei Cheng (Chaoyang University of Technology);
Pang-Ching Chang (Chaoyang University of Technology);
Che-Nan Kuo (CTBC Financial Management College)*

International Track

**Nov. 19, 13:30-15:00**

# Session-C3: International Poster (I)

## Session Chair: Prof. Chu-Hui Lee

**C3-1. An Automatic Response System based on Multilayer Perceptual Neural Network and Web Crawler**
Yen-Ting Liu (Tatung University)*;
Mei-Hua Hsih (Department of. Education and Aviation Tourism, Zhangzhou College of Science and Technology);
Chen-Chiung Hsieh (Tatung University)

**C3-2. Application of Deep Learning for Mushrooms Cultivation**
Bin-Rui Huang (National Kaohsiung University of Science and Technology);
Ji-Yun Chen (National Kaohsiung University of Science and Technology);
Xin-Yu Lai (National Kaohsiung University of Science and Technology);
Guan-Wei Chen (National Kaohsiung University of Science and Technology);
Ko-Wei Huang (National Kaohsiung University of Science and Technology)*

**C3-3. Deep Learning-based Real-time Detection and Correction System for Stroke Rehabilitation Posture**
Yen-Chiu Chen (Chung Hua University)*;
Chia-Jou Yang (Chung Hua University)

**C3-4. Machine Learning in Cyber Security Analytics using NSL-KDD Dataset**
Rui-Fong Hong (Chaoyang University of Technology);
Shih-Cheng Horng (Chaoyang University of Technology)*;
Shieh-Shing Lin (St. John's University)

**C3-5. PAPR Reduction of OFDM Signals Using Partial Transmit Sequences with Modified Phase Generation Mechanism**
Ming-Jie Li (Chaoyang University of Technology);
Hsin-Ying Liang (Chaoyang University of Technology)*

**C3-6. Using Random Forests and Decision Trees to Predict Viewing Game Live Streaming via Viewers' Comments**
Thao-Trang Huynh-Cam (Chaoyang University of Technology);
Zi-Jie Luo (Chaoyang University of Technology);
Long-Sheng Chen (Chaoyang University of Technology)*

**C3-7. Finding the Key Factors of Successful Personal Brand of Internet Celebrities**
Kuei-Chien Chiu (Chaoyang University of Technology)*;
Chih-Sung Lai (National Taichung University of Education);
Roman Sokorevskiy (National Taichung University of Education);
Hsing-Hui Chu (Chaoyang University of Technology);
Rung-Ching Chen (Chaoyang University of Technology)

**C3-8. Maximum Power Point Tracking Based on the Fuzzy Controller in Photovoltaic Power Systems**
Cheng-Shion Shieh (Far-East University)*

Domestic Track

**Nov. 19, 15:30-17:00**

# Session-C4: Domestic Track-Poster

## Session Chair: Prof. Jin-Fa Lin

**C4-1. 以智慧型遊戲 App 實現「觀念延續性」+「知識內化」之教學理念**

Beyin Chen (Department of Information Technology, Ling Tung University)*;
Ji-Fu Chen (Department of Information Technology, Ling Tung University)

**C4-2. AI 健身趣：基於深度學習之健身姿勢識別系統**

Yen-chiu Chen (Chung Hua University)*; Tzu-Han Liao (Chung Hua University);
Teng-Huang Hsueh (Chung Hua University); Kian-Kah Tan (Chung Hua University);
Yu-Ting Wu (Chung Hua University); Wei-Cheng Huang (Chung Hua University)

**C4-3. Improve Chit-chat and QA Sentence Classification in User Messages of Dialogue System using Dialogue Act**

Chi-Hsiang Chao (ChingShin Academy); Xi-Jie Hou (ChingShin Academy);
Yu-Ching Chiu (National Central University)*

**C4-4. 多維空間中的快速 k-NN 演算法**

Gene Eu Jan (National Taipei University); Kuan-Lin Su (National Taipei University)*;
Ming Che Lee (Ming Chuan University)

