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Book of Abstracts

3rd World Conference on

ENGINEERING, TECHNOLOGY AND APPLIED SCIENCE

NOVEMBER 18, 2024

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3rd World Conference on

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November 18, 2024 | Bangkok, Thailand

BOOK OF ABSTRACTS

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ABOUT EURASIA CONFERENCES

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SCIENTIFIC PROGRAM

08:50-09:00 @
Introduction and Welcome Note
Conference Room:
SIAM MEETING ROOM 2

NOVEMBER 18, 2024

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Dr. Sanjoy Das, Indira Gandhi National Tribal University, Regional Campus Manipur, India

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Title: AI driven Sustainability for Autonomous Driving

Prof. Ankush Ghosh, University Center for Research & Development (UCRD), Chandigarh University, Mohali, Punjab, India

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Title: Unleashing Small Language Models (SLMs) Everywhere: For offline/on-device access - Edge and Web Deployment with Wasm & WebGPU and Mobile device deployment with Mediapipe

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

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Title: Machine Learning: Recent Applications

Prof. Amit Saxena, Professor, Department of CSIT, Guru Ghasidas Vishwavidyalaya, Bilaspur CG India

Speaker Sessions

Session Chair: Prof. Amit Saxena, Professor, Department of CSIT, Guru Ghasidas Vishwavidyalaya, Bilaspur CG India

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Title: Timeons: The Master Key to Unlocking the Secret of the Universe

Ittipat Roopkom, Phetchaburi Rajabhat University, Phetchaburi, Thailand

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Title: Optimizing Room Security and Resource Management through RFID-Based Lighting Systems

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16:30-17:00

Title: Assessment of Digital Waste Management in the Baltic States and the Experience of Taiwan

Inna Stecenko and Tien Han Kuang, Transport and Management Faculty, Transport and Telecommunication Institute, Riga, Latvia. International Trade Department, Chinese Culture University, Taipei City, R.O.C. (Taiwan).

Poster Sessions 17:00-17:30

Poster-1

Title: Development of Thermal Plasma Application Carbon Material Using Anthracite

Yong-Hyun Lee, Yeongwol Industrial Promotion Agency/Yeongwol-eup, Yeongwol-gun, Gangwon- state, Korea

Poster-2

Title: Ferroelectric Properties of Lead-free Non-stoichiometric Bi0.5+x(Na0.78K0.22)0.5-3xTiO3 Ceramics for Energy Conversion

Jeong Ho Cho, Korea Institute of Ceramics Engineering and Technology, Korea

Poster-3

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P.P. Ruwanpathirana, United Graduate School of Agricultural Sciences, Kagoshima University, Korimoto, Kagoshima, Japan

