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Book of Abstracts

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ENGINEERING, TECHNOLOGY AND APPLIED SCIENCE

10th World Conference on

ADVANCED MATERIALS, NANOSCIENCE AND NANOTECHNOLOGY

10th World Conference on

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NOVEMBER 20, 2025

BANGKOK, THAILAND

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November 20, 2025 | Bangkok, Thailand

BOOK OF ABSTRACTS

Abstracts of the Joint Events on 4th World Conference on Engineering, Technology and Applied Science & 10th World Conference on Advanced Materials, Nanoscience and Nanotechnology & 10th World Conference on Chemistry and Chemical Engineering

Conference Dates:
November 20, 2025

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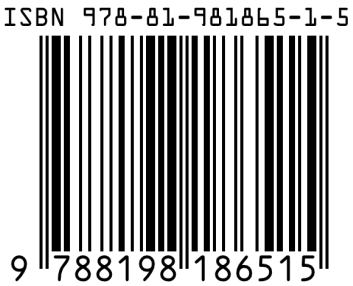

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ABOUT EURASIA CONFERENCES

Established in 2022, Eurasia Conferences has rapidly gained recognition for organizing high-quality conferences across a diverse range of fields including science, technology, social sciences, humanities, business and economics, life sciences, medicine, and healthcare. Our mission is to drive progress and innovation through dialogue and collaboration among professionals worldwide.

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SCIENTIFIC PROGRAM

DAY 1

NOVEMBER 20, 2025

08:55-09:00 @
Introduction and Welcome Note
Conference Room: Garden 2

Keynote Speaker Sessions

09:00-09:30

Title: Fuzzy Modeling and Decision-Making Applications in Science & Engineering

Dr. Sunny Joseph Kalayathankal, Professor of Computer Science & Engineering Rajagiri School of Engineering & Technology, Cochin, Kerala, India

09:30-10:00

Title: Pharmacological Modulation of Oncogenic Transcriptional Networks and c-Met Signaling Pathways in Cancer

Prof. Gautam Sethi, Department of Pharmacology, National University of Singapore, Singapore

10:00-10:30

Title: From Retrieval Augmented Generation to Reality: Document Generator – An Artificial Intelligence-Powered System Utilizing Reliable Artificial Agents for Generating Safety-Critical Documentation

Nirav Kumar, Head of AI and Engineering, Navatech Group, Bangalore, Karnataka, India

Group Photo, Tea and Refreshments Break 10:30-11:00

Speaker Sessions

11:00-11:30

Title: Multimodal Materials Based on Lanthanide Complexes for NMR/ MRI Diagnostics and Therapy

Prof. S.P. Babailov, Federal State Budgetary Institution A.V. Nikolaev Institute of Inorganic Chemistry SB RAS, Novosibirsk, Russia

11:30- 12:00

Title: Silicon Photonic Materials for Scalable Quantum Computing

Dr. Rohit K Ramakrishnan, Centre for High Energy Physics, Indian Institute of Science, Bangalore, India. Co-Founder & Chief Technology Officer, QOSMIC Satellite Systems, Bangalore, India.

12:00- 12:30

Title: Circularity for Ocean Plastics: Clean Rivers, Recycle Plastics, Protect Ocean

Roshan Bhandari, Environmental, Social and Governance Department, RiverRecycle Oy, Mikonkatu, Helsinki, Finland

Lunch Break 12:30-13:30

13:30-13:50	**Title: Surveillance system by Intelligence CCTV using YOLOv12** **Mr. Pisit Plaikaew, Mr. Chonlasit Lidsuwan and Mr.Polaphat Laima,** Phetchaburi Rajabhat University and Srinakharinwirot University, Bangkok, Thailand.
13:50-14:10	**Title: Non-stochastic Aluminum/Diamond Composite Foams With Engineered Interfaces for High-Efficient Thermal Management** **L.P. Maiorano and J.M. Molina,** University Materials Institute of Alicante and Inorganic Chemistry Department, University of Alicante, Spain
14:10-14:30	**Title: Smart Navigation System within Phetchaburi Rajabhat University Using GPS** **Mr. Noppong Cheychuen, Mr. Wannatham Noyklay and Mr. Polaphat Laima,** Phetchaburi Rajabhat University and Srinakharinwirot University, Bangkok, Thailand
14:30-14:50	**Title: IoT-Based Smart Health Monitoring for Preventive Care** **Ms. Kamonwan Oiumekha, Mr. Sombat Sroidokmai and Mr. Polaphat Laima,** Phetchaburi Rajabhat University and Srinakharinwirot University, Bangkok, Thailand
14:50-15:10	**Title: The Hidden Link Between Newton's Gravity and Coulomb's Law** **Dr. Ittipat Roopkom,** Phetchaburi Rajabhat University, Bangkok, Thailand
15:10-15:30	**Title: Routing strategy issues for eco-diverse fleets in LTL transport** **Radosław BELKA,** Faculty of Electrical Engineering, Automatics and Computer Science, Kielce University of Technology, Kielce, Poland

Tea and Refreshments Break 15:30-16:00

16:00-16:20	**Title: Comparative Analysis of Prepackaged Materials Versus Calcium Sulfoaluminate Cement for Rapid Pavement Repair Application** **Daniel D. Akerele and Federico Aguayo,** Department of Construction Management, University of Washington, Seattle, WA, USA

Poster Sessions

Poster-1	**Title: Electromagnetic Modeling and Analysis of Eddy Current Losses in the Three-Phase Power Cables** **Sang Hyeom Im,** Electrical Engineering, Dong Eui University, Busan, South Korea

