

National Penghu University of Science and Technology Received an External Financial Support Through the Help of Taiwan President Tsai

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Prof. Yo-Ping Huang has been the President of National Penghu University of Science and Technology, Penghu, Taiwan since August 1, 2021. He is also serving his second-term (2022-2023, 2024-2025) as the Vice President for Conferences and Meetings, IEEE SMCS. Despite being occupied with heavy administrative duty and multiple research projects, he never stops thinking about the following: how to apply for more government funding to improve the university infrastructure, how to cultivate talented students to work for the industry after graduation, how to highlight unique programs of each department for future development, how to enhance students' skill by hands-on learning, how to narrow the gap between what students have learnt in class and the demand from industry, how to encourage students to participate in national and international contests, how to provide a platform to bridge university with industry, and how to promote the university reputation, etc.

In this article, Prof. Huang shares a recent event from his own endeavor in inviting Taiwan's first lady President, Dr. Ing-wen Tsai, to visit the university on March 28, 2024. Note that President Tsai served two-term and 8 years as Taiwan President until May 20, 2024. In truth, arranging the President's visit to the university was no small undertaking, as it required much behind-the-scene coordination and hard work to address major concerns about security, route planning, and briefing presentation, etc. Fortunately, Prof. Huang's neat arrangement made the President's visit quite successful. This can be attributed to Prof. Huang's personal characteristics and dedication to higher education in the past 30 years.

Dr. Huang's personal inspirational motto is:

1. In terms of research: when you persevere, you will find that the road to research and development will bear fruits, solving industry needs and pain points.
2. In terms of school management: how to motivate professors to teach attentively, make students willing to study seriously, cultivate teamwork spirit, strive for external resources, establish school characteristics, and create sustainable development for the university.

His current research interests include deep learning modeling, intelligent control, fuzzy systems design and modeling, and AIoT for aquaculture. In recent years, Dr. Huang's main focus of research has been on the application of AI and IoT systems in agriculture, aquaculture, health care, and subtle defect detection. He devotes his research and system design to solve the pain points of the industry as the starting point and the deployment of their developed systems

to the industry as the ultimate goal.

1. In the field of smart medical care: Long-term cooperation with Veteran's General Hospital and Chang Gung Memorial Hospital. His research focuses on how to quantitatively analyze symptoms, detect early, and achieve precise medical goals. He led a joint effort with Rehabilitation Medical Department in Veteran's General Hospital, Taipei to develop a system for LSVT BIG (Lee Silverman Voice Treatment BIG) rehabilitation for patients with Parkinson's disease. The research results solved three major problems in clinical rehabilitation treatment: (1) Whether the patient follows home care instructions? (2) How long did each rehabilitation last? (3) How to track and quantitatively analyze the rehabilitation process? Another project involving the Ophthalmology Department, Chang Gung Memorial Hospital, Linkou, Taiwan where the team designed an early screening system for retinopathy of prematurity. The main contribution is that it can screen image files without abnormality first, allowing doctors to focus their valuable time on identifying fundus images with suspected symptoms.

2. In the field of AI-based inspection: Cooperating units include AUO, Acer, and EERise. For subtle defects caused by the panel manufacturing process, their technology can not only automatically locate and laser cut the defects, but also identify the type of defects. The identification accuracy of the same product can be improved and achieved an accuracy rate of more than 97%. At the same time, it can significantly reduce the computational cost of retraining AI models for products with small sample size and the labor cost for manual inspection.

3. In the field of smart agriculture and aquaculture: Collaborating with Fongyu Co., Everlife Biotech Co., and five cage nets farms in Penghu County, Taiwan, by applying AI and automatic control technology to solve pain points faced by agriculture and aquaculture. In terms of breeding, they have four main innovations: monitoring water surface ripple changes to optimally control the amount of sprayed feed; designing a triangular net system to estimate the optimal feed amount and determine the activity of white shrimps; instead of submerging equipment into ponds to measure water quality, they developed a new method that pumped water into buckets on shore to measure water quality; the fish and shrimp counting system combines AIoT architecture and image processing technology to automatically count with high accuracy (about 97%), replacing traditional labor-intensive and often inaccurate manual counting.

In summary, Dr. Huang focuses his research on applying AI and IoT technology integrated with the control system in a wide array of industries such as medical care, subtle defect detection on TFT-LCD panel images, agriculture and aquaculture with hopes to provide effective solutions to resolve specific pain points.

In recognition of his outstanding and practical work in both academia and industry, Dr. Huang has received several prestigious awards in the past three years, including:

1. Outstanding Engineering Professor Award from the Chinese Institute of Engineers in 2022;
2. Outstanding ICT Elite Award from Taipei Computer Association in 2022;
3. IoT Innovation Award from Pan Wen Yuan Foundation in 2022;
4. Outstanding Research Award from the National Science and Technology Council (formerly Ministry of Science and Technology), Taiwan in 2021.

Prof. Huang was in attendance when the Chinese Institute of Engineers arranged the recipients of Outstanding Engineering Professor Award to meet President Tsai in the Presidential Hall on March 7, 2023. After delivering a welcome speech, the President said she still had time for two-way communication. Then, Prof. Huang was the first guest who was permitted by the President to ask questions. He seized this good opportunity to extend one invitation and propose two suggestions to the President. On the behalf of all faculty, staff and students, he sincerely invited the President to visit the university. He also mentioned the serious architectural problem of their administrative building. Since the building was only constructed 30 years ago, not over 50 years, by law it cannot be destructed. The President appreciated Prof. Huang's suggestions and promised that she will arrange a time to visit the university. The President originally scheduled to visit the university a month later, however due to bad weather the night before her visit, that trip was cancelled. Fortunately, she held her promise and came to visit the university on March 28, 2024. So, nothing is impossible. As you work hard, even the country's President will help you fulfill your reasonable proposals. This is why National Penghu University of Science and Technology received a big extra funding to build a brand new administrative building. Prof. Huang is proud to be the President of the university. Fig. 1 to Fig. 3 show some of the pictures taken during the President visited NPU.

Dr. Huang received his Ph.D. degree in Electrical Engineering from Texas Tech University, Lubbock, TX, USA. He is the President of National Penghu University of Science and Technology, Penghu, Taiwan. He is also a Chair Professor in the Department of Electrical Engineering, National Taipei University of Technology, Taipei, Taiwan, where he served as the Secretary General. He was a Professor and the Dean of Research and Development, the Dean of the College of Electrical Engineering and Computer Science, and the Department Chair with Tatung University, Taipei.

He is a Fellow of IEEE, IET, CACS, TFSA, and AAIA. He serves as the Chair of the IEEE SMCS Technical Committee on Intelligent Transportation Systems (received Most Active TC Award, 2019). He is the President of Chinese Automatic Control Society (CACS, 2024-present). He was the IEEE SMCS BoG (2019-2021), President of the Taiwan Association of Systems Science and Engineering (2015-2019), the Chair of IEEE SMCS Taipei Chapter (received Outstanding Chapter Award, 2016) the Chair of the IEEE CIS Taipei Chapter, and the CEO of the Joint Commission of Technological and Vocational College Admission Committee, Taiwan (2011-2015).



Fig. 1. Prof. Huang accompanied President Tsai and Minister of Education, Mr. Pan, to inspect the administrative building of NPU.



Fig. 2. President Tsai delivered a welcome speech at NPU.



Fig. 3. Prof. Huang represented NPU to send a small plate as a gift to President Tsai.