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

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

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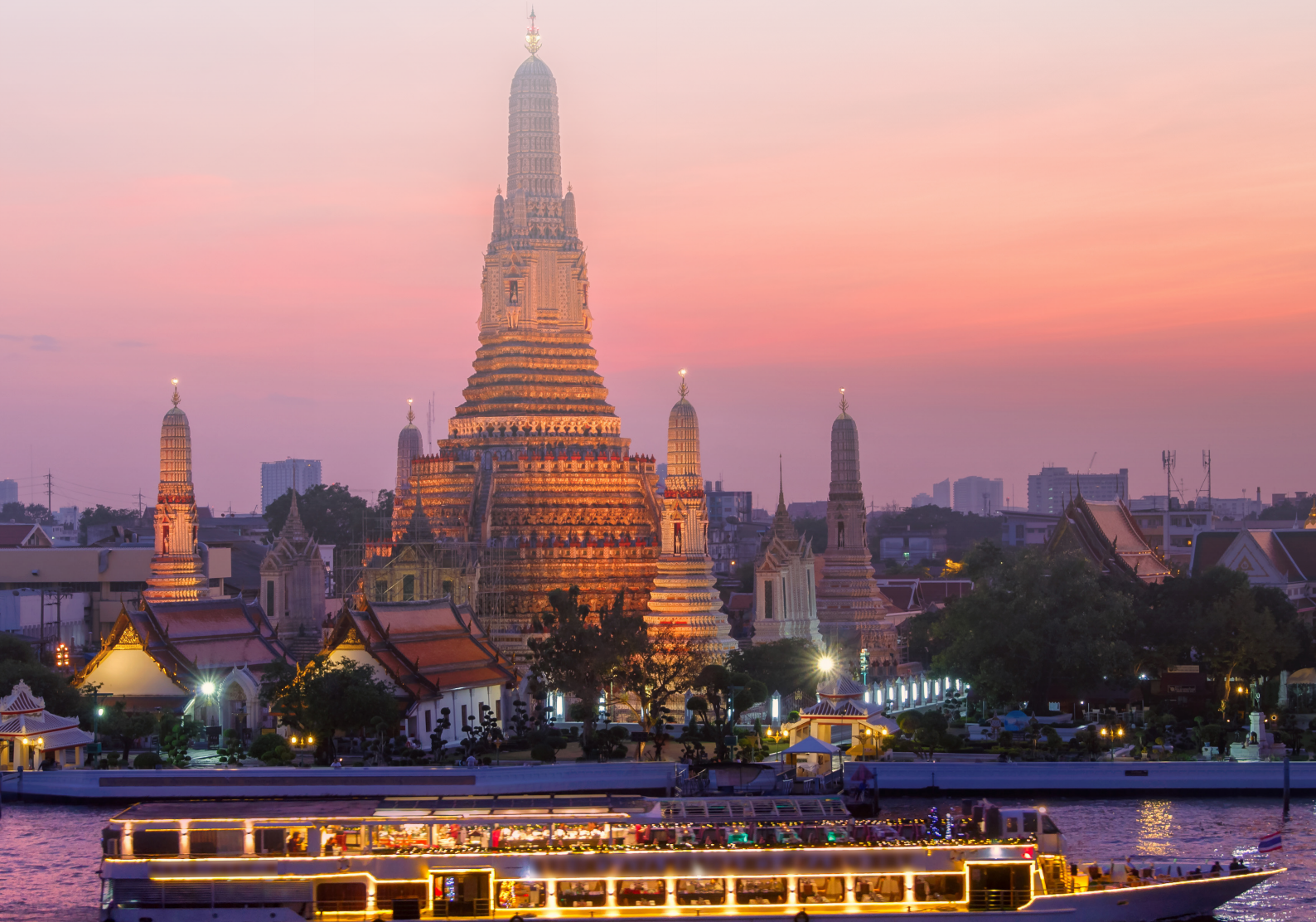
Sang Hyeon Im, Electrical Engineering, Dong Eui University, Busan, South Korea

Conference Closing 17:30-18:00



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KEYNOTE PRESENTATIONS

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Internet of Things in smart agriculture: Scopes and challenges

Prof. Sanjoy Das
Department of Computer Science, Indira Gandhi National Tribal University,
Regional Campus Manipur, India

The Internet of Things (IoT) is a network of physical objects that are connected to the Internet and can exchange data with other devices and systems. Smart farming, or smart agriculture, is adopting advanced technologies and data-driven farm operations to optimize and improve sustainability in agricultural production. Technologies used for smart agriculture include artificial intelligence (AI), machine learning, data analytics and the Internet of Things (IoT). Smart farming advances rapidly and uses IoT sensors, drones, and AI algorithms. These advanced technologies help farmers optimize agricultural processes, enhancing efficiency, yield, and sustainability. Real-time data processing helps precise decision-making, reducing resource wastage and environmental impact. Smart farming revolutionizes the agriculture sector and improves productivity and profitability while optimizing resource utilization by protecting the environment and natural resources.

Biography:

Dr. Sanjoy Das is currently working as Professor and Head Department of Computer Science at Indira Gandhi National Tribal University (A Central Government University), (Regional Campus Manipur)- India, since 2017. He did his B. E. and M. Tech, PhD in Computer Science. He has 18+ years of experience in Teaching and Research. He has organized many International Conferences series like ICCCA, GUCON. , ICACIT, ICEEE, ICCAIS, and attended as session chair and delivered talks in different programmes. He has published 100+ research papers in Scopus/Web of Science/ SCI-indexed international journals, conference proceedings, and books. He has been the editor of eight books on various emerging areas of Computer Science published with reputed publishers like Springer, CRC, IGI Global and Apple Academic Press. He has four patents granted and four published. His current research interest includes Mobile Ad hoc Networks and Vehicular Ad hoc Networks, Distributed Systems, Data Mining and the Internet of Things, etc.

https://doi.org/10.62422/978-81-974314-7-0-002

AI driven Sustainability for Autonomous Driving

Prof. Ankush Ghosh
University Center for Research & Development (UCRD), Chandigarh University,
Mohali, Punjab, India

Self-driving technology is poised to revolutionize transportation infrastructure globally, offering a unique opportunity to enhance the quality of life. As urban areas face challenges such as rapid growth, avoidable collisions, vehicle emissions, and congestion from single-occupant commuters, autonomous vehicles promise to transform transportation systems by delivering significant environmental, social, and economic benefits.

