Japan-Thailand AI and Sustainability Summit (JTAS) 2025

August 23-24, 2025, Kitakyushu, Japan

Proceedings, Vol. 1 Abstracts

JTAS Organizing Team
- Research Center for Disaster Countermeasures, The University of Kitakyushu
- Pacific Institute of Management Science

Contents: Vol. 1, Abstracts

[General information]

1. Summit schedule
- August 23, 2025
    Kitakyushu City Tour of Koyanose historical post town and Takatoyama observation point

- August 24, 2025
    Summit meeting

2. Summit venue
Kokura Satellite Campus, The University of Kitakyushu
1-1 Asano, Kokura-kita ku, Kitakyushu, Fukuoka 802-0001, Japan

3. Organizers
a. Research Center for Disaster Countermeasures, The University of Kitakyushu
 1-1 Hibikino, Wakamatsu-ku, Kitakyushu, Fukuoka 808-0135, Japan
 Prof. Kato Takaaki

b. Pacific Institute of Management Science
 7/7 Moo 14 Thetsaban Lam Luk Ka 3 Rd., Lam Luk Ka District, Pathum Thani 12150, Thailand
 Dr. Chen Shu-Chung and Dr. Chen Wang Kun

[Presentation program]

[Oral presentation]

	Begin	End	Duration	Activity	Presenter	Topic
	9:00	9:30	0:30	Registration		
Session 1	9:30	9:40	0:10	Opening remarks		
Invited presentation	9:40	10:10	0:30	Presentation 1	Yuan Chun You	Agentic AI Empowered Four-in-One Ecosystem of Integrative Narratology and its Application of Chiplet based Medical ASIC
Chair: Wang Kun Chen	10:10	10:30	0:20	Presentation 2	Hua Chen, Shihan Luo, Qing Liu, Wenbin Wei, Tianshan Meng, Chenyang Zhang, Yufan Chen, Fang Xu, Chaozhe Jiang	Intelligent Empowerment for Transportation Hub Safety: LSTM-Based Fire Risk Prediction for High-Speed Railway Stations
	10:30	10:50	0:20	Presentation 3	Wei Ming-Tsung, Jack Huang, Michael Glasek	Empowering Youth for SDGs Entrepreneurship: Design-Driven Strategies and Global Partnerships
	10:50	11:00	0:10	Break		
Keynote	11:00	11:40	0:40	Keynote speech	Cheerawit Rattanapan, Tarinee Buadit	Green Productivity of Sustainable Supply Chain Management for Thai Tire Industries by Value Chain Analysis
	11:40	11:45	0:05	Break		
Session 2	11:45	12:05	0:20	Presentation 4	Albert Lin	A Community-Based Carbon Credit Bank for Equitable Climate Action
Invited chair:	12:05	12:25	0:20	Presentation 5	Ken Mana, Takaaki Kato	Bridging Traditional Knowledge and Modern Governance: A Framework for Earthquake Resilience in Vanuatu
Iris Liou	12:25	12:45	0:20	Presentation 6	Jack Huang, Masato Abe	Artificial Intelligence: A Transformative Force for Sustainable Development Integration
	12:45	13:05	0:20	Presentation 7	Chen Huang	Dual Cognitive Alignment Framework: Value Transmission and Behavioral Anchoring of ESG Motivation in Human-Machine Collaboration
	13:05	13:15	0:10	Project introduction	Mari Ishikawa	Sustainable use-cases with verifiable credential in Japan and global
	13:15	15:15	2:00	Buffet Lunch at RIHGA Royal hotel Kokura (13:30-15:00)		
Session 3	15:15	15:35	0:20	Presentation 8	Celina, Chun Ru Chou	ESG Professional Secretarial Functional Literacy in the AI Era: Responding to Future Challenges and Opportunities
Chair: Mai Ngoc Chau	15:35	15:55	0:20	Presentation 9	Juan Zhang, Yuan Chun You	Agentic AI Empowered Four-in-One Ecosystem for Sustainable Mental Health
	15:55	16:15	0:20	Presentation 10	Yafeng He, Michael A. Aloria, Donnalyn C. Cabaces, Baixiong Deng	Multi-Objective Optimization of Expanded Polystyrene Concrete Using Machine Learning and Nonlinear Programming
	16:15	16:20	0:05	Break		
Session 4	16:20	16:40	0:20	Presentation 11	Shue Mei Yu	Artificial Intelligence in the Revitalization of Indigenous Languages and Sustainable Culture: A Case Study of Taiwanese
Chair: Kato Takaaki	16:40	17:00	0:20	Presentation 12	Yin-Lin Wang, Yu-Ting Chen, Wang Kun Chen	JTAS: Japan–Thailand AI and Sustainability – From Just Tech to Joint Industrial Transformation
	17:00	17:50	0:50	Round table	All participants	Use of AI for diversity and sustainability
	17:50	17:55	0:05	Closing remarks		

[Video presentation]

Please watch JTAS YouTube Channel for Video presentations

https://www.youtube.com/@JTAS2025-b1b

This is a tentative list. Submission of a video is required to complete a video presentation.

Code	Authors	Title
S1	Qiu Weiyang	Feasibility Study of Generative AI in Primary School Informatics Competition Training
S2	Liu Baotong	Optimization of Intelligent Control Nodes Based on Single - Chip Microcomputers in Large - Scale Automated Systems
S3	Liang Jian	Construction of a College Admissions Consulting System and Research on Privacy Protection Based on Qwen Offline Large Language Model and Federated Learning
S4	Huang Zhan	Readers' Ability to Distinguish AI-Generated Literary Works: Cognitive Status and Challenges
S5	Weng Zhen	Challenges and Countermeasures of Artificial Intelligence in the Medical Industry: A Comprehensive Analysis from the Perspectives of Technology, Ethics, and Law
S6	Weng Chaoye	Application and Challenges of Generative AI in the Comprehensive Education Model of "Job-Course-Competition-Certification" in Secondary Vocational Schools - Taking the Internet of Things Major as an Example
S7	Chuanlong Miao	Intelligent Network Failure Prediction Based on Generative AI: Methods, Challenges, and Feasibility Analysis
S8	Liyuan Ruan	Evaluation of Effectiveness and User Experience of AI-Driven Virtual Psychological Counselors
S9	Xue Xiamin	Generative AI helps elementary school classical Chinese teaching: An empirical analysis of promoting understanding of traditional Chinese culture
S10	Qiao Hu	An Overview of ETF Return Prediction and Interpretability in the Japanese Stock Market: Why LSTM and SHAP?
S11	Wei Shixiong, Anton Louise P De Ocampo, Liao Hongfei	Design and Implementation of a Serial Communication and Smart Car Control System Based on MATLAB GUI
S12	Naw Aye Thidar Han, Seksan Papong, Cheerawit Rattanapan	Exploring the sustainable transportation policy in Bangkok: A qualitative Delphi approach
S14	Vu Thi Hong Nhung, Takaaki Kato	Mangrove forest coverage and local livelihood in Thanh Hoa Province, Vietnam: Impact analysis using Remote sensing, GIS, and field survey
S15	Tsai Cheng-ChungCheng, Aihua	A systematic Review of AI-Powered Smart Learning Systems for Addressing Diverse Student Learning Needs: A Case Study of China
S16	Ming-Shan Chang	Research on the Sustainable Development of the Human Resource Supply Chain in China's Home Economics Education Industry: An Artificial Intelligence Perspective
S17	Yu-Min Chang	Mapping the moral mind: Establishing sound moral and cultural standards: the fundamental foundation for social progress

Oral Presentation Abstracts

[Keynote speech]   5

**Green Productivity of Sustainable Supply Chain Management for Thai Tire Industries
by Value Chain Analysis**

Cheerawit Rattanapan[1], Tarinee Buadit[1]
1. ASEAN Institute for Health Development, Mahidol University

