ICGTD

The 6th International Conference On Green Technology And Design

Reflection of Applied Artificial Intelligence in Green Technology for Sustainable Development Goals

Book of Abstract

September
26-27, 2024

itenas
Institut Teknologi Nasional

Co Host:
INTI International University
YOUR FUTURE BUILT TODAY

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ICGTD 2023 VENUE

GSG

SMART CLASS ROOM

OPENING REMARK

Assalamualaikum wr wb
Ladies and gentlemen, esteemed colleagues, distinguished guests and beloved students,

Welcome to the 6th International Conference on Green Technology and Design (ICGTD2023) hosted by Institut Teknologi Nasional Bandung (ITENAS), Bandung, Indonesia, where we gather to explore the frontiers of artificial intelligence (AI) to support the sustainable development goals. It is an honor to have you all here, united by a shared passion for innovation and the transformative potential of AI and green technology.
Over the next few days of the conference, we will delve into cutting-edge research, groundbreaking technologies, and the ethical considerations that shape our rapidly evolving landscape. Together, we will discuss how AI can address some of the world's most pressing environmental challenges while fostering collaboration across disciplines and borders. We can be part of the solution by exploring ideas through this international conference hence collective efforts can be implemented.

We sincerely thank keynote and invited speakers and all participants who have made their wonderful efforts to be part of this conference's success. We also appreciate the hard work of the organizing committee to bring in more than 80 articles to be presented in this conference, submitted by our international and domestic participants. We expect that this conference will provide a platform for multidisciplinary and interdisciplinary collaborations in the near future. We also hope that you will enjoy all of the conference sessions, and hope that we can continue learning each other for future collaboration.

Let us embrace the opportunity to share ideas, inspire one another, and forge connections that will drive our field forward for better future. Thank you for your participation and let's embark on this exciting journey together during the ICGTD 2024.

Wassalamualaikum wr wb,

Rector of Itenas
Prof. Meilinda Nurbanasari, PhD.

OPENING REMARK

Assalamu'alaikum wa rahmatullaahi wa barakaatuh,

Dear participants,

It is my great honor and privilege to welcome you all to the 6th International Conference on Green Technology and Design (ICGTD2024), hosted by Institut Teknologi Nasional Bandung (ITENAS), Bandung, Indonesia. This year's theme, "Reflection of Applied Artificial Intelligence in Green Technology for Sustainable Development Goals," challenges us to not only reflect on global issues but also take meaningful actions at the local level.

At the *international level*, the world continues to grapple with the urgent challenges of climate change, environmental degradation, and the need for a rapid transition to renewable energy sources. Artificial intelligence has emerged as a critical tool in advancing innovative solutions, from optimizing energy systems to enhancing environmental monitoring. However, we must also remain aware of AI's ethical and environmental implications, such as its energy consumption and potential biases in decision-making.

At the *national level of Indonesia*, we are at a pivotal moment. The government is pushing forward with ambitious goals to reduce emissions and accelerate the deployment of renewable energy. Yet, Indonesia faces the dual challenge of harnessing its vast natural resources while mitigating the environmental impact of its energy sector. Artificial intelligence can be a catalyst for change, optimizing the integration of renewable energy into the national grid and enhancing climate resilience across sectors.

At the *provincial level of West Java*, the region is leading in green innovation and renewable energy adoption, but much work remains to be done. West Java's commitment to sustainable urban development, reducing emissions, and protecting natural resources will require continued collaboration between government, academia, and industry. AI and green technologies have the potential to transform how we manage energy, waste, and transportation, but only through sustained effort and partnerships will we achieve long-lasting results.

This conference is an opportunity to build new collaborations that address these critical issues. With over 80 articles being presented and participants from more than five countries, I am confident that the discussions here will provide valuable insights and solutions to advance our shared goals.

I would like to extend my deepest gratitude to the keynote speakers, invited speakers, and all participants for joining us. This conference is the culmination of the hard work and dedication of many individuals, and I thank everyone who contributed to making it possible.

Once again, welcome to ICGTD2024. I hope you enjoy the conference, our campus, and the vibrant city of Bandung.

Wassalamu 'alaikum wa rahmatullaahi wa barakaatuh,

Head of LPPM ITENAS

Iwan Juwana, PhD

OPENING REMARK

Dear honorable speakers and participants,

As the Chairperson of the 6th International Conference on Green Technology and Design 2024, it is both an honor and a pleasure to extend a warm welcome to all attendees. I am honorably welcome you all to Institut Teknologi Nasional Bandung, Indonesia.

Our theme for this year's conference, "Reflection of Applied Artificial Intelligence in Green Technology for Sustainable Development Goals", with 85 papers from academic and institution in Indonesia and abroad.

I would like to express my gratitude to the Rector of Institut Teknologi Nasional Bandung, the INTI International University & College as Co-Host, Direktorat Riset, Teknologi, dan Pengabdian kepada Masyarakat (DRTPM), the Head of LPPM Institut Teknologi Nasional Bandung for supporting us. I would also like to thank the organizing committee and volunteers who have worked tirelessly to make ICGTD 2024 a reality.

May your participation in this conference be both professionally enriching and personally rewarding. Thank you for being part of this journey towards a greener and more sustainable future.

Regards,

Chairperson of ICGTD 2024

Dr. Arsyad Ramadhan Darlis, S.T., M.T.

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CONFERENCE PROGRAM

ICGTD 2024

Time	Agenda
26th September 2024, Thursday Place: Main Hall- GSG Bale Dayang Sumbi Itenas Topic: ICGTD 2024 Day 1 Join Zoom Meeting https://us06web.zoom.us/j/81003842226?pwd=86KaNT8xNXFbtFXbHP7xqh4HQW6p2K.1 Meeting ID: 810 0384 2226 Passcode: 832500	
08:00 – 08:10	**Opening Ceremony** **Place: GSG** Welcoming remark by master of ceremony
08:10 – 08:20	**Welcoming remark** Organizing committee chair **Dr. Arsyad Ramadhan Darlis, M.T..**
	Welcoming remark Head of LP2M Itenas **Iwan Juwana, S.T., M.EM., Ph.D.**
	Welcoming Speech and Opening Rector of Institut Teknologi Nasional Bandung (Itenas) **Prof. Meilinda Nurbanasari**
08:20 – 09:55	**Keynote speech** **Dr. Chan Choon Kit** (INTI International University & College, Malaysia) Moderator: Dr. sc. Lisa Kristiana Halim.
09:55-10:10	**Coffee Break**
10:10 – 11:00	**Invited speaker 1** **Dr. Ekbordin Winijkul.** (Asian Institute of Technology (AIT), Thailand)

<table>
<tr><th>Time</th><th colspan="2">Agenda</th></tr>
<tr><td></td><td colspan="2">Moderator: Dr. Eng. Didin A Permadi.</td></tr>
<tr><td>11:00 – 11:50</td><td colspan="2">Invited speaker 2
Prof. Andi Adriansyah
(Universitas Mercubuana, Indonesia)
Moderator: Fahmi Arif, Ph.D.</td></tr>
<tr><td>11:50 – 13:00</td><td colspan="2">Lunch break (GSG)</td></tr>
<tr><td></td><td colspan="2">Parallel session (Smart Class Room and GSG)
(zoom breakout room to be announced later through the zoom main session)</td></tr>
<tr><td>13:00 – 17:00</td><td>Parallel session 1:
Geo-spatial Technology for Sustainable DevelopmentRoom:
Smart Classroom-1

Moderator:
Dr. Sitarani Safitri (BRIN)

Presenters:

1. (13:00-13:20) Sandi Ronggo Panji and Sugiarto Sugiarto
| Implementation of the Backpropagation Algorithm for Predicting Relative Humidity in Digital Surface Weather Observation System|

2. (13:20-13:40) Muhammad Iqbal Habibie and Nety Nurda
| Geo-Spatial Monitoring of Vegetation Dynamics Using Multi-Index Analysis for Sustainable Development|
3. (13:40-14:00) Defrianto Defrianto and Dewi Kania Sari
| Mapping Landslide Susceptibility in West Bandung Regency Using Artificial Neural Network (ANN) Method|

4. (14:00-14:20) Gusti Ayu Jessy</td><td>Parallel session 2:
Green Information and Communication Technology
Room: Smart Class Room 2

Moderator:
Dr. Susmini (Unikom).

Presenters:

1. (13:00-13:20) Gaby H Abou Haidar, Roy Abi Zeid Daou, and Mohamad Rahal
| Smart Agri-SprayBot |
2. (13:20-13:40) Anung Andi Hidayatullah, Hari Purnomo, Hartomo Soewardi, Imam Djati Widodo
| Conceptual Framework for Sustainability in Chili Processing MSMEs |
3. (13:40-14:00) Joni W. Simatupang and Fernando Fernando
| Design Implementation of IoT-Based Power Control and Monitoring System in Transformer Production Area of PT Hexta Integral Technology |
4. (14:00-14:20) Marisa Premitasari and Ilham Ramadhan
| Supply and Demand Forecast in UMKM Using Moving Average Technologies |</td></tr>
</table>

Time	Agenda	
	| Integrating Laser Scanning Technologies for High-Resolution Cave Mapping: A Comparative Approach| 5. **(14:20-14:40)** *Dian Noor Handiani* | Coastal Vulnerability Index: Assessing Vulnerability to Various Sea Level Scenarios in the Northern Coast of Bekasi Regency, West Java-Indonesia| 6. **(14:40-15:00)** *Soni Darmawan and Rika Hernawati* | Investigating the Accuracy of Land Cover Mapping Derived from Automatic Features Extraction System (AFES) Using Deepness and Mapflow Applications | 7. **(15:00-15:20)** *Rika Hernawati and Soni Darmawan* | Estimation of Oil Palm Canopy Height Based C-Band SAR |	5. **(14:20-14:40)** *Himma Dewiyana and Alif Akbar Saragih* | Implementation of Green Information Communication Technology at Universitas Sumatera Utara Library | 6. **(14:40-15:00)** *Refriyan Adrianto* | Weighted Naive Bayes for Imbalanced Data Classification on Palm Oil Fruit Maturity | 7. **(15:00-15:20)** *Muhammad Fahri Muharam, Fahrul Nurfadillah Arsyad, Esa Fallah Royani, Lita Lidyawati* | Revolution Agriculture Maggot AI Ecosystem: Implementation of Artificial Intelligence to Maximize Agricultural Production by Utilizing Maggot as a Fertilizer Source | 8. **(15:20-15:40)** *Meliza Syafita* | Designing Interactive Counselling Services for Higher Education Students| 9. **(15:40-16:00)** *Kurnia Ramadhan R Putra and Sandi Yusup Sinaga* | Analysis of the Effect of User Experience on the Success of the Grab Application Using the Delone and McLean Model| 10. **(16:00-16:20)** *Nur Fahrudin* | Analysis of the Influence of Brand Image, Trust, and User Satisfaction on Xiaomi Brand Customer Loyalty|
	Parallel session 3: **Green Energy** ***Room:*** *Smart Class Room 3* **Moderator:** Dr. Eng. Mohammad Aziz Mahardika. **Presenters:**	**Parallel session 4:** **Smart Materials and Adaptable Design** ***Room:*** *Smart Class Room 4* **Moderator:** Maharani Dian Permanasari, M.Phil., Ph.D. **Presenters:**

Time	Agenda	
	1. **(13:00-13:20)** *Wara Dyah Pita Rengga, Muhammad Ibnu Khawariz, Sutikno Madnasri and Urwatun Wusko* | Zeolitic Imidazole Frameworks Synthesis by Solvothermal Process as Battery Anode Material | 2. **(13:20-13:40)** *Danang Adi Setiaji, Subiakto Sukarno and Agus P. Sari* | Development Municipal Solid Waste (MSW) into Waste to Energy (WTE) Considering Carbon Credit Scheme| 3. **(13:40-14:00)** *Catur Rini Widyastuti, Wara Dyah Pita Rengga, Anggit Wijaya, Oktalina Putri Sandiani and Dinda Adelia Fauzi* | Biodiesel Synthesis Through Green Processes Using Lipase Immobilized on Carbon| 4. **(14:00-14:20)** *Dini Fauziah* | Diagnosis Condition of Sf6 Gas on Circuit Breaker and Sealing End Based on Purity Value, Moisture Content and Dew Point| 5. **(14:20-14:40)** *Megawati Megawati, Widi Astuti, Zuhriyan Ash Shiddieqy Bahlawan, Forita Dyah Arianti, Agung Prabowo, Nabila Nabila, Brilliyani Shafura Aftisyah, Listya Suci Ramdhani, Sri Devi Eudia Pamusok and Daffa Zamiira Pradana* | Kinetics of Separate Hydrolysis and Fermentation of Cow Rumen and Rice Straw in Bioethanol Production| 6. **(14:40-15:00)** *Jono Suhartono* | Concentrating Fresh Milk by Forward Osmosis Using Molasses as Draw Solution| 7. **(15:00-15:20)** *Tarsisius Kristyadi* | Development of Gas Engine Power Plant of Small Island in Indonnesia Case Study on Sumba Island|	1. **(13:00-13:20)** *Siti Azira Abd Rahim, Ts.* | The Green Technology Adaptation of Digital Documentation for Heritage Building Conservation; Case Study of Masjid Lama Parit Istana, Kuala Pilah| **2. (13:20-13:40)** *Aldrian Agusta Rahim* | Visual Identity and Environmental Graphics in Coffee Plantations: The Uncle Fly Experience| 3. **(13:40-14:00)** *Ananda Ahnaf Wandina Putri and Rosa Karnita* | The Valuable Effects of Busy Books as Educational Media for Children with Autism Spectrum Disorder| *4.* **(14:00-14:20)** *Putri Yudianita* | Compact Packaging Design Exploration of Therapeutic Colouring Books for Students in Higher Education| 5. **(14:20-14:40)** *Shirley Wahadamaputera, Wahyu Buana Putra and Joudy George Bitty* | An Effort to Preserve Cultural Building Through Digital Documentation: Case Study Roof Maintenance of Tongkonan House Tandung Nanggala Sulawesi, Indonesia| 6. **(14:40-15:00)** *Maharani Permanasari* | PELÜK - Deep-Touch-Pressure (DTP) Sensory Vest to Reduce Anxiety for Students with Particular Learning Difficulties|

