



INDUSTRY, INNOVATION AND INFRASTRUCTURE

GOVERNANCE AND OPERATIONS

UCSI University advances Sustainable Development Goal 9 (Industry, Innovation and Infrastructure) through institutional platforms that support research innovation, industry collaboration and knowledge commercialisation. A key mechanism is the Centre of Excellence for Research, Value Innovation and Entrepreneurship (CERVIE), which coordinates research management, value innovation and entrepreneurial development across the University. Through the triple helix model, CERVIE promotes collaboration between academia, industry and government to translate research outputs into practical solutions and potential commercial applications.

Complementing this structure is the Praxis, Industry and Community Engagement (PICE) unit, which connects UCSI researchers, students and staff with industry partners, government agencies and community stakeholders. PICE facilitates collaborative research, consultancy, industry engagement and knowledge transfer activities that strengthen industry–university partnerships and support innovation-driven initiatives.

In 2025, UCSI University further strengthened its innovation ecosystem through externally funded research grants and industry-supported projects. These initiatives expand research infrastructure, enhance interdisciplinary collaboration and contribute to research income from industry while supporting the development of intellectual property and potential university spin-offs.

TEACHING AND LEARNING

1. FOOD AND DRINKS MALAYSIA

UCSI University participated as an exhibitor at Food and Drinks Malaysia by Salon International de l'Alimentation (SIAL) 2025 to strengthen university–industry linkages and promote applied scientific innovation in the food and biotechnology sectors, addressing the challenge of translating research into scalable, industry-ready solutions. The Faculty of Applied Sciences showcased a healthy frozen confection shortlisted in the SIAL Innovation Challenge and demonstrated UCSI's algae-growing expertise for alternative biological resources.

Immediate outcomes included increased visibility of UCSI's research, enhanced industry networking and validation of academic innovation. At a broader level, the participation also supports SDG 12 through sustainable food solutions and SDG 17 by fostering collaboration between academia and industry, contributing to resilient innovation ecosystems and research commercialisation.



2. HACKATHON FLAGHUNT 2025: CYBER CAPTURE CHALLENGE

On 12 November 2025, UCSI University hosted Hackathon FlagHunt 2025: Cyber Capture Challenge, engaging 92 university students in a cybersecurity-focused innovation programme. The event addressed the sustainability challenge of strengthening digital infrastructure and technical expertise, aligning with SDG 9. Participants developed practical cybersecurity skills through interactive problem-solving and competitive challenges, enhancing technical competencies, collaboration and problem-solving abilities. Certificates of participation reinforced achievement and motivation.

At a broader level, the hackathon contributed to national capacity-building in digital security and a skilled, innovative workforce. It also advances SDG 4, SDG 8 and SDG 17 by providing experiential learning, preparing students for future careers, and fostering collaboration between universities, industry and stakeholders in technological development.



3. HUAWEI INTELLIGENCE WORLD 2025

On 7 November 2025 15 selected students from UCSI University, along with Asst Prof Ts Dr Ghassan Saleh Hussein Al-Dharhani, paid a visit to Huawei Technologies (Malaysia) Sdn Bhd. The event addressed the sustainability challenge of developing resilient digital infrastructure and a skilled ICT workforce, supporting SDG 9. Participants gained practical insights into industry trends, ICT applications and career pathways, enhancing technical understanding, motivation and employability awareness.

At a broader level, the visit fostered collaboration between academia and industry, strengthening innovation and preparing students for future technological challenges. It also contributes to SDG 4, SDG 8 and SDG 17 by enhancing experiential learning, developing digital skills, promoting workforce readiness and supporting partnerships that advance inclusive technological growth and sustainable industrial development.





RESEARCH AND DISCOVERY

1. TRANSPARENT AND RELIABLE CONSTRUCTION COST PREDICTION USING ADVANCED MACHINE LEARNING AND EXPLAINABLE AI

(Engineering Science and Technology, an International Journal, Volume 70, (2025). Prof EUR ING Ir Ts Dr Lim Wei Hong)

Accurate construction cost prediction is vital for project management, influencing budgeting, resource allocation and overall success. This study proposes a comprehensive framework that combines machine learning models, uncertainty quantification through Confidence Intervals and explainable AI techniques using SHapley Additive exPlanations (SHAP) to enhance transparency and decision-making. Ten machine learning models, including Ridge Regression, Lasso Regression, Elastic Net, K-Nearest Neighbor Regression and advanced ensemble methods such as XGBoost, CatBoost and HistGradient Boosting, were evaluated on the RSMeans dataset. Among these, HistGradient Boosting achieved the best performance on the testing dataset. Beyond traditional metrics, Confidence Intervals quantified prediction reliability and SHAP identified critical cost drivers like “Formwork” and “Tributary Area,” enabling interpretable and robust prediction. This study highlights the potential of machine learning models to revolutionise construction cost estimation by integrating predictive accuracy, uncertainty analysis and explainability. The proposed framework supports resource efficiency and enables process innovation in cost management. It contributes to the advancement of sustainable building practices, offering a strong foundation for future research and promoting the adoption of machine learning-based solutions with enhanced transparency and confidence.