Abstract

The objective of this research was to develop the green productivity enhancement for tire rubber supply chain of Thailand by clean technology. Firstly, the environmental impact assessment of tire supply chain was conducted. Then, the current performance of tire supply chain was conducted by green productivity value with value chain analysis for identifying the value and cause of wasteful resource. The enhancement approach of green productivity for tire rubber supply chain of Thailand was proposed by the mechanism of clean technology. The reduction of environmental impact was analyzed by the life cycle impact assessment for recommending the policy implementation of green productivity for tire rubber supply chain of Thailand. The result found that the high values of green productivity for the primary and intermediate rubber products were the fresh latex and the smoke sheet rubber, respectively. The values of wasteful resources and waste were identified by value chain analysis. The finding showed that the fertilizer consumption in the cup lump production, the water consumption in the STR20 production, the steam consumption in the tire production and the cooling process in pyrolysis production were the dominant of wasteful resources value. The enhancement approach of green productivity for the value chain analysis was developed by clean technology. From the enhancing approach of clean technology options presented that the 20 % reduction of fertilizer consumption in the cup lump production, the 30 % of water consumption in STR20 production, the 20 % reduction of coal consumption and 80 % reduction of water consumption in pyrolysis production. From this finding, the sustainable supply chain of Thai tire rubber production by clean technology were implemented as the master plan of the balance between economic value and environment impact toward sustainable development.

Keywords: Green productivity; Sustainable supply chain management; Thai Tire Industries;
          Value Chain Analysis

[Invited presentation (presentation 1)]

**Agentic AI Empowered Four-in-One Ecosystem of Integrative Narratology
and its Application of Chiplet based Medical ASIC**

Yuan Chun You
Integrative Narratology Intelligent Digital Storytelling, Ltd

Abstract

Agentic AI represents the next frontier beyond generative AI—ushering in an era defined by autonomous reasoning, multi-agent collaboration, and dynamic decision-making. In parallel, chiplet-based technology has emerged as one of the most advanced and promising architectures in contemporary chip design, offering modular integration and unprecedented flexibility. This speech introduces a groundbreaking hybrid architecture: Agentic AI-powered Chiplet Integration, supported by a novel Four-in-One Ecosystem encompassing AI technology, software, hardware, and management technology. Both concepts are original contributions by the author.

Agentic AI and machine reasoning—recently emphasized by GPT co-founder Ilya Sutskever as the future of AI after the predicted end of pretraining in late 2024—were first presented by the author in a 1986 paper, "Expert System for Model Management," at an international AI conference. Building on this foundation, the author pioneered a new interdisciplinary field in 2023: Integrative Narratology—a convergence of narrative theory, mathematics, philosophy, cognitive science, complexity science, humanities, and digital technologies including AI and the Metaverse.

The author's work on Integrative Narratology has been internationally recognized with multiple accolades, including the Best Scientist (AI) Award and three Best Researcher Awards (2024–2025). Published by IEEE, the foundational paper proposed the Fractal Integrated Narrative System (FINS)—a holistic, five-dimensional narrative framework spanning science, technology, engineering, mathematics, and the humanities. FINS incorporates entropy theory, fractals, and graph theory to enable the automatic generation of Intelligent Digital Storytelling (IDS) and supports an AI-powered virtual education system comprising 15 learning models and over 100 narrative competencies across 12 thematic categories.

On the hardware frontier, chiplets—modular, verified reusable functional dies—enable rapid integration into SoCs or ASICs, dramatically reducing design complexity, time-to-market, and cost. When powered by Agentic AI, chiplet design becomes a high-level autonomous process: multi-agent systems simulate expert-level decisions, enabling a single engineer to design multiple chip blocks—replacing the traditional need for large EDA teams to optimize each block individually.

This invited speech showcases a compelling application of Agentic AI-powered chiplet integration: a medical image reconstruction accelerator ASIC, enhanced by the NUFFT algorithm, graphRAG, and digital twin simulations. This approach enables precision in early diagnosis, prevention, and treatment—offering a critical leap forward in smart healthcare and disaster trauma therapy.

Keywords: Agentic AI, Chiplet, Narratology, graphRAG, medical image, digital twin

[Oral presentations]

Presentation 2: Intelligent Empowerment for Transportation Hub Safety: LSTM-Based Fire Risk Prediction for High-Speed Railway Stations

Hua CHEN[1,2,5], Shihan LUO[1], Qing LIU[2,3,5], Wenbin WEI[2,3,5], Tianchang Meng[2,4], Chenyang ZHANG[1], Yufan CHEN[1], Fang XU[6], Chaozhe JIANG[1*]

1. School of Transportation and Logistics, Southwest Jiaotong University, Chengdu
2. Fire Institute, China Academy of Building Research, Beijing
3. School of Civil Engineering, Harbin Institute of Technology, Harbin Heilongjiang
4. School of Emergency Management & Safety Engineering, China University of Mining & Technology, Beijing
5. State Key Laboratory of Building Safety and Environment, Beijing
6. Supply Chain and Procurement Center, Sichuan Tourism University, Chengdu

Abstract

This study focuses on fire safety in transportation hubs, addressing the fire risk prevention of high-speed railway stations. Innovatively, it develops a fire temperature prediction and three-dimensional dynamic simulation model based on artificial intelligence (AI) technology. The research follows a technical approach of Data-driven modeling – FDS simulation validation – Intelligent decision optimization: First, environmental sensor networks in real high-speed railway stations collect temperature data to establish a multi-dimensional feature database. Then, an LSTM neural network is utilized to construct a spatiotemporal fire temperature prediction model, enabling temperature variation forecasts across different fire zones. Furthermore, the Fire Dynamics Simulator (FDS) is employed to build a 3D numerical fire model of the high-speed railway station. By integrating AI-based predictions, the intelligent fire scenario simulation improves simulation accuracy by 10% and reduces prediction errors by 20% compared to traditional methods. Experimental validation demonstrates that the proposed system can provide real-time temperature field outputs, offering theoretical support for fire emergency decision-making. The research findings establish a comprehensive prediction-simulation-decision solution for fire prevention and control in smart transportation hubs, with significant application value in enhancing operational safety and minimizing disaster losses.

Keywords: Transportation management, AI, Fire safety

Presentation 3: Empowering Youth for SDGs Entrepreneurship: Design-Driven Strategies and Global Partnerships

Wei, Ming-Tsung[1], Jack Huang[1], Michael Glasek[2]
1. Chinese Youth Growth Foundation, Taipei
2. National Taiwan University of Science and Technology, Taipei

Abstract

Sustainable development today faces unprecedented challenges, from accelerating climate change to widening socio-economic inequalities. While technological innovation continues to advance rapidly, and younger generations are increasingly ready to take the lead, achieving meaningful and scalable impact requires strong global partnerships.

As a long-standing youth empowerment organization for the past three decades, the Chinese Youth Growth Foundation (CYGF) recognizes its responsibility to equip young people with the skills, mindset, and networks necessary to drive SDGs-focused entrepreneurship. Our approach integrates multiple strategic initiatives: hosting quarterly 30-Country Youth Forums in global cities to amplify youth voices; launching Buddy Programs in various cities to foster entrepreneurial thinking among youth and teenagers; supporting global

young entrepreneurs in accessing local markets; and implementing the Urban Migratory Talent Program—leveraging ten global offices to provide short-term, in-country training opportunities.

Furthermore, through collaborations with educational institutions, we are introducing AI-powered learning tools to accelerate youth capacity-building in both SDG entrepreneurship and advocacy. These efforts reflect our commitment to fostering a generation of changemakers who can design and scale solutions for a sustainable future.

