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# Taipei Tech Post

## National Taipei University of Technology





Professor Zheng Meng-cong and students of Taipei Tech Department of Industrial Design demonstrated how modern hearing aids can be the perfect blend of fashion and function

Achievements

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## Industrial Design Students Bring Refresh Design to Hearing Aids



There are over 100 million people suffering from hearing loss globally. Professor Zheng Meng-cong and students of Taipei Tech Department of Industrial Design successfully demonstrated how modern hearing aids can be the perfect blend of fashion and function. Collaborated with PSA Charitable Foundation, the Taipei Tech design team refreshed the hearing aids design through three core ideas, "Hear, Help, and Happiness." The design team were also invited to showcase their products along with Hsu Shu-hao, a singer who was nominated for Taiwan's Golden Melody Awards, on July 7.

Zheng indicated that the design team utilized metal materials to design the hearing aids, and they also tried to incorporate elements such as stones, feathers, embroideries, silicone, and polylactic acid into the hearing aids. "This experience was a perfect opportunity for the students to acquire problem-solving skills, and the results were beautiful and practical products," said Zheng.

Yang Shih-hsuan, Vice President of Taipei Tech, pointed out that Taipei Tech has been actively involved in promoting industry innovation and providing social services that echo United Nation's Sustainable Development Goals. "We believe that through this collaboration with PSA Charitable Foundation, we can help develop innovative technological devices to effectively reduce barriers, counter stereotype, and achieve inclusivity," said Yang.

"Eclipse," designed by student Huang Chun-yen, is inspired by lunar phase. The hearing aids' structural design make them easy to be folded and unfolded. The curved-shape, which mimics the shape of crescent moon, also makes them highly wearable and fit comfortably around ears.

"Angel's Melody," designed by Lin Yu-hsuan, uses feathers to emphasize kindness and warmth. The pendant hearing aids, "Guardian Hear," designed by Shih Tzu-ching, incorporates traditional element of the indigenous Paiwan tribe, including pattern of *Deinagkistrodon acutus* and glass beads, to make the hearing aids a fashionable statement that celebrates Taiwanese culture.

"LO-FI," designed by Chen Yu-wen, adds embroidery details to alleviate the coldness of regular metal hearing aids. "Sunfee," designed by Chen Shi-yun, is inspired by the shape of sunflower and exudes vitality, boldness, and confidence. "Fly TO Hear," designed by Lai Shao-chen, is a highly-decorative piece in the shape of a butterfly, symbolizing that the users are ready to break through from their limitation like a butterfly emerging from its chrysalis.



# 友達 · 北科聯合研發中心揭牌典禮

Collaboration



## Taipei Tech and AUO Join Hands to Establish New Joint Research Center



The research center will focus on smart manufacturing technology such as autonomous mobile robots, robotic arm system, and collaborative robot system

AUOptronics (AUO), one of the world's most renowned panel manufacturers, partnered with Taipei Tech to establish a new joint research center. Located in the new Taipei Tech Pioneer International R&D Building, the research center focuses on smart manufacturing technology. Taipei Tech and AUO held a ceremony on August 31 to unveil the new research center.

Wang Sea-fue, Taipei Tech President, mentioned that Taipei Tech had worked with AUO in the past to develop an energy-saving solution for the air-conditioning system in AUO's Longtan factory by utilizing AI and 5G technology. This industry-academic cooperation project is a successful model that demonstrates how the academia sector can provide innovative solutions to meet the needs of the industry sector. Wang believes that the new research center will deepen partnerships and create a "win-win" situation for both industry and academia.

Paul Peng, CEO and Chair of AUO, indicated that AUO and Taipei Tech have been longtime partners and have worked on more than thirty collaborative projects. "Our projects ranged from developing industrial robots, image recognition, process optimization, alarm equipment, and virtual reality integration," said Peng, "and we are now expanding to work on AI-enabled voice feedback, barrier-free mobility solutions, and collaborative robots."

