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INDUSTRY, INNOVATION AND INFRASTRUCTURE

2019-2023 Publications	428
2019-2023 Percentage of all Taiwan Publications	6%
Course Units	1,436
Student Engagements with Units on SDG 9	23,092

Research

2023 Future Tech Award

The "2023 Future Tech Award," co-organized by the National Science and Technology Council, Academia Sinica, Ministry of Education, and Ministry of Health and Welfare, focuses on four main areas: "Net Zero Technology," "AIoT Smart Applications," "Biotechnology, New Drugs, and Medical Devices," and "Humanities and Technology." The competition attracted over 500 entries, with 80 key technology innovations ultimately selected. Our university had 12 winning teams, showcasing innovative technologies such as the "Multi-objective Time Series Early Prediction Technology and Emergency Warning System" developed by Professor Vincent S. Tseng from the Department of Computer Science and Information Engineering and the "In-needle Ultrasound Thoracic Regional Anesthesia Guidance System" from Professor Huihua-Kenny Chiang's team in the Department of Biomedical Engineering. These achievements highlight the university's contributions to technological innovation and create significant value for Taiwan's scientific research.

Promotion of the Research Data Management Platform

In 2022, our university established the Research Data Management Platform (NYCU Dataverse) to provide researchers with more convenient data preservation, sharing, and management services. This platform is one of the university's foundational infrastructures for driving research innovation. It adheres to the FAIR (Findable, Accessible, Interoperable, Reusable) principles, promoting open science, facilitating the sustainable utilization of research outcomes, and enhancing research transparency and international visibility. Fostering a more favorable environment for researchers encourages further innovative research and teaching applications. As of July 2024, the NYCU Dataverse platform has collected 344 datasets and 6,151 files, with global downloads reaching 2,526 times according to Metrics indicators.

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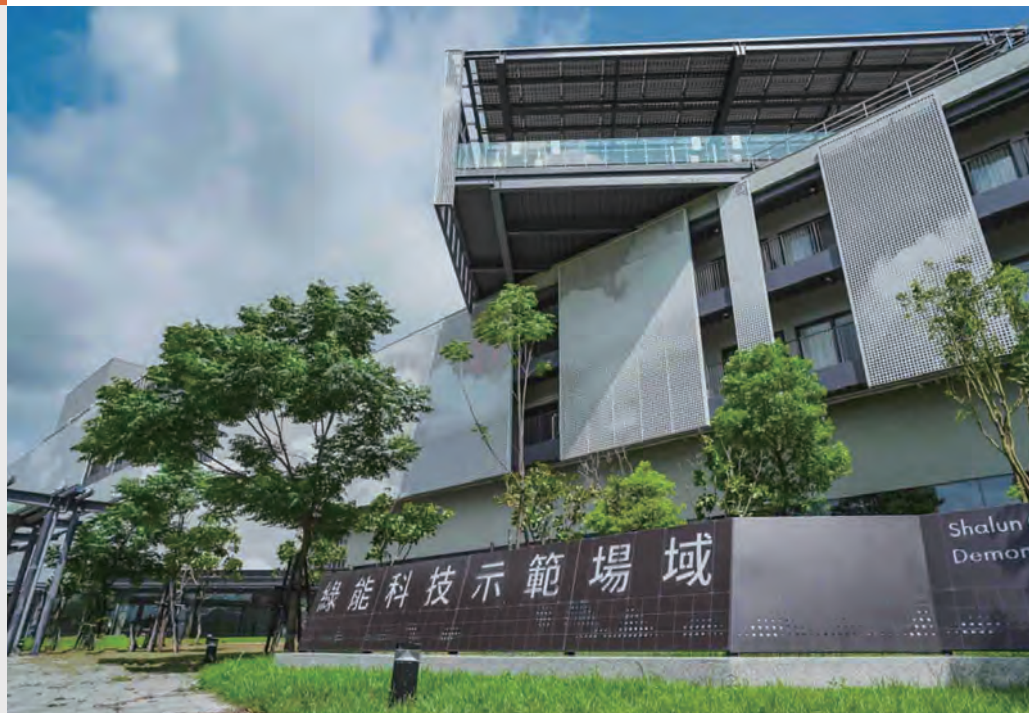
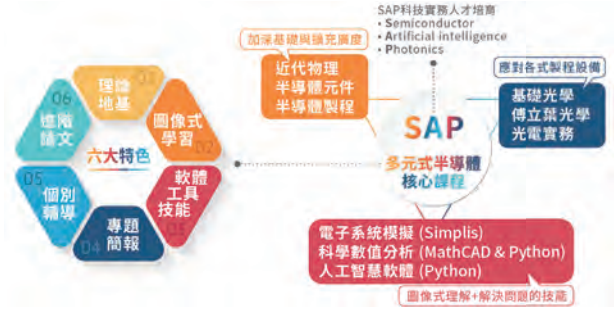
Social Impact