Poster-2

Title: Research on Predicting Eddy Currents in Single-Phase Power Cables

Sang Hyeom Im, Electrical Engineering, Dong Eui University, Busan, South Korea

Poster-3

Title: Analysis of Sulfated Cyanopeptides in Lake Erie Water Samples: Quantification via SPE-UHPLC-PDA-MS

Omoniyi Babajide Awe, Department of Chemistry and Biochemistry, University of Toledo, Toledo, OH, USA

Poster-4

Title: Multimodal Materials Based on Lanthanide Complexes for NMR/ MRI Diagnostics and Therapy

Shabanova Chimnaz MamedZahyd, Institute of Catalysis & Inorganic Chemistry Ministry of Science and Education of the Republic of Azerbaijan

Certificate Distribution and Conference Closing Ceremony 17:00-17:30

UPCOMING CONFERENCES

11th World Conference on
Advanced Materials, Nanoscience and Nanotechnology
May 21 - 22, 2026 | Vienna, Austria

11th World Conference on
Chemistry and Chemical Engineering
May 21 - 22, 2026 | Vienna, Austria

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KEYNOTE PRESENTATIONS

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Fuzzy Modeling and Decision-Making Applications in Science & Engineering

Dr. Sunny Joseph Kalayathankal
MSc., BEd, MPhil, CIC, PGDCA, ADCA, MCA, M.Tech
Ph.D (Mathematics), Ph.D (Computer Science)
Professor of Computer Science & Engineering Rajagiri School of Engineering & Technology
Cochin, Kerala, India.

The thought process involved in the act of decision making is a complex array of streaming possibilities in which a person selects or discards information made available from diverse sources. In doing so one is led by a meaningful analysis of available information and optimal selection out of several apparently equi-efficient decisions. Since Zadeh (1965) published the fuzzy set theory as an extension of classic set theory, it has been widely used in many fields of application, such as pattern recognition, data analysis, system control, management etc. The unique characteristic of this theory, in contrast to classic mathematics, is its operation on various membership functions (MF) instead of the crisp real values of the variables. Molodtsov (1999) initiated the concept of soft set theory as a new mathematical tool for dealing with uncertainties. Pabitra Kumar Maji et al. (2001) introduced fuzzy soft set theory which also deals with uncertainties.

Out of the several higher order fuzzy sets, intuitionistic fuzzy sets by Atanassov (1985) and Ordered intuitionistic fuzzy sets proposed by Kalayathanal et al. (2010) have been found to be highly useful to deal with vagueness. Intuitionistic fuzzy set is described by two functions: a membership function and a non - membership function. We develop and apply similarity measures between ordered intuitionistic fuzzy sets to multiple attribute decision making (MADM) under fuzzy environment.

Biography:

Prof. Dr. Sunny Joseph Kalayathankal received the MSc. degree from Kerala University, Kerala, India in 1986, B.Ed from Calicut University, Kerala in 1987, MPhil from Kerala University in 1993 and Ph.D (Mathematics) degree in 2010 from Kerala University, MCA from Indira Gandhi National Open University, New Delhi, India in 2002, M.Tech IT from Karnataka State Open University in 2013 and Ph.D. in Computer Science under Bharathiar University, Coimbatore, India in 2018. He was the Head of the Department of Mathematics, K.E.College, Mannanam, Kottayam, Former Principal of Jyothi Engineering College Cheruthuruthy, Trissur , Former Director of Research in Jyothi Engineering College Affiliated to APJ Abdul Kalam Technological University, Kerala India. He is currently working as Professor of Computer Science & Engineering in Rajagiri School of Engineering & Technology, Kerala , India and has 38 years of teaching and 21 years of research experience. He has published more than 117 papers in the area of Fuzzy Modelling and Decision Making, Graph Theory and Applied Mathematics. He has produced 5 Ph.Ds in the area of Graph Theory and Fuzzy Modelling. He has served as 66 Keynote and Invited Speaker in various National and International Conferences. He is the Research guide of APJ Abdul Kalam Technological University, M.G.university Kottayam and Bharathiar University Coimbatore. He is the reviewer of Iranian Journal of Fuzzy System, International Journal of Fuzzy System and Journal of Mathematical Modeling and Computer Simulation.

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Pharmacological Modulation of Oncogenic Transcriptional Networks and c-Met Signaling Pathways in Cancer

Professor Gautam Sethi[1]
[1]Department of Pharmacology, National University of Singapore, Singapore

Oncogenic transcription factors, particularly the Signal Transducers and Activators of Transcription (STAT) family, serve as central regulators of diverse cellular programs that control proliferation, survival, angiogenesis, and immune evasion. Among them, STAT3 has emerged as a critical oncogenic driver that is aberrantly and constitutively activated in a broad spectrum of solid tumors and hematological malignancies. Persistent STAT3 signaling promotes tumor initiation and progression by upregulating genes involved in cell growth, survival, and invasion, while simultaneously reprogramming the tumor microenvironment to favor immune suppression and angiogenesis. Furthermore, STAT3 activity contributes to the maintenance of cancer stem cell phenotypes and metabolic adaptation, leading to enhanced metastasis and therapeutic resistance. Parallel to this, the c-Met/hepatocyte growth factor (HGF) signaling cascade functions as another potent oncogenic pathway, often intersecting with STAT3 to amplify downstream pro-tumorigenic signaling. The cooperative activation of STAT3 and c-Met/HGF promotes invasive tumor growth, epithelial–mesenchymal transition, and resistance to targeted or chemotherapeutic agents. Thus, given their pivotal and convergent roles in cancer pathobiology, targeting STAT3 and c-Met/HGF represents a compelling pharmacological strategy. In this presentation, I will highlight the molecular interplay between these pathways, discuss their clinical significance in tumor progression, and introduce a series of novel small-molecule inhibitors developed by our group that effectively disrupt STAT3 and c-Met signaling, demonstrating promising anti-cancer efficacy in preclinical models and potential for therapeutic translation