Lien Ching-chang, Director General of the Industrial Development Bureau, Ministry of Economic Affairs, who attended the ceremony, noted that Taipei Tech has educated many great innovative engineers for the industry, and AUO has been the pioneer enterprise that promotes sustainability and renewable energy. "I am happy to see the industry and academia join hands to address the issue of manpower shortage and sustainable development."

Chen Chin-sheng, Director of the AUO-Taipei Tech Joint Research Center, indicated that the center is now developing autonomous mobile robots, robotic arm system, and collaborative robot system. The autonomous mobile robots are designed based on the ROS/ROS 2 platform, integrating robotic arms with autonomous navigating transporters to create adaptable and agile solutions that greatly improve production safety as well as product reliability and precision. "These smart automations can help relieve the manpower shortage problem that manufacturers are currently facing," said Chen.

# Collaboration with Taipei Medical University Produces Great Results in Smart Medical Technology Products



Taipei Tech and Taipei Medical University held a press conference on July 28 to unveil the commercialized products from their joint research in smart healthcare

Taipei Tech and Taipei Medical University held a press conference on July 28 to unveil the commercialized products from their joint research in smart healthcare. The products include innovative hemostatic materials, AI diagnostic biomarker system, and smart endoscopy.

Wang Sea-fue, President of Taipei Tech, indicated that Taipei Tech and Taipei Medical University have long been partners in the University System of Taipei. The two schools have collaborated in fields such as engineering, medicine, Big Data, and AI. In 2021, the two universities joined forces to set up a joint research center to promote the research and development on smart healthcare and translational medicine. The research center received \$10 million NTD funding to cultivate research talents.

Lin Chien-huang, President of Taipei Medical University, noted that Taipei Medical University is well-experienced in the commercialization of biomedical products. "By bringing in Taipei Tech's expertise in engineering," said Lin, "our collaboration had led to the preparation of a start-up company, six patent applications, three Institutional Review Board (IRB) project applications, and four National Science Council project applications." Lin believes that more fruitful and inventive results will be generated by the cross-disciplinary cooperation between the two universities in the future.

To address to lack of anti-adhesion hemostatic materials used in surgeries, Fang Hsu-wei, Distinguished Professor of Taipei Tech Department of Chemical Engineering & Biotechnology, worked with Chen Chih-yu, Orthopedic Doctor of the Taipei Medical University Shuang-Ho Hospital, to develop novel polysaccharide-based powdered anti-adhesion material. The product is expected to be approved and achieve technology transfer by next year.

Pai Tun-wen, Professor of Taipei Tech Department of Computer Science and Information Engineering, and Liu Ming-che, Urologist of Taipei Medical University Hospital, co-developed a diagnostic biomarker system through utilizing AI algorithm to select and analyze DNA methylation-based biomarkers in bladder cancer. Wu Meng-huang, Orthopaedic Spine Specialist of Taipei Medical University Hospital, and Chang Cheng-chun, Professor of Taipei Tech Department of Electrical Engineering, cooperated on smart spinal endoscopy development that can effectively prevent visual obstruction during surgery. These products are in the process of verification and is expected to be launched onto the market soon.

**TAIPEI  
TECH**





Representatives from new partners and existing partners of Smart Railway Institute gathered together to sign letter of intent to promote and advance railway development



## New Partners Join Forces to Advance Smart Railway Development

To accelerate the innovation of smart railway systems, the Taipei Tech-headed Smart Railway Institute is joining hands with more partners. On July 13, representatives from new partners and existing partners gathered together to sign letter of intent to promote and advance railway development. The new partners include National Taipei University, National Taiwan University of Technology, Chinese Culture University, and New Taipei Metro. The existing partners include Taipei Tech, Yuan Ze University, Kainan University, Taipei MRT Corporation, and Taoyuan MRT Corporation.

Wang Sea-fue, Chairperson of the Smart Railway Institute and President of Taipei Tech, said that the Smart Railway Institute is a platform that integrates government, industry, and academia resources to cultivate talents for the smart railway industry. "We are excited that more partners are joining us to facilitate the research and development of smart railway," said Wang.