To maximize impact, three key areas are required: cross-sector partnerships that bridge government, academia, industry, and civil society; funding mechanisms to scale youth-led SDG solutions; and access to cutting-edge digital tools, including AI-driven platforms for learning and collaboration. Looking ahead, CYGF aims to expand its network of global offices from ten to fifteen within the next two years, deepening our regional capacity for youth entrepreneurship training and SDG advocacy. Through continuous innovation and an ever-growing alliance of partners, we envision a generation of globally connected changemakers leading systemic transformation toward a sustainable and inclusive future.

Keywords: AI empowerment, sustainable development, entrepreneurial mindset, Chinese Youth Growth Foundation, Global SDGs Alliance.

Presentation 4: A Community-Based Carbon Credit Bank for Equitable Climate Action

Albert Lin
Advisor, ESG Service Corporation Association, Bangkok

Abstract
This study presents the Carbon Credit Community Bank (CCCBk), an innovative, community-led model for carbon removal and equitable climate action. The Bangkok pilot addresses severe $PM_{2.5}$ air pollution during the dry season by converting agricultural waste into biochar, reducing open burning, and sequestering carbon. The model integrates digital Monitoring, Reporting, and Verification (dMRV) with Web3 enabled Carbon Dioxide Removal (CDR) Coins, each representing 1 tCO_2, ensuring transparent and tamper-proof carbon credit issuance. A Personal Carbon Ledger incentivizes low-carbon behavior through gamification and rewards, while corporate partners provide financing and revenue-sharing. The proof-of-concept demonstrates potential annual sequestration of 100,000 1,000,000 tCO_2, generating carbon assets worth hundreds of millions USD. Co benefits include improved soil fertility and water retention, reduced fertilizer use, job creation, and restoration of degraded land. The initiative aligns with multiple SDGs, including Climate Action (SDG 13), Life on Land (SDG 15), and Decent Work and Economic Growth (SDG 8). The expansion strategy moves from a Thailand pilot to national, ASEAN, and global replication, supported by modular pyrolysis and dMRV technologies. Positioned within frameworks like SBTi, ESG, and BCG, CCCBk provides high-quality, verifiable carbon removal supply—critical for corporate ESG commitments, as seen in Microsoft's CDR procurement. CCCBk is a democratic governance experiment in climate action, creating a fair and inclusive carbon economy where community contributions are recognized and rewarded, offering scalable solutions for the Global South.

Keywords: Carbon Credit, Biochar, Community-Based Climate Action, dMRV, Web3, SDGs, $PM_{2.5}$, Global South, ESG, Carbon Removal.

Presentation 5: Bridging Traditional Knowledge and Modern Governance: A Framework for Earthquake Resilience in Vanuatu

Ken Mana[1], Takaaki Kato[2]
1. Graduate School of Environmental Engineering, The University of Kitakyushu
2. Institute of Environmental Science and Technology, The University of Kitakyushu

Abstract

Vanuatu, an archipelago in the South Pacific, is highly vulnerable to earthquakes due to its location on the Pacific Ring of Fire. Traditional knowledge and modern governance systems both offer valuable insights and strategies for disaster resilience. This research project aims to develop a comprehensive framework that integrates traditional knowledge with modern governance to enhance earthquake resilience in Vanuatu. The framework will be designed to be culturally sensitive, inclusive, and sustainable, ensuring that it respects and incorporates the indigenous practices and beliefs of the Ni-Vanuatu people while leveraging modern scientific and governance approaches.

This study investigates the potential for integrating Indigenous knowledge systems with modern disaster governance to enhance earthquake resilience in Vanuatu, one of the world's most seismically active regions. Combining the information from existing studies, governed documents, and local cooperatives, the research examines how traditional knowledge (TK) and customary governance structures interact with contemporary disaster risk reduction (DRR) frameworks.

Findings reveal that Vanuatu's traditional knowledge systems - including oral histories of past seismic events, land-use practices avoiding hazardous areas, and community-based early warning mechanisms - contain valuable resources for disaster resilience. However, institutional barriers, generational knowledge erosion, and policy marginalization currently limit effective integration with modern governance systems.

The study proposes a hybrid governance framework that creates formal spaces for dialogue between traditional leaders and government agencies, incorporates TK into official hazard mapping, and develops co-management systems for disaster preparedness. This framework demonstrates how respecting Indigenous epistemologies while leveraging modern scientific capacities can produce more culturally-grounded and effective resilience strategies.

The research contributes to broader debates about decolonizing disaster governance and offers practical insights for policymakers seeking to implement the Sendai Framework's call for inclusive, locally-adapted DRR approaches in the Pacific region. By validating traditional knowledge as complementary rather than contradictory to scientific risk management, this study provides a model for bridging knowledge systems in post-colonial contexts facing escalating climate and geological hazards.

Keywords: Disaster, Preparedness, Traditional Knowledge, Vanuatu

---

Presentation 6: Artificial Intelligence: A Transformative Force for Sustainable Development Integration

Jack Huang[1], Masato Abe[2]
1. Consultant of the International Telecommunication Union (ITU) Regional Office for Asia and the Pacific
2. Economist of the United Nations Multi-Country Office for Micronesia

Abstract

Artificial intelligence (AI) is a transformative force with the potential to accelerate progress toward the United Nations' Sustainable Development Goals (SDGs). AI's capacity for data analytics and predictive modeling can enhance decision-making and resource allocation across various sectors. This chapter examines AI's role in advancing the SDGs, particularly in healthcare, education, and environmental management, while addressing challenges related to ethical considerations and equitable access. It incorporates evidence from various research reports and global frameworks, adopting the case study method. In healthcare, AI can shift the focus

from reactive treatment to preventative, personalized care through medical imaging analysis, disease prediction, and remote patient monitoring. AI-powered platforms, coupled with data protection measures, can also expand educational access for all students including those in remote areas. In environmental management, AI can optimize resource use, monitor air quality, and develop smart cities. Ultimately, AI can catalyze global change, but its deployment requires coordinated action among governments, private enterprises, and civil society. In particular, the digital divide, energy demands, and algorithmic bias pose significant challenges to the equitable and sustainable deployment of AI. Policy recommendations include strengthening collaborative governance, scaling infrastructure investments, embedding ethical standards, advancing workforce development, and fostering public-private collaboration.

Keywords: Artificial Intelligence (AI), Sustainable Development Goals (SDGs), Data Analytics, Healthcare, Education, and Environment

---

Presentation 7: Dual Cognitive Alignment Framework: Value Transmission and Behavioral Anchoring of ESG Motivation in Human-Machine Collaboration

Chen Huang
Doctor of Philosophy, Information Technology Management and Development, Pacific Institute of Management Science

Abstract
This study contends that effective translation of ESG motivations into operational practices requires resolving two fundamental tensions in human-machine collaboration: (1) the inherent ambiguity of context-dependent ESG values, which resist machine quantification using conventional financial metrics (Gillan et al., 2021), and (2) the cognitive divide between human heuristic judgment and algorithmic symbolic logic, often reducing complex ethical concepts like social welfare to statistical abstractions (Floridi et al., 2018).
To bridge these gaps, we propose the Dual Cognitive Alignment Framework (DCAF). Rejecting unidirectional value implantation as inadequate (Suchman, 2007), DCAF integrates:
Symbolic decomposition of ESG principles into hierarchical operational rules, Machine learning interpretation of contextual nuances, and A hybrid behavioral anchoring mechanism enforcing rigid thresholds for critical ESG boundaries (e.g., emissions caps) while preserving flexibility in higher-order goals (e.g., community engagement), informed by behavioral economics (Thaler et al., 2008).
The framework establishes a reflective-iterative loop enabling mutual calibration: humans refine algorithmic biases while machines provide contextualized data insights. However, its efficacy remains constrained by ESG's irreducible semantic ambiguity (Tsoukas, 2005) and latency challenges in highly dynamic environments.