**C4-5. 四元樹分類新解**

Gene Eu Jan (National Taipei University); MingChe Lee (Ming Chuan University);
Kuan-Lin Su (National Taipei University)*

**C4-6. 基於元學習之跨領域增量推薦系統**

I-Shyan Hwang (Yuan Ze University)*; Cheng-Wei Shih (Yuan Ze University);
Ching-Hu Lu (National Taiwan University of Science Technology)

**C4-7. 基於生成改編故事之聊天機器人**

Jin-De Li (朝陽科技大學)*; Shih-Hung Wu (Chaoyang University of Technology);
Guan-Xiang Wang (朝陽科技大學)

**C4-8. 應用於客服機器人基於意圖分類與關鍵詞提取之回覆生成技術**

Ming-Xian Zou (National Kaohsiung University of Science and Technology)*;
Chun-Chih Lo (National Kaohsiung University of Science and Technology);
Chih-Hsueh Lin (Department of Electronic Engineering, National Kaohsiung University of Science and Technology);
Chin-Shiuh Shieh (National Kaohsiung University of Science and Technology);
Mong-Fong Horng (National Kaohsiung University of Science and Technology);
Kun-Mu Tu (EverGuard Technology Co. Ltd.)

**C4-9. 以情境資訊改進學術圖書館讀者 Top-N 推薦方法**

Feng-I Chung (National Chung Cheng University)*;
劉立頌 (國立中正大學)

**C4-10. 效益之週期性頻繁樣型探勘 應用於股票資料分析**

Wen-Chen Wen (Chung Yuan Christian University);
Yi-Hung Wu (Chung Yuan Christian University)*

International Track

**Nov. 20, 09:00-10:30**

# Session-C5: International Poster (II)

## Session Chair: Prof. Jong-Shin Chen

**C5-1. The TOTP Security Method for MQTT Protocol**
Chia Fen Hsieh (Chaoyang University of Technology)*;
Chih Kai Chang (Chaoyang University of Technology)

**C5-2. Preliminary Implementation of Grasping Operation by a Collaborative Robot Arm: Using a Ball as Example**
Wen-Chang Cheng (Chaoyang University of Technology);
Chien-Hung Lin (Chaoyang University of Technology)*;
Cheng-Yi Shi (Chaoyang University of Technology);
Hung-Chou Hsiao (Chaoyang University of Technology);
Chun-Lung Chang (ITRI)

**C5-3. The Needs Analysis of Virtual Exergaming**
Long-Sheng Chen (Chaoyang University of Technology)*;
Yi-Xun Wu (Chaoyang University of Technology)

**C5-4. Predicting Credit Risk in Peer-to-Peer Lending: A Machine Learning Approach with Few Features**
Yun Chieh Cheng (Yuan Ze University);
Hui Ting Chang (Yuan Ze University);
Chia-Yu Lin (Yuan Ze University)*;
Heng-Yu Chang (Chang Gung University)

**C5-5. Improving Multi-Scale Models with A Comparative Framework for Semantic Segmentation**
Ting-Chen Hsu (National Taiwan University of Science and Technology)*;
Bor-Shen Lin (National Taiwan University of Science and Technology)

**C5-6. User Addiction Behavior Towards Online Mobile Games Influences In Apps Purchase Behavior**
Andri Dayarana K. Silalahi (Chaoyang University of Technology);
Teguh Indra Bayu (Chaoyang University of Technology)*

**C5-7. Fireworks Image Classification with Deep Learning**
Chih-Lung Chang (Asia University);
Hsin-Ming Tseng (Asia University);
Hsueh-Ting Chu (Asia University)*

**C5-8. Applying Discriminant Analysis and LVQ Neural Network to an Empirical Study of Corporate Social Responsibility on Taiwanese Electronics Companies**
Hsio-Yi Lin (Chien Hsin University of Science and Technology)*