Biography:

Dr. Gautam Sethi is a tenured Associate Professor in the Department of Pharmacology, Yong Loo Lin School of Medicine, National University of Singapore. His research focuses on elucidating the mechanisms underlying activation of oncogenic transcription factors by carcinogens and inflammatory mediators and developing novel inhibitors for cancer prevention and therapy. He has published over 500 papers in high-impact journals and serves on the editorial boards of several leading journals. Recognized among the world's Highly Cited Researchers (Clarivate, 2020–2021) and Stanford's Top 2% Scientists (2019–2025), he ranks in the top 0.05% globally in Pharmacy and Pharmaceutical Sciences (Scholar GPS, 2023–2024).

https://doi.org/10.62422/978-81-981865-1-5-003

From Retrieval Augmented Generation to Reality: Document Generator – An Artificial Intelligence-Powered System Utilizing Reliable Artificial Agents for Generating Safety-Critical Documentation

Nirav Kumar
Head of AI and Engineering, Navatech Group, Bangalore, Karnataka, India

In the rapidly evolving domain of Artificial Intelligence, the capability to generate compliant documentation in near real time has emerged as a pivotal requirement. This study presents a multi-agent AI framework deployed on a Kubernetes cluster, designed to autonomously generate Risk Assessment and Method Statement (RAMS) documents within approximately 30 minutes, significantly reducing the conventional preparation cycle of 3–5 days. The proposed architecture demonstrates substantial improvements in process automation, compliance consistency, and computational efficiency within enterprise document generation workflows

Our solution combines: Planner agents for document structure, Researcher agents with hybrid search (embeddings+BM25) achieving 95% accuracy, and Writer agents preventing hallucinations in safety-critical content. Key innovations: markdown conversion preserving multi-page tables, process scanned documents with OCR, 60-result retrieval with re-ranking for optimal relevance, and image caption extraction from scanned PDFs

Biography:

Nirav Kumar: Leading Innovator in Artificial Intelligence.

With a decade of experience in data science and machine learning, Nirav Kumar is a prominent leader in the tech world. As the Head of AI and Engineering at Navatech Group, he leads groundbreaking research and development projects aimed at advancing AI technology. Nirav has made notable contributions to the field of Applied AI, particularly in the realm of Conversational AI, making it accessible on web and mobile platforms.

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Multimodal Materials Based on Lanthanide Complexes for NMR/ MRI Diagnostics and Therapy

S.P. Babailov
Federal State Budgetary Institution A.V. Nikolaev Institute of Inorganic Chemistry SB RAS,
Novosibirsk, 630090, Russia

Lanthanide (Ln) complexes have unique luminescent, magnetic and chemical properties, which makes them promising for various multimodal applications (including theranostics). In this paper, several series of Ln complexes are investigated as multifunctional materials promising for use in various areas of science and technology (in particular, for MRI, luminescent control of complex localization, radiation therapy). By means of optimization analysis of the paramagnetic lanthanide-induced shifts (LIS) and the relaxation rate enhancements (RREs) it is possible {by NMR methods} to simultaneously determine the structure of complexes, their molecular dynamics and their paramagnetic properties in solution. This methodical approach is illustrated by a number of examples of 1H, 13C, 19F, 23Na NMR studies of the kinetics of intermolecular and conformational dynamics of crown ethers, porphyrins, macrocyclic chelates, DTPA-, EDTA- and DOTA-like ligands, as well as beta-diketone anions coordinated with Ln in solutions (where Ln = Ce, Pr, Nd, Eu, Tb, Tm, Ho, Dy and Yb). For the first time, the dependences of the activation energy of molecular dynamics of complexes on the ionic radius of Ln cations are analyzed. The effect of gadolinium break in the dependences of the activation energy on the atomic number of Ln was experimentally detected on several series of complexes [2]. The fundamental studies carried out make it possible to find optimal conditions for using the complexes as relaxation thermosensor reagents for MRI. The thermosensory properties found (according to both LIS and RRE data) are proposed to be used not only for diagnosing diseases (oncology and inflammation), but also for monitoring the increase in local temperature caused by radiofrequency heating during MRI scanning of animals and humans. This is important for developing optimal protocols for MRI studies of humans and animals. In addition, the complexes can be used as NMR probes to monitor local temperature increases during laser hyperthermia. Further research may potentially yield a new MRI technique based on relaxation lanthanide thermal contrast reagents for diagnosing a number of diseases.

The work was supported by the Ministry of Science and Higher Education of the Russian Federation (research project 121031700321-3).

References

[1] S.P. Babailov, E.N. Zapolotsky, E.S. Fomin, M.A. Polovkova, G.A. Kirakosyan, A.G. Martynov, Y.G. Gorbunova, Molecules (2022), 27, 22, 7836.

[2] S.P. Babailov, Ya. Qu, E.N. Zapolotsky, J. Incl. Phen. Macrocycl. Chem. (2022), 102, 1-2, 1 – 33.

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Silicon Photonic Materials for Scalable Quantum Computing

Rohit K Ramakrishnan[1,2]
[1]Centre for High Energy Physics, Indian Institute of Science, Bangalore, India,
[2]Co-Founder & Chief Technology Officer, QOSMIC Satellite Systems, Bangalore, India

Photonic approaches to quantum computing can be produced with the same lithographic and deposition tools long used in semiconductor fabrication. Silicon photonics has become the most developed of these platforms, allowing research devices to be scaled through standard foundry processes. This work discusses recent progress in silicon materials and device structures that underpin quantum information processing, focusing on fabrication methods suited to largescale integration. The study examines silicon-on-insulator and ultra-low-loss silicon-nitride waveguides, hybrid III–V gain layers, and heterogeneous junctions that combine silicon with lithium niobate or atomically thin emitters. Reports from academic groups and industrial programs such as PsiQuantum and Xanadu show steady reductions in propagation loss (<0.1 dB cm^{-1}) and higher photon-pair generation efficiency via four-wave mixing and parametric down-conversion. These results indicate that wafer-scale quantum photonic integration is feasible within current foundry tolerances.