However, autonomous ground vehicles (AGVs) must overcome various challenges to navigate safely from origin to destination. In this lecture, we will explore these challenges across different self-driving models. We will delve into self-driving algorithms, the integration of supervised learning and reinforcement learning, fundamental driving functions, and collision avoidance using deep reinforcement learning. The talk will conclude with test results and an assessment of risk levels for self-driving technology.

Biography:

Prof. Ankush Ghosh is Senior member of IEEE, Fellow of IETE working as Vice-President at ADSRS Education and Research Foundation, India. He has received his Ph.D. (Engg.) degree from Jadavpur University, India in 2010. He was a research fellow of the Advanced Technology Cell- DRDO, Govt. of India. He was awarded National Scholarship by HRD, Govt. of India. He has outstanding research experiences and published more than 20 edited books from Springer & Elsevier; 3 National & 8 International patents and more than 150 research papers indexed in Scopus/Web of Science. He is serving as an editorial board member of several international journals including Chief Editor. He has more than 20 years of experience in teaching, research as well as industry. His UG and PG teaching assignments include Microprocessor and microcontroller, AI, IOT, Embedded and real time systems etc. He has delivered Keynote/Invited lecture in a number of international seminar/conferences, refreshers courses, and FDPs. He has guided a large number of M.Tech and Ph.D. students. Dr. Ghosh is an active member of IEEE and organized a number Seminars and workshops in association with IEEE. He is an editor & organizing committee member of the Conference series GUCON, GlobConET, GlobConPT, GlobConHT, ICACIS ICCCA, ICEEE, ICACIT. He is a Global Jury member of National Entrepreneurship Network- Mentor Group. He has received award for contributing in Innovate India programme from AICTE- DST, Govt. of India in 2019 and 2020.

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Unleashing Small Language Models (SLMs) Everywhere: For offline/on-device access - Edge and Web Deployment with Wasm & WebGPU and Mobile device deployment with Mediapipe

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

In the rapidly evolving landscape of machine learning (ML) deployment, the demand for efficient access to models without extensive cloud infrastructure or constant internet connectivity is paramount. WebAssembly (Wasm) alongwith Mediapipe, are the technologies spearheading a new era of ML deployment. This talk delves into the power of leveraging Wasm and WebGPU along with projects like wasi-nn to deploy Small Language Models (SLMs) directly within web browsers and edge devices, reshaping the possibilities of on-device AI. We explore practical examples showcasing the fusion of Wasm's cross-platform execution capabilities and WebGPU's prowess in parallel computation, enabling developers to deploy SLMs seamlessly across diverse environments. These tools empower developers to harness the full potential of SLMs on the edge and web, providing them with the necessary infrastructure to deploy, optimize, and execute ML models efficiently in browser and edge environments.

Also deploying and accessing machine learning (ML) models (SLM's) over mobile devices using flutter efficiently poses significant challenges. Traditional methods rely on Native platforms and constant internet connectivity. This talk explores an approach for deploying Small Language Models (SLMs) directly within app thereby reducing reliance on constant internet access. Utilizing MediaPipe on flutter opens-up the opportunity to run SLM's models locally on device.

Biography:

Nirav Kumar: Leading Innovator in AI, Web, and App Development With a decade of experience in data science and machine learning and 15 years in web and app development, 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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Machine Learning: Recent Applications

Prof. Amit Saxena
Professor, Department of CSIT, Guru Ghasidas Vishwavidyalaya, Bilaspur CG India
(An A++ Accredited Central University of India)

Machine Learning (ML) is among the most popular branch of Computer Science in general and Artificial Intelligence (AI) in particular. The major benefits of using ML include but not limited to image recognition, health care, forecasting/nowcasting, financial management, identification of water logging spots, forest fire etc. There is an unlimited number of ML applications and all being equally important and challenging. It is almost beyond imagination to count these applications as in every part of life mostly, ML or its derived applications are in existence. The stake holders include students, trainers, industrialists, doctors, engineers or many more. The presentation includes applications and a very basic but simple tour of ML techniques and algorithms used in implementing these applications.