Keywords: Cognitive alignment, ESG implementation, Human-AI collaboration, Value-action gap, Neuro-symbolic systems

---

Presentation 8: ESG Professional Secretarial Functional Literacy in the AI Era: Responding to Future Challenges and Opportunities

Celina, Chun Ru Chou
Ph.D. Candidate, Pacific Institute of Management Science

Abstract
With the rapid development of artificial intelligence (AI) technology, enterprises are facing new challenges and opportunities in promoting environmental, social and governance (ESG) policies. In this context, in addition to traditional professional knowledge, communication and coordination skills, and leadership, ESG professional

secretaries also need to have AI-related skills and literacy. Through in-depth interviews with business owners and experts, this study explores the functional literacy that ESG professional secretaries should possess in the AI generation. The results of the study show that ESG professional secretaries should master the ability to apply AI tools, integrate ESG and AI, analyze data and interpret strategies, and strengthen communication, collaboration and ethics compliance. In the future, ESG secretaries need to shift from administrative support roles to strategic collaborators, playing the key role of AI-assisted sustainability decision-making.

Presentation 9: Agentic AI Empowered Four-in-One Ecosystem for Sustainable Mental Health

Juan Zhang[1], Yuan Chun You[1]
1. Integrative Narratology Intelligent Digital Storytelling, Ltd

Abstract
The world faces an escalating mental health crisis. According to Gallup, seven in ten people globally report struggling or suffering, and over 380 million experience burnout or depression—driven by rapid technological change, socio-political instability, and post-disaster psychological trauma. Achieving truly sustainable mental health requires more than incremental improvement; it demands a radical transformation of our lifestyles and emotional resilience. Alarmingly, evidence suggests we are entering an Emotional Recession—a prolonged state of emotional depletion akin to an economic recession, revealing the profound costs of unsustainable living.
Human life unfolds in two realms: the inner world and the outer world. These worlds are navigated through two dimensions of human nature—rationality and sensibility, which correspond to two folds of human intelligence IQ and EQ. While IQ governs logic and analysis, EQ blends thinking with feeling to foster optimal decisions, self-awareness, and authentic connection. Yet traditional mental health services struggle to meet growing demand due to resource constraints, cost barriers, and cultural stigma, underscoring the urgent need for personalized, accessible, and emotionally intelligent digital solutions at scale.
Agentic AI—the next frontier beyond generative AI—ushers in an era of genuine reasoning, multi-agent collaboration, and adaptive decision-making. We present a pioneering Four-in-One Ecosystem integrating AI technology, software, hardware, and technology management to transform mental health support. This system employs a multi-agent crew that emulates human expert roles, leveraging emotion-spectrum modeling based on the "Language of Emotion", Plutchik's Wheel of Emotions, the Geneva Emotion Wheel, and Russell's Circumplex Model. It also incorporates a consciousness spectrum grounded in David R. Hawkins' Map of Consciousness to guide self-improvement and trauma recovery.
Through dynamic orchestration, AI agents deliver personalized therapy—drawing on CBT, MBCT, Emotion-Focused Therapy, Satir, Positive Psychology, ACT, and DBT—tailored to individual emotional fluctuations. Post-disaster trauma care is integrated seamlessly into this adaptive framework.
Our ultimate vision is the fusion of IQ and EQ through human–machine symbiosis, enabling individuals to climb a cognitive ladder toward emotional resilience, enlightenment, and spiritual growth. By aligning mental health sustainability with AI-driven innovation, this approach lays the foundation for an emotionally intelligent future that is both resilient and humane.

Presentation 10: Multi-Objective Optimization of Expanded Polystyrene Concrete Using Machine Learning and Nonlinear Programming

Yafeng He[1], Michael A. Aloria[2], Donnalyn C. Cabaces[3], Baixiong Deng[4]

1. College of Graduate School, Batangas State University-Alangilan Campus, Batangas
2. College of Engineering- Department of Mechanical Engineering, Batangas State University-Alangilans, Batangas
3. College of Engineering- Department of Mechanical Engineering, Batangas State University-Alangilans, Batangas
4. 4. Research Center for Language and Language education, Central China Normal University, Wuhan

Abstract

This study presents a multi-performance collaborative optimization framework for Expanded Polystyrene Concrete (EPSC) using integrated nonlinear programming and artificial intelligence techniques to simultaneously optimize compressive strength, flexural strength, impermeability, and density. A comprehensive dataset of 120 samples was developed through controlled laboratory experiments incorporating lightweight aggregates including polystyrene particles and manufactured sand. The research framework integrated Response Surface Methodology (RSM) for experimental design, Random Forest ensemble modeling using TreeBagger algorithms, and multilayer Neural Networks with [16-12-8] architecture for nonlinear performance prediction. Multi-objective optimization employed weighted Mean Squared Error (MSE) loss functions with engineering-based objective weights [0.4, 0.3, 0.2, 0.1] for performance criteria optimization. The developed models demonstrated exceptional predictive accuracy with global R-squared values approaching 1.0000 and weighted MSE of 4.463509. Variable importance analysis revealed aggregate content as the most critical factor for density prediction (importance score: 4.449), while sand content showed highest importance for impermeability (importance score: 2.552). Random Forest models consistently outperformed Neural Network approaches, exhibiting superior residual distributions and reduced prediction errors across all performance metrics. The validated optimization framework enables engineers to achieve targeted performance specifications while minimizing material costs and environmental impact, supporting practical mix design decisions for sustainable construction applications.

Keywords: Expanded Polystyrene Concrete, Multi-objective optimization, Machine Learning, Random Forest, Neural networks, Nonlinear programming

---

Presentation 11: Artificial Intelligence in the Revitalization of Indigenous Languages and Sustainable Culture: A Case Study of Taiwanese Indigenous Languages

Shuemei Yu
Independent Researcher &Committee Member, Taiwan Association for Humanities and Local Culture (TAHLC), Taipei

Abstract

The rapid decline of indigenous languages worldwide poses a significant threat to cultural diversity and heritage. In Taiwan, most indigenous languages of Austronesian origin face endangerment due to declining numbers of speakers and limited intergenerational transmission. This paper proposes an AI-based framework for revitalizing indigenous languages, combining large-scale corpus collection, grammatical structure analysis, parallel corpus alignment, and lexical supplementation, while exploring linguistic comparisons with Malay to promote language preservation and sustainable cultural development. Through AI technologies, language platforms are established, enabling users to actively use their mother tongue through mobile applications, chatbots, voice assistants, and educational games, while integrating language learning with cultural education, such as interactive storytelling, tribal songs, traditional knowledge instruction, and cultural activity simulations. Simultaneously, AI can preserve elders' oral histories and practical knowledge for research and educational

purposes, fostering a community-driven sustainable cultural ecosystem. The AI-based language revitalization model proposed in this study is not only applicable to Taiwan but also provides a scalable model for the protection of minority languages worldwide, facilitating cross-generational and cross-regional language communities, enhancing cultural pride and group cohesion, and demonstrating the feasibility of coexisting technology and tradition to safeguard intangible cultural heritage in the 21st century.

Keywords: Indigenous languages, Taiwan, AI, language revitalization, corpus collection, NLP, Malay loanwords, sustainable culture, Austronesian languages, cultural preservation.