Machine-learning-assisted optimisation is increasingly applied to the design of resonators, splitters, and mode converters. By replacing exhaustive manual parameter sweeps with data-driven fitting, these methods shorten simulation and layout cycles while allowing joint optimisation of optical, electrical, and thermal properties. Overall, the evidence points to silicon's evolution from a passive optical substrate to an active material system capable of integrating sources, modulators, and quantum interconnects on a single chip. Continued advances in low-loss processing and automated design are expected to enable larger quantum circuits and stronger coupling between quantum and classical control electronics.

Biography:

Dr. Rohit K. Ramakrishnan is a Raman Postdoctoral Fellow at the Centre for High Energy Physics, Indian Institute of Science (IISc), Bangalore. His research focuses on quantum photonics, machine learning, and computational models for quantum communication. He earned his Ph.D. in Quantum Technology from IISc and has previously worked at the Centre for Quantum Technologies, National University of Singapore, and the Australian Defence Force Academy. He is Co-Founder and Chief Technology Officer of QOSMIC, an IISc-incubated deep-tech startup developing optical and quantum communication infrastructure for next-generation satellite networks.

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Circularity for Ocean Plastics: Clean Rivers, Recycle Plastics, Protect Ocean

Roshan Bhandari[1]*
[1]Environmental, Social and Governance Department RiverRecycle Oy, Mikonkatu, Helsinki, Finland

Rivers are the primary pathways of plastic leakages into the ocean, carrying approximately 80% of marine-bound plastic debris. Addressing this problem requires systemic solutions that combine technological and data-driven interventions, circular practices, and multi-stakeholder collaboration. This paper highlights the operational framework and quantifiable impact of RiverRecycle, an industrial model designed to intercept plastic waste at a river source's, using a circular business model thereby preventing its entry into marine environment. RiverRecycle has so far installed its patented river-cleaning technology in 14 rivers across 5 countries and operates low value plastic recycling facilities that transform waste into usable products such as plastic boards and pyrolysis oil. Since its inception, it has collected more than 5.4 million kilograms of waste from the rivers, including 2.5 million kilograms of plastic waste. With an annual processing capacity of 3000 tons, the initiative not only diverts plastic waste from oceans and contributes to climate change mitigation, but also generates socio-economic benefits by creating thousands of jobs. This effort has contributed to saving 1072.5 metric tons of CO2 equivalent emission, that is equivalent to removing hundreds of vehicles from the road. Scientific insights from our data-driven system reveal that this intervention can prevent up to 1 million tons of plastic waste from entering oceans annually when scaled. This contribution demonstrates how industry-led, science informed interventions complement policy and research by delivering measurables outcomes on a scale. By bridging innovation, community engagement, and data-driven impact, RiverRecycle provides a replicable model for reducing ocean plastic pollution, and fostering progress on SDG 6, SDG 13, and other interconnected SDGs.

Keywords: circular economy; data-driven impact; ocean plastic pollution; Rivers

Biography:

Roshan Bhandari is the representative and CSR Manager of RiverRecycle Oy, a Finnish circular economy modelled social enterprise. He pursed his post graduate degree in environmental engineering and management from the Asian Institute of Technology (AIT) Thailand, jointly with an exchange semester at Lappeenranta University of Technology (LUT) Finland. His research interests are on ESG, plastic circularity, microplastics, sediment pollution, climate change, Renewable energy, and geospatial analysis. He has held key positions in different organizations and has authored several publications in his field.

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Surveillance system by Intelligence CCTV using YOLOv12




Wirote Jongchanachavawat[1], Noppon Mingmuang[2], Bureerak Sungkongmueng[3], Pisit Plaikaew[4], Chonlasit Lidsuwan[5], Thanapasit Phonyiam[6], Ittipat Roopkom[7], Polaphat Laima[8], Suphat Bunyarittikit[9]

[1-7]Faculty of Engineering and Industrial Technology, Phetchaburi Rajabhat University, Phetchaburi, Thailand.
[8]Srinakharinwirot University Prasarnmit Demonstraion School, Wattana, Bangkok, Thailand,
[9]School of Architecture, King Mongkut's Institute of Technology Ladkrabang,
Bangkok, Thailand

With the growing demand for public and private security, automatic handgun detection through CCTV cameras has become an important application of real-time object detection. This paper presents a framework that employs the newly released YOLOv12 model to perform handgun detection using a single CCTV camera in real-time surveillance scenarios. YOLOv12, an attention-centric upgrade in the YOLO family, integrates mechanisms such as area-based attention (A^2), Residual Efficient Layer Aggregation Networks (R-ELAN), and memory-optimized FlashAttention, enabling superior accuracy while maintaining low latency. These enhancements improve feature extraction and attention handling, which are critical for detecting small and partially occluded handguns.To adapt YOLOv12 for surveillance contexts, we construct a specialized handgun dataset enriched with weapon annotations and augmented with blur, occlusion, and rotation, challenges often encountered in CCTV footage. The proposed system is implemented with a simple computer-based interface, where detected handguns are visualized by bounding boxes on the display. This research focuses on lightweight single-camera deployment with visual-only alerts. Experimental results show that YOLOv12 outperforms YOLOv10 and YOLOv11 in terms of mean Average Precision (mAP), precision, recall, and inference latency. Early evaluations confirm YOLOv12's robustness in detecting small and partially obscured handguns under real-time surveillance conditions. By combining YOLOv12's architectural innovations with a streamlined display interface, this study demonstrates a practical and effective single-camera CCTV handgun detection system, contributing to the development of safer and more responsive surveillance solutions.