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Precision People Counting: Utilizing Dual IR Sensors for Accurate Entry and Exit Monitoring




Wirote Jongchanachavawat[1], Noppon Mingmuang[2], Bureerak Sungkongmueng[3], Nirumol Hirunwijitporn[4], Pisit Plaikaew[5], Supachai Poumpong[6], Narongsak Wornplop[7], Pannawat Koonmee 8, Roongpraew Wiwatkamolwat[9], Wirut Jongchanachavawat[10]

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[4]Faculty of Management Science, Phetchaburi Rajabhat University, Phetchaburi, Thailand
[9]Ekamai International School, Vadhana, Bangkok, Thailand
[10]Freeland Researcher, Thanyaburi , Prathumthani, Thailand

In the original system for counting the number of people passing through a doorway, a single IR sensor was used. However, this setup faced challenges when people entered and exited simultaneously. The system could not accurately distinguish between entry and exit movements, resulting in counting errors. This research aims to improve the accuracy of people counting by employing two IR sensors instead of one. With this dual-sensor setup, the system can accurately detect the direction of movement, whether a person enters through the exit or exits through the entry. This allows for 100% accurate people counting, regardless of the direction individuals are moving, thereby solving the limitations of the previous single-sensor approach. The proposed solution ensures reliable performance in various scenarios where foot traffic flows in opposing directions.

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. Supachai Phumpuang graduated high school from Khongkaram School in 2022. Currently he is studying an Electrical Engineering at Phetchaburi Rajabhat University, He is interested in Electrical Automation such as Electrical Vehicle (EV), etc.

Mr. Narongsak Wornplop graduated from Ban Lat Wittaya School in 2022. He is currently studying an Electrical Engineering at Phetchaburi Rajabhat University. His main research interests are electrical circuit, programming to control automatic machine.

Ms. Roongpraew Wiwatkamolwat is currently studying in junior high school year (Grade11) at Ekamai International School, Bangkok. The main research areas of interest are computer engineering and AI. Roongpraew is particularly interested in developing innovative algorithms and software solutions that can enhance human-computer interactions. This includes exploring machine learning techniques, neural networks, and data analysis to create intelligent systems that can solve real-world problems efficiently. Additionally, Roongpraew is fascinated by the potential of AI to revolutionize various industries, from healthcare to finance, and aims to contribute to advancements in these fields.

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Timeons: The Master Key to Unlocking the Secret of the Universe

Ittipat Roopkom[1], Beverly F. Stout[2], Wirote Jongchanachavawat[1], Pishet Wisartpong[3], Tawatchai Mayteevarunyoo[4] and Pramote Wardkein[5]
[1]Phetchaburi Rajabhat University, Phetchaburi, Thailand
[2]BME, and independent researcher, Delta State University, Cleveland, MS, USA.
[3]Mahanakorn University of Technology, Bangkok, Thailand
[4]Naresuan University, Phitsanulok, Thailand
[5]King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand

Time is a one-dimensional entity and the fourth dimension of spacetime. It is a concept deeper than we can easily comprehend. While we can perceive one, two, and three dimensions of space, the fourth dimension of time eludes our comprehension. This article introduces the hypothesis of a new elementary particle called the "Timeon," which we propose gives rise to time in matter. Timeons exhibit both particle and wave properties, integrating with space to form a unified entity encompassing three spatial dimensions that extend throughout the universe, along with one dimension of time, referred to as spacetime.

When considering time as an axis, it behaves as a one-dimensional continuum that progresses forward along the arrow of time. A thorough analysis of all four dimensions may help us better understand the mechanisms of time hidden within the universe. Our study suggests that Timeons create time for matter and transfer energy through spacetime, converting it into gravitational force acting upon matter. This novel perspective on the existence of Timeons offers a deeper understanding of the nature of time and gravity. Therefore, Timeons may hold the key to unlocking the mysteries of the universe.