Presentation 12: JTAS: Japan–Thailand AI and Sustainability: From Just Tech to Joint Industrial Transformation

Yin-Lin Wang[1], Yu-Ting Chen[2], Wang Kun Chen[3]
1. Post-Doctoral Researcher, National Taiwan University, Taipei
2. Doctoral Student, Faculty of Logistic and Aviation Technology, Southeast Bangkok
3. Professor, Faculty of Logistic and Aviation Technology, Southeast Bangkok

Abstract

JTAS is an acronym with multiple interpretations, including Japan–Thailand AI and Sustainability Summit, Joint Technology, AI and Sustainability, and Just Tech, AI and Sustainability Summit. It represents a multidimensional framework for addressing the intersection of advanced technology and equitable sustainability. The Japan–Thailand industrial landscape is undergoing strategic transformation: Taiwan Semiconductor Manufacturing Company (TSMC) has established a plant in Kumamoto, Japan, reinforcing Japan's semiconductor ecosystem, while Thailand has emerged as a major hub for printed circuit board (PCB) manufacturing. This evolving cross-border supply chain underscores the technological complementarity between the two nations. Artificial Intelligence (AI) is accelerating innovation across semiconductor, PCB, and smart manufacturing sectors, while sustainability imperatives are driving energy efficiency, carbon reduction, and circular economy practices.

The concept of Just Tech emphasizes that technological advancement must be accompanied by ethical data governance, environmental justice, and social inclusion, ensuring that benefits are equitably shared rather than exacerbating inequalities. JTAS serves not only as an international dialogue platform but also as a strategic blueprint for transnational cooperation. By integrating AI innovation with sustainability principles, Japan and Thailand can jointly shape a resilient, low-carbon, and socially responsible technology ecosystem. This paper explores JTAS as a model for regional collaboration, offering an "Asia-led" perspective on global technology governance and sustainable industrial development.

Keywords: Japan–Thailand cooperation, AI, sustainability, Just Tech, semiconductor, PCB, ethical technology, supply chain, circular economy, regional collaboration.

Video Presentation Abstracts

Presentation S1: Feasibility Study of Generative AI in Primary School Informatics Competition Training

Qiu Weiyang

Graduate Student, Institute of Innovation and Information Technology, Southeast Bangkok University

Abstract

This study explores the feasibility of generative AI in primary school informatics competition training, focusing on its potential applications in programming education, short-term measurable advantages, and practical implementation challenges. With the increasing attention on elementary informatics competitions, the current training model faces multiple issues, including limited programming proficiency among teachers, varying student foundations, difficulties in personalized instruction, and imbalanced self-learning abilities among students, all of which impact overall training effectiveness. Generative AI's advantages in code generation, algorithm optimization, and intelligent tutoring position it as a valuable tool for improving the quality of competition training. However, whether AI-assisted programming is genuinely suitable for elementary informatics competition training requires further empirical research.

The core questions of this study include: How feasible is generative AI in elementary informatics competition training? What are its effects on students' learning outcomes and teachers' instructional efficiency? To answer these questions, this study adopts a combination of literature analysis and experimental research. First, a literature review is conducted to examine the current applications of generative AI in programming education. Second, an experimental study is designed with students from elementary informatics competition training programs, focusing on C++ programming. Students are divided into an AI-assisted teaching group and a traditional teaching group, with their performance compared in terms of competition problem-solving ability, code quality, and learning efficiency.

The experimental design includes:

(1) Selecting representative participants;

(2) Introducing generative AI tools in the experimental group to assist students with code debugging and optimization;

(3) Analyzing the actual impact of AI through test scores, questionnaires, and learning records.

Expected findings suggest that generative AI can enhance students' programming skills and problem-solving abilities while improving teachers' instructional efficiency. However, some students may develop excessive dependence on AI, leading to insufficient algorithmic thinking training. Therefore, in the discussion and conclusion sections, this study will analyze the feasibility of generative AI, explore its applicable scenarios, and propose optimization strategies to ensure AI-assisted teaching supports students' cognitive development without hindering their independent thinking. The results of this study will provide practical guidance for elementary informatics competition training and offer insights into the future application of AI in programming education.

Keywords: Generative AI, Programming Education, Informatics Competition, Intelligent Tutoring, Algorithmic Thinking, AI-Assisted Learning

---

Presentation S2: Optimization of Intelligent Control Nodes Based on Single-Chip Microcomputers in Large-Scale Automated Systems

Liu Baotong

Master student at the Institute of Innovation and Information Technology, Southeast Bangkok University

Abstract

In engineering practice, it has been found that using single-chip microcomputers as intelligent control nodes in large-scale automated control systems can effectively reduce construction costs. However, due to the limited system resources of single-chip microcomputers, intelligent deployment and maintenance in large-scale systems are rather difficult, increasing the debugging burden on system engineers.

To address this issue, a self-organizing network algorithm based on single-chip microcomputers is proposed. This algorithm unifies the software implementation of control nodes, eliminating the need to configure identity information for each node individually. After a node joins the system, it can automatically obtain its identity information, enabling undifferentiated installation. In addition, when a node fails, the system can automatically determine the location of the faulty node and perform undifferentiated maintenance using standardized spare parts, allowing the node to resume operation automatically. This method significantly reduces the complexity of large-scale automated control systems during construction, installation, and troubleshooting, improving the system's maintenance efficiency and reliability.

The effectiveness and feasibility of this method were verified by building and testing an automated control system with 120 control nodes, providing theoretical support and technical guidance for the implementation of large-scale intelligent control systems.

Keywords: Single-chip microcomputer, Intelligent control, Self-organizing network, Automated system, Fault diagnosis, Large-scale deployment

---

Presentation S3: Construction of a College Admissions Consulting System and Research on Privacy Protection Based on Qwen Offline Large Language Model and Federated Learning

Liang Jian
Master's Program, Institute of Innovation and Information Technology, Southeast Bangkok University

Abstract
With the expansion of college admissions scale and the diversification of consulting needs, traditional admissions consulting systems face multiple challenges, including insufficient data privacy protection, information silos, and low consulting efficiency. To address these issues, this study proposes a college admissions consulting system based on the Qwen offline large language model and federated learning, aiming to improve consulting efficiency while ensuring the security of data privacy.
The core objectives of this study are twofold: firstly, to achieve effective sharing and collaboration of college admissions data while ensuring data privacy; and secondly, to enhance the intelligence level of admissions consulting and provide accurate and efficient consulting services for candidates.
By integrating deep learning and federated learning technologies, this study leverages the powerful natural language processing capabilities of the Qwen offline large language model to build an intelligent question-answering system that meets the diverse consulting needs of candidates. Meanwhile, the privacy protection mechanism of federated learning is employed to ensure data security and privacy in a distributed environment. Through simulating college admissions consulting scenarios and collecting and analyzing candidate consulting data, this study compares the performance of the traditional consulting system and the proposed system in terms of consulting response time, accuracy, and privacy protection.
Experimental results show that the admissions consulting system based on the Qwen offline large language model and federated learning significantly outperforms the traditional system in consulting efficiency and privacy protection. This study further explores the adaptability of the system in different college scenarios and proposes optimization suggestions for personalized needs. The conclusion indicates that the constructed system can not only improve the efficiency of admissions consulting but also effectively protect data privacy, offering an innovative solution for college admissions work with high application value.

Keywords: Qwen offline large language model, federated learning, college admissions consulting system, data privacy protection, intelligent question-answering

Presentation S4: Readers' Ability to Distinguish AI-Generated Literary Works: Cognitive Status and Challenges

Huang Zhan
Information Technology Program, Southeast Bangkok University

Abstract

The rapid development of artificial intelligence (AI) technology is driving its in - depth application in the field of literary creation. The quality of texts generated by AI is constantly improving, enabling it to gradually penetrate into various literary genres such as news, novels, and poetry. However, this trend has also raised a question worthy of exploration: Do ordinary readers have the ability to distinguish between literary works generated by AI and those created by humans? This research aims to analyze the ability of ordinary people to distinguish AI - generated literary works and explore the impact of AI - based literary creation on traditional literary aesthetics and education.