Domestic Track

**Nov. 18, 15:30-17:00**

# Session-D1: Intelligence system

## Session Chair: Prof. Tzu-Hsien Yang, Prof. Jiun-Jian Liaw

### D1-1. On Wang kWTA with Recurrent State Decay

John Sum (National Chung Hsing University)*;
Chi Sing Leung (City University of Hong Kong);
Janet Chang (National Chung Hsing University)

### D1-2. 基於自動分頁預測之大規模資料應用程式介面建置 - 以活動擷取為例

Cheng Ju Wu (National Central University);
Chia-Hui Chang (National Central University)*

### D1-3. 應用多任務序列標記模型於零樣本跨語言網頁模板移除之研究

Yu-Hao Wu (National Central University);
Chia-Hui Chang (National Central University)*

### D1-4. 基於電腦視覺之大白鼠行為辨識

Chien-Cheng Lee (Yuan Ze University)*;
Wei-Wei Gao (Yuan Ze University);
Ping-Wing Lui (Taichung Veterans General Hospital)

### D1-5. 農作蜜棗損傷原因之高效能分類

Chung-Yu Wang (National University of Kaohsiung);
Kai-Chi Tu (National University of Kaohsiung);
Ya-Chiao Yang (National University of Kaohsiung);
Hsiu-Chun Tsai (National University of Kaohsiung);
Tzu-Hsien Yang (National University of Kaohsiung, Taiwan)*

### D1-6. 不確定的環境中無人機的階層式協力運動規劃

Yi-Chuan Tsai (National Chengchi University)*;
Tsai-Yen Li (National Chengchi University)

International Track

**Nov. 19, 10:30-12:00**

# Session-D2: Special Session S1: Intelligent Applications of Data Collection and Analysis for Context Awareness (IADACA)

**Session Chair: Prof. Yue-Shi Lee, Prof. Jeang-Kuo Chen**

**D2-1. Combination of EEG and Brainwave Mind Lamp to Detect the Value of Attention, Meditation and Fatigue of a Person**
Rung-Ching Chen (Chaoyang University of Technology);
Ming-Jheng Liou (Chaoyang University of Technology);
Christine Dewi (Chaoyang University of Technology)*

**D2-2. Risk Management Analysis of the Sustainable Supply Chain Using a Fuzzy Hybrid Approach in India**
Venkateswarlu Nalluri (Chaoyang University of Technology);
Ching-Torng Lin (Da-Yeh University);
Long-Sheng Chen (Chaoyang University of Technology)*

**D2-3. The Transformation of RDB to NoSQL DB**
Jeang-Kuo Chen (Chaoyang University of Technology)*;
Wei-Zhe Lee (Chaoyang University of Technology)

**D2-4. A Unified Temporal Erasable Itemset Mining Approach**
Tzung-Pei Hong (National University of Kaohsiung);
Hao Chang (National Sun Yat-Sen University);
Shu-Min Li (National Sun Yat-Sen University);
Yu-Chuan Tsai (National University of Kaohsiung)*

***Nov. 19, 15:30-17:00***

# TAAI 2021 PhD/Master Award Session

## Session Chair: Prof. Wei-Ta Chu, Prof. Chin-Ling Chen

### 博士論文獎

**深度財務意見探勘**

陳重吉, 國立臺灣大學資訊工程所

### 碩士論文獎

**學習三維圖卷積網路於點雲分析**

林志皓, 國立台灣大學電信工程學研究所

### 碩士論文獎

**基於異質性城市資料推估數據之多準則競合路線規劃框架：以交通運輸為例**

林寰鐸, 國立成功大學電腦與通信工程研究所

**Nov. 20, 10:50-12:00**

# Session-D3: Special Session for High School Students

## Session Chair: Prof. Jen-Wei Huang

### D3-1. AI-FML Tool for High School Student Learning and Practical Application

Sheng-You Huang (Kaohsiung Senior High School);
Rin-Pin Chang (National University of Tainan);
Mei-Hui Wang (National University of Tainan);
Sheng-Hui Huang (National University of Tainan);
Chang-Shing Lee (National University of Tainan);
Sheng-Cheng Huang (DongGuang Primary School );
Wei-Chih Chen (DongGuang Primary School)

