09

INDUSTRY, INNOVATION AND INFRASTRUCTURE

Research

Smart River Planning and Smart Flood Prevention Platform Construction Plan

"NYCU's Disaster Prevention and Water Environment Research Center" helped the New Taipei City Water Resources Department implement the "New Taipei City Smart River Planning and Smart Flood Prevention Platform Construction Plan," which aims to compile and obtain key water information. When it comes to urban flood prevention, it's important to not only buy more warning time to prevent disasters, but also quickly pinpoint areas at risk of flooding. The smart urban flood prevention platform compiles water information, such as weather radar returns and ground-level rainfall monitoring warnings. With automated IoT value-added analysis of the real-time data, the platform provides real-time information for urban drainage and river flood warning systems. By integrating IoT technology, big data water information analysis, and AI applications, this platform has become a useful tool in urban disaster prevention that can effectively help mitigate urban flooding.

Sustainable Urban Buildings and Environments

To improve the environment and quality of life while considering the circular use of energy and materials, “DIYGreen” utilized recycled bottles to create circular farm systems and green rooftops that not only provide heat insulation, and reduce indoor temperature and the heat island effect, but also minimize flooding and noise, providing a creative and effective new solution that conserves energy and reduces carbon emissions! The process of urban renewal generates a lot of waste, with construction being one of the main causes of CO2 emissions. Additionally, the extreme weather patterns in recent years coupled with the increasingly severe urban heat island effect have prompted further research into new construction methods. "The Transdisciplinary Design Innovation Shop" (TDIS) uses specially engineered domestic cross-laminated timber to strengthen the structure of buildings. This technique not only reduces the construction period and the manpower needed, but also allows the timber to be taken apart and reused. This method allows materials to be recycled in high-density cities, providing more eco-friendly and more efficient urban renewal options.

Forward-Looking Research in Collaboration with ASUS

"ASUS Intelligent Cloud Service Center" (AICS) and NYCU teamed up to initiate the "Hua Yang Project," an industry-academia collaboration focused on three major AI forward-looking research projects, including: "using machine learning to predict the prognosis of non-small cell lung cancer," "pre-clinical dementia drug development assessment based on neuroimaging," and a "smart neuroimage diagnostic platform." NYCU and ASUS also collaborated in terms of education, launching the AI for Medical internship program to train professional talents in the field. With technical support from ASUS, NYCU is confident that it will be able to accelerate industry-academia medical research focused on lung cancer, dementia, neurosis, and other major illnesses.

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54
Course Units

Social Impact

Industry Accelerator and Patent Development

Since its inception in 2013, the Center of Industry Accelerator and Patent Strategy (IAPS) has cultivated over 750 startups and research teams, and facilitated over NT$20 billion of early-stage investment for startups.

Technology Camp

The NYCU Center for Teacher Education and Department of Electrical and Computer Engineering organized a technology camp for junior high school students to experience important technologies like automatic facial recognition, robotic mobility aid systems, and inverted pendulums. The camp also included an electronic circuit DIY experience where junior high school students could make their own ultrasonic ruler. The hands-on experience was meant to inspire the students' curiosity and interest in electrical engineering technology and give them a better understanding of the scientific applications of physical phenomena. Additionally, "the NYCU Service-Learning Center" collaborated with "TSMC" to organize a one-day technology camp. Teachers and students from Nanliao Elementary School were invited to visit NYCU's Guangfu Campus to play a programming board game, which is an easy way to show students the everyday applications of integrated circuits. The event was an educational and beneficial experience between an elementary school, a university, and a corporation.