Keywords: Timeons, time, gravity.

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 obtained 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, as well as the study of the nature of time and gravity.

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Assessment of Digital Waste Management in the Baltic States and the Experience of Taiwan

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The twenty-first century was marked by intensifying processes of digitalization, transformation in the economies of countries. At the same time, a new challenge has arisen to solve digitalization processes - these are digital waste, which has acquired particular relevance in the scientific and practical fields. The adoption of the UN document "Strengthen the means of implementation and revitalize the global partnership for sustainable development" (United Nations, 2015) poses the important task of not only collecting digital waste but also recycling it. Scientists from various countries, including Kiyan, E., Ikizoglu, B (Kiyan et al. 2020), NK Singh, (Singh et al. 2020), analyze the growing influence of digital waste on the formation of a green economy in countries. The subject of the study is the factors of the formation of digital waste, and the object of the research is digital waste. Based on theoretical analysis, the authors of this research analyze the dynamics of digitalization processes in countries and the level of digital waste.

The research goal is a comparative analysis of the level of digitalization in countries and the generation of digital waste in the Baltic States and Taiwan.

Based on the concept of the triple planetary crisis (UN, 2020), the authors assess the dynamics of change in digital waste in the world by the regions, as well as in the Baltic States and Taiwan under study.

During the research process, the authors analyze the experience of the Republic of Taiwan as one of the leaders in the global economy in processing digital waste in the world (Executive Yuan, 1997) and, based on them, formulate suggestions for managing digital waste in the Baltic States.

Acknowledgments: The research supported by the Ministry of Foreign Affairs in Taiwan in 2024.

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Optimizing Room Security and Resource Management through RFID-Based Lighting Systems




Wirote Jongchanachavawat[1], Noppon Mingmuang[2], Bureerak Sungkongmueng[3], Nirumol Hirunwijitporn[4], Pisit Plaikaew[5], Supachai Poumpong[6], Narongsak Wornplop[7], Pannawat Koonmee[8], Roongpraew Wiwatkamolwat[9], Wirut Jongchanachavawat[10]

[1-3,5-8]Faculty of Engineering and Industrial Technology, Phetchaburi Rajabhat University, Phetchaburi, Thailand
[4]Faculty of Management Science, Phetchaburi Rajabhat University, Phetchaburi, Thailand
[9]Ekamai International School, Vadhana, Bangkok, Thailand
[10]Freeland Researcher, Thanyaburi , Prathumthani, Thailand

This research focuses on the application of RFID technology to enhance security in restricted access rooms. In such environments, only authorized personnel are permitted entry, and RFID is typically used to verify these individuals' credentials. To further improve security and functionality, this research explores the development of an RFID-based system that not only controls access but also automates lighting within the secure room. The RFID system is designed to automatically turn lights on when an authorized individual enters and off when the room is vacant. The research findings demonstrate a 100% success rate in controlling the lights based on authorized entry. Additionally, user satisfaction surveys indicate a high level of approval, with most users reporting a positive experience with the system. This integration of RFID for both access control and environmental management significantly enhances the security and efficiency of the controlled space.

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

Mr. Pannawat Koonmee graduated from Amphawan Wittayalai School in 2022. Currently, he is studying an electrical engineering at Phetchaburi Rajabhat University. His main interested in developing innovation technology to be better. (664653118@mail.pbru.ac.th)

Ms. Roongpraew Wiwatkamolwat is currently studying in junior high school (Grade11) at Ekamai International School, Bangkok. The main research areas of interest are computer engineering and AI. Roongpraew is particularly interested in developing innovative algorithms and software solutions that can enhance human-computer interactions. This includes exploring machine learning techniques, neural networks, and data analysis to create intelligent systems that can solve real-world problems efficiently. Additionally, Roongpraew is fascinated by the potential of AI to revolutionize various industries, from healthcare to finance, and aims to contribute to advancements in these fields. (pennyroongpraew@gmail.com)

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POSTER PRESENTATIONS

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Development of Thermal Plasma Application Carbon Material Using Anthracite

Yong-Hyun Lee[1], Kyu-Hong Kyung[1], Jeong-Mi Yeon[2], Sun-Yong Choi[2]
[1]Yeongwol Industrial Promotion Agency/Yeongwol-eup, Yeongwol-gun, Gangwon- state, Korea
[2]Cheorwon plasma research institute/ Galmal-eup Cheorwon-gun, Gangwon- state, Korea

Recently, the issue of internalization of carbon materials in response to the movement toward strategic materials for carbon materials, which are emerging as core materials for cutting-edge future industries, is greatly emerging. Gangwon-State, which has the largest coal deposits in Republic of Korea, has been driving the country's industrial development, but due to the coal industry rationalization policy, almost all coal mines have been shut out and abandoned since 1989.