### D3-2. A study of CBT-based Consulting System: App for People with Stress or Depression

Chi-Lin Liu (Taoyuan Municipal Nei Li Senior High School),
Ti-En Hsieh (Taoyuan Municipal Nei Li Senior High School),
Ching-Yi Liao (Taoyuan Municipal Nei Li Senior High School)

### D3-3. How AIoT Joins Hand in Hand with the Persimmon Sun-Dried Machine Re-Invents Community Imagination and Tourism

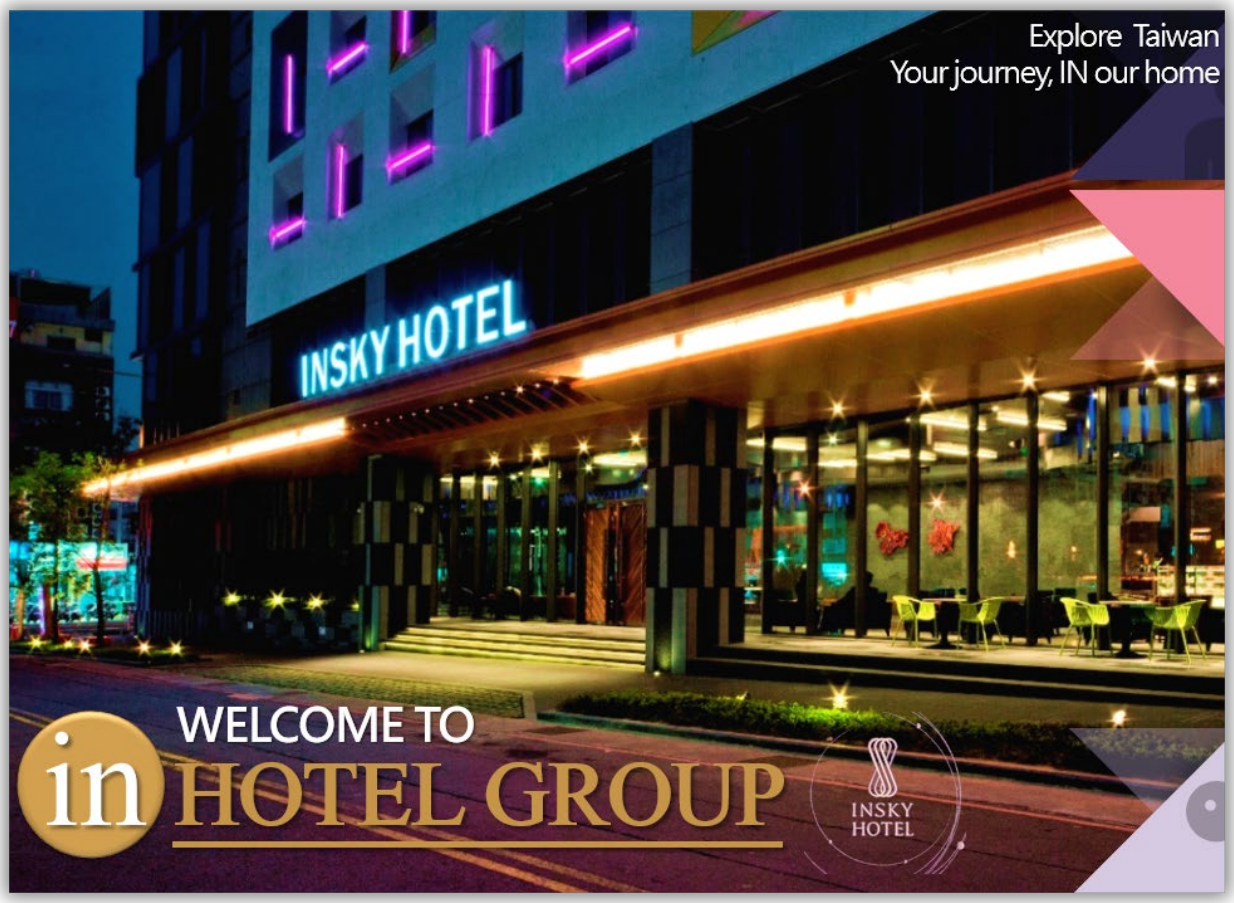
Yen-Wei Huang (Taoyuan Municipal Nei-Li Senior High School);
Chung-Jui Tang (Taoyuan Municipal Nei-Li Senior High School);
Ching-Yi Liao (Taoyuan Municipal Nei-Li Senior High School)