Biography:

Asst. Prof. Dr. Wirote Jongchanachavawat received his B.Sc. (Solid State Electronics) from King Mongkut 's Institute of Technology Ladkrabang in 1994, B.Eng. from South-East Asia University from 2014, MBA. from National Institute of Development Administration in 1999, M.Eng. from King Mongkut's Institute of Technology Ladkrabang in 2000 and D.Eng. from King Mongkut's Institute of Technology Ladkrabang from2009. He had more than 20 years in information system and management from many company. He is an assistant professor in Faculty of Engineering and Industrial Technology, Phetchaburi Rajabhat University, Thailand since 2022. His main research interests are analog circuit design, management information system (MIS), Operation Management, technology management, Big Data, IoT and automation.

Mr. Pisit Plaikaew graduated high vocational certificate at Phetchaburi Technical College in 2021. Currently, he is studying an electrical engineering at Phetchaburi Rajabhat University. His main research interests are programming to control Electrical by automatic (664653121@mail.pbru.ac.th)

Mr. Chonlasit Lidsuwan graduated from Phetchaburi Technical College School in 2022. Currently, he is studying an electrical engineering at Phetchaburi Rajabhat University. His main interested in developing innovation technology to be better. (664653106@mail.pbru.ac.th)

Mr.Polaphat Laima is currently studying in high school at Srinakharinwirot University Prasarnmit Demonstraion School, Bangkok. His research interests focus on medicine and dentistry, with a particular emphasis on the application of AI and automation systems in medical and dental practices. (polaphatlaima405@gmail.com)

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Non-stochastic aluminum/diamond composite foams with engineered interfaces for high-efficient thermal management

L.P. Maiorano[1] and J.M. Molina[2]
[1,2]University Materials Institute of Alicante and Inorganic Chemistry Department, University of Alicante, Alicante, Spain

To address the growing challenges of heat dissipation in increasingly compact and high-power electronic systems, aluminum/diamond (Al/diamond) composite foams with high porosity and controlled architecture are developed in the present work. These materials combine engineered interfaces with a Kelvin-type structural design to simultaneously enhance thermal transport and minimize flow resistance. The manufacturing route begins with the additive manufacturing of polylactic acid (PLA) templates, whose porosity ranges from 79% to 91%. These templates are transformed into ceramic molds densely filled with diamond particles, into which molten aluminum is pressure-infiltrated to ensure complete metal penetration.

A key aspect of the process is the deliberate control of interfacial reactions, enabling the formation of a thin Al_4C_3 layer at the aluminum–diamond interface. This tailored interface results in a substantial increase in heat transfer capability: the composite foams exhibit thermal conductivities up to three times higher than those of pure aluminum foams with the same Kelvin geometry. At the same time, their low pressure drop performance is preserved, a crucial factor for energy-efficient cooling applications. When compared with commercial Duocel® foams of equivalent porosity, the new materials demonstrate remarkable improvements—approximately 240% higher thermal conductivity compared to aluminum and 120% compared to copper—while maintaining a favorable balance between thermal performance and fluid flow resistance. The synergy of experimental measurements, analytical predictions, and numerical simulations confirms that combining interfacial engineering with non-stochastic structural design offers a powerful pathway for developing next-generation thermal management materials.

Biography:

Lucila Paola Maiorano Lauria is a postdoctoral researcher at the University of Alicante, specialized in advanced materials engineering and thermal management using metal foams with carbon-based inclusions. She has also developed foam materials for a variety of applications, including catalysis, biomedical uses, and sound absorption. She currently coordinates a collaborative project with the University of Luigi Vanvitelli focused on the development of foams with guest phases for energy storage and heat dissipation, incorporating thermal and fluid-dynamic finite element simulations. She is the author of 19 publications in this field and has contributed to more than 30 scientific conferences

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Smart Navigation System within Phetchaburi Rajabhat University Using GPS




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This research presents the development of a Smart Navigation System for Phetchaburi Rajabhat University, utilizing Global Positioning System (GPS) technology to support efficient navigation across the campus. The system is designed to assist visitors, students, and staff in locating faculties, administrative offices, and university facilities through real-time guidance. The proposed system integrates digital mapping with GPS signals and is implemented as a mobile application. The research methodology includes requirement analysis, system design, prototype development, and usability testing with a sample group of 100 participants. The evaluation results demonstrate that the GPS-based navigation system improves accessibility, reduces time spent searching for destinations, and enhances user satisfaction. However, limitations were found in indoor areas where GPS signals are weak or obstructed. The study concludes that while GPS provides a cost-effective solution for outdoor campus navigation, future enhancements should integrate hybrid technologies for improved indoor-outdoor performance.

Biography:

Asst. Prof. Dr. Wirote Jongchanachavawat received his B.Sc. (Solid State Electronics) from King Mongkut 's Institute of Technology Ladkrabang in 1994, B.Eng. from South-East Asia University from 2014, MBA. from National Institute of Development Administration in 1999, M.Eng. from King Mongkut's Institute of Technology Ladkrabang in 2000 and D.Eng. from King Mongkut's Institute of Technology Ladkrabang from2009. He had more than 20 years in information system and management from many company. He is an assistant professor in Faculty of Engineering and Industrial Technology, Phetchaburi Rajabhat University, Thailand since 2022. His main research interests are analog circuit design, management information system (MIS), Operation Management, technology management, Big Data, IoT and automation.