2. A ROBUST WRAPPER-BASED FEATURE SELECTION TECHNIQUE BASED ON MODIFIED TEACHING LEARNING BASED OPTIMIZATION WITH HIERARCHICAL LEARNING SCHEME

(Engineering Science and Technology, an International Journal, Volume 61 (2025). Prof EUR ING Ir Ts Dr Lim Wei Hong)

Feature selection is a pivotal preprocessing step in deploying machine learning solutions aimed at removing redundant features from datasets while preserving predictive accuracy. Despite the popular use of wrapper-based feature selection techniques with metaheuristic search algorithms (MSAs) such as Teaching Learning Based Optimisation (TLBO), balancing exploration and exploitation in identifying optimal feature subsets remains a fundamental challenge. This paper introduces an advanced wrapper-based feature selection method utilising an enhanced TLBO variant, termed Modified TLBO with Hierarchical Learning Scheme (MTLBO-HLS). MTLBO-HLS incorporates significant enhancements in both teacher and learner phases to better balance exploration and exploitation, thus improving robustness in solving complex problems like feature selection. Specifically, the Multi-Hierarchical Teacher Phase (MH-TP) divides the MTLBO-HLS population into multiple group tiers based on fitness, where learners are guided by superior peers from better tiers. The Dynamic Peers Interaction Based Learner Phase (DPI-LP) enriches the learning process by enabling interactions with single and multiple elite peers and retaining valuable knowledge across dimensions. Extensive simulations demonstrate MTLBO-HLS's superior performance in feature selection, consistently identifying the smallest feature subsets and achieving the highest classification accuracies across various datasets. These results highlight its potential to drive industrial innovation through enhanced machine learning model efficiency and accuracy.

COMMUNITY AND PARTNERSHIP

1. UCSI SIGNS MOA WITH BIGOBJECT

UCSI University signed a Memorandum of Agreement with BigObject, a global innovator in AI-ready open data management to strengthen digital infrastructure and foster innovation in education, supporting SDG 9. The partnership, officiated by Prof Emeritus Datuk Ts Ir Dr Siti Hamisah Tapsir, integrates BigObject's Aralia ecosystem into UCSI's academic and research programmes, providing students and researchers with hands-on experience using authentic datasets, AI tools and open data platforms. Outputs include enriched curriculum content, student projects and applied research in AI and data governance.

Immediate impacts include enhanced technical skills, data literacy and employability, while fostering practical innovation. At a wider level, the initiative also advances SDG 4, SDG 8 and SDG 17 by promoting cross-border collaboration, developing a skilled workforce and strengthening partnerships between academia, industry and global innovation networks.



2. UCSI UNIVERSITY FORGES STRATEGIC PARTNERSHIP WITH ASEM

UCSI University formalised a strategic partnership with the Advanced Semiconductor Academy of Malaysia (ASEM), formerly AI Nusantara, to enhance collaboration in AI and semiconductor education, supporting SDG 9. The MoUs were signed by Prof Emeritus Datuk Ts Ir Dr Siti Hamisah Tapsir and Dato' Syed Haizam Jamalullail, establishing frameworks for industry-academic collaboration and pilot classes to provide students with hands-on experience in emerging technologies.

Immediate outcomes include improved access to industry-standard software, specialised training and practical learning opportunities, equipping students with innovative competencies. At a broader level, the partnership strengthens Malaysia's innovation ecosystem, cultivates a skilled workforce for high-tech industries and fosters global research collaboration. The initiative also advances SDG 4, SDG 8 and SDG 17 by promoting applied learning, employability, technological innovation and strategic partnerships between academia, industry and international networks.



3. UCSI UNIVERSITY-BIO BUREAU BIOTECNOLOGIA MOA SIGNING FOR SUSTAINABLE SEAWEED INNOVATION

UCSI University, in collaboration with Bio Bureau Biotecnologia of Brazil, formalised a partnership through a Memorandum of Agreement witnessed by Brazil President Luiz Inacio Lula da Silva and Malaysia Deputy Prime Minister Datuk Seri Fadillah Yusof. The agreement was led by Chancellor YAM Tunku Zain Al-'Abidin and involved UCSI leadership, Distinguished Prof Tan Sri Dr Zakri Abdul Hamid and Distinguished Prof Dr Phang Siew Moi.

The collaboration aims to sustainably scale the global seaweed industry through technological innovation, high-yield strain development and advanced bioprocessing for products such as bioplastics, nutraceuticals and plant-based feed.

Immediate outcomes include strengthened research collaboration and knowledge exchange, enhancing Malaysia-Brazil scientific ties. At a broader level, the partnership also advances SDG 12, SDG 13 and SDG 17 by promoting sustainable industrial practices, innovation in biotechnology, climate-resilient production and international research partnerships.