Organizing the International Startup Competition—the "Hult Prize"

"The Hult Prize"—dubbed "the Nobel Prize for university students"—is a global startup competition for university students led by the United Nations Foundation. The NYCU Center of Industry-Academia Collaboration (CIAC), Global MBA program, sponsors like meet.job, and students from various fields came together to organize the 2021 competition. The theme for the 2021 competition is "Food for Good: Transforming Food into a Vehicle for Change." Students are tasked with creating new business models that rethink the connection between food production, distribution, and consumption. Teams began brainstorming and planning in 2020 and in the end, the team chosen to represent the University in the 2021 regional finals was the PHxTW team (Bukid) composed of students from the Philippines and Taiwan. PHxTW presented a mobile-based Enterprise Resource Planning (ERP) management system that combines agriculture and education, hoping to use technology to solve issues between Southeast Asian farmers and the market.

Biomedicine Maker Program—Cultivating Innovative Interdisciplinary Talents

The Yang-Ming Campus Continuing Education Center, Makerspace, the Digital Medical Center, CTAI, and the VR Center worked together to launch the four-week "Biomedicine Elite Maker Program," which provides high school students interested in medicine and engineering with hands-on learning opportunities that can help them understand how new technology is applied in the field of medicine. The program aims to cultivate interdisciplinary biomedicine maker talents knowledgeable in not only medicine, but also engineering. Many past participants praised the program for giving them the opportunity to see, hear, and learn medical knowledge that is not normally accessible. They also said that the course taught them to look at problems from different perspectives and to create new things in innovative ways!

2580
Students who chose the Course Units

Student Cultivation

Interdisciplinary Application and Cultivating Entrepreneurship

With a focus on "caring for disabled people" and "developing inclusive products," the Entrepreneurship and New Product Development course taught by Professor Sirirat Sae Lim of the Management of Technology, College of Management, NYCU encourages students, people with disabilities, and stakeholders to think from each other's perspectives and get in touch with one another to create solutions in innovative and entrepreneurial ways. The course won first place in the "Sustainability Teaching Practice and Achievements Competition" co-organized by the Taiwan Institute for Sustainable Energy and the CTCI Education Foundation.

To cultivate students' entrepreneurial and innovative capabilities, the University established the "Venture Innovation Program" (VIP). The program features courses that invite industry professionals to share their practical experiences. Students can create entrepreneurial proposals and, with guidance from industry professionals, cultivate future entrepreneurial skills and experiences. In addition, to cultivate interdisciplinary skills in terms of the humanities and engineering, NYCU established the Design and Innovative Technology Program (DITP). The program integrates teaching resources from the Graduate Institute of Architecture, the Institute of Applied Arts, and the Institute of Communications Studies to provide students with courses across four major fields, namely architectural design, industrial design, sustainable environment and smart city design, and innovative technology design. The mostly project-oriented courses aim to cultivate students' empathy towards society and the environment, encouraging them to solve real-world problems creatively.

6.3%
Percentage of All Taiwan Publications

351
Publications in SCOPUS

Stewardship

Among the resident companies of "NYCU's Center for Industry-Academia Collaboration" (CIAC), there are many manufacturers committed to the development of sustainable and environmentally friendly green energy technologies. By collaborating with NYCU's technology research and development team, these companies are able to accelerate the commercialization of their products. For example, Jotun Technologies is committed to gas purification technology, including odor removal and organic waste gas removal. Hsiung Han Technology focuses on energy-saving services with the goal of developing and installing customized energy management systems. Megago Tech specializes in smart electric vehicles, self-driving cars, and green energy application project integration and manufacturing. InnoKnight Inc. develops electric vehicle charging fee calculation systems to help electric car owners calculate charging fees for public charging stations at their apartments or office buildings. AgriTalk Technology is committed to providing society with healthy, pesticide-free agricultural products. It has become a model for the production of new agricultural technology and pesticide-free agricultural products by introducing a comprehensive agricultural AI smart technology management system. In addition to supporting resident companies, the Center also actively helps the University establish sustainable green energy-related industry-academia collaborations. For example, the Center matched the NYCU Orchid House team and Professor Cheng-Huan Chen's integrated daylight lighting and green electricity skylight system to establish an industry-academia collaboration with a German company to construct sustainable development energy houses.