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IoT-Based Smart Health Monitoring for Preventive Care




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With the increasing demand for preventive health care, real-time monitoring of vital signs is essential for early detection of health risks. This research presents the development of an IoT-based smart health monitoring system capable of measuring blood pressure, oxygen saturation (SpO_2), and heart rate at an initial prototype stage. The system integrates IoT-enabled sensors, a microcontroller, and wireless communication to collect and transmit physiological data to a cloud-based platform. Users can view their health status through a mobile application or web interface in real time. Preliminary results indicate that the system provides reliable data and can support preventive health care, especially for individuals in community-based smart health initiatives.

Biography:

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Mr.Polaphat Laima is currently studying in high school at Srinakharinwirot University Prasarnmit Demonstraion School, Bangkok. His research interests focus on medicine and dentistry, with a particular emphasis on the application of AI and automation systems in medical and dental practices.

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The Hidden Link Between Newton's Gravity and Coulomb's Law

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This paper presents a unification framework that formalizes the profound connection between Newtonian gravitation and Coulomb's electrostatic force. Inverse-square laws govern both fundamental interactions, yet they operate at vastly different scales: Newton's law of universal gravitation describes the attraction between masses, governing large-scale cosmic structures, while Coulomb's law defines the interaction between electric charges, dominating atomic and subatomic phenomena. Despite their differences in relative strength and realm of application, their striking mathematical similarities suggest a potential common theoretical foundation.

The proposed unification offers significant implications for understanding fundamental forces, potentially revealing deeper symmetries in physical laws and providing a novel bridge between classical and quantum descriptions of nature. This work marks a step toward more comprehensive unified field theories by reframing the relationship between gravity and electromagnetism.

Keywords: Newton's gravity, Coulomb's law

Biography:

Ittipat Roopkom received his B.Eng. and M.Eng. degrees from Mahanakorn University of Technology, Thailand, in 2002 and 2005, respectively. In 2009, he received his D.Eng. degree in electrical engineering from King Mongkut's Institute of Technology Ladkrabang, Thailand. In 2022, he became an assistant professor at the Faculty of Engineering and Industrial Technology, Phetchaburi Rajabhat University, Thailand. His research focuses on analog circuit design and wideband amplifiers.

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Routing strategy issues for eco-diverse fleets in LTL transport

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Following the announcement of the EU's "Fit for 55" climate regulations, the urgency to develop solutions for reducing CO2 emissions has intensified. Consequently, the transport industry is witnessing a growing trend toward fleet diversification, characterized by an increased adoption of alternative fuel vehicles, such as electric and hydrogen-powered models. These eco-diverse fleets require updated management and planning procedures to ensure their use is both economically viable and environmentally sustainable. This article explores the challenges of routing in eco-diverse Less-than-Truckload (LTL) transport, considering restrictions imposed by clean transport zones. It analyzes the requirements for planning solutions tailored to heterogeneous fleets, which vary in transport capacities, maintenance costs, and specific operational constraints. The article introduces a proprietary hybrid planning algorithm that combines the Nearest Neighbors (NN) heuristic with Iterated Local Search (ILS) to optimize routes based on a dual monetary-ecological cost framework. Additionally, it examines the impact of fleet composition on both ecological and financial outcomes. This study also presents the effectiveness of ILS metaheuristics for real-world route planning in a MixedFleet SplitDelivery Time Window Capacitated MultiTrip MultiDepot with Site-Dependent routing problem.

Keywords: eco-diverse fleet, LTL transport, VRP, multi-objective optimization,

Biography:

A researcher at Kielce University of Technology, Poland, with diverse expertise in data analytics, communication technologies, IoT, cybersecurity, and computational intelligence. He specializes in optimization techniques, metaheuristic planning algorithms, statistical data analysis, and data mining and exploitation methods. As the research and development manager, he spearheaded three ICT projects funded under the EU POIR programme from 2018 to 2023: “Cybermatrix - an integrated tourist service system”; “TARGET - a multifunctional system for transport fleets”; and “Autonomous Coordinator of Eco-Diverse Transport Resources.” He has authored 49 scientific publications and co-invented three patents.

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Comparative Analysis of Prepackaged Materials Versus Calcium Sulfoaluminate Cement for Rapid Pavement Repair Application

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The variability in climatic conditions across different regions, coupled with the negative impacts of extended road closures, necessitates developing region-specific, rapid-setting cement materials in pavement repair applications. While Calcium SulphoAluminate (CSA) cement has demonstrated effectiveness in such scenarios, its long-term durability remains under investigation. This study explores the use of regionally available prepackaged cement materials, which offer potential advantages in consistency, ease of use, and rapid strength gain. By conducting a comparative laboratory analysis with CSA mixes, the research evaluates the mechanical properties, fresh properties, and durability performances of various prepackaged materials. Utilizing ASTM standardized testing in conjunction with manufacturers' recommendations, this study provides practical guidelines and limitations for their application in rapid pavement repair. The findings aim to assist in decision making for different repair options to enhance pavement repair efficiency, minimize downtime, and improve infrastructure resilience, thereby addressing the urgent need for reliable, sustainable, and rapid repair solutions.

Biography:

Daniel is a PhD Candidate at the University of Washington, Department of Construction Management. With strong background in civil engineering, his research focuses on developing alternative cementitious materials and rapid-set concrete to enhance sustainability and performance in civil infrastructure. His work combines laboratory testing, performance evaluation, and field-scale investigations to improve early-age strength and long-term durability of innovative binders, including qualitative aspects of construction management. Daniel is a recipient of prestigious fellowships such as the ACI Foundation Fellowship and the Clean Energy Institute Fellowship, reflecting his commitment to advancing low-carbon, high-performance construction solutions. Daniel also has solid years of progressive construction field practice and teaching experience.