Application of nanotechnology is required for innovation in future high-tech industries, and in the case of anthracite, there is a demand for conversion to high value-added materials such as artificial graphite and graphene for application in this high-tech industry.

In order to revitalize Gangwon-State's anthracite industry, which is being abandoned under the pretext of lack of economic feasibility, it is urgently necessary to transform it into a high value-added material in addition to its application as a raw material used in the current traditional industry.

In this study, we conducted to internalize resources by converting anthracite coal refined by flotation separation into carbon materials using thermal plasma method. First, raw materials with an ash content of about 30% were refined into high-quality refined anthracite coal with an ash content of about 5% through the flotation separation process. Through this, the uniformly refined anthracite coal was manufactured into graphite using dry plasma method, and the degree of graphitization was analyzed using XRD. The developed graphite showed 97% graphitization, and major impurities (Fe, Si, etc.) showed a decreasing trend.

Biography:

Ph.D Yong-Hyun Lee is currently as the regional industry innovation promotion team General Manager at Yeongwol industrial promotion agency. He is currently working on a project to build a value chain innovation platform for anthracite-based carbon nanomaterials and parts industry. His research interests are the development of materials using minerals and ceramic. And he has carried out various national R&D projects, including the development of functional ceramic materials through mineral refinement and the development of piezoelectric materials for sensors.

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Ferroelectric Properties of Lead-free Non-stoichiometric $Bi_{0.5+x}(Na_{0.78}K_{0.22})_{0.5-3x}TiO_3$ Ceramics for Energy Conversion

Jeong Ho Cho
Korea Institute of Ceramics Engineering and Technology, Korea

In order to create A-site vacancy, lead-free $Bi_{0.5+x}(Na_{0.78}K_{0.22})_{0.5-3x}TiO_3$ ceramics were synthesized by a conventional solid state reaction method.

In this paper, we investigated the dielectric and electrical properties of $Bi_{0.5+x}(Na_{0.78}K_{0.22})_{0.5-3x}TiO_3$ ceramics with an excess $Bi^{3+}$and a deficiency of Na^+ and K^+. The structure and morphology of $Bi_{0.5+x}(Na_{0.78}K_{0.22})_{0.5-3x}TiO_3$ ceramics were characterized by X-ray diffraction and field emission scanning electron microscopy. Also the temperature dependent dielectric constant and loss and the electric field dependent polarization and strain were measured.

From these results, it is found that an antiferroelectric phase can be induced through a modulation of the mole ratio of Bi^{3+}, Na^+ and K^+. A phase boundary between ferroelectric and antiferroelectric phases can be observed at ambient temperature. The antiferroelectric phase can be induced to the ferroelectric phase by an applied electric field. The stability of the induced ferroelectric phases strongly depends on the mole ratio of Bi^{3+}, Na^+ and K^+. A recoverable strain of 0.33% was achieved in $Bi_{0.5+x}(Na_{0.78}K_{0.22})_{0.5-3x}TiO_3$ ceramics.

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Evaluate the Effect of Biodegradable Super Absorbent Polymers (SAPs) on Soil Hydro-physical Properties: Special Reference to Water Conservation in Agriculture