### D3-4. EFUNet: Enhanced Feature-based Image Colorization with Generative Adversarial Networks

Ting-Wei Chuang (National Tainan First Senior High School);
Kai-Hsiang Chen (Graduate Program for Multimedia Systems and Intelligent Computing, National Cheng Kung University and Academia Sinica);
Zhong-Yun Zheng (National Tainan First Senior High School);
Yung-Chin Yen (National Tainan First Senior High School);
Tun-Hsien Chien (National Tainan First Senior High School),
Jen-Wei Huang (Department of Electrical Engineering, National Cheng Kung University)

# Information

## Conference Venue

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ARTIFICIAL INTELLIGENCE COLLABORATION PLATFORM
AIdea

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AIdea人工智慧解題平台評估企業需求應用AI解決的有效性後，經過資料整備、議題設計將需求轉換成AI可以解的題目公開上架到平台，應用群眾解題方式，協助企業快速找到最佳方案。AIdea平台已累積12000位AI人才，協助超過50件產業案例公開解題，皆獲得極佳成效。

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The AIdea crowd-sourcing platform first evaluates the effectiveness of AI inresponse to enterprise needs. After data preparation and topic design, the needs are transformed into AI-solvable questions and put on a public platform. The best AI solution can be thus quickly found through crowd-sourcing. The AIdea platform has accumulated 12,000 AI talents, with more than 50 industry cases been publicly solved through the platform, all of which have achieved satisfying results.

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https://aidea-web.tw/

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企業出題
人才解題

創意作法分享
賽外多元交流

匯集超過
7,000名AI人才

- 2021 冬季賽 信用卡消費類別推薦 — 聰明消費來預3
- 2021 夏季賽 中文手寫字影像辨識 — 你，識字嗎？
- 2020 夏季賽 NLP應用挑戰賽 — Gotcha！人人都可以是反洗錢大師！
- 2019 秋季賽 真相只有一個「信用卡盜刷偵測」
- 2019 夏季賽 台灣不動產AI神預測
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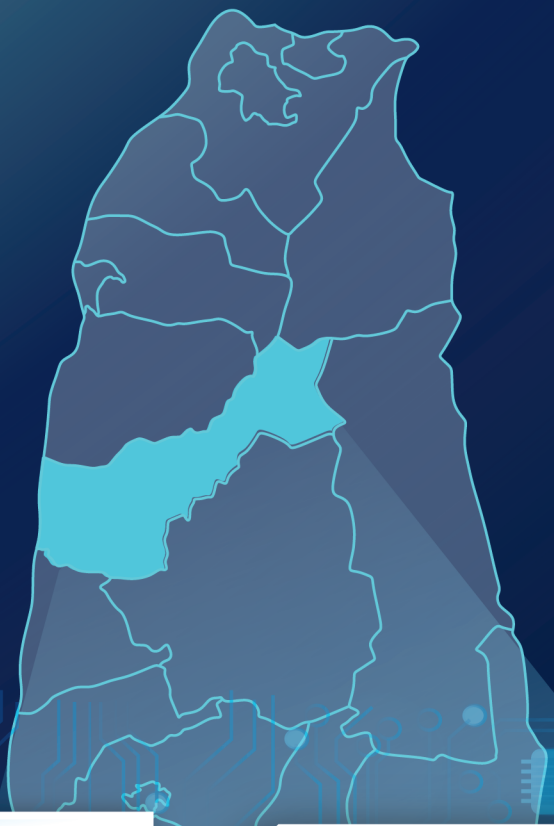

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