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Electromagnetic Modeling and Analysis of Eddy Current Losses in the Three-Phase Power Cables

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Eddy currents in the metallic sheath are induced by the alternating magnetic field generated from conductor currents, as described by Faraday's law. In single-phase systems, the magnetic field links circumferentially with the sheath, producing eddy currents in the opposing direction. In three-phase systems, however, additional mutual components link perpendicularly to the sheath, leading to eddy currents of different magnitudes and directions compared to single-phase cases. Thus, accurate prediction of eddy current losses in three-phase cables requires consideration of both magnetic and mutual components.

This study theoretically analyzes the origin of eddy current losses and employs finite element method (FEM) electromagnetic analysis to evaluate their distribution and magnitude in the metallic sheath of three-phase cables under different arrangements. A 154 kV field cable was modeled with rated current applied. The results show that, in horizontal arrangements, mutual components play a dominant role in eddy current generation. Furthermore, FEM simulations were used to compare eddy current density distributions and losses in both horizontal and triangular arrangements.

Biography:

Sang Hyeon Im received the Ph.D degree in electrical engineering from Pusan National University, Busan, South Korea in 2020. From 2021 to now, he is an Assistant Professor with Dong Eui University, Busan

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Research on Predicting Eddy Currents in Single-Phase Power Cables

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With the increasing interest in enhancing the energy efficiency of power transmission cables, research on energy losses in power transmission systems has been actively conducted. Energy losses in such systems can be categorized into transformer losses, cable losses, accessory losses, and circulating current losses. Transformer losses can be directly measured through power monitoring, making their prediction relatively straightforward. However, the measurement and prediction of the other types of losses are more complex, thus requiring further study. Accordingly, previous research has investigated hysteresis losses and eddy current losses in accessories, as well as circulating current losses. Nevertheless, research on internal losses within cables remains insufficient.

The internal losses of cables consist of copper losses occurring in conductors and losses generated in the metallic sheath. Copper losses can be easily calculated based on current and resistance. In contrast, the metallic sheath is subject to alternating magnetic fields induced by conductor currents, which generate eddy currents. These losses are difficult to measure and predict directly, thereby necessitating further investigation into eddy current losses in the metallic sheath.

In this study, we analyzed the distribution of eddy currents generated in the metallic sheath of single-phase cables using an electromagnetic analysis program. The internal structure and material properties of conventional cables were modeled, and actual operating currents were applied to perform the analysis. The results confirmed that the distribution of eddy currents in the metallic sheath varies depending on the phase of the current, and this variation was used to predict eddy current losses.

Biography:

Sang Hyeon Im received the Ph.D degree in electrical engineering from Pusan National University, Busan, South Korea in 2020. From 2021 to now, he is an Assistant Professor with Dong Eui University, Busan

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Analysis of Sulfated Cyanopeptides in Lake Erie Water Samples: Quantification via SPE-UHPLC-PDA-MS

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Microcystins, hepatotoxic heptapeptides produced by cyanobacteria, and cyanopeptolins are significant environmental concerns due to their potential adverse effects on aquatic ecosystems and human health. Accurate quantification of these cyanotoxins in complex environmental matrices like Lake Erie water samples is crucial for assessing their prevalence and potential risks. This study focuses on developing a robust methodology for quantifying sulfated microcystins and cyanopeptolins using solid-phase extraction (SPE) coupled with Ultra-High-Performance Liquid Chromatography-Mass Spectrometry (UHPLC-MS). Three distinct SPE sorbents, including Hydrophilic Lipophilic Balance (HLB), Weak Anion Exchange (WAX), and C18 cartridges, were employed to optimize the extraction process for cyanopeptolins with m/z 1068.36, m/z 910.39, and m/z 917.36.

Comparative quantification revealed differences in extraction efficiency and signal intensity among the cartridges. The HLB cartridge exhibited the highest extraction efficiency for cyanopeptolins, with the congener m/z 1068.36 showing the most intense signal (NL = 8.94E6), followed by m/z 910.39 (NL = 3.01E6) and m/z 917.36 (NL = 2.49E6). In contrast, the C18 cartridge produced a strong signal for the congener m/z 1068.36 (NL = 5.49E6), followed by m/z 910.39 (NL = 1.86E6) and m/z 917.36 (NL = 1.46E6). The WAX cartridge, while effective, displayed comparatively lower signal intensities, with m/z 1068.36 showing the most intense signal (NL = 1.87E6), followed by m/z 910.39 (NL = 2.31E5) and m/z 917.36 (NL = 2.16E5).

Preliminary experimental results demonstrated the efficacy of the developed methodology, with % recovery ranging from 73.66% to 91.40% for WAX SPE and 78.87% to 88.28% for HLB SPE. Additionally, the method exhibited acceptable precision, with relative standard deviations (RSD) after SPE ranging from 6.08% to 25.28%. High-resolution LC-MS analysis confirmed the presence of sulfated microcystins and cyanopeptolins, with intense peaks observed in the extracted ion chromatograms across the different SPE cartridges.

These findings underscore the versatility and reliability of the developed methodology in detecting and quantifying a wide range of cyanotoxins in environmental samples. By comparing the performance of C18, WAX, and HLB cartridges, this research provides critical insights into the optimal SPE approaches for cyanotoxin monitoring, addressing key gaps in environmental and public health research.

Biography:

Omoniyi Babajide Awe is a Senior Lab Analyst I at AbbVie Pharmaceuticals in North Chicago, Illinois, with expertise in chromatographic and mass spectrometric analysis of pharmaceutical and environmental samples. His research focuses on the development of advanced solid-phase extraction (SPE) and UHPLC-MS methodologies for the detection and quantification of sulfated cyanotoxins, including microcystins and cyanopeptolins, in complex water matrices.