Time	Agenda	
	8. **(15:20-15:40)** *Nuke Lydiaa and Riny Yolandha Parapat* | Improving Penetration and Softening Point of Asbuton Asphalt by Adding of Nano TiO2, Nano Mineral, and Nano Styrene-Butadiene Rubber (SBR) from Waste Tires|	
	Parallel session 5: **Sustainable Infrastructure and Environment*Room:*** *Smart Class Room 5* **Moderator:** Ratih Nurjayati, M.T (BRIN) **Presenters:** 1. **(13:00-13:20)** *Arief Irfan Syah Tjaja* | Model of Suppy Chain Collaboration of Fresh Vegetable Agroindustry: A Systematic Literature Review and Research Agenda| 2. **(13:20-13:40)** *Eka Wardhani, Khaila Nastiti and Athaya Zahrani Irmansyah* | Use of the Water Quality Index Method in Assessing Groundwater Quality Around the Sarimukti Landfill| 3. **(13:40-14:00)** *Widi Astuti, Irene Nindita Pradnya, Triastuti Sulistyaningsih, Megawati Megawati, Mohammad Faizal Widi Hidayat, Muthi'ah Kurnia Rahmah, Luluk Arvi Cahyaning Suwandi, Afifah Sagita Fitria Wati, Zulfa Ajrina Fitri* | Moringa Oleifera Seed Waste Based-Activated Carbon as an Efficient Adsorbent for Dye Removal| 4. **(14:00-14:20)** *Adie Taufiqurrahman*	**Parallel session 6:** **Research Funding** ***Room:*** *GSG Lantai 2* **Moderator:** Dr. Eng. Didin A Permadi **Presenters:** 1. **(13:00-13:20)** *Erma Desimaliana and Euneke WS Widyaningsih* |The Effect of Curing Method on Geopolymer Concrete Compressive Strength| 2. **(13:20-13:40)** *Mustika K. Wardhani* | 'Re-Architecture-Ing' Traditional Markets in Post-Pandemic Era: Perspective from Aging Community| 3. **(13:40-14:00)** *Badriana Nuranita* | The Evaluation of Upper Structure Performance for Through-Type Callender Hamilton (CH) Modular Steel Bridge| 4. **(14:00-14:20)** *Alfan Ekajati Latief and Muhammad Pramuda, Noviyanti Nugraha* | Design of 60 kg/Hour Pineapple Fiber Reel Type Chopping Machine in the CVT Composite Manufacturing Process| 5. **(14:20-14:40)** *Inko Sakti Dewanto* | Modern Visuality in Indonesian Pop Music Album Covers of the 1980s| 6. **(14:40-15:00)** *Novrizal Primayudha, Imam Santosa and Achmad H Destiarmand, Achmad Syarief.*

Time	Agenda	
	| Hydrochemical Characteristic of Surface Water in Upstream Watershed Citarum River, Bandung Regency|	| An Investigation of Jami Muntok Mosque, the Sustainability Religious Building in Tin Mining Town, Bangka, Indonesia|
	5. **(14:20-14:40)** *Shafa Maharani and Iwan Juwana* | Watershed Pollution Control Strategy Against Accommodation Capacity of Sector Pollution Load Domestic in Cimanuk Indramayu Watershed|	7. **(15:00-15:20)** *Noveryna Reztrie and Ratu Sonya Mentari Haerdy* | The Relationship Between Personal Characteristics, Housing Characteristics, and Green Behavior on Energy Efficiency, Case Study: Houses of Y and Z Generation in Bandung|
	6. **(14:40-15:00)** *Farhan Bagus Adhari and Iwan Juwana* | Analysis of Residual Chlorine Distribution in Sigajah Drinking Water Supply System of PDAM Tirta Aji|	8. **(15:20-15:40)** *Riny Yolandha Parapat* | Sustainable and Efficient Conversion of Waste Lubricating Oil into Diesel-Like Fuel Using Green Synthesized FeNi/TiO2 Nanocatalyst|
	7. **(15:00-15:20)** *Arief Irfan Syah Tjaja* | Model of Supply Chain Collaboration of Fresh Vegetable Agroindustry: A Systematic Literature Review and Research Agenda|	9. **(15:40-16:00)** *Mohamad Rangga Sururi* | Absorbance Spectral Slopes of CDOM and Inorganic Nitrogen for Monitoring Shallow Ground Water Quality in Urban Setting|
	8. **(15:20-15:40)** *Dinda Dwi Paramita and Iwan Juwana* | Assessment of the Potential Application of the 4Rs (Reduce, Reuse, Recycle, Recovery) at Bakery Factory X in Bandung City|	10. **(16:00-16:20)** *Noviyanti Nugraha* | Infrastructure of Solar System for Performance Analysis Coating Monocrystalline Photovoltaic Module 50Wp|
		11. **(16:20-16:40)** *Galih Ashari Rakhmat, Muhammad Ichwan, Ramzi Syuhada, Shandy Handika and Faruq Muhammad* | Package Delivery Game Application Based on Prototype of Bicycle Simulator|

Time	Agenda
27th September 2024, Friday Place: Main Hall- GSG Bale Dayang Sumbi Itenas Topic: ICGTD 2024 Day 2 Join Zoom Meeting https://us06web.zoom.us/j/86731063650?pwd=bn6YFpOXLefntx4MmlLF5bNB6wjuNY.1 Meeting ID: 867 3106 3650 Passcode: 056765	
08:00 – 09:00	**Parallel session** **Place: GSG, 2nd floor**
	Parallel session 1: **Research Funding** ***Room:*** *GSG, 2nd floor* **Moderator:** Dr. Dr. Eng. Didin A Permadi **Presenters:** 1. **(08:00-08:20)** *Mohamad Rangga Sururi* | Improvement of Operational Systems in Drinking Water Treatment Plants Based on Climate-Resistant Drinking Water Safety Plans (RPAM) | 2. **(08:20-08:40)** *Soni Darmawan and Rika Hernawati* Development Urban Heat Island Application System Using Google Earth Engine (GEE) | 3. **(08:40-09:00)** *Agustina Kusuma Dewi, Ganis Resmisari, Iyus Kusnaedi, Adi Surahman, Shiddiq Bi'tsatulfathi Syaiful Karim, Moh. Arief Mawaskito* | The Cultural Modality in Garin Nugroho's Art Film "Setan Jawa" in Constructing National Ideology in the Era of Society 5.0 |
09.00-09.05	**Opening** Welcoming remark by master of ceremony

09:00 – 10:00	**Invited Speaker** **Prof. Waluyo** (Institut Teknologi Nasional Bandung, Indonesia) Moderator: Fahmi Arif, Ph.D	
10:00-10:15	**Coffee Break**	
10:15 – 11:00	**Invited Speaker** **Dr. Judhi Prasetyo.** ((Middlesex University Dubai, United Arab Emirates)) Moderator: Fahmi Arif, Ph.D	
11:10 – 13:00	**Lunch**	
13:00 – 13:45	**Keynote speaker** **Prof. Anton Satria Prabuwono.** (King Abdulaziz University, Arab Saudi) Moderator: Fahmi Arif, Ph.D	
	Parallel session (Smart Class Room, ITENAS Library and GSG) *(zoom breakout room to be announced later through the zoom main session)*	
14:00 – 16:00	**Parallel session 1:** **Research Funding** ***Room:*** *GSG 2nd Floor* **Moderator:** Iwan Juwana, Ph.D **Presenters:** 1. **(14:00-14:20)** *Mohamad Arif Waskito* | Utilization of Digital Technology in Improving Visual Innovation of Laminated Bamboo in Cultural Products "Kelom Geulis" | 2. **(14:20-14:40)** *Waluyo Waluyo* | Study on Early Stage Solar Cell and Thermoelectric Combination Power Generation in Various Time of Day |	**Parallel session 2:** **Green Information and Communication Technology-1** ***Room:*** *Smart Class Room 2* **Moderator:** Dr. Selvi Lukman (BINUS). **Presenters:** 1. **(14:00-14:20)** *Liman Hartawan, Galih Ashari Rakhmat, Noviyanti Nugraha, Nuha Desi Anggraeni, Muhammad Iqbal, Bramantio Syahrul Alam, Junior Al Fani, Muhammad Ilyas Al-Fadhlih and Keindra Bagas Maulana* | Design of IoT-Based Greenhouse Temperature and Humidity Monitoring System| 2. **(14:20-14:40)** *Kurnia Ramadhan R Putra, Sofia Umaroh, Asep Rizal Nurjaman, Deprinda Widia* | Application of Design Thinking Method with UEQ and Heuristic Evaluation for Website UI/UX Improvement and Evaluation|

	3. **(14:40-15:00)** *Didin Agustian Permadi, Aristian Nurfauzi and Taufik Rizki Ramadhan* | Evaluation of the Weather Research Forecast Model Performance During Air Pollution Episodes in Jakarta | 4. **(15:00-15:20)** *Raden Budiraharjo, Mira Barmawi, Carissa Adnyana Putri Radja* | Triple Exponential Smoothing and Random Forest Algorithms for a Hybrid Risk Forecasting by Using Weighted Event Data | 5. **(15:20-15:40)** *Juarni Anita, Dwi Kustianingrum, Ratu Sonya Mentari Haerdy and Locita Prajna* | Government and Community Responses for Sustainability of Flood-Prone Village in Lamajang Peuntas, Dayeuhkolot, Bandung Regency, West Java Province, Indonesia | 6. **(15:40-16:00)** *Hary Nugroho and Dewi Kania Sari* | Landslide Susceptibility Assessment Based on Random Forest Machine Learning Algorithm Using Rare Training Samples, Case Study Bandung District, West Java Province, Indonesia| 7. **(16:00-16:20)** *Sofia Umaroh and Kurnia Ramadhan R Putra* | Knowledge Representation of Researcher Profiles in Higher Education Using Ontology and Knowledge Graph | 8. **(16:20-16:40)** *Indra Noer Hamdhan, Rahma Welan Ulfaida and Aurora Dwipantara* | Slope Stability Modeling with Recycled Plastic Pin Material Reinforcement Using 3D Model Approach|	3. **(14:40-15:00)** *Jasman Pardede and Andika Wahyu Syaputra* | Structured Pruning Utilizing DepGraph with L2 Norm to Reduce the Number of CNN Parameters| *4.* **(15:00-15:20)** *Hendi Handian Rachmat and Ilham Ramadhan* | Development of a Telemedicine System for Real-Time Core Body Temperature Monitoring in Parkinson's Patients| **(15:20-15:40)** *Mohammad Noer Fadhilah* | Short-Time Fourier Transform for Audio Conversion in Music Genre Classification Using Inception V3| 5. **(15:40-16:00)** *Ratna Susana, Arya Padmadi Purwasunu, Lita Lidyawati Lita* | Application of the Fuzzy Logic System for Avoidance Obstacle on Mobile Chain Wheel Robot|

9. **(16:40-17:00)** *Maya Musadi* | Simulation of Used Oil Integrated Fractionation Pyrolysis Process Characteristics Using Computational Fluid Dynamics (CFD)|	
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1. Implementation of the Backpropagation Algorithm for Predicting Relative Humidity in Digital Surface Weather Observation System - *Sandi Ronggo Panji, Sugiarto Sugiarto*

The bread production process at Bakery Factory X produces solid, liquid, and gaseous waste. The factory has implemented waste management principles by reusing and recycling some of its waste. This factory has the potential to carry out other waste management, such as reducing waste (reduce) and restoring the production process and work environment (recovery) to create quality improvements in environmental aspects, product quality, and employee safety. Therefore, in this study, the preparation of a mass balance and evaluation of the production process and work environment of Bakery Factory X was carried out to determine alternative 4R (reduce, reuse, recycle, recovery) applications that are suitable for implementation at Bakery Factory X by considering the advantages and disadvantages based on technical, economic, and environmental aspects. The reduce principle can be applied by reducing the length of the kopyor bread packaging. The principle of reuse has been applied by reusing the remaining dough, kopyor, and the remaining slices of kopyor bread. The principle of recycling can be done by selling expired bread to breeders and the remaining packaging to collectors and waste banks for recycling. The recovery principle can be carried out by using room heaters and humidifiers in the fermentation room, using masks for all employees, increasing the number of racks for baking trays, using anti-slip shoes for all employees, using automatic bread cutting tools, using automatic bread packaging tools, using plastic curtains for the entrance, cooling room, slicing, and packaging rooms, cleaning production equipment using soap and hot water, building a communal WWTP to treat wastewater from the Babakan Rahayu Bread Center, also sorting and using waste containers.

2. Investigating the Accuracy of Land Cover Automatic Features Extraction System Using Deepness and Mapflow Applications on Unmanned Aerial Vehicle Aerial Photo Data - *Soni Darmawan, Rika Hernawati*

Large-scale base maps on 1:1,000 and 1:5,000 scales are essential on spatial planning in Indonesia. Actually until now, only 3-5% of the area in Indonesia covered large-scale basemap. This years Indonesian government have plan to make large scale base maps for whole Indonesian area. However manual digitization or stereoplotting from satellite imagery or aerial photography data extracts features such as buildings, roads, and vegetation, is very timeconsuming and not economic. Automatic feature extraction system (AFES) has become popular with applications such as Deep Neural Remote Sensing (Deepnees) and Mapflow, which use deep learning approach techniques. The Objective is study is to investigate the Accuracy of Land Cover Mapping Derived from an Automatic Features Extraction System (AFES) Using Deepness and Mapflow Applications on unmanned aerial vehicle (UAV) data. The result of this study is an semantic accuracy for Deepness of 88% while Mapflow of 91% accuracy. The Deepnees application also has a geometric

accuracy of RMSEr of 0.915 m for buildings, 1.183 m for roads, and 1.375 m for vegetation, while Mapflow has an RMSEr accuracy of 0.834 m for buildings, 2.121 m for roads, and 0.582 m for vegetation.

3. **Integrating Laser Scanning Technologies for High-Resolution Cave Mapping: A Comparative Approach** - ***Gusti Ayu Jessy Kartini, Irwan Gumilar, Muhammad Rasendriya Nabil Nugany***

This study focuses on the comparative analysis and integration of four distinct scanning technologies: Medium-Range Terrestrial Laser Scanners (TLS-MR), Short-Range TLS (TLS-SR), Solid-State LiDAR (SSL), and Structured Light Scanners (SLS). The goal is to evaluate their performance in accurately capturing cave environments, which pose unique challenges due to irregular geometry, limited accessibility, and variable lighting conditions. Data integration was conducted using cloud-to-cloud registration, utilizing natural point features to align datasets. Results show that while SSL offers broader area coverage, it produces higher Root Mean Square Error (RMSE) compared to SLS, which provides denser point clouds. The integration of SLS with TLSSR delivered the most accurate and detailed results, making this combination ideal for environments requiring precise surface feature documentation. This research highlights the strengths and limitations of each technology, offering insights into their optimal application for 3D cave mapping, supporting geological and archaeology research.