This research adopts the questionnaire survey method and assesses the respondents' cognitive level of AI - generated texts through experimental reading tests. The specific methods include:

Text Preparation: Invite authors with a literary background to create a purely human - written literary work. At the same time, use AI to assist in generating a text, and let AI create another text independently.

Experimental Design: Select 10 subjects who will read the above three texts in sequence. After reading, they are required to fill out a questionnaire to record their judgments on the text creators (human or AI).

Data Analysis: Calculate the judgment accuracy rate of the subjects, and analyze the recognizability of AI - generated literary works in terms of content coherence, style characteristics, emotional expression, and other aspects.

Based on an investigation of the characteristics of AI - generated works and the current public's cognitive level, this study anticipates that most subjects will find it difficult to accurately distinguish AI - generated works. This indicates that the application of AI in literary creation has achieved a high degree of concealment and acceptability. Therefore, the wide - spread application of AI technology brings new opportunities and challenges to literary theory research, creative models, and the education system.

This study emphasizes that scholars and educators should actively respond to the trend of the development of AI – generated literature:

1. Deepen the research on AI - generated literature — explore the creative mechanisms, aesthetic characteristics of AI - generated texts and their impact on the literary ecosystem, and promote the innovation of literary theory.

2. Enhance the adaptability of literary education — In literary education, guide students to correctly understand AI - generated literature, cultivate their digital literacy and aesthetic appreciation abilities, so that they can better inherit literary culture in the intelligent era.

This study provides a preliminary empirical analysis for the cognitive research of AI - generated literature and offers a reference for the future development direction of the integration of AI and literature.

Keywords: Artificial Intelligence Literature, Text Discrimination Ability, Literary Creation, AI - generated Content, Digital Literacy

Presentation S5: Challenges and Countermeasures of Artificial Intelligence in the Medical Industry: A Comprehensive Analysis from the Perspectives of Technology, Ethics, and Law

Zhen Weng

Institute of Innovation and Information Technology, Southeast Bangkok University

Abstract

With the accelerated digital transformation of the medical industry, artificial intelligence (AI), leveraging its robust data processing and analysis capabilities, has demonstrated extensive application potential in fields such as disease diagnosis, drug development, and health management. However, the practical implementation of AI in healthcare still faces numerous challenges, including technical bottlenecks, ethical controversies, legal-regulatory constraints, and issues related to public perception and acceptance. In-depth research on these challenges will not only facilitate the deep integration of AI with the medical industry but also hold significant implications for improving the quality and efficiency of healthcare services. This study systematically investigates the primary challenges and corresponding countermeasures for AI in medical applications from four dimensions: technology, ethics, law, and social acceptance. The research methodology included literature analysis, case-study methods, questionnaire surveys, and expert interviews. First, through literature analysis, this study reviews domestic and international research to outline the current status and developmental trends of AI in healthcare. Second, representative case studies were selected to analyze practical experiences and challenges of AI in clinical diagnosis, medical imaging, and AI-driven drug discovery. Additionally, questionnaire surveys were conducted to collect first-hand data on the perspectives, demands, and concerns of patients, healthcare professionals, and administrators regarding AI applications. Finally, interviews with medical experts, technology developers, and legal professionals provided multi-perspective insights to further explore viable development pathways for AI in medicine. The findings reveal that the advancement of AI in healthcare is constrained by issues such as data quality and standardization, insufficient algorithm transparency and interpretability, privacy and data security risks, ethical decision-making challenges, and the adaptability of existing legal-regulatory frameworks. Furthermore, public and healthcare professionals'trust and acceptance of AI-based medical technologies significantly influence their widespread adoption. To address these challenges, this paper proposes countermeasures including strengthening medical data governance and standardization, enhancing the interpretability and reliability of AI models, improving data privacy and security mechanisms, promoting the establishment of ethical frameworks for AI in medicine, and refining the adaptability of regulatory policies and legal systems. This study provides systematic analysis and empirical data to support AI applications in the medical industry. The findings offer actionable insights for policymakers, technology developers, and healthcare practitioners, facilitating the healthy and orderly development of AI in medicine and advancing the innovation and practical implementation of AI-driven medical technologies.

Keywords: Artificial Intelligence, Medical Industry, Technical Challenges, Medical Ethics, Legal Governance, AI in Medicine

---

Presentation S6: Application and Challenges of Generative AI in the Comprehensive Education Model of "Job-Course-Competition-Certification" in Secondary Vocational Schools - Taking the Internet of Things Major as an Example

Weng Chaoye

Information Technology Major, Southeast Bangkok University

Abstract

Taking the comprehensive education mode of "job, course, competition and certificate" of the Internet of Things major in secondary vocational schools as the research object, this paper discusses the application and

challenges of generative AI. With the rapid development of generative AI technology, its potential impact on secondary vocational education has become increasingly prominent, especially in the cultivation of talents in emerging technical majors such as the Internet of Things. This paper studies how to effectively integrate generative AI into the various links of "job, course, competition and certificate" of the Internet of Things major in secondary vocational schools, and solves many possible problems. Specifically, on the one hand, the simple application methods of generative AI in job analysis, course teaching, skill competition and professional certification are clarified; on the other hand, some common challenges encountered in technology and education during application are analyzed, and some coping methods are given.   Through the literature research method, the existing research results of generative AI in education are reviewed; using the case analysis method, some application examples of generative AI in the teaching of the Internet of   Things major in secondary vocational schools are studied; with the help of   the survey research method, questionnaires are distributed to teachers an   d students in schools and interviews are conducted to collect information. This study explores the application scenarios of generative AI in the comprehensive education mode of "job, course, competition and certificate" of the Internet of Things major in secondary vocational schools, hoping to provide some reference for secondary vocational schools to use generative AI to improve the quality of education.

Keywords: Generative AI, Vocational education, IOT, Integrated education model, Talent cultivation

---

Presentation S7: Intelligent Network Failure Prediction Based on Generative AI: Methods, Challenges, and Feasibility Analysis

Chuanlong Miao

Abstract

With the continuous expansion and increasing complexity of modern networks, traditional network operations and failure prediction methods face significant challenges in terms of efficiency and accuracy. Existing rule-based monitoring techniques (e.g., SNMP, log analysis) and manual inspection methods are constrained by sparse failure data and limited model generalization capabilities, making them inadequate for intelligent network operations in complex environments. The rapid advancement of Generative AI offers new possibilities for addressing these challenges.

This study explores the feasibility of applying Generative AI in intelligent network failure prediction, focusing on its potential for data augmentation, failure detection, and model optimization. Specifically, we analyze the following key questions:

- How can Generative AI (e.g., GANs, VAEs) be leveraged to expand network failure datasets and improve the generalization capability of predictive models?
- How can deep learning techniques (e.g., LSTMs) be integrated to optimize failure prediction, enhancing accuracy while reducing false positives?
- What challenges and limitations might arise when applying Generative AI to network operations?

To address these questions, this study first reviews the current state of network failure prediction technologies and examines potential applications of Generative AI in data augmentation and anomaly detection. Case studies are then conducted to evaluate its applicability in different network environments (e.g., campus networks, enterprise networks, ISP networks), while also discussing potential technical bottlenecks such as data quality, computational cost, and real-time processing constraints.