With two master's degrees in Analytical Chemistry from the University of Toledo, USA, and the Federal University of Technology Minna, Nigeria, he integrates precision analytical science with environmental sustainability. He is currently pursuing a Master of Science in Artificial Intelligence at the International University of Applied Sciences, Berlin, to advance AI-driven chromatographic data processing. Omoniyi's work bridges innovation and regulatory compliance, aiming to enhance data quality, process efficiency, and public health protection.

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Multimodal Materials Based on Lanthanide Complexes for NMR/ MRI Diagnostics and Therapy

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Visualization of optimal areas is highly advantageous for nanotechnology and nano-measurement applications. This technique facilitates the optimization of experimental conditions and minimizes the number of expensive experiments by providing diverse parameter combinations that yield the optimal process regime.

The Digital Data Visualization Method (DDVM) corresponding to the category of Machine Learning (ML) is applied in the problem of optimal design of a chemical-technological process (CTP). The application of the DDVM in optimization problems of the CTP is based on the processing and analysis of an array of data generated by a regression model of the process. The key feature of data obtained through machine learning is that it is a prediction, classification, or generation—that is, it is not the original data, but the result of analytical or creative processing of this data by the model. The author has developed this DDVM method using the Excel & VBA environment and practiced it on the several processes to visualize optimal areas:

- the process of electrodeposition of an antimony-selenium mixture;
- the destruction of phenol - C6H5OH - in the presence of a composite catalyst based on carbon fiber containing a metal/metal oxide (with iron/iron oxide) for the heterogeneous liquid-phase oxidation of phenol with hydrogen peroxide - H2O2;
- the utilization of waste carbohydrate feedstock in the process of hydrolysis of enzymatic catalysis using enzymes as biologically active catalysts;
- the process of producing hydrogen by a hydrolysis reaction.

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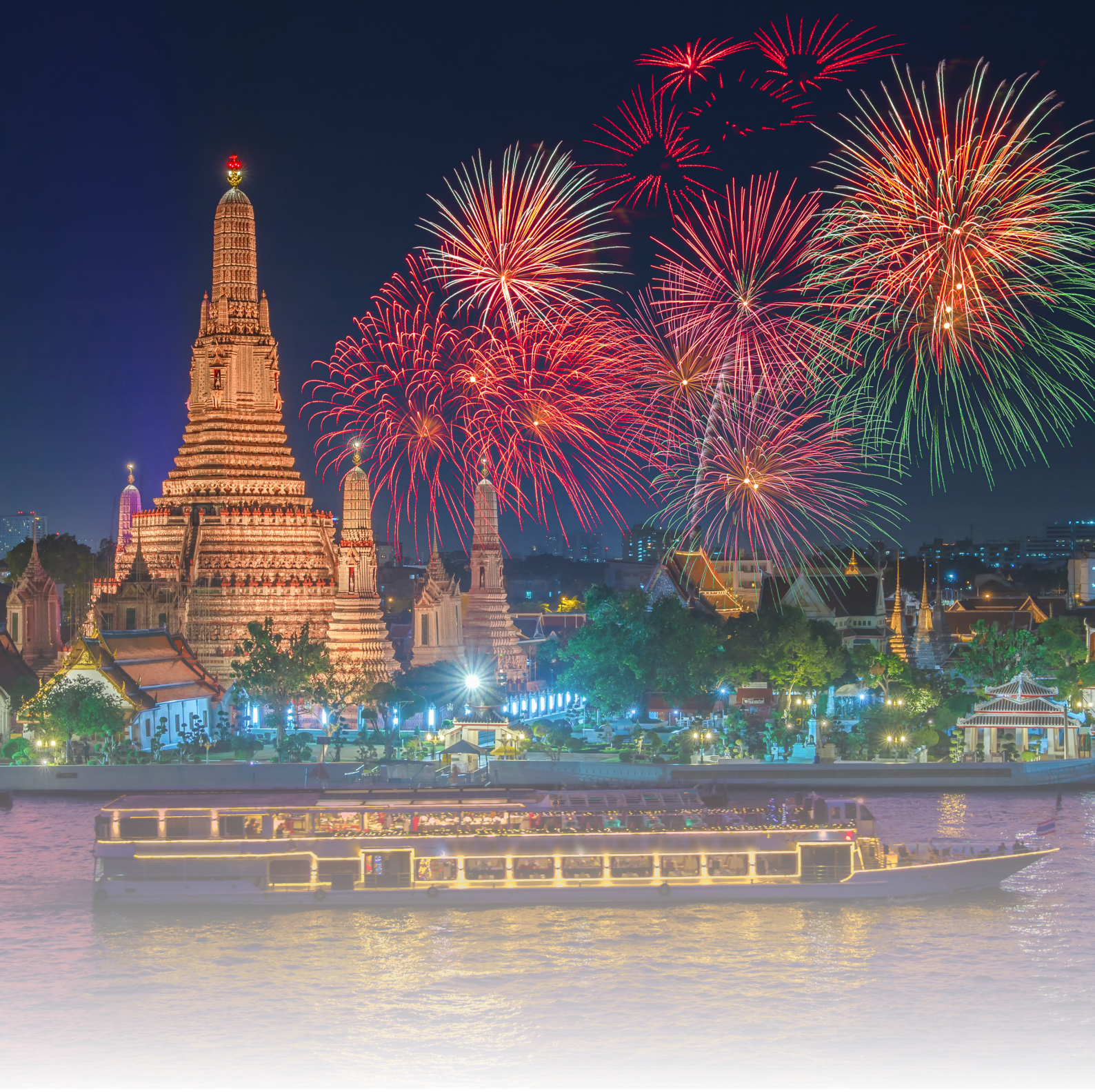

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