4. **Coastal Vulnerability Index: Assessing Vulnerability to Various Sea Level Scenarios in the Northern Coast of Bekasi Regency, West Java-Indonesia** - ***Dian Noor Handiani, Aida Heriati***

The northern coast of Bekasi Regency, West Java, Indonesia, faces increasing environmental 10 degradation due to extensive land use, unsustainable resource extraction, and climate change. This has led to coastal 11 erosion, accretion, pollution, flooding, and land subsidence. Our study assessed future sea-level rise scenarios for 12 the year 2100 along this coastline using a weighted Coastal Vulnerability Index (CVIw), considering factors such 13 as coastal relief, morphology, shoreline change, tidal range, wave height, land subsidence, and land use. Results 14 showed that vulnerability varied across the region. Segarajaya village, for instance, remained low in vulnerability 15 due to its dominant mangrove and swamp land use and rocky, cliffed morphology. In contrast, most villages, from 16 the north to the south of Bekasi Regency, exhibited increasing vulnerability, ranging from low to very high. These 17 findings highlight the growing vulnerability of local coastlines to rising sea levels and offer practical insights for 18 decision-makers in developing effective adaptation and mitigation strategies.

5. **Mapping Landslide Susceptibility in West Bandung Regency Using Artificial Neural Network (ANN) Method** - ***Defrianto Defrianto, Dewi Kania Sari***

Landslides are among the most costly natural disasters, particularly in areas with steep topography. West Bandung Regency, located in West Java Province, is highly vulnerable to landslides. This study applied Artificial Neural Network (ANN), a machine learning algorithm, to map landslide susceptibility in the region. Eleven factors used as predictors in the models, included elevation, slope angle, plan and profile curvatures, terrain ruggedness index (TRI), topographic position index (TPI), topographic wetness index (TWI), soil types, land use, NDVI, and rainfall. The ANN model was developed using Python, and its performance was evaluated through accuracy assessment using Confusion Matrix (CF), ROC, and AUC scores. The model achieved an accuracy of 0.72 for train-test data and 0.55 for validation data. ROC-AUC scores of 0.786 and 0.776 were obtained for train-test and validation, respectively. Landslide susceptibility was classified into five categories: very low (28.88%), low (44.86%), moderate (7.52%), high (18.73%), and very high (11.88%). The results demonstrate that ANN is an effective method for landslide susceptibility mapping.

6. **Geo-Spatial Monitoring of Vegetation Dynamics Using Multi-Index Analysis for Sustainable Development**- ***Muhammad Iqbal Habibie, Nety Nurda***

This study uses important indicators such as NDVI, EVI, SAVI, GNDVI, and NDWI to investigate the usefulness of GIS technologies for monitoring vegetation health across several land-use categories, including forests, agricultural, and urban areas. Each index provides specific information on plant qualities such as density, vigor, soil brightness, and moisture content. The temporal study demonstrates considerable seasonal variation in vegetation indices, with greater NDVI and GNDVI values suggesting fast development during the planting season and higher NDWI values during the rainy season. SAVI and EVI are effective at detecting early crop growth when considering soil exposure and canopy development. SAVI and EVI monitor early crop growth from days 73 to 105 of the planting season, accounting for soil exposure and the appearance of the first canopy. The NDVI and GNDVI readings increase later in the growth season, between days 233 and 297, indicating fast development and increased photosynthetic activity as plants mature. Crop health and water stress may be properly established by carefully monitoring these vegetation indicators throughout time, allowing for more exact tracking of growth cycles. This study helps to build sustainable policies and preserve ecosystems by incorporating these technologies into more comprehensive frameworks for environmental management. To ensure a sustainable future, expanded environmental monitoring and management measures, as well as further developments in geospatial technology, are required.

7. Estimation of Oil Palm Canopy Height Model (CHM) Based on Age Using C-Band SAR - *Rika Hernawati, Soni Darmawan*

Oil palm canopy height is an indicator of tree growth and health, and it contributes to plantation productivity. Canopy height can be estimated using Interferometric Synthetic Aperture Radar (InSAR) technology. The aim of this study is to develop the oil palm canopy height estimation based on InSAR Sentinel-1A data. The study area is in Asahan Regency, which is an oil palm plantation area managed by PT. Perkebunan Nusantara (PTPN) III Sei Dadap Plantation. The data include two Sentinel-1A with acquisition on November 14, 2022, and November 26, 2022, DEMNAS for DEM data, and 160 points of tree canopy height for each oil palm age block from age of 0.5 to 22 years. The methodology includes preprocessing, interferogram generation, phase unwrapping, conversion to height, and calculation of canopy height model. The results showed the area of canopy height has value from 0 to 84.75 meters, has a positive linear correlation (y = 0.8427x + 2.7142 and R2 = 0.94) with the age of oil palm trees. CHM with InSAR offers a reliable and flexible approach for monitoring oil palm farms, providing useful insights for plantation management and decision-making. Although the InSAR technique has shown promising results, there is a requirement for additional improvement in data processing and model calibration to increase accuracy, especially in areas with complex vegetative structures.

8. Urban Heat Island (UHI) Application Development Using Google Earth Engine (GEE) - *Soni Darmawan, Rika Hernawati*

The Urban Heat Island (UHI) phenomenon has been seriously studied by climate scientists globally, including in Indonesia. Indonesia government need to identify and to monitor urban heat island (UHI) for disaster mitigation. However need techmology for identification and monitoring UHI for whole Indonesian area. The use of geospatialbased artificial intelligence (GeoAI) technology shows great potential in fast and efficiently identifying and monitoring large areas. Although there has been a significant quantity of studies carried out on artificial intelligence, the use of GeoAI to discover and monitor Urban Heat Island (UHI) occurrences in Indonesia is still limited. The objective of this study is to develop application system for identification and monitoring UHI in Indonesia area. This application will utilize Google Earth Engine to track UHI occurrences in Indonesia between the years 2003 and 2023. The research approach includes every step of design development, data gathering and processing, application development, testing, and visualization of Urban Heat Island (UHI) phenomenon in Indonesia. This work has led to the development of a system application for monitoring Urban Heat Island (UHI) occurrences in Indonesia. The development of this application was carried out with a focus on improving functionality that allows users to select a specific time range and location. Thus, this application has succeeded in answering user needs to obtain UHI visualization in the desired time period. The UHI visualization is shown on a dashboard using Earth Engine Apps, which can be accessed at the website https://bit.ly/UHI_ITENAS-2024.

9. Landslide Susceptibility Assessment Based on Random Forest Machine Learning Algorithm Using Rare Training Samples, Case Study Bandung District, West Java Province, Indonesia - *Hary Nugroho, Dewi Kania Sari*

Landslides are a recurring natural disaster that frequently affects regions with steep terrain or mountainous areas. This phenomenon manifests globally, causing numerous casualties and fatalities along with extensive damage to property and infrastructure. Addressing this issue necessitates the prediction and risk assessment of landslides, coupled with effective disaster mitigation measures, aiming to minimize both human and material losses. In the assessment of landslide vulnerability, the prevailing approach involves the application of machine learning methods.

While machine learning is widely recognized as an effective statistical approach that produces precise classification outcomes when trained on expansive datasets, it encounters a common challenge related to the scarcity of soil samples from landslides and the intricacies of data distribution, where the boundaries between landslide and non-landslide points overlap. This results in classification outcomes that are less dependable. Such challenges are particularly prominent in regions with limited occurrences of landslides, where obtaining information about landslide-prone areas is essential for disaster mitigation and public safety, notably in the context of building permits. To tackle these challenges, this study employs an experimental approach, classifying areas prone to landslides using a restricted number of training samples ranging from 20 to 200 samples for both landslide and non-landslide areas. The variation in the number of training samples is designed to offer insights into the minimum quantity required to develop a machine learning algorithm capable of providing accurate classification outcomes.

Additionally, feature importance is determined in this study to identify the key features contributing to the development of the machine learning algorithm. The chosen machine learning algorithm is Random Forest. The study is carried out in Bandung distric, West Java Province, Indonesia, utilizing vegetation density from Sentinel 2A satelite image, rainfall, landuse, soil type, lithology, and land slope data. All classification outcomes are validated against 120 landslide points excluded from the training process.

The findings reveal that the minimum number of training samples yielding satisfactory results is 50 for both landslide and non-landslide areas. The obtained training accuracy is 73%, with a validation accuracy of 72%, precision of 82%, recall of 75%, and an F1 score of 72%. Meanwhile, the feature importance obtained was different for each dataset, namely rainfall (dataset 20), rainfall, slope and vegetation density (dataset 50), slope (dataset 100) and slope and vegetation (dataset 200).

Green Automation

10. Conceptual Framework for Sustainability in Chili Processing MSMEs - Anung Andi Hidayatullah, Hari Purnomo, Hartomo Soewardi, Imam Djati Widodo

This study develops a conceptual framework for promoting sustainability in the chili processing sector in Garut Regency, with a focus on policy development, stakeholder collaboration, and technology integration. The framework highlights the critical role of technology, particularly the Internet of Things (IoT), which facilitates real-time environmental monitoring. Digital platforms are utilized to improve communication and resource sharing among government entities, enterprises, and educational institutions. Additionally, the framework incorporates Artificial Intelligence (AI) and Learning Management Systems (LMS) to optimize resource utilization, streamline operations, and support data-driven decisionmaking. The integration of these technologies fosters a sustainable and resilient industry, providing significant benefits to both the local economy and the broader community.

11. Design Implementation of IoT-Based Power Control and Monitoring System in Transformer Production Area of PT Hexta Integral Technology - *Joni W. Simatupang, Fernando Fernando*

The idea of making a prototype power control and monitoring system based on the Internet of Things (IoT) at PT Hexta Integral Technology emerged from thinking about Indonesia's electricity consumption hich has reached 1,172 kWh/capita in 2022. The prototype was made as a simple illustration of reducing electricity consumption as well as increasing efficiency automatically. We have conducted a test of electricity usage for 5 days with a control system producing 63.6 kWh of energy usage at a rate of Rp 91.882.91 compared with a non-controlled system generating 75.43 kWh with a price of Rp 108.973.72. From the results, we can summarize that there has been an efficiency in electricity usage. Nevertheless, this cannot be compared in a balanced way due to the small differences in size of the wire, the many minor rolls, and the model of the trafo roll (part of the research limitation). As a follow-up, we suggest to adding fire detection sensor as fire safety and motion sensor for anti-thief to optimize IoT functionality. Despite this, the cost of components still remain as a major concern for researchers.

Green Building

12. The Relationship Between Personal Characteristics, Housing Characteristics, and Green Behavior on Energy Efficiency, Case Study: Houses of Y and Z Generation in Bandung - *Noveryna Reztrie and Ratu Sonya Mentari Haerdy*

In recent years, attention to energy consumption in the residential sector has increased sharply. This is in line with the increasing use of building performance simulations to be able to predict the amount of operational energy needed. However, the building performance calculations were found to have gaps with actual energy consumption figures. Building user behavior is considered to be one of the main factors causing this gap. On the other hand, currently Indonesia has the largest population of generations Y and Z. Some data shows that the projected number of generations Y and Z population in Indonesia will continue to increase until 2050. This indicates that these two generations will be the main actors who use buildings for decades to come. This research was conducted to find out the current conditions in Indonesia, especially the Greater Bandung area, regarding the behavior of generations Y and Z in residential areas and the amount of operational energy required. The research will be carried out in two stages, namely the first stage (descriptive and exploration of the phenomena that occur) is carried out by identifying significant similarities or differences between the 2 population groups. Then the second stage (confirmation stage) is carried out by identifying associations between variables which are then compiled into a conceptual hypothesis model of energy efficiency in residential homes based on case studies. By conducting this research, it is hoped that it can provide an overview of the factors that can play an important role in the relationship between building user behavior and the resulting energy consumption. Apart from that, the results of this research will also be useful for residential sector stakeholders to be able to create appropriate policies to support the implementation of efficient residential energy use.

13. Advancements in Green and Self-Healing Concrete - *Yuli Panca Asmara, Firda Herlina*

Green and self-healing concrete represent innovative advancements in the construction industry, addressing both sustainability and durability concerns. Green concrete incorporates eco-friendly materials such as recycled waste products and industrial by-products, significantly reducing the environmental footprint associated with traditional concrete production. Self-healing concrete, on the other hand, utilizes advanced technologies to autonomously repair cracks and damages, thereby extending the lifespan of concrete structures and reducing maintenance costs. This paper reviews the latest developments in green and self-healing concrete technologies, evaluating their potential to meet current and future infrastructure challenges. By examining case studies and experimental data, we highlight the efficacy, economic viability, and environmental benefits of these cutting-edge materials. Our findings suggest that the integration of green and self-healing

concrete into mainstream construction practices could play a pivotal role in fostering sustainable development and enhancing the resilience of infrastructure worldwide.

14. **An Investigation of Jami Muntok Mosque, the Sustainability Religious Building in Tin Mining Town, Bangka, Indonesia** - ***Novrizal Primayudha, Imam Santosa, Achmad H Destiarmand, Achmad Syarief***

Research on the thermal performance and energy conservation within mosque edifices represents a developing area of inquiry when juxtaposed with other architectural research. Nevertheless, the discourse surrounding sustainable architecture, which has increased in the past twenty years alongside advancements in technological innovation and digitalization, frequently neglects the indigenous practices historically employed by communities in their environmental adaptations. The Jami Muntok Mosque, an architectural relic located in the tin mining town of Bangka, Indonesia, exemplifies the embodiment of sustainable architectural tenets as conceived in the 19th century, principles that retain their pertinence in contemporary discourse. The primary aim of this research endeavor is to examine the sustainable characteristics of the Jami Muntok Mosque, which has been inherently designed to accommodate the regional climate and utilize materials that are locally sourced. This investigation employs qualitative research methodologies, incorporating field observations and building analysis techniques. The process of data acquisition was conducted through a review of existing literature and comprehensive interviews with prominent figures within the community. The principal outcomes of this research reveal that the sustainability features of the mosque were meticulously crafted, considering the implementation of 19th-century natural ventilation, elevated ceilings supported by soko guru, strategically positioned openings, effective natural illumination, and the incorporation of indigenous materials that are congruent with the surrounding environment. The architectural conception of Jami Muntok Mosque (JMM) exemplifies its adaptability to the coastal climatic conditions of Muntok, which are characterized by an average wind velocity along with elevated humidity and warm temperatures, thereby rendering this mosque an environmentally sustainable edifice since antiquity. This research substantiates that Jami Muntok Mosque serves not only as a site for religious observance or a cultural emblem but also as a paradigm of architectural ingenuity capable of harmonizing with its environmental context. Moreover, while incorporating the utilization of artificial intelligence, this mosque illustrates that conventional architectural methodologies can yield sustainable solutions applicable to contemporary predicaments. Consequently, this investigation enriches the discourse on sustainable architecture, particularly concerning historical edifices that leverage indigenous knowledge to attain energy efficiency and ecological equilibrium.