Enhancing the R&D Capabilities of Sharon Smart Green Energy Science City

The Tainan campus of our university is located in the Shalun Smart Green Energy Science City in Tainan. The College of Smart Science and Green Energy, also known as the "AI College," primarily aims to cultivate talent with both AI theoretical knowledge and practical skills, covering the current AI industry needs in areas such as the Internet of Things (IoT), healthcare, green energy, agriculture, drones, and more. The college has already achieved significant results in various industrial sectors, such as assisting drones in recognizing small objects, providing robotic care in long-term care facilities, preventing agricultural diseases through the agricultural IoT, improving radiotherapy scan images, urban planning, and architectural design. Moreover, with the support of companies like NVIDIA, AUO, and Wistron, the university has established R&D and innovation centers in Tainan's Shalun. The AI development solutions created in Shalun aim to help professionals solve problems and reduce costs effectively across related industries through AI integration.





Pre-employment Training Courses for the Semiconductor Industry

Our university's Laser System Research Center, commissioned by the Hsinchu City Government's Department of Labor, organizes pre-employment training courses for the semiconductor industry. These courses aim to cultivate talent in semiconductors, optoelectronics, and data analysis applications with a global market perspective through solid training, career counseling, and corporate matching opportunities. The training is open to working professionals, job seekers, and students. Courses previously held include the "Technology and AI Application Talent Training Program," "FPGA and Microelectronics Technology Program," "Electronics and AI Application Professional Talent Program," and the "Semiconductor and AI Application Professional Talent Program." The teaching methods combine full-day instruction with recorded lectures, offering one-on-one employment counseling such as resume revision, interview preparation, and career discussions with teaching assistants. The program aims to establish local connections with companies through comprehensive vocational training, fostering cross-disciplinary talent through collaboration between industry, government, and academia.

Education & Cultivation

Student-formed Formula Racing Team

Our university's Formula Racing Team comprises students from various departments, including engineering, business management, and more. By integrating each member's diverse knowledge, skills, expertise, and perspectives, the team fosters creativity and fully demonstrates the potential of cross-disciplinary collaboration. The team relies entirely on students seeking support from the university, securing sponsorship for equipment, and funding from various companies. Additionally, seven professors from the Electrical Engineering and Mechanical Engineering departments have been invited to provide technical guidance, significantly enhancing the team's technical capabilities. In 2021, the team unveiled its fuel-powered race car and won first place in the Taiwan Formula Student competition. Recently, the team has begun researching electric race cars and plans to participate in the world’ s largest and most influential student engineering competition, the "Formula SAE (FSAE)," in Australia by the end of 2024.

Expanding the Semiconductor Talent Pool

In response to the diverse talent needs of the global semiconductor industry, which requires not only technical and managerial personnel but also cross-disciplinary and cross-cultural professionals, our university established the first "Department of Semiconductor Engineering" in 2023, housed within the College of Electrical Engineering. The department is divided into two tracks: Solid-State Electronics and Nanoscience. The first cohort of 65 students will be admitted in September 2024. The department maintains close ties with the industry and invites companies to become partners, offering senior-year internships and opportunities for students to study abroad. The department has already gained strong support from TSMC and aims to secure further backing from other companies. As the first department of semiconductor engineering in a research-oriented university, it seeks to attract more talented young professors and students to strengthen both research and industrial development capabilities in the semiconductor field.

Stewardship

Establishing a GPU High-Performance Computing Platform

Our university has built a "GPU High-Performance Computing Platform to meet the advanced AI computing demands." The platform currently includes two Nvidia DGX H100 servers and three Nvidia DGX H200 servers, integrated with a high-speed parallel AI file system. Coupled with wireless bandwidth switches, this setup allows the use of 40 GPU cards in a cluster, increasing both the number and flexibility of GPU cards available for computation. The platform is equipped with resource scheduling and management software, enabling efficient and flexible provision of AI computing resources to research teams across the university, thereby enhancing our AI research capabilities. The platform aims to integrate and provide the necessary GPU resources for the university, improving the efficiency of resource allocation campus-wide. Additionally, power usage efficiency reached 1.58 by utilizing the university's green energy data center, effectively conserving energy and reducing carbon emissions. The maintenance team will continue to work toward resource-sharing and energy-saving goals, contributing to sustainability efforts.

Promoting a Sustainable Endowment Fund

Our university is promoting the establishment of a sustainable endowment fund modeled after Ivy League universities in the U.S. This fund will generate income through dividends or interest without utilizing the principal. The goal is to reach NT$50 billion in the endowment by 2035, allowing the university to cover a significant portion of its expenses through investment returns. This approach mirrors the sustainable financial models used by leading American universities.