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Efficient water management is vital for sustaining agricultural productivity and ensuring food security. Recently, super absorbent polymers (SAPs) have emerged as valuable soil amendments due to their ability to conserve water by stabilizing soil structure and enhancing soil quality. However, many commonly used SAPs are not readily biodegradable, which can result in long-term environmental pollution. This study aimed to assess the effectiveness of biodegradable SAPs as soil conditioners for addressing water scarcity in subtropical regions. Five concentrations of biodegradable Fasal Amrit polymer (EFP) (P1: 0, P2: 0.02%, P3: 0.04%, P4: 0.08%, and P5: 0.12%) were tested to evaluate their impact on soil hydraulic properties. Soil water retention curves (SWRCs) were generated, and water capacity indicators were derived using the van Genuchten model. The SWRCs showed that EFP-treated soils enhanced water retention capacity compared to the control. With increasing EFP concentrations, the infiltration rate consistently declined, from the highest in P1 to the lowest in P5. Moreover, EFP-treated soils exhibited lower hydraulic conductivity than the control. Soil aggregate stability significantly improved ($p < 0.05$) with higher EFP concentrations, as the polymer promoted better soil aggregation. These results demonstrate that EFPs can improve water retention and availability for crops by enhancing soil hydrological properties, making them a promising solution for mitigating water scarcity as effective soil conditioners.

Keywords: biodegradable, soil hydrological properties, super absorbent polymer, water retention, water scarcity

Biography:

PP Ruwanpathirana is a third-year Ph.D. candidate at the United Graduate School of Agricultural Sciences, Kagoshima University, Japan. He obtained his master's from the Faculty of Graduate Studies, University of Ruhuna, Sri Lanka, and his bachelor's degree from the Faculty of Agriculture, University Ruhuna, Sri Lanka. His research studies are mainly focused on soil and water engineering, precision agriculture, and non-destructive techniques. He has presented his findings at international conferences and published in several peer-reviewed journals, contributing to advancements in precision agriculture and soil conservation strategies.

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A Study on the Demagnetizing Factor for Predicting Magnetic Signals of the Ship Equivalent Model

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Many recent studies have made it possible to determine the demagnetizing factors of the magnetic materials of various Shape. However, in the case of the non-ellipsoid, the actual internal demagnetizing factors are distributed differently in the body, and the study is insufficient. There is also a lack of research on the demagnetizing factors of hollow cylinders. Hollow cylinders are mainly used in research on magnetic signal reduction. When a magnetic signal is felt from the outside, a magnetic field is applied and the applied magnetic field changes due to the anti-magnetic field. Therefore, it is difficult to predict magnetic signals generated externally.

Therefore, in this study, the distribution of the internal demagnetizing factors of the magnetic body was analyzed and compared with the results of the previous research. Also, new calculation method was proposed to determine demagnetizing factors of hollow cylinder model.

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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A Research on the Mutual Influence between Magnetic Materials to Reduce Magnetic Signals of Warship

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Since warships are generally made of magnetic materials, magnetic signals are generated externally by the earth's magnetic field and internal magnetic field. In order to reduce these magnetic signals, magnetic fields are applied from the outside and inside to reduce various magnetic signals. In Previous studies, generally only one magnetic material was used for reduction of magnetic signals. However, since the warship is made up of various types of magnetic materials, they are mutually influenced by the applied magnetic field.

In order to analyze demagnetization for the warship, it is necessary to analyze the hysteresis characteristics and the magnetic interaction between materials. Therefore, in this study, the magnetic interaction between the ferromagnetic materials during the demagnetization process was analyzed using Preisach model.

Biography:

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A Study on Prediction of Eddy Current Signals by Rolling of Warship

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In general, when a large magnetic flux is generated, it becomes possible to design high-performance electric devices, thereby increasing efficiency. However, in the defense field, especially in the case of the navy, the risk of attack by magnetic-sensitive mines increases because the magnetic materials constituting the ship generate magnetic field signals to the outside.

Warship are generally made of magnetic materials with electrical conductivity. While the ship is operating, the Earth's magnetic field is applied to the ship at a constant rate, but as it fluctuates due to waves, changes in magnetic flux that link the ship body occur. According to Faraday's law, eddy currents are generated and magnetic signals of eddy currents is generated externally. Therefore, research is needed on techniques for predicting eddy currents generated by vessel rolling.

In this study, a modeling technique for predicting eddy current signals of warships was proposed and the eddy current magnetic field signals generated from the equivalent model was analyzed.

Biography:

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The Effect of Shielding Plate on Induction Range

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The induction range's working coil system consists of a coil, ferrite core, and shielding plate. Since the ferrite core has a significant impact on efficiency by amplifying the magnetic field generated from the coil, research on optimal design was conducted.

The shielding plate protects the circuit by shielding the magnetic field from the board, but it also affects the overall magnetic field signal. Therefore, research is needed on the effects of shielding plates.