15. Watershed Pollution Control Strategy Against Accommodation Capacity of Sector Pollution Load Domestic in Cimanuk Indramayu Watershed - *Shafa Maharani*

Watershed management in Indonesia has decreased, causing pollution, one of the watersheds that has experienced pollution is the Cimanuk watershed in Indramayu Regency. The purpose of this research is to calculate the existing water quality in the Old Cimanuk River using the CCME Method and assess its suitability in the context of watershed management. Based on the results of the calculations carried out, the Old Cimanuk River obtained a quality status of light cemar while using IP while the CCME method received a quality status value of fair and marginal. Furthermore, the calculation of capacity for the upstream segment in 2024 amounted to -6,479.74 kg/day and in 2029 amounted to -8,300.78 kg/day. While the capacity for the downstream segment in 2024 amounted to - 15,567.55 kg/day and the downstream segment in 2029 amounted to -20,832.9 kg/day. Water pollution control strategies in the Cimanuk watershed are divided into two aspects, namely technical and non-technical aspects. The technical aspect consists of technology development that can reduce the BOD pollutant load which will be simulated in the QUAL2Kw modeling software.

Green Energy

16. Zeolitic Imidazole Frameworks Synthesis by Solvothermal Process as Battery Anode Material - *Wara Dyah Pita Rengga, Muhammad Ibnu Khawariz, Sutikno Madnasri, Urwatun Wusko*

Zeolitic Imidazolate Frameworks (ZIFs) have great potential as energy storage materials due to their ability to increase electrical conductivity and inhibit volume reduction in metal oxide-based anodes. This study aimed to determine the optimum synthesis temperature ZIF-8 using zinc nitrate hexahydrate and 2-methylimidazole in methanol solvents via a solvothermal process. The focus was on the effect of temperature on the properties of the fabricated ZIF-8. Temperature optimization was performed by varying the heating temperature from 110°C to 170°C. The optimum synthesis temperature of ZIF-8 was found to be 150°C. The crystalline and morphological properties of ZIF-8 were observed and analyzed using XRD, FTIR, and SEM, while electrical properties were tested using an IV Meter. XRD characterization revealed sharp peaks indicating ZIF-8 crystals at angles of 2°13.29, 14.35, and 16.23. The FTIR spectra showed a Zn–N bond at 431 cm^{-1}, resulting from the interaction between zinc and the nitrogen atoms of the methylimidazole group forming imidazole. The morphology of ZIF-8 was dodecahedron-shaped. ZIF-8's electrical conductivity, indicated by a positive exponential IV Meter analysis curve, showed the highest current conductivity reaching 0.0030 A. These crystalline structures, carbon groups, and ZIF-8 conductivity properties indicate its potential as a new anode material in batteries.

17. **Nonsingular Fast-Reaching Sliding Mode Observer for Battery State of Charge Prediction - *Sabat Anwari, Lita Lidyawati Lita***

The use of batteries, especially in electric vehicles such as electric cars, requires optimal energy management for the efficient operation of the battery and the improvement of the reliability and safety of the vehicle. Energy management from batteries requires monitoring with an accurate SOC (state of charge) measurement process. SOC is a measure of the remaining battery capacity in the form of a percentage of the maximum value (when the battery is fully charged). Measuring SOC while the battery is in use is not easy because it cannot be measured directly. Battery dynamics show nonlinear behavior and are influenced by various internal and external factors when the battery is used as a power supply. As a result, accurate SOC measurements require quite complicated methods. The first step is to conduct battery dynamics modeling. There are various approaches to modeling battery dynamics, i.e., electrochemical mechanism (EM) approaches, equivalent circuit (EC) approaches, and data-driven (DD) approaches. The EM approaches are very complex and require solving partial differential equations, which are difficult to apply to real-time systems. The DD approaches require a lot of real data to make the model realistic. In this paper, the EC approaches are chosen due to their computational ease. Based on the voltage measurement data and the chosen model, the SOC can be predicted accurately. In real systems, the model has uncertainties. A nonsingular fast-reaching sliding mode observer, which has been proven to be insensitive to uncertainties, is proposed in this paper for battery SOC prediction.

18. Development Municipal Solid Waste (MSW) into Waste to Energy (WTE) Considering Carbon Credit Scheme - *Danang Adi Setiaji, Subiakto Sukarno*

The rapid increase in population, urbanization, and industrialization has significantly escalated municipal solid waste (MSW) generation, necessitating innovative waste management solutions. This paper explores the potential of wasteto-energy (WtE) technologies in transforming MSW into valuable energy resources while addressing environmental and economic challenges. The study focuses on Central Java, Indonesia, evaluating the financial and technological feasibility of WtE projects, particularly gasification, compared to incineration. It emphasizes the role of the carbon credit scheme introduced in early 2023, assessing its impact on the project's internal rate of return (IRR) and Net Present Value (NPV). The findings indicate that although the carbon credit scheme marginally improves financial metrics, the overall attractiveness of WtE projects is reinforced by their contribution to sustainable development goals (SDGs) and the circular economy. The research concludes that gasification technology, due to its lower toxic emissions, is a preferable investment for renewable energy from waste, offering a sustainable solution to MSW management and energy production.

19. Biodiesel Synthesis Through Green Processes Using Lipase Immobilized on Carbon - Catur Rini Widyastuti, Wara Dyah Pita Rengga, Anggit Wijaya, Oktalina Putri Sandiani, Dinda Adelia Fauzi

Biodiesel production can be carried out conventionally through a transesterification reaction using strong base catalysts such as NaOH and KOH. However, the use of chemical catalysts in the liquid phase shows disadvantages, mainly due to their toxicity to the environment and the difficulty of separating them from the reaction products. In the present study, a green process was developed through transesterification using lipase-immobilization on carbon as a biocatalyst. Immobilization was carried out using the crosslinking method with supporting material. The research aims to determine the effect of pH and contact time during the immobilization process on the adsorption capacity of functionalized activated carbon. The resulting biocatalyst was then used for biodiesel synthesis through the transesterification reaction at a temperature of 60°C for 2 hours with varying molar ratios of oil to methanol of 1:6 and 7% (wt/wt) of the biocatalyst used in the oil. The study confirms the ability of the biocatalyst to promote the transesterification reaction using palm oil and methanol as substrates. Further analysis using GC-MS identified the main content of fatty acid methyl ester (FAME) in the product sample. The reaction yielded biodiesel up to 61% with the characteristic compared to the Indonesian national standard (SNI).

20. Design of 60 kg/Hour Pineapple Fiber Reel Type Chopping Machine in the CVT Composite Manufacturing Process - *Alfan Ekajati Latief, Muhammad Pramuda Nugraha Sirodz, Noviyanti Nugraha*

The CVT system on two-wheeled vehicles was designed to transmit the power and rotation from the engine to the rear wheels. The slide piece is a components in CVT system to maintain the stability of the Ram Plate movement when transmission ratio was changed by force the roller. Slide pieces can be made using pineapple fibre-reinforced composites. Pineapple fibre has a length of 80-120 cm and can withstand tension force up to 42.33 kg/mm2 , and it can be used as reinforcement in composite materials for making slide piece. In making pineapple fibre-reinforced composites, pineapple fibres need to be chopped into pieces under 5 mm before make it into powder and melted with Polypropylene high Impact (PPHI) then injected into the mold. This study aims to design a pineapple fibre reel type chopping machine with dimensions below 5 mm and a 60 kg/hour capacity. The design of this pineapple fibre chopping machine includes the selection of electric motors, transmission, shaft and peg planning, to the design of blades. The frame and the reel blade was simulated using software to determine the stress and displacement. The material used as a blade is AISI 1045, which is heat treated. This machine is planned to use an electric motor with a power of 1.5 HP, the transmission system using pulley and belt with a diameter of 150 mm for driver pulley and diameter of 280 mm for driven pulley, as well as a belt length of 1778 mm, and uses a helix reel blade with a blade angle of 30°, a helix angle of 26.5°, a length of 280 mm and a diameter of 345 mm. The maximum stress on the frame is 46.7 MPa and

the displacement is 0.24 mm. For the Reel blades, the maximum stress is 4.3 MPa and the displacement is 0.021 mm. Therefore, the material is sufficient for the pinnaple fiber reel type chopping machine.

21. **Sustainable and Efficient Conversion of Waste Lubricating Oil into Diesel-Like Fuel Using Green Synthesized FeNi/TiO2 Nanocatalyst -** ***Riny Yolandha Parapat***

The efficient conversion of waste lubricating oil into high-quality fuels is of significant interest for sustainable energy production. This study elucidates how the pyrolysis of waste lubricating oil was influenced by the preparation of $FeNi/TiO_2$ nanocatalyst. The nanocatalyst was synthesized from mangosteen peel extract at room temperature. The green synthesis of $FeNi/TiO_2$ nanocatalyst was optimized to enhance the yield and quality of the resulting pyrolysis oil. The process yielded 49% pyrolysis oil which exhibited properties comparable to premium diesel, including a high cetane number, making it a promising candidate for diesel fuel production. The catalyst synthesis itself demonstrated a yield of 65%, highlighting its efficiency in catalyst production. The use of a naturally derived nanocatalyst not only provides an ecofriendly approach but also enhances the sustainability of the entire process.

22. Kinetics of Separate Hydrolysis and Fermentation of Cow Rumen and Rice Straw in Bioethanol Production - Megawati Megawati, Widi Astuti, Zuhriyan Ash Shiddieqy Bahlawan, Forita Dyah Arianti, Agung Prabowo, Nabila Nabila, Brilliyani Shafura Aftisyah, Listya Suci Ramdhani, Sri Devi Eudia Pamusok, Daffa Zamiira Pradana

The usage of cow rumen and rice straw in the production of ethanol will lead to the decrease in agriculture and farming waste. The study is purposed to study the kinetics of sulfuric acid hydrolysis of cow rumen and rice straw using pseudo-homogeneous first order model as well as the kinetics of fermentation of the hydrolysates glucose by yeast using Gompertz model. The hydrolysis was conducted at various conditions: cow rumen:rice straw ratios (0, 20, 40, 60, 0, and 100%), temperatures (80 and 90 oC), and catalyst concentrations (0.3 and 0.6 M). The fermentation was carried out at various yeast concentrations (9, 15, and 20 g/L). Reaction rate constant decreases when rumen:rice ratio increases and increases when temperature increases. Hydrolysis rate constant at catalyst concentration 0.6 M is higher than 0.3 M. In fermentation, the higher the yeast concentration (9.63, 10.65, and 11.99 g/L), the higher the maximum ethanol production rate (0.20, 0.38, and 0.68 g/L.h).

23. Improving Penetration and Softening Point of Asbuton Asphalt by Adding of Nano TiO2, Nano Mineral, and Nano Styrene-Butadiene Rubber (SBR) from Waste Tires - ***Riny Yolandha Parapat, Nuke Lydia Agustias, Wemvy Nugraha, Imam Aschuri, Jasman Pardede, Aflian Noviyanto, Michael Schwarzey***

The development of using nano-asphalt modified with nanomaterials has been extensively researched and has shown promising results in enhancing asphalt application performance. One approach to producing nano-asphalt is by using nanorubber as the base material. Nanorubber is a composite material consisting of nano-sized rubber particles. This material possesses superior mechanical properties, including high tensile strength, flexural strength, and good wear resistance. Additives that can be used in the production of modified asphalt include Styrene-butadiene rubber (SBR), TiO2, and Asbuton minerals. The results of research conducted to achieve optimal outcomes were supported by Python software using the Scikit-Learn regression method. The optimization results showed good physical properties of the asphalt, with a penetration value of 61,12 and a softening point of 65,85°C. These results were obtained from an optimized mixture of 6% Nano-SBR, 0,5% Nano-TiO2, and 2% Nano-Minerals.

24. **Green Synthesis of Fe-Ni/TiO2 Nanocatalyst from Mangosteen Peel Extract for High Cetane Pyrolysis Oil Production from Waste Lubricating Oil** - ***Riny Yolandha Parapat, Aji Tri Laksono, Rizki Imam Fauzi, Jono Suhartono, Mila Dirgawati, Michael Schwarze, Reinhard Schomäcker***

This study explores the green synthesis of Fe-Ni/TiO2 nanocatalyst using mangosteen peel extract for the pyrolysis of waste lubricating oil to produce high cetane pyrolysis oil. The synthesis was simulated using a factorial design with four factors: A (amount of metal in the precursor), B (amount of reducing agent), C (amount of support), and D (duration of nanoparticle synthesis). The responses evaluated were oil yield, calorific value, density, and catalyst yield. The results indicated that the most significant factors influencing oil yield, calorific value, density, and catalyst yield were the amount of reducing agent, synthesis duration, amounts of metal and support, and amount of reducing agent, respectively. Significant interactions between factors were observed: A and B, A and D, and C and D for oil yield; A and C, and B and D for density; and A and C, B and C, and A and D for catalyst yield. The simulation results of the optimization of oil yield, calorific value, density, and catalyst yield showed an increase in the quality and quantity of pyrolysis oil where the optimum oil yield produced was 47.29% and the catalyst yield was 74.88%. These findings demonstrate the effectiveness of the Fe-Ni/TiO2 nanocatalyst synthesized through green methods, emphasizing its potential for sustainable production of high-quality pyrolysis oil from waste lubricating oil.

25. Diagnosis Condition of Sf6 Gas on Circuit Breaker and Sealing End Based on Purity Value, Moisture Content and Dew Point - ***Dini Fauziah and Abdul Rahman***

Currently, SF6 is an insulating material that is widely used in electricity due to its superior insulating properties. To maintain the quality of sf6 gas performance, periodic testing is required. This research aims to diagnose SF6 gas in circuit breakers (CB) and sealing end at the Kiaracondong GIS Main Substation, based on Purity value, Moisture Content and Dew Point parameters. The analysis results show a decrease in the SF_6 gas purity value at several points, caused by environmental contamination and decomposition products during arc extinguishing operations. However, the SF6 gas purity value at most points still meets IEC 60376 standards (>97%), except at Pole A and Pole B which require further inspection because the purity value is below 97%. Apart from that, there was an increase in moisture content values at all points due to frequent PMT operations and increased loads which caused heating of the SF_6 gas, although it was still below the PLN standard (<3960 ppmv). An increase in the dew point value was also detected, but was still within normal limits with an accuracy of ± 2°C. Overall, the condition of the SF6 gas at the sealing end and PMT in Bay GDBGE1 is still good and in accordance with applicable standards, although further investigation is needed at Pole A and Pole B regarding the decrease in purity values.