Preliminary findings indicate that data augmentation methods powered by Generative AI can enhance the performance of failure prediction models, particularly in detecting rare failures, where traditional approaches often fall short. However, key challenges remain, including ensuring the authenticity of generated data, maintaining diversity in training datasets, and adapting models in real time. Additionally, integrating

Generative AI with streaming data processing technologies (e.g., Kafka, Flink) to improve real-time failure prediction in large-scale network environments requires further exploration.
Based on the feasibility analysis, we propose the following future research directions:

- **Data quality optimization**: Investigate the impact of synthetic data on predictive models and enhance Generative AI's applicability in rare failure simulation.
- **Model architecture improvement**: Integrate graph neural networks (GNNs) to model network topologies and enhance prediction accuracy.
- **Real-time prediction optimization**: Explore streaming data processing solutions to improve real-time adaptability, meeting the operational demands of AIOps (AI for IT Operations).

This study provides a novel perspective on intelligent network operations by investigating the potential, challenges, and future directions of Generative AI in network failure prediction, laying a theoretical foundation for further research in the AIOps domain.

Keywords: Generative AI, Intelligent Network Operations, Failure Prediction, Data Augmentation, Deep Learning, AIOps

---

Presentation S8: Evaluation of Effectiveness and User Experience of AI-Driven Virtual Psychological Counselors

Liyuan Ruan
Master's Student, Institute of Innovation and Information Technology, Southeast Bangkok University

Abstract
With the growing demand for mental health services and the shortage of professional therapists, AI-driven virtual psychological counselors are gradually becoming a supplementary method to traditional psychological counseling. Relying on artificial intelligence (AI) technologies such as natural language processing (NLP), machine learning, and affective computing, these systems not only provide personalized psychological interventions but also demonstrate unique advantages in interactivity and accessibility. However, their effectiveness and user experience have not been systematically evaluated.
This study aims to explore the effectiveness and user experience of AI-driven virtual psychological counselors. Based on theories such as Cognitive Behavioral Therapy (CBT) and Humanistic Therapy, an AI virtual counselor prototype is constructed. Participants are recruited through an online platform and randomly assigned to the AI counseling group or the traditional psychological counseling group. During the study, core data on symptom improvement, counseling adherence, satisfaction, and trust are systematically collected, and statistical analysis methods are used to compare the differences between the two groups in terms of psychological intervention effectiveness and user experience. Furthermore, the study investigates key factors influencing the effectiveness and user experience of AI virtual counselors, such as emotional recognition accuracy, human-computer interaction models, and personalized recommendation mechanisms.
The expected results will define the applicability of AI virtual psychological counselors to different psychological issues and propose strategies to optimize their design and enhance user experience. The findings will not only help promote the application of AI in mental health but also provide theoretical foundations and practical guidance for the development of future intelligent psychological intervention systems.

Keywords: AI-driven, Virtual psychological counselor, Mental health, Effectiveness evaluation, User experience.

**Presentation S9: Generative AI helps elementary school classical Chinese teaching:
An empirical analysis of promoting understanding of traditional Chinese culture**

Xue XiaMin

Graduate Student, Institute of Innovation and Information Technology, Southeast Bangkok University

Abstract

Classical Chinese, a cornerstone of primary school language curricula in China, encapsulates profound traditional cultural values. However, its archaic linguistic structures, unfamiliar vocabulary, and cultural contextual gaps often hinder students' comprehension and engagement, limiting their ability to grasp the underlying cultural heritage. Generative Artificial Intelligence (Generative AI), exemplified by models such as Generative Pre-trained Transformers (GPT) and Generative Adversarial Networks (GANs), has emerged as a transformative tool in natural language processing, offering innovative solutions for real-time text annotation, contextual enrichment, and interactive learning—thus presenting new possibilities for classical Chinese education.

This study investigates the practical efficacy of Generative AI in elementary classical Chinese instruction through a case study of the Boya Playing the Qin lesson in the sixth grade of Cangshan Experimental Primary School. A quasi-experimental design was employed, with 60 sixth-grade students divided into an experimental group and a control group. The experimental group utilized Generative AI platforms (e.g., GPT-4, ChatGPT, and Wenxin Yiyan) for real-time annotations, historical context supplementation, virtual role-playing, and interactive Q&A. The control group received traditional instruction. Data were collected via pre-test/post-test scores, classroom observations, teacher interviews, and student questionnaires to evaluate differences in comprehension, cultural cognition, and learning engagement.

Results indicated significant advantages of Generative AI in enhancing learning outcomes. Students in the experimental group demonstrated statistically significant improvements ($p < 0.01$) in lexical understanding, sentence translation, and cultural context comprehension compared to the control group. Interactive features such as historical reenactments and virtual dialogues also heightened student engagement, fostering active class participation and post-class autonomous learning motivation. However, limitations were identified, including occasional inaccuracies in AI-generated content, superficial cultural analysis, and potential over-reliance among students.

To address these challenges, this study proposes targeted recommendations: developing a primary school-specific classical Chinese knowledge base to enhance AI content accuracy; establishing pre-screening mechanisms for age-appropriate and culturally authentic AI outputs; strengthening teacher-AI collaboration to leverage teachers' roles in cultural interpretation and critical thinking cultivation; and designing interactive tasks that promote active reflection and cultural identity. This research contributes a hybrid "AI + Teacher" pedagogical model for classical Chinese education, offering empirical and theoretical insights into the integration of AI and traditional cultural instruction.

Keywords: Generative AI; Classical Chinese Teaching; Boya Playing the Qin; Cultural Heritage Cognition; AI-Enhanced Learning

---

Presentation S10: An Overview of ETF Return Prediction and Interpretability in the Japanese Stock Market: Why LSTM and SHAP?

Qiao Hu

Digital Technology and Innovation, Southeast Bangkok University

Abstract

The inherent volatility and nonlinear dynamics of financial markets underscore the critical role of time series forecasting in financial research. Recent advancements in deep learning have introduced new opportunities for financial data analysis, with Long Short-Term Memory (LSTM) networks demonstrating superior

performance in predicting stock and exchange-traded fund (ETF) returns due to their strong capacity for modeling long-term dependencies. However, as a prototypical "black-box" model, LSTM lacks interpretability, which constrains its applicability in financial decision-making and investment strategy development. To address this limitation, this study employs the Shapley Additive Explanations (SHAP) framework, which leverages a game-theoretic approach to quantify the contributions of individual features to model predictions. By elucidating key market drivers, SHAP enhances the transparency and credibility of financial modeling.

This paper begins by reviewing the characteristics of the Japanese ETF market and surveying key return prediction methodologies, including traditional statistical models (e.g., ARIMA, GARCH), machine learning techniques (e.g., XGBoost, Random Forest), and deep learning approaches (e.g., LSTM). After evaluating the strengths and limitations of these methods, we focus on the effectiveness of LSTM in financial time series forecasting, particularly its ability to model market nonlinearity and capture trend dynamics. Furthermore, we explore the role of SHAP in financial interpretability analysis and compare it with alternative explainability techniques, such as Local Interpretable Model-agnostic Explanations (LIME) and attention mechanisms, highlighting SHAP's robust mathematical foundation and consistent feature contribution evaluation.

Existing research suggests that LSTM is considered more effective than traditional statistical models and shallow machine learning approaches in capturing market price dynamics for ETF return prediction. Additionally, the integration of SHAP has been recognized as a valuable approach for enhancing model transparency by attributing predictions to key market factors. However, notable challenges persist. LSTM's capacity for long-horizon forecasting remains constrained by its generalization ability, while SHAP's computational demands present scalability limitations. Future studies may explore advanced deep learning architectures, such as Transformer models and Temporal Convolutional Networks (TCN), alongside market sentiment data (e.g., news sentiment analysis and social media sentiment indices) to refine forecasting frameworks, ultimately contributing to improve the accuracy and interpretability of financial time series modeling.