Hu Hsiang-ling, Deputy Minister of Transportation and Communications, indicated that with new partners joining the institute, it will certainly have a positive impact on Taiwan's railway development. "The Ministry of Transportation and Communications fully supports the research and development of smart railway technologies

and related inspection regulations," said Hu, "I believe the institute will strengthen Taiwan's smart railway technology and further earn global recognition."

Lee Hsien-ming, Taoyuan City Deputy Mayor, shared that he had only realized how impressive it is for Taiwan's metro systems to be punctual after he experienced the metro systems in other countries. "Railway construction is critical for Taoyuan to facilitate our population growth," said Lee, "so we look forward to cooperating closely with the industry and academia sectors to develop state-of-the-art smart transportation technologies."

The Smart Railway Institute has been commissioned by the Ministry of Transportation and Communications to provide training for railway track inspectors to boost safety. Furthermore, four hundred students enrolled in the smart railway micro program in 2021, and fifteen students joined the master program offered by the Institute in 2022. The institute continues to host seminars and discussion panels. It is also planning to publish a report on railway professional talent cultivation as well as amending the draft of smart railway system information security regulation.





Taipei Tech launched a new Offshore Wind Power Research Center to accelerate the technological development and certificate program implementation of offshore wind power in Taiwan



Shen Jong-chin, Vice Premier of the Executive Yuan, recorded a remark for the opening ceremony

## New Offshore Wind Power Research Center to Accelerate Green Technology

To accelerate the technological development and certificate program implementation of offshore wind power in Taiwan, Taipei Tech launched a new Offshore Wind Power Research Center on August 23. Shen Jong-chin, Vice Premier of the Executive Yuan, recorded a remark for the opening ceremony. Hsieh Han-Chang, Deputy Director of the Bureau of Standards, Metrology and Inspection (BSMI) of the Ministry of Economic Affairs, together with representatives from international offshore wind power developer, manufacturer, third-party inspection companies, and engineering consulting companies also joined the ceremony.

Vice Premier Shen noted that Taiwan's goal is to raise its offshore wind power capacity to 5.7 gigawatts (GW) by 2025, which will yield 21.5 billion kilowatt-hours of clean, home-grown energy each year and cut carbon emissions by 11.92 million metric tons annually. Shen further commended Taipei Tech's role in assisting BSMI to stipulate site survey and designing technical regulations for offshore wind power since 2020.

Deputy Director Hsieh also express his appreciation for Taipei Tech's effort in coordinating and conducting various projects including site survey, engineering, construction, and policy-making. "To battle against climate change that can seriously affect our lives," said Hsieh, "offshore wind power is an effective approach to achieve energy conservation and carbon reduction."

Yang Shih-hsuan, Vice President of Taipei Tech, mentioned that the newly-established center combines the expertise of Taipei Tech's Colleges of Engineering, Mechanical and Electrical Engineering, and Electrical Engineering and Computer Science, aiming to expedite the process of offshore wind power industry taking root in Taiwan.

Sung Yu-chi, Director of the Offshore Wind Power Research Center, indicated that the center is currently conducting multiple major projects in relation to weather assessment and support structures for wind turbines. "We have also published the latest research results on hot spot stress analysis for welded tubular joint in offshore jacket structure in the Ocean Engineering journal this May. The research suggests a new method in supporting an offshore wind turbine that is cost effective and helps reduces overall design time," said Sung.





Immersive VR projects, "Journal of My Journey" and "Waving Blanket", from Taipei Tech Department of Interaction Design were selected to be part of the SIGGRAPH 2022 Emerging Technologies and Immersive Pavilion program

## Immersive VR Projects to Showcase at 2022 ACM SIGGRAPH Event

Two immersive VR projects from Taipei Tech were selected to be part of the SIGGRAPH 2022 Emerging Technologies and Immersive Pavilion program, making them the only 2 Taiwanese representatives made it into the list. These two projects—"Journal of My Journey" and "Waving Blanket"—are made by professor and students of Taipei Tech Department of Interaction Design. "Journal of My Journey" is also listed in the Top Selection Award of the SIGGRAPH 2022 Immersive Pavilion.