26. **Mass and Energy Balance Evaluation of Industrial Scale HDPE (High Density Polyethylene) Polymerization Reactor** - ***Andhini Putri Fitriani, Riny Yolandha Parapat, Syayah Dhini***

High-Density Polyethylene (HDPE) is a crucial plastic material in the industry, valued for its strength and versatility. Mass and energy balances are fundamental tools for optimizing production efficiency, monitoring reactor performance, and controlling operational conditions to ensure that production meets established standards. This analytical approach not only aids in the development of higher-quality products but also ensures adherence to environmental and safety regulations. The data obtained from these calculations offer valuable insights for improving HDPE production quality and strengthening its position within the petrochemical industry. The analysis indicates that the calculated conversion in the 1st and 2nd reactors were below the conversion design. It is likely due to factors such as hydrogen supply in termination reaction, feedstock quality, reactor fouling, and catalyst deterioration. The energy released by the reactors was managed using cooling water to maintain the desired temperature range. These findings highlight the discrepancies between real production conditions and simulation predictions, which are influenced by unpredictable variables.

27. Circuit Breaker Performance Analysis Based on Its Simultaneity Value - *Rizwan Rizwan and Dini Fauziah*

Circuit Breaker (CB) is one of the main devices in the electrical system used to protect equipment and networks from excessive electric current interference. The purpose of this research is to ensure the performance of the CB to function normally, properly and synchronously in the event of a disturbance in the electricity distribution system. Tests were conducted using the Breaker Analyzer Vanguard CT 6500 tool, with scenario simulations to obtain delta time for showing synchronization value. The value obtained was then compared with the 1983 SPLN No. 52-1 standard for 20 kV voltage systems, which is $\Delta t < 10$ ms. The results showed that at the Kiaracondong substation, KSM 1 extension, the close time Δt value was 12.7 ms and open time Δt value was 11.75 ms, which exceeded the SPLN No. 52-1 1983 standard for $\Delta t < 10$ ms. Thus, this study found that the CBs in Kiaracondong substation are not in accordance with the standard. So, it can be concluded that the CB is no longer suitable for use so it is necessary to carry out maintenance in the form of cleaning the mechanical system and resetting the moving contact CB to prevent potential protection failures and damage to the electricity distribution system.

28. Development of Gas Engine Power Plant of Small Island in Indonnesia Case Study on Sumba Island - *Tarsisius Kristyadi*

Electrical energy has a very important role in supporting regional development, especially to support other development sectors. In meeting the needs of electrical energy, the production of electrical energy is strived to reduce the use of fuel and provide sufficient energy, including for peak load needs (peaking). The paper described of design of gas engine power plant in Sumba Indonesia. The capacity of power plant is 10 MW, fuelled by Natural Gas. The capacity is calculated based on 10 year projection of electricity need in Sumba island. Based on design optimisation the power plant is consist of 3 identical gas engine. The design is consist of mechanical aspect, electrical aspect and civil aspect. The power plant is equipped with complete gas engine and assessories, electrical equipment and building.

29. Infrastructure of Solar System for Performance Analysis Coating Monocrystalline Photovoltaic Module 50Wp - *Noviyanti Nugraha*

Dust particles attached to photovoltaic will affect the efficiency and capacity of the electricity it produces. Nano coating using polysilazane liquid is an attempt to improve the efficiency of photovoltaic against dust particles. Two photovoltaic s of 50Wp each were compared for the power generated, over 10 days of testing. The first PV was given nano coating on its surface, while the second PV was not given nanocoating. The test was conducted at the ITENAS campus. Measurement of the power generated by each photovoltaic was done manually every 9:00 am,

12:00 am and 3:00 pm. Photovoltaic produces the greatest power at 12.00 am. photovoltaics treated with nanocoating always produce greater power when compared to PVs without coating. The efficiency of photovoltaic using nano coating is 25.25%, while that without coating is only 17.17%, so it can be concluded that the use of coatings can improve the performance of solar panels.

30. Study on Early Stage Solar Cell and Thermoelectric Combination Power Generation in Various Time of Day - *Waluyo Waluyo*

Solar radiation produces two main components, namely light and heat. Basically, both radiation components can be converted into electrical energy in turn with the main equipment of solar cells and thermoelectric. This study aimed to obtain the initial electric power from a design and implementation of a combination of the solar cells and thermoelectric. The solar cells were connected in parallel with thermoelectric. The results of the parallel connection entered an MPPT (Maximum Power Point Tracking), and were then connected to the battery and load through an inverter. Testing and measurements were carried out for two days between 10:00 and 13:00. In the two days, the system was given a load of 135.5 watts ac and 5.4 watts dc, and showed a minimum power at MPPT of 84 watts at 13:00 and a maximum of 384 watts at 10:00. While the typical powers on the first and second days were 344 watts and 271 watts, respectively. The power read on the MPPT was greater because the generator, in addition to supplying power to the load, also supplies power to the battery.

31. Stress Analysis of Dented Oil Tank Using Numerical Simulation - *Mohammad Azis Mahardika*

Oil tank is a structure used to store oil or petroleum product which have the shape of vertical cylinder. The safety of oil tank is important as the failure could lead to explosion, polluting the environment, and disturb the operation which gives huge cost for the companies. Dented oil tank resulted to stress concentration which affect the integrity of oil tank. Therefore, it is imperative to study the stress concentration induced by dent at the oil tank. Numerical simulation by using ANSYS software is used to analyze the stress of oil tank. The result shows that the stress value of the dented oil tank is 2 times bigger compared with the normal oil tank (wihtout dent). To ensure the safe operation of the oil tank with dent, the oil height is reduced from 17 m to 12 m.

32. Simulation of Used Oil Integrated Fractionation Pyrolysis Process Characteristics Using Computational Fluid Dynamics (CFD) - *Maya Musadi*

33. Organic Rankine Cycle Experimental Progress Setup - *Diki Ismail Permana, Dani Rusirawan, Liman Hartawan*

Solar Thermal is one of several heat sources that may be used to support the ORC system. The benefit of employing solar thermal as a heat source in conjunction with an ORC system is that it may supply economical energy supplies in distant regions and is suited for disaster zones. Indonesia has an annual worldwide horizontal irradiation of 1314 to 2191 kWh/m2, making it a pretty suitable location for placing solar collectors. This makes it an excellent location for solar collectors in combination with an ORC system. In solar thermal applications, a solar collector transforms solar irradiation energy to heat energy via a working fluid; strong optical performance is necessary to absorb as much heat as possible. The paper reports the extent to which solar-ORC research has progressed.

Green Transportation

34. Utilizing PIV Techniques to Optimize Train Head Design for Sustainability - Beny Halfina, Lukman Shalahuddin, Basir Basir, Syariefatunnisa Syariefatunnisa, Jean Mario Valentino, Irfan Ansori, Hendrato Hendrato, Yudiawan Fajar Kusuma, Yudi, Yohanes Pringeten Dilianto Sembiring

Aerodynamic drag is one of the contributors of resistance force in the railway tranportation. Reducing drag will help lowering energy consumption and greenhouse gas emissions. This study looks into the optimization of train heads to improve energy efficiency and promote sustainable transportation. The research employs Particle Image Velocimetry (PIV) experiments to observe fluid flow around train head models. Prior to the experiment, initial CFD simulations were conducted to provide preliminary results and assist the design iteration. The PIV experiment provides verification of the simulations in real-world physics. In addition, the qualitative data of fluid dynamics, flow characteristics and velocity vector reveal the aerodynamic performance of the train head design. In PIV setup, two 1/25th train scale models were observed to compare the effects of the design feature and modifications. The test configuration consists of two laser positions: above and side. The coefficient of drag of the model 1 is calculated to be 0.902 and model 2 is 0.784. An observation of the velocity contour reveals the effect of improvement in window and frontal area. This research contributes to the development of sustainable and energy-efficient green train systems aimed at lowering rail transportation's carbon footprint.

35. **Bicycle Lanes in the Borobudur National Tourism Strategic Area to Support Green Mobility and Promote Green Tourism** - ***Ahyani Ahyani, Sri Sarjana, Muhammad Fazlur Rahman, Agus Pramono***

Bicycle lanes in strategic tourism areas play a crucial role in promoting green tourism, which is increasingly becoming a major focus in the development of sustainable tourism destinations. This study aims to plan a bicycle lane in the Borobudur National Tourism Strategic Area to support the concept of green mobility and increase tourist attraction. A quantitative approach is carried out by analyzing the performance of road sections through the calculation of the V/C ratio before and after the implementation of the bicycle lane, supported by survey data and field observations at the study location. The results show that the implementation of the bicycle lane is part of an effort to develop environmentally friendly transportation infrastructure in the studied area. In addition, the results of the road performance calculation show that after the implementation of the bicycle lane, the V/C ratio is in the range of 0.4 to 0.7, indicating that the performance of the road section is still in good condition. This finding is expected to be implemented through the policy of implementing bicycle lanes in the Borobudur KSPN can be implemented without sacrificing traffic efficiency, able to support green mobility and encourage the development of sustainable tourism.

Smart Materials and Adaptable Design

36. **Modern Visuality in Indonesian Pop Music Album Covers of the 1980s** - ***Inko Sakti Dewanto***

Wajah dalam foto potret semakin populer sejak abad ke-19, hingga menjadi bagian penting dalam budaya populer dan seringkali muncul pada sampul media cetak. Potret wajah, lambat laun menjelma menjadi simbol idola pop, sehingga menciptakan standar ideal dalam kurun waktu budaya tertentu, terutama pada genre musik pop dan kalangan generasi muda. Pada era 1980-an, di Indonesia muncul pengaruh yang makin tak terbendung dari budaya pop Barat ke dalam budaya lokal, yang sudah dimulai sejak era 1950-an. Pada masa ini, musik-musik "pop cengeng" mendapat popularitas tinggi, dengan menjual irama yang melankolis dan lirik yang menyayat hati. Meskipun wajahwajah glamor musisi sangat mendominasi sampul album musik pop 1980-an, namun tren tersebut bertolak belakang dengan lirik dan nada lagu melankolis yang mereka usung. Melalui gambaran dan asumsi awal tersebut, peneliti menilai bahwa wajahwajah musisi pop era 1980an tidak hanya memiliki struktur visual yang identik, tetapi juga memiliki potensi untuk diinterpretasikan lebih mendalam terkait dengan konteks tematik, hingga mitos, dan ideologinya. Lebih luas lagi, hubungannya dengan kondisi sosial, politik, dan ekonomi pada masa itu juga akan dielaborasi melalui pendekatan kualitatif (historis), yang bertujuan memberikan kontribusi ilmiah bagi generasi saat ini dan perkembangan desain sampul album musik di masa mendatang.

37. PELÜK - Deep-Touch-Pressure (DTP) Sensory Vest to Reduce Anxiety for Students with Particular Learning Difficulties - *Maharani Permanasari*

In the learning process on campus, students do not always experience good circumstances or situations. Therefore, it is expected that teachers do not consider the anxiety experienced by students as a temporary phase. One potential approach is to apply the DTP method to help students through their anxiety. Deep touch pressure (DTP) is a type of tactile sensory input obtained through physical action by using pressure interventions to help students' physical and emotional healing process. Designing a sensory vest with the deep-touch-pressure method (DTP/weighted vest) aims to provide a calming effect. To solve the needs of the students who experience specific learning difficulties and/or students diagnosed with special needs when they experience anxiety in certain situations on campus is this research's main objective. The design approach method was applied in this research process, starting with observation, interviews, ideation, sketching design alternatives, and prototype testing of sensory vest products involving students. The DTP Vest as an adaptiveassistive technology was validated using the Visual Analogue Scales method completed by 60 students. The results of this design provide a solution to help calm anxiety, offering positive stimulation in self-emotional regulation, especially in competitive learning situations. The outcomes of this design also serve as a supporting medium for the disability service unit at Itenas Bandung, which can be utilized by students, lecturers, and the academic community experiencing anxiety dysregulations.

38. The Valuable Effects of Busy Books as Educational Media for Children with Autism Spectrum Disorder - *Ananda Ahnaf Wandina Putri, Rosa Karnita*

Busy books, also known as activity or silent books, have become increasingly popular for engaging children with autism spectrum disorder. These books are intended to offer a tactile and interactive learning experience, engaging children with autism through various sensory stimuli and activities. However, data shows that the increase in ASD in the world is increasing, especially in Black, Hispanic and Asian children. It is also confirmed that the big challenge being faced is that therapy for autism is still minimal in large and small cities. The research aims to determine whether the busy book can significantly improve the skills of children with autism. Using a pre-experimental design that employs a one-group pretestposttest method, we assess the children's abilities using a busy book before and during the intervention. The research employs interviews and data collection through literature studies to deeply understand the participants' capabilities and interactions with the busy book. The performance of individuals with autism before and after they use a busy book was compared. The data provides valuable insights into the activities that children with autism enjoy and those that produce positive results. Also, children with autism can experience beneficial effects on their motor and cognitive skills, particularly their improvement and ability to focus on one or more activities when using a busy book. These findings may inform the development of more effective learning tools for children with autism. Some activities can be

designed to encourage turntaking, sharing, and following instructions, which are essential for social interaction. Busy books can provide a calming and structured activity, which can help manage anxiety and give a sense of routine. In summary, the research highlights the significance of art therapy as a fundamental component of autism management and treatment strategies—art therapy, mainly through busy books.

39. **Compact Packaging Design Exploration of Therapeutic Colouring Books for Students in Higher Education -** ***Putri Yudianita***

Today, the mandala colouring book is a well-known therapeutic tool in modern psychology, and its evolution can be traced back to this implementation. In Buddhism, Jainism, and Hinduism, mandalas represent the universe and are tools for meditation. Contemporary art therapy uses them to manage a variety of psychological problems, including stress, anxiety, and depression, by encouraging awareness, relaxation, and self-expression. The complexity and repeating geometric patterns in mandalas can increase focus and concentration, making the mind more relaxed and calm. In everyday life, students in higher education prone to frequently using smartphones become more stressed and anxious when there is no encouragement to use therapeutic colouring books as therapy and a diversion from gadgets. The focus of this research aims to explore packaging designs for therapeutic colouring books that are compact with colouring tools so that they are more practical for students in higher education to use. Students may choose colouring books with various topics and designs to make their experience unique. Data were collected through interviews with seven students and literature reviews of the benefits of therapeutic colouring books, document studies of small therapeutic colouring books on the market, and research into the impact of shape and colour on audience perception. There are relatively few practical packaging designs for therapeutic colouring books. Results from interviews showed that some participants did not consistently turn to therapeutic colouring books as a means of relieving stress and anxiety. Instead, they sometimes turn to other strategies. Some were also interested in trying to carry out therapeutic activities when the packaging design for the mandala therapeutic book was more compact, with colouring tools included, because people choose to relieve their stress and anxiety quickly for many reasons. The paper concludes that this innovative packaging design offers practical features that enhance its functionality. It is hoped that this will persuade students to use therapeutic colouring books to reduce symptoms of stress and anxiety. This research examines how the audience needs to use mandala colouring tools to release negative emotions in various situations. The ease of obtaining colouring tools provides motivation and freedom for the audience. The implication of this study is to provide a solution to use the compact therapeutic colouring book packaging innovation with colouring tools effectively and maximize its benefits.