Keywords: LSTM, SHAP, ETF Return Prediction, Deep Learning, Interpretability

---

Presentation S11: Design and Implementation of a Serial Communication and Smart Car Control System Based on MATLAB GUI

Wei Shixiong[1], Anton Louise P De Ocampo[1], Liao Hongfei[2]

1. Batangas State University
2. Nanning Guokai Road Primary School

Abstract

IAiming at the need for efficient interaction between the host computer and hardware in embedded systems, this paper designs and implements a MATLAB Graphical User Interface (GUI)-based serial communication and intelligent cart control system. The system uses MATLAB's Instrument Control Toolbox to build a visual serial port debugging platform, which realizes the functions of serial port selection, communication parameter configuration, real-time command issuance and data return. On this basis, the motion control module of the cart is integrated, which supports the operations of forward, backward, left and right steering and stopping, and extends the functions of sensor information display and status feedback. Experimental results show that the platform has high communication stability, low command response delay, friendly interface interaction, and can effectively improve the hardware debugging and control efficiency. The method can be widely used in laboratory teaching, scientific research verification and embedded system prototyping, and has strong potential for function expansion.

Keywords: MATLAB GUI; serial communication; intelligent cart; device control; visualization interaction

---

Presentation S12: Exploring the sustainable transportation policy in Bangkok: A qualitative Delphi approach

Naw Aye Thidar Han[1], Seksan Papong[2], Cheerawit Rattanapan[3]
1. Graduate Program of Health and Sustainable Development, Mahidol University, Salaya Campus, Nakhonpathom
2. National Metal and Materials Technology Center (MTEC), National Science and Technology Development Agency (NSTDA), Khlong Luang, Pathum Thani
3. ASEAN Institute for Health Development, Mahidol University, Salaya Campus, Nakhonpathom

Abstract

Air pollution is the one of the major causes of health problems in urban areas and transportation sector is a significant contributor to air pollution. Bangkok has suffered air pollution problems especially high concentration PM2.5 emissions from the road traffic complications. However, measures and policies addressing air pollution within the transportation sector remain limited and require stronger enforcement. Although in Thailand, it has an Environmental Sustainable Transport Master Plan (2013-2020), its awareness among stakeholders is relatively low. To gain a deeper understanding of the existing policies, as well as the roles of responsible organizations and government agencies, this study critically examines the current policy landscape, and its impact on air pollution reduction and associated health outcomes as well as potential policy intervention recommendation. Due to the sensitivity of the issues, the study used Qualitative Delphi approach to assess the policy information, achieve consensus on the policy interventions scenarios, and access its effects on the air pollution reduction and health. Three rounds of interview were conducted using online platform to validate and gather the consensus from the panels of experts specializing in transportation, public health, and environment. The study was conducted over a period of one year, with an initial participation of 20 experts. However, 11 experts remain to provide validation and responses on the final round. The results indicated that the majority of experts were not familiar with the Environmental Sustainable Transport Master Plan. This is due to fragmentation of plans and policies across multiple government agencies, each with distinct jurisdictions. As a result, identifying and confirming the existence of an integrated policy that encompasses the health, environment, and transport sectors remains challenging. On the other hand, all experts agreed that bus electrification scenario is an achievable policy intervention to have the significant reduction in air pollution while strengthening Bangkok's sustainable transportation system. Although experts acknowledged that the bus electrification is feasible scenarios, there are still challenges including the potential increased emissions from the energy sector and the public's limited awareness of sustainable transportation system and mode choice of the public. Addressing these challenges will be crucial for the successful implementation of sustainable transport policy in Bangkok.

Keywords: Air pollution, PM$_{2.5}$ emissions, Health benefits, Sustainable Transport, Policy, Delphi

---

Presentation S14: Mangrove forest coverage and local livelihood in Thanh Hoa Province, Vietnam: Impact analysis using Remote sensing, GIS, and field survey

Vu Thi Hong Nhung[1], Takaaki Kato[2]

1. Graduate School of Environmental Engineering , The University of Kitakyushu
2. Institute of Environmental Science and Technology University of Kitakyushu

Abstract

Mangrove forests prevent coastal erosion, mitigate severe storm impacts, and store carbon. Thanh Hoa

Province includes 22 districts with four mangrove forests: Hau Loc, Hoang Hoa, Nga Son, and Nghi Son. This study examined the time trends of mangrove forest coverage and its impact on local livelihood problems in Thanh Hoa Province, Vietnam, using geospatial analysis and socioeconomic survey. The former used Google Earth and Landsat satellite imagery to track mangrove forest changes from 2014 until 2024. ArcGIS software mapped Thanh Hoa mangrove forests using satellite imagery. An interview survey of 216 households where mangrove cover was growing (Hau Loc district) and declining (Hoang Hoa district) was done in January 2025 to understand people's relevance with the mangrove forest and their perception of the problems of the forest. The remote sensing data showed that mangrove forest areas in Nga Son District increased by approximately three times from 2014 to 2024. Hau Loc District grew 1.86 times in ten years. Conversely, Hoang Hoa District demonstrated a positive trajectory until 2019, after which a downturn occurred, indicating a loss of mangroves. Nghi Son District's mangrove forest area has remained steady without considerable change.

The interview survey showed that unsustainable aquaculture, coastal erosion from tourism infrastructure, and climate change were considered to harm mangroves. In Hau Loc district, 49.1% of families resided within 300 meters of mangroves and 1.9% more than 1000 meters away. While mangrove forests diminished in Hoang Hoa district, just 9.3% of households lived within 300 meters of the trees, and 42.6% lived beyond 1000 meters. This contrast shows that communities in expanding mangrove forests have better access to forest resources than those in declining forests. In Hau Loc, just 31.7% reported resource shortages. In contrast, 62.9% of Hoang Hoa district cited resource shortages. This simultaneous loss in forest acreage and resource availability threatens livelihoods in the Hoang Hoa district. Regarding livelihood difficulties linked to mangrove forests, only 13.9% of households in areas with increased forest cover mentioned challenges. In contrast, this figure more than doubled to 29.6% in regions with decreased forest cover.

Keywords: Mangrove, Remote sensing, Community survey, Vietnam

---

Presentation S15: A Systematic Review of AI-Powered Smart Learning Systems for Addressing Diverse Student Learning Needs: A Case Study of China

Tsai Cheng-ChungCheng, Aihua
Krirk University, Bangkok Thailand

Abstract
The rapid evolution of artificial intelligence (AI) has transformed educational practices, with AI-powered smart learning systems (AI-SLS) emerging as powerful tools for addressing diverse student learning needs. This systematic review aims to assess the current state of research on AI-SLS, focusing on their key features, effectiveness, implementation challenges, and optimization strategies. Adhering to the PRISMA guidelines, the review analyzed peer-reviewed studies and grey literature from 2010 to 2023, employing a rigorous methodology to ensure transparency and reproducibility. The findings reveal that AI-SLS, through adaptive algorithms, natural language processing, and data-driven analytics, significantly enhance personalized and inclusive learning. However, their effectiveness is contingent on equitable access, teacher readiness, and alignment with pedagogical goals. Ethical concerns, technical limitations, and institutional resistance were identified as major barriers to implementation. To address these challenges, the review proposes strategies such as developing ethical guidelines, investing in infrastructure, and fostering stakeholder collaboration. The study contributes to the literature by highlighting the integration of advanced functionalities like emotion recognition and gamification, which represent a significant evolution in AI-SLS. Furthermore, it emphasizes the need for context-sensitive designs and scalable solutions to ensure inclusivity. By aligning technological advancements with ethical principles and practical considerations, this review provides actionable insights for educators, policymakers, and developers, ultimately advancing the goal of creating equitable and effective learning environments for all students.

Keywords: AI-powered smart learning systems, Personalized learning, Inclusive education, Adaptive

algorithms, Ethical challenges, Implementation barriers, Optimization strategies