In this paper, first, the eddy current loss occurring in the shielding plate was analyzed by using 3D FEM(Finite Element Method) program of Maxwell 3D . Next, the effect of the thickness and air gap of the shielding plate was analyzed. By analyzing the eddy current distribution occurring in the shielding plate, an optimal design to reduce loss can be performed.

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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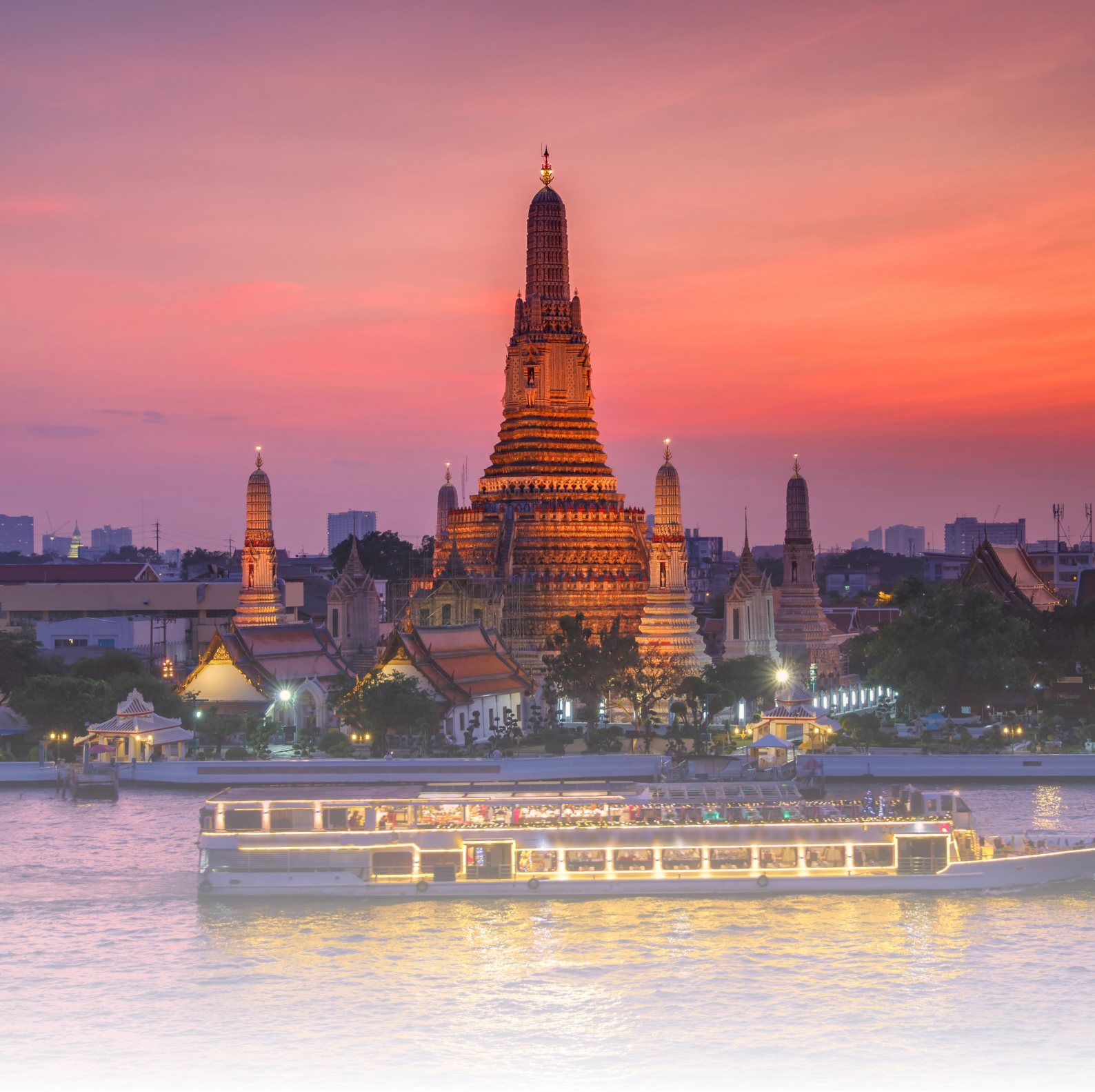

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