40. Utilization of Digital Technology in Improving Visual Innovation of Laminated Bamboo in Cultural Products "Kelom Geulis" - *Mohamad Arif Waskito*

Visual innovation and uniqueness are elements that can increase the functional and economic value of a product, especially for products that are conceptually loaded with a certain identity/theme in determining their design. Indonesia as a country rich in traditional cultural heritage has great potential to develop products that utilize local cultural identity as its advantage. “Kelom Geulis” as a local indigenous footwear product is considered to have great potential to be a promotional tool for the nation's cultural wealth. Therefore, it is considered important to develop and preserve such cultural products so that their existence can encourage the improvement of the economy of the local community.

41. An Effort to Preserve Cultural Building Through Digital Documentation: Case Study Roof Maintenance of Tongkonan House Tandung Nanggala Sulawesi, Indonesia - *Shirley Wahadamaputera, Wahyu Buana Putra, Joudy George Bitty*

Indonesia, which consists of various tribes, is rich in cultural heritage, one of which is traditional houses. The construction and maintenance of traditional houses were carried out over generations and without written instructions or documentation. As time goes by, it is feared that increasing technology will trigger the loss of authenticity of traditional buildings. The uniqueness of a conventional house is the shape of its roof, which can identify its regional origin, one of which is the Tongkonan-Toraja house. The uniqueness of the tongkonan roof needs to be preserved, especially in the maintenance stages. Conservation efforts can be made through the creation of documentation. This paper will present a roof maintenance method that produces documentation in 3D SketchUp form. The documentation focuses mainly on roof maintenance methods, starting from the supporting pillars and their bases at the bottom, the floor with beams and roof structure, and the layer-by-layer roof covering. It is hoped that with this documentation, the next generation can learn information about maintaining original tongkonan roofs. The use of this documentation is expected to continue digitally for the next generation. It is hoped that information on digital maintenance methods will be spread more easily and quickly so that tongkonan as a cultural heritage can be preserved.

42. Smart Agri-SprayBot - Christian Tannoury, Acil Sati, Rebecca Aina, Sharbel Mkarzel, Gaby Abou Haidar, Roy Abi Zeid Daou, 2 Mohammad Rahal

The agricultural sector in Lebanon faces various challenges, ranging from labor-intensive practices to environmental concerns associated with conventional chemical applications. In response, precision agriculture has emerged, employing various methods such as mechanical sprayers and aerial drones. However, these approaches encounter limitations, including imprecise targeting and inefficient resource utilization, underscoring the need for advanced solutions. There has been

a notable surge in the development of autonomous technologies to address all these challenges. This study introduces SprayBot, an innovative autonomous spraying robot precisely engineered to revolutionize crop protection and fertilization practices. This device represents a significant advancement in agricultural technology, offering a comprehensive solution to the challenges faced by traditional methods. The spraying machine is equipped with state-of-the-art technologies, prominently featuring Artificial Intelligence (AI) and computer vision. These cutting-edge components empower this robot to autonomously detect and target unwanted weeds with unparalleled precision, thereby minimizing the need for excessive chemical usage while optimizing crop quality. By seamlessly integrating technology with agricultural practices, this device emerges as a signal of innovation, heralding a sustainable future for farming practices worldwide.

43. The Cultural Modality in Garin Nugroho's Art Film "Setan Jawa" in Constructing National Ideology in the Era of Society 5.0 - Agustina Kusuma Dewi, Ganis Resmisari, Iyus Kusnaedi, Mohamad Arif Waskito, Shiddiq Bi'tsatulfathi Syaiful Karim, Adi Surahman, Muhammad Arvi Suria

Multimodality is a term used to refer to the way people communicate using different modes at the same time. The above communication modes include text, images, voice, and data to access and communicate meaning. The film "Setan Jawa" by Garin Nugroho, inspired by Friedrich Wilhelm Murnau's classic film, Nosferatu (1922); is a black and white silent film that uses a cinematic-orchestral approach; which also involves gamelan composer Rahayu Supanggah. First released in 2016 in Indonesia, until now, this film is still being screened in various countries. With the complexity of modalities, forms of collaboration and approaches used; this film becomes an art film, because in it, it is not only based on cinematic elements, but also involves the director's regularity very strongly. Using a qualitative approach based on case studies and text analysis, this study aims to identify what elements of communication modes collaborate in constructing cultural identity, as part of strengthening the nation's ideology. With research instruments of interviews, observations, and literature studies; it was identified that narrative and movement elements are the most dominant modes as modalities that form cultural identity. In this case, it is concluded that there is a process of translation and transposition of cultural texts into multimodality that plays an indirect role in constructing the nation's ideology; especially in the area of love for local Indonesian traditional culture. This, furthermore, strengthens the assumption that art films can potentially have diverse modes of communication that can indirectly play a role in constructing the nation's ideology in the era of digital transformation.

44. Supply and Demand Forecast in an UMKM using Moving Average Technologies - *Marisa Premitasari, Ilham Ramadhan*

The recent growth of small and medium enterprises (SMEs) known as UMKM (Usaha Mikro) Kecil Menengah) has continuously expanded, leading to intense competition among businesses. This scenario necessitates companies reduce operational costs while concurrently improving operational effectiveness and efficiency. Accurate demand forecasting was critical in this context, as insufficient forecasting relative to actual demand can result in the unavailability of raw materials and products when required by consumers, thereby compromising customer service and resulting in lost profits. Consequently, it was crucial to implement a forecasting method that was accurate, precise, and easily applicable by management or operational staff to meet consumer demands. The best forecasting method will be utilized based on the clothing product demand data from the past year to determine the appropriate product inventory levels. Therefore, a sales prediction system was developed using the Weighted Moving Average and Single Exponential Smoothing methods. Thus, the result indicate that the average error for the Weighted Moving Average was 4.26%. The Single Moving Average shows an error of 4.5%. For Single Exponential Smoothing, the errors were shown the fewest percentage 9.05% for α equal to 0.2 and 12.92% for α equal to 1 represented the highest. These research concluded that weighted moving average was better methods in calculating minimum errors for supply and demand prediction. In addition , the dataset tested in cloud computing services which was Amazon Web Service (AWS) Sagemaker Canvas as comparison.

45. TRIPLE EXPONENTIAL SMOOTHING AND RANDOM FOREST ALGORITHMS FOR A HYBRID RISK FORECASTING BY USING WEIGHTED EVENT DATA - *R. Budiraharjo, Mira Musrini B., Carissa Adnyana Putri R.*

Risk forecasting plays a crucial role in various fields, ranging from finance to environmental management. This research proposes a novel approach that combines the Triple Exponential Smoothing (TES) method and the Random Forest (RF) algorithm to achieve more accurate and reliable risk forecasting. TES is highly effective in predicting seasonality and trends in timeseries data, while RF excels in handling complex non-linear relationships and mitigating model overfitting. By integrating these two methods, the proposed hybrid model aims to leverage the strengths of each method to enhance the accuracy and performance of risk prediction. This research represents an effort to improve the performance of the seventh step in the Improved Multi-Attribute Risk Assessment (IMARA) method, which is risk forecasting. The experiments in this study utilize a dataset from PT Terminal Peti Kemas Surabaya to evaluate the performance of the proposed approach. The results of this research are expected to demonstrate an improvement in the accuracy and performance of risk prediction compared to the risk prediction performance generated by the TES and RF methods when applied individually, especially in dealing with complex data patterns and dynamic risk factors. This research uses three scenarios for combining

TES and RF to obtain the highest accuracy in risk forecasting. The results from the first phase of the experiments showed that Scenario 3 yields slightly better accuracy compared to the two other scenarios.

46. IMPLEMENTATION OF GREEN INFORMATION COMMUNICATION TECHNOLOGY AT UNIVERSITAS SUMATERA UTARA LIBRARY - *Himma Dewiyana, Alif Akbar Saragih*

Universitas Sumatera Utara Library has implemented Green Information Communication Technology to support the USU Green Campus program. This study aims to determine Universitas Sumatera Utara Library user perceptions about implementing Green Information Communication Technology using the G-Readiness framework, namely Attitude, Policy, Practice, Technology, and Governance. This study used a descriptive approach and a simple random sampling technique with 100 people. Data was collected using a Likert Scale questionnaire. The analysis technique used descriptive statistics. User perception is positive or can be said to be 'feasible' if it has a percentage above 60% (>60%). If the percentage is below 60% (<60%), then the value of the statement cannot be said to be 'feasible'. The results showed that library users' perceptions of the application of Green Information Communication Technology at the Universitas Sumatera Utara Library got 71% on the Attitude indicator, 71% on Policy, 71% on Practice, 72% on Technology, and 70% on Governance, thus getting an average result of 71%, which indicates that user perceptions are feasible or positive towards the application of Green Information Communication Technology at the Universitas Sumatera Utara Library. The highest value is in the Technology indicator, with an average value of 72%, which indicates that library users know what technology related to Green Information Communication Technology has been implemented at Universitas Sumatera Utara Library.

47. Design of IoT-based Greenhouse Temperature and Humidity Monitoring System - Liman Hartawan, Galih Ashari Rakhmat, Noviyanti Nugraha, Nuha Desi Anggraeni, Keindra Bagas Maulana, Muhammad Rangga Ridjali, Muhammad Iqbal, Muhammad Kevin Mahardhika, Bramantio Syahrul Alam, Junior Al Fani, Luthfy Fahlevi Amarullah, Muhammad Ilyas Al-Fadhlih, Muhammad Ravli Sbastio, Adrico Alexander Purba

In 2021, Indonesian government has launched a national priority program, "making Indonesia 4.0" [1]. The agricultural community in Lembang Bandung, Indonesia, known as "Gapoktan Lembang Agri," has constructed an intelligent greenhouse that utilises advanced farming techniques, including an automated sprinkler system powered by Arduino IoT Cloud [2]. This greenhouse serves as a pilot project in the West Bandung District. This study aimed to develop a monitoring system for air temperature and humidity in the Lembang Agri Smart Greenhouse. Due to fluctuations in temperature and humidity within the greenhouse, it is necessary to take measurements at multiple locations. This system aims to create multiple interconnected devices that can wirelessly measure temperature and humidity. These devices will then transmit the

collected data to the internet. Each device has a separate power source derived from the battery and can connect to a photovoltaic system. This study uses the WEMOS D1 Mini microcontroller on the measuring devices, enabling wireless data transmission and reception through the ESP-NOW protocol. The sensor employed in this study is the DHT21, known for its superior performance compared to the DHT11 or DHT22 sensors. The website dashboard utilises PHP to receive, validate, and store the data in the Firebase Real-time Database. The Website features a navigation button allowing users to access and display specific data and historical information for each device.

48. Application of Design Thinking Method with UEQ and Heuristic Evaluation for Website UI/UX Improvement and Evaluation- ***Kurnia Ramadhan Putra, Sofia Umaroh, Asep Rizal Nurjaman, Deprinda Widia***

Technology plays a crucial role in modern life and has become an essential aspect of daily activities. At the Bandung National Institute of Technology (Itenas), technology has been integrated into academic processes through the development of the Academic Information System (SIKAD). This system is designed to streamline academic administration, enhance communication between lecturers and students, and provide up-to-date lecture schedule information. To address the challenges identified through a User Experience Questionnaire (UEQ) distributed to 7,093 active students, along with qualitative insights gathered from empathy map interviews with 9 SIKAD users, the Design Thinking method was employed. This approach involves five key stages: empathize, define, ideate, prototype, and test, aimed at improving the interaction design of SIKAD. The redesign resulted in enhanced User Interface (UI) and User Experience (UX) elements, addressing existing issues. Testing of the new SIKAD interface revealed improvements in user experience, as indicated by higher graphical satisfaction scores compared to the previous design. Furthermore, a heuristic evaluation of the new UI yielded an average score of 74.7 across various aspects, translating to a 74% satisfaction rate. These findings suggest that the new UI design of the SIKAD Itenas website is considered satisfactory, with only minor issues ranked as low-priority.

49. Structured Pruning Utilizing DepGraph with L2 Norm to Reduce The Number of CNN Parameters - ***Jasman Pardede, Andika Wahyu Syaputra***

CNN architectures have been shown to perform well in several tasks, including image classification, natural language processing, and speech recognition. The architecture's performance is directly proportional to the model's size, which presents a significant challenge in its practical application. This research proposed structured pruning on a Convolutional Neural Network (CNN) using a Dependency Graph (DepGraph) with an L2 norm pruning criterion. This approach can reduce the number of parameters so that the CNN architecture is lighter. Additionally, it was intended to enhance the model's processing speed, specifically in terms of the

rate at which images can be processed. To prove that DepGraph with L2 norm can effectively competently reduce the huge amount of parameters in CNN architecture, this study uses three commonly used CNN architectures: EfficientNetV2-S, MobileNetV3-S, and ResNet-18. Each pruned architecture is trained to build a classification model. The models' performance is evaluated by accuracy, precision, recall, and F1-score. The experimental results revealed that structured pruning using DepGraph with an L2 norm pruning criterion effectively reduces the number of parameters in these models. The DepGraph with an L2 norm pruning criterion decreases the number of parameters EfficientNetV2-S, MobileNetV3-S, and ResNet-18 architectures by 74.36%, 73.40%, and 74.96%, respectively. Nevertheless, the performance of each model is maintained with no significant decrease in accuracy.

50. **Development of a Telemedicine System for Real-time Core Body Temperature Monitoring in Parkinson's Patients -** ***Hendi H. Rachmat, Ilham Ramadhan***

This study focuses on developing a telemedicine system for real-time monitoring of core body temperature (CBT) in patients with Parkinson's disease. CBT measurements are carried out using a tympanic thermometer based on the MLX90614 sensor, designed in the shape of an earphone for comfortable use on the patient's right ear. The software development includes the implementation of the TEAR Android application to receive and display data from the tympanic thermometer via Bluetooth communication on an Android device. Additional development involves incorporating data storage in Google Spreadsheet and automatic data transmission using the Telegram application to other relevant parties, such as family members, relatives, or referral doctors, enabling remote monitoring of Parkinson's patients. Testing results showed that the tympanic thermometer successfully measures CBT with an accuracy of 0.1 °C. The temperature data and patient condition were also successfully stored and sent to the relevant parties, with the data including the patient's location in the form of a GPS link.