The SIGGRAPH conference is the world's leading annual interdisciplinary educational experience showcasing the latest in computer graphics and interactive techniques. SIGGRAPH 2022, the 49th annual conference, takes place as a hybrid event, with live events in Vancouver and virtual content available online.

Reflecting on the concept of multiverse, the project "Journal of My Journey: Seamless Interaction in Virtuality and Reality With Digital Fabrication and Sensory Feedback" aims to enable users to explore the possibilities of seamless interactions in virtuality and reality.

Han Ping-hsuan, professor in the Interaction Design Department, and students Deng Ying-jie, Lui Ching, Chen Yi-shiuan, Lin Zin-yin, and Chou Yu-chih designed the project. Han pointed out that in order to implement the multiverse experience, the team uses tracker, laser cutting machine, and VR headset to seamlessly connect user's experience in the virtual world with the reality. Lui shared that this is the first time that she designed a VR application, and she is thankful to all the people who have helped them achieve this amazing result.

"Waving Blanket: Dynamic Liquid Distribution for Multiple Tactile Feedback Using Rewireable Piping System" is also headed by Professor Han, working with another group of students, including Chen Yu-yen, Pan Wu-ting, Hsu Hui-wen, Jiang Jin-Rong, and Wu Wen-Jun. The project utilizes a water pump, air valve, VR headset, and aroma diffuser to create a multisensory relaxation application. Wu mentioned that they had to study fluid mechanics in order to have a better understanding of the air-water interaction and structural mechanics. "Working on the project has been the most fulfilling experience as we were able to program a single device to provide multisensory experience," said Wu.





# Students Work with Local Historians to Make Documentary of Coal Mining Town

Houtong is now known as the “cat village” by tourists, but it was originally a small coal mining town. Taipei Tech General Education Center worked with Houtong Kuanggong Historical Museum and New Taipei City Gold Museum to hold the screening of the documentary, “A Ramble in Houtong Coal Town” on August 14. The documentary captures the history of Houtong’s coal mining industry, celebrating the last-generation miners and local culture.

The founder of Houtong Kuanggong Historical Museum and a former miner, Chao Zhou-nan, pointed out that it is a meaningful thing for old miners to disseminate the forgotten history of coal mining industry through video. “We are truly grateful for the students and teachers of Taipei Tech who help to film and preserve our story,” said Chao.

Yang Shih-hsuan, Vice President of Taipei Tech, noted that National Taipei Institute of Technology, the predecessor of Taipei Tech, was the most prestigious school with the subject of mining engineering. In 2021, Taipei Tech started to work with the Kuanggong Historical Museum through the University Social Responsibility (USR) project to implement film documentation on Houtong’s coal mining industry and workers’ life stories.

Cheng Yi-wen, professor of Taipei Tech General Education Center, mentioned that the project lasted for three semesters, aiming to document the history through three different perspectives: “tools”, “workers’ life,” and “coal mine landscape.” Twenty students from six different colleges worked closely with the Historical Museum to create the film that documents the lives of coal mine workers.

Chiu Chin-wei, student of the Department of Architecture who participated in the project, indicated that the process of making the documentary was inspiring and meaningful. “I am truly happy to do something that gives back to the society,” said Chiu, “and it is a heart-warming experience to receive gratitude and feedback from the elderly coal mine workers.”

After the initial screening, Shengping Theater of New Taipei City Gold Museum will continue to play the documentary regularly until the end of September.

“A Ramble in Houtong Coal Town” (猴硐煤鄉漫遊) trailer: <https://youtu.be/hgQtqIWj5C8>



“A Ramble in Houtong Coal Town” captures the history of Houtong’s coal mining industry, celebrating the last-generation miners and local culture



Taipei Tech General Education Center worked with Houtong Kuanggong Historical Museum and New Taipei City Gold Museum to hold the screening of the documentary, “A Ramble in Houtong Coal Town” on August 14



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