51. **Knowledge Representation of Researcher Profiles in Higher Education Using Ontology and Knowledge Graph -** ***Sofia Umaroh, Kurnia Ramadhan Putra***

Scholars are encouraged to collaborate with academics from different fields in different universities when research demands emphasize collaboration and cross-disciplinarity. Even though there are already research repositories in the academic setting, such as the Sinta database and DOAJ, both on campus and in Indonesia, they are still unable to offer information about the characteristics of researchers who might be interested in collaborating on research projects. Although the application of knowledge graphs has been widely used in the education domain, specifically in the domain of researcher profiles based on the ontology built, it is still limited. Research collaboration can be enhanced by researchers using knowledge representation. The purpose of this study is to discover possible university research collaborations by creating an ontology and knowledge Graph representation of researcher profile domain. Knowledge

representation is provided based on the results of competency questions. Collaboration recommendations between researchers are obtained using the graph similarity method on the knowledge graph.

52. Short-Time Fourier Transform for Audio Conversion in Music Genre Classification Using Inception V3 - *Dewi Rosmala, Mohammad Noer Fadhilah*

This research examines the development of music genres and technological applications in music genre recognition through the MIR (Music Information Retrieval) approach. With the increasing complexity of sub-genres that develop from the main genre, while the labeling of music genres is done by experts manually and rather than that, manual labeling of music genres by experts requires time, effort, and cost. Automatic music genre labeling is expected to help, reduce, and suppress the role of humans in terms of music genre labeling. This research proposes the use of Mel Spectrogram as an audio representation in the frequency domain. We adopt Convolutional Neural Network (CNN), specifically Inception V3 architecture, to classify Mel Spectrogram into music genres. CNN is chosen for its ability to recognize complex and hierarchical patterns, which corresponds to the musical features represented in the spectrogram. We applied transfer learning techniques and fine-tuning of the trained model on a large dataset, allowing us to improve the accuracy of music genre classification. This study uses a dataset of 1000 audio files in .wav format, with each genre represented by 100 files, to evaluate the performance and effectiveness of the proposed method in the context of music genre classification. It includes the general background, the methodology used, as well as the main objectives and contributions of this research towards the development in the domain of music genre recognition using deep learning techniques.

53. Weighted Naive Bayes for Imbalanced Data Classification on Palm Oil Fruit Maturity - *Dewi Rosmala, Refriyan Adrianto*

This research aims to develop a classification model to determine the maturity level of oil palm fruits using digital images and the Weighted Naive Bayes (WNB) algorithm. The main challenge in this research is addressing the issue of data imbalance, where the "not ripe" class has a larger number of samples than the other classes. This study uses 111 samples of oil palm fruit images taken directly from plantations in Riau. Colour histogram features are used as image representation after preprocessing. The WNB model is trained using 80% training data and 20% test data. Evaluation results show that the WNB model achieves an accuracy of 95%, significantly higher than the 55% accuracy of Naive Bayes. This increase in accuracy indicates that WNB is effective in handling class imbalance issues in the oil palm fruit image dataset. This research makes an important contribution to the development of more accurate and efficient classification methods for determining the maturity level of oil palm fruits, which can provide significant benefits to the oil palm plantation industry.

54. Revolution Agriculture Maggot AI Ecosystem: Implementation of Artificial Intelligence to Maximize Agricultural Production by Utilizing Maggot as a Fertilizer Source - ***Muhammad Fahri Muharam, Fahrul Nurfadillah Arsyad, Esa Fallah Royani, Lita Lidyawati***

The management of organic waste in Indonesia is a growing concern due to its substantial amount and the harm it does to the environment. Using Black Soldier Fly (BSF) maggots as a decomposition agent to break down organic waste and use the resulting natural fertilizer is an efficient solution. In addition, by taking into account different soil parameters, artificial intelligence (AI) technology can assist in identifying the kind of plant that is best suited for a specific piece of land. In order to manage organic waste and boost agricultural productivity in a sustainable way, this research suggests a "Revolution Agriculture Maggot AI Ecosystem." By recommending crops based on environmental factors to prevent crop failure, the AI technology is anticipated to support food security.

55. Designing Interactive Counselling Services for Higher Education Students - ***Meliza Syafita, Rosa Karnita***

Colleges are educational institutions that equip young adults for the workforce while fostering a more profound comprehension of the world and its history and cultivating an admiration for diverse skills. Universities have a crucial role in shaping knowledge, skills, and viewpoints. However, to attain goals in higher education, students must go through various challenges that are not easy—starting from challenging assignments, relationship conflicts, and unsupportive learning systems. Internal and external factors, such as family, economy, work, and many more, are problematic for many students. Therefore, many college students have symptoms of mental illness, and if not addressed, these symptoms can lead to physical health problems, drug and alcohol usage, changes in behaviour, and more. Counselling services are essential for students who often face personal, emotional, or academic challenges in higher education. The service aims to improve students' academic achievement and social competence, whether they are ordinarily developing or have a disability. One of the Institutes in Indonesia that has provided counselling services is Institut Teknologi Nasional Bandung (ITENAS). This study intends to determine how students perceive counselling services at ITENAS according to their needs and corresponding expectations for these services to develop a design that can enhance the counselling service system at ITENAS. This research was conducted by interviewing current student resource persons on the Itenas campus by providing questions about their opinions about counselling services at ITENAS, how much there is a need for counselling services, and their hopes to improve these services.

As a result, the students hope that ITENAS needs to improve its counselling service procedure system to be more accessible and that the information is widely disseminated to reach students

in need. Therefore, ITENAS counselling services will be improved by creating social media and registration websites. Currently, social media is an effective place to disseminate information, one of which is Instagram, the most popular platform used by various age groups. ITENAS Counseling Services disseminates information through Instagram. This website is a medium that makes it easier for students to register for counselling, and there is detailed information about the service. In conclusion, this study has found that for many students, college can be a challenging period. Therefore, government policies regarding the implementation of inclusive services must be strengthened by improving the university counselling service system to support students in achieving reasonable academic goals and results and increasing awareness in the campus environment to continue caring for others.

56. **The Importance of Digital Archiving in Sustaining The Creative Journey of Itenas Visual Communication Design Student Association -** ***Calya Fajrian, Rosa Karnita***

Student associations play an indispensable role in the campus ecosystem as a forum for exploration outside classroom boundaries. Throughout its twenty-year history, IMADjI DKV has generated a variety of innovative concepts and exhibitions that extend from the earliest era to the present day. Indeed, in order to showcase their creative output, IMADjI DKV effectively uses social media as their preferred medium, consequently adapting to today's digital world. However, social media has not fulfilled the requirements to accomplish the crucial task of digital archiving. This study aims to understand the problems and challenges in maintaining the existence of IMADjI DKV among the many similar DKV student associations in Bandung city and examined perspectives according to IMADjI DKV members and lecturers on the importance of archiving IMADjI DKV activities, achievements, and creative works. Data were collected by comparing portfolio websites from other student associations or designer organizations, interviews with IMADjI DKV members and lecturers, and literature reviews relevant to website characteristics to achieve the research objectives and support the argument. The paper concludes that a digital archiving effort is required to generate comprehensive reports on various activities, achievements, creative works and other track records of iMADjI DKV. By serving as an information provider, digital archiving can inspire future members, enhance the reputation of DKV Itenas in the public's perception, and significantly contribute to the sustainable development of IMADjI DKV's brand character. Initially, the idea was to develop an IMADjI DKV portfolio website designed to meet the particular needs of its members, complemented by a literature analysis on the characteristics of a website fulfilling digital archiving needs.

57. Application of the Fuzzy Logic System for Avoidance Obstacle on Mobile Chain Wheel Robot - *Ratna Susana, Arya Padmadi Purwasunu, Lita Lidyawati*

The ability to avoid obstacles is a fundamental requirement for an autonomous robot. The robot can perform its tasks efficiently and autonomously with this abilities. A robot can be made to avoid obstacles in a variety of ways, of one of which is by using the HC-SR04 ultrasonic sensor as a detection component. Fuzzy logic systems can be used to analyze data and make logical decisions, a task that This research was carried out by design hardware using an Arduino Mega Microcontroller and ultrasonic sensors HC-SR04 and also design robot command programming using Arduino IDE software and Matlab software are as tools to design the Fuzzy Logic. The results of this research are the use of HC-SR04 ultrasonic works well accordin to needs robot, but the data obtained shows inaccuracies when used at a long distance. The fuzzy logic test results shows that the fuzzy logic design used is sucessful in making the robot avoid collisions but the angel formed when the robot avoids collisions is inaccurate with several fuzzy rules that have been created.

58. Analysis Of Bima+ Application And Bonstri Program Quality Using Delone & Mclean Model And Theory Of Planned Behavior - *Monalisa Putri Rezeki, Sofia Umaroh*

Bima+ is a mobile application that provides telecommunication services to Tri mobile operator users that aims to make it easier for users to meet the needs and services of Tri cards. To meet customer needs, Bima+ does not only offer easy access to services. Service providers are starting to innovate in retaining customers by meeting the digital needs of Gen Z, one of which is by holding a loyalty program. One of the loyalty programs provided by the Bima+ application is the Bonstri program. The Bonstri program is a tri-point bonus that can be exchanged for attractive offers such as internet quota, game vouchers, e-commerce vouchers, cashback vouchers, and others. In assessing the quality of the Bima+ application, the Delone & McLean IS Success Model (D&M ISSM) is used, while the quality of the Bonstri program uses the Theory Of Planned Behavior (TPB) model. In this study, data was obtained using a quantitative approach, namely an online questionnaire with a total of 100 respondents. In the D&M ISSM model, information quality and service quality are proven to have a significant influence on customer satisfaction. In addition, it was found that customer satisfaction has a significant effect on customer loyalty and intention to repurchase. Furthermore, customer loyalty and intention to repurchase also significantly influence each other. In the second model, namely TPB, attitudes and perceived behavioral control have a significant influence on intention to repurchase. Furthermore, repurchase intention has a significant influence on customer loyalty in the context of the Bonstri program.

59. Intrusion Detection In Campus Information Systems Through Penetration Tests - *Yusup Miftahuddin, Sholahuddin*

Cyber security is a crucial aspect in maintaining the integrity, availability and confidentiality of data in a system. Based on the results of the Nessus Essentials scan, the Itenas campus website was identified as having a critical vulnerability with a Base Score of 7.5 and an Impact Score of 3.6, which is categorized as High Severity. This can be exploited by attackers to gain unauthorized access to sensitive data. This research focuses on improving the security of the Itenas website using the Penetration Testing Execution Standard (PTES) method combined with a Machine Learning-based intrusion prediction model. PTES is used as a framework for conducting structured penetration testing, while an intrusion prediction model is developed using the Random Forest algorithm. This research produces a model that is able to detect various types of threats such as TCP-SYN Flood, Port Scanning, Flow Table Overflow, Blackhole Attack, and Traffic Diversion Attack with an accuracy rate of 83%.

60. Customer Lifetime Value (CLV) Analysis on Customer Segmentation using RFM Model with K-Means Clustering - *Dhea Halimatu S., Nur Fitrianti F.*

The problem that companies often face is identifying the right customers, causing the company to lose potential customers, which is detrimental to the company itself. The main objective of CLV is to find the most optimal method to treat customers differently, depending on the potential value they may have in the future. In calculating CLV, the RFM (Recency, Frequency, Monetary) model is used which helps in understanding customer behavior. The purpose of this research is to determine the value of CLV in customer segmentation. In this study, CLV calculations were carried out with the RFM model and the K-means clustering algorithm. Where the highest CLV value is in the 2nd cluster with a value of 0.888889 and the lowest CLV value is in cluster 4 which is 0.010320.

61. Analysis Of The Influence Of Brand Image, Trust, And User Satisfaction on Xiaomi Brand Customer Loyalty - *Muhammad Awalidzan Ahda, Nur Fitrianti F.*

Since 2011, technological advancements have greatly impacted people's lives. Especially, with the increasing use of smartphones. with the emergence of various advanced communication technology devices that make daily activities easier. With its various innovative products, Xiaomi, one of the leading technology manufacturers, has become an icon of the technological revolution. This study aims to find the influence between the variables of user satisfaction, trust, and also brand image on customer loyalty. The results show that the variables of system quality and product quality have a significant influence on customer satisfaction. While information quality and service quality do not have a big influence on user satisfaction.

Furthermore, user satisfaction and brand image have a significant influence on customer loyalty.

62. Comparative Analysis of Vectorization on Twitter (X) Sentiment Analysis Using Lexicon-Based and SVM Methods - *Kurnia Ramadhan Putra, Kirana Indria Revansa*

Information technology is advancing rapidly, transforming how people interact through social media platforms that enable global communication. Social media, particularly X (formerly known as Twitter), provides an easy way for users to express their views and opinions online. However, text data is often unstructured and noisy, making processing challenging. To address this issue, text mining and sentiment analysis techniques are employed to facilitate the identification of patterns and emotions in textual data. The X tweet data regarding SiCepat's services, successfully collected using the Tweet-Harvest tool, amounts to 3,315 entries. This data was then labeled using the VADER-Lexicon after being translated into English, resulting in sentiment distribution: 35.3% positive, 39.1% neutral, and 25.6% negative for the lemmatization data; and 27.6% positive, 48.6% neutral, and 23.7% negative for the stemming data. Undersampling techniques were applied to balance the sentiment data. Based on the results of training the SVM model with a comparison of normalization and vectorization methods, the best combination was the SVM model using the lemmatization method with Bag of Words vectorization on a 90:10 data split, utilizing the SVM parameters {'C': 100, 'gamma': 0.01, 'kernel': 'rbf'}, achieving an accuracy of 86.3%.

63. Analysis of the Effect of User Experience on the Success of the Grab Application Using the Delone and McLean Model - *Sandi Yusup Sinaga, Kurnia Ramadhan Putra*

During the current technological development, it encourages people to take advantage of online transportation services as an option for people who want to travel somewhere, one of the online transportation service providers that is currently in demand is Grab. Grab managed to achieve its success by reaching a total valuation of more than Rp.150 trillion, based on the Delone and McLean success model, one of the variables that affect the success of an information system is user satisfaction which is influenced by other variables, apart from the variables contained in the Delone and McLean model there are other variables that can also affect the success of an application, namely user experience by knowing the effect of user experience on user satisfaction, later the success factor of the Grab application can be used as a reference material for other similar services to follow Grab's success. This study involved 90 Grab application users, and included 9 hypothesis tests of which 2 were accepted empirically.

64. **Parallel value iteration as an introduction to undergraduatelevel parallel computing courses** - ***Lisa Kristiana, Auralius Manurung***

Value iteration is often used as an introduction topic to reinforcement learning and optimal control. Value iteration can be used to solve both Markovian and deterministic processes. Here, we use value iteration to solve a specific deterministic optimal control problem, i.e., finding shortest paths from anywhere in a map to a specific target in that map. Considering the size of the selected maps, parallelizing value iteration may become inevitable. Thus, we explore five different parallelization frameworks that is available in Python programming language (i.e., vectorization, multiprocessing, Cython with OpenMP, Numba, and Open MPI) since Python programming language is known to be slow in executing codes with loop and even slower with nested loops. Additionally, solving one problem but with several different methods can be beneficial for pedagogical purposes. In this paper, we present the results of our explorations and use them to promote case-oriented methods (project-based learnings) in undergraduate parallel computing courses.

65. **Package Delivery Game Application Based on Prototype of Bicycle Simulator - Galih Ashari Rakhmat, Muhammad Ichwan, Ramzi Syuhada, Faruq Muhammad, Shandy Handika**

The development of technology has created many new experiences for users, one of which is the simulator. The basic principle of simulator development is the resemblance of the form, function, or mechanism of a real system or tool. Simulators are here to provide the same user experience value but are realized in a simpler tool and environment. However, the level of complexity, mechanism, and function of real tools can be a major problem in building the simulator. The use of potentiometers, magnetic-based speed sensors, heart rate sensors, has been said to be sufficient to develop a simple prototype for this bicycle simulator. On the game application side, a story has also been developed about package delivery which will be a challenge for users to use this bicycle simulator. The Ardity library used as a data communication bridge between the microcontroller and the game application has good compatibility to support consistent data delivery so that it does not experience lagging.

66. **Visual Identity and Environmental Graphics in Coffee Plantations: The Uncle Fly Experience** - ***Aldrian Agusta Rahim***

This seminar explores the integration of visual identity and environmental graphic design within the unique context of coffee plantations, focusing on the Uncle Fly Coffee Plantation. The presentation will delve into the principles and strategies employed to create a cohesive and engaging visual environment that enhances both the aesthetic appeal and functional aspects of the plantation. Key topics include the development of a distinctive brand identity, using

sustainable materials, and the impact of graphic design on visitor experience and operational efficiency. Through case studies and practical examples, attendees will gain insights into the challenges and opportunities of implementing environmental graphic design in agricultural settings, with a particular emphasis on sustainability and cultural relevance.

67. **The Evaluation of Upper Structure Performance for Through-Type Callender Hamilton (CH) Modular Steel Bridge -** ***Badriana Nuranita, Karno Romadon***

Callender Hamilton (CH) is one of the popular types of modular steel truss bridges used in Indonesia, with a Through-type bridge floor system, where the bridge deck is supported by the bottom of the main structure. These bridges were manufactured by Balfour Beatty Power Construction Limited, United Kingdom, and has been used in Indonesia since 1975, which means these bridges are approaching their service life of 50 years. This study evaluates the strength performance of the existing Through-type Callender Hamilton modular steel bridge structure, adjusted to the bridge structure criteria and current loading requirements specified in SNI 1725-2016. The study is applied to the Tajum II Margasana CH Bridge in Banyumas, Central Java with each span of 50,29 m. The evaluation aims to determine the strength and stiffness of the structure based on the stress ratio capacity and bridge deflections.
The modeling and analysis results show that the existing bridge condition is no longer able to accommodate its loads. This can be seen in several bridge trusses with a stress ratio of around 1,0 - 8,7 (>1), indicating a weak condition. This is further supported by the deformation value of 18,11 cm on the existing bridge, exceeding the allowable deflection of L/800 or 6,29 cm, indicating need for repairing to restore the bridge's performance. Strengthening using two methods, external prestressing and adding profile configurations to the elements. The use of 5 external prestressing tendons on each side of the CH bridge with a tensile force of 660 kN, combined with adding profile configurations to certain elements, it should reduce the stress ratios <1 and decrease the bridge deflection by 68,36% to 5,73 cm which is below the deflection limit, so that structural performance of the CH bridge is now adequate.

68. The Effect of Curing Method on Geopolymer Concrete Compressive Strength - ***Erma Desimaliana, Euneke Widyaningsih, Almas Qothrun Nada Kaltsum***

Geopolymer concrete is a type of concrete that does not utilize cement as a binding material. Instead, it relies on precursor materials with high silica and alumina content, such as fly ash from coal-fired power plant waste, to serve as the binder. Also, geopolymer concrete is synthesized through an endothermic polymerization reaction involving fly ash and an alkaline activator. This reaction produces concrete with significantly high compressive strength, attributed to the elevated temperatures induced by the curing process. Therefore, this study aims to analyze the compressive strength of geopolymer concrete as affected by variations in curing methods The study investigates various curing methods, including membrane, oven, and steam. For each curing

method, the test specimens used three 10 cm × 20 cm cylinders. Compressive strength testing of geopolymer concrete was performed at 3, 7, and 28 days, with a total of 36 specimens evaluated. The alkaline activator consists of a solution of NaOH at 8M concentration and Na2SiO3, mixed in a 1:2 ratio. The aggregate-to-binder ratio is 60%:40%. The experimental results of geopolymer concrete with various curing methods of membrane, oven, and steam at 28 days show the average compressive strength are 21.17 MPa, 20.61 MPa, and 26.76 MPa, respectively. The experimental results show that two of the variants of the curing methods, such as membrane and steam, are adequate to achieve structural compressive strength, and have nearly specified compressive strength. The application of hightemperature curing methods on geopolymer concrete results in enhanced compressive strength to reach structural concrete performance.

69. Use of the Water Quality Index Method in Assessing Groundwater Quality Around the Sarimukti Landfill - *Eka Wardhani, Khaila Nastiti, Athaya Zahrani Irmansyah*

Sarimukti Landfill is located in Sarimukti Village, Cipatat District, West Bandung Regency. This landfill is located at an altitude of 380-450 m above sea level and has a free aquifer layer of 10-15 meters, with a slope of 10-15% to the southeast. This landfill is the final waste disposal site for the greater Bandung area. The increasing amount of waste, along with population growth, has an impact on the increase in leachate generation from the waste decomposition process. The study aims to determine the quality status of groundwater using the Water Quality Index method. The location of the sampling points was carried out at monitoring well 1 (107.350240, -6.797314), monitoring well 2 (107.348764, -6.805887), and monitoring well 3 (107.347783, -6.809044). Groundwater sampling was carried out on June 22, 2023, referring to the Indonesian National Standard 6989:58 of 2008 concerning groundwater sampling methods. Groundwater level measurement using a water level meter. Based on references, heavy metal testing refers to the Indonesian National Standard 6989-84:2019 concerning metal testing methods using an atomic emission spectrophotometer Atomic Adsorption Spectrophotometry at the Bandung Institute of Technology Water Quality Laboratory. The data obtained were then analyzed descriptively using quality standards based on the Minister of Health Number 32 Regulation of 2017 concerning environmental health standards and water requirements for hygiene and sanitation purposes, swimming pools, solus per aqua, and public baths. The parameters analyzed were Total Dissolved Solid, pH, temperature, turbidity, Fe, Cd, Mn, Pb, and Zn. Based on the study's results, the quality of groundwater monitoring wells 1 and 2 are included in the poor category, while monitoring well 3 is categorized as very good. The position of monitoring well 3 above is not affected by leachate produced by the landfill. Parameters that do not meet the quality standards in monitoring wells 1 and 2 are turbidity, Total Dissolved Solid, and Mn, while in monitoring well 3 only Mn. Monitoring should be carried out during the rainy and dry seasons to determine the effect of differences in well water quality at the activity location. Keywords. Groundwater, Monitoring Wells, Heavy Metals, Sarimukti Landfill.

70. The Green Technology Adaptation of Digital Documentation Framework for Heritage Building Conservation; Case Study of Masjid Lama Parit Istana, Kuala Pilah - ***Siti Azira Abd Rahim, Norul Izzati M Ashaari, Suhaida Suhana Kamarudin, Mohd Amir Shazwan Hashim, Sangeetha Arjinan, Noor Hayati Ismail, Nurul Syala Abdul Latip, Girma T. Chala, Syahrul Rahmat***

To extend the life of historical structures, conservation is a technical activity that involves a method that prevents the building from decaying and involves physical action to protect the material and structure. Building conservation should preserve as much of the original building's structure and fabric as feasible to adhere to the conservation concept. Currently, all conservation documentation information is kept in conventional documentation methods. As a result, this demands the question of how to develop digital documentation in an alternative way that preserves strict data protection, safety measures, and governance frameworks in the documentation system while saving a substantial amount of physical space, being easily accessible, and being able to take on various forms. In the era of rapid technological advancement, building information modelling (BIM) as part of green technology has been applied in several historic sites, where a precise digital reconstruction of a heritage building is created to maintain the structure for the duration of its life, including demolition. The study aimed to provide a digital documentation framework for heritage building conservation. A possible conservation framework might be proposed after investigating broad guidelines for conserving heritage buildings and using digital tools. The formulated research objectives were achieved via the respective chosen qualitative research methods which are on-site observation, expert interview, and 3D Simulation. This research explores and compiles data on the Heritage building conservation data documentation from practitioners and local authorities. Digitalization, which includes BIM tools, is suggested to ensure data storage for years. Furthermore, integrating green technology within the HBIM framework can facilitate sustainable documentation practices for conservation works. Moreover, the Historic Building Information Modelling (HBIM) version will generate accurate digital representation practices and enhance the long-term preservation of heritage buildings for renovation and refurbishment projects.

71. Application of Building Information Modeling (BIM) Generative Design Concept in Building 12 -- ***Kamaludin, Husni Alteza Muttaqin, Eka Wardhani, Athaya Zahrani Irmansyah***

Building Information Modeling (BIM) 6D in energy analysis in buildings has been applied to obtain energy efficiency in green building planning. This modeling application in Indonesia is still in the development stage. This study aims to analyze the potential energy savings that can be achieved in Building 12 of the Bandung National Institute of Technology. The BIM method used is the integration between Autodesk Revit 2022 software and the Autodesk Insight website. The scenario used is a simulation of installing window shades with 2/3 of the window height on the

north and south sides of the building, replacing window glass material with the Trp LoE type, setting the infiltration level to 2 air change rate (ACH), applying lighting efficiency to 7.53 Watts/m2, applying natural lighting and occupancy control, applying plug load efficiency to 10.76 Watts/m2, and installing Heating Ventilation and Air-Conditioning (HVAC) with the High Efficiency Heat Pump type. The study's results by applying this scenario can reduce the energy consumption intensity of Building 12 from 220.04 kWh/m2/year to 135.76 kWh/m2/year or a decrease of 38.3% so that it is in the efficient criteria based on SNI 03-0196:2010.

72. **The Cost Estimation and Time Scheduling Comparison Study of Bottom-Up and Top-Down Method in Cafe Building Construction Project -** ***Ratih Dewi Shima, Erma Desimaliana, Enrico Moreno***

Value Engineering (VE) in construction projects is a systematic approach aimed to improve the value of an engineering product by assessing its functions, cost, quality and performance (the triple constraints). Value engineering goals is to optimize overall value by reducing unnecessary cost without compromising the triple constraint. Value Engineering benefits from Building Information Modelling (BIM) as a tool to visualize the construction design along with various scenarios and alternative methods. In Indonesia, the implementation of BIM has not been fully utilized nor obligatory to be used despite its effectivity in simulating various scenario of construction methods for commercial properties such as restaurant or café building. This study implements the effectiveness of BIM utility by comparing the value engineering of two construction methods (Bottom-Up and Top-Down Method) performances, for café building construction project study case. Two values used as the constraints of research are Cost estimation and Duration. The modelling process used Tekla Structures 2023 (Student License) software to generate beam and column capacity ratio along with time schedule between two construction methods. The outcome of the modelling concluded that the Bottom-Up Methods for café building has less Cost Estimation by 9,34% and 17 working days differences.

73. **Slope Stability Modeling with Recycled Plastic Pin Material Reinforcement using 3D Model Approach -** ***Indra Noer Hamdhan, Rahma Welan Ulfaida, Aurora Dwipantara***

Unstable slopes are very common in soils and can cause landslides. For this reason, it is necessary to reinforce the slope to prevent landslides, one of the methods of preventing landslides on slopes is the use of recycled plastic pin reinforcement can be a feasible alternative to use on slopes. In this study, the existing slope that has a factor of safety ≤ 1.5 will be reinforced with recycled plastic pin reinforcement, then to determine the effect of using recycled plastic pin reinforcement, The slope stability analysis will be carried out using 3D model which is based on the finite element method. The modeling results show that the reinforcement of plastic pin recycling can increase the slope stability with various variations of reinforcement length, variation of placement pattern, and variation of slope of plastic pin recycling. The most effective reinforcement of recycled plastic

pins is used on slopes with slope variations of 1:1, 1:1.5, and 1:2 reinforcement with a length of 15 m as many as 8 pieces, at a reinforcement slope of 30° rectangular pattern has an increase in the safety factor value of about 27% - 45%.

74. **Evaluation of the Weather Research Forecast Model Performance during Air Pollution Episodes in Jakarta -** ***Aristian Nurfauzi, Didin Agustian Permadi, Taufik Rizki Ramadhan***

Jakarta with its unique geographical conditions and influenced by ocean wind circulation and monsoon cycles, often experiences air pollution episodes due to the accumulation of PM2.5 and ozone pollutants that are exacerbated by certain meteorological conditions. This study aims to evaluate the performance of the WRF model in simulating meteorological conditions during ozone and PM2.5 episodes in Jakarta in two time periods, namely July 15-16, 2021 and October 29-30, 2023. Evaluation of the WRF model was carried out on the parameters of temperature, humidity, and wind speed, with results that were generally similar to observational data, although there were deviations in some statistical evaluations of the model, especially in relative humidity. The temporal and spatial distribution analysis showed patterns similar to the actual conditions, such as the highest temperature in the afternoon and high humidity in the morning. In addition, the planetary boundary layer (PBL) plays an important role in atmospheric dynamics, where low PBLH at night is associated with stagnant air conditions and pollution risk, while high PBLH during the day favors vertical mixing and better air circulation.

75. **Concentrating Fresh Milk by Forward Osmosis Using Molasses as Draw Solution -** ***Jono Suhartono, Aprilliza Napisah, Thasya Afiyah Yuniar, Muhammad Samsuri***

Dairy milk has good nutritional content with a complete nutritional composition, so it can fulfill human nutritional needs. Milk can be processed into various products, such as powdered milk, evaporated milk, and sweeteners. Processing fresh milk into various products are for increasing the value and shelf life of the milk. The process of making various dairy products usually by removing most of the water contained in the milk to produce a concentrated milk. Most of the water is removed using the forward osmosis method. Forward osmosis is a separation process that utilizes the difference in osmotic pressure caused by the difference in the concentration of dissolved solutes between the feed solution and the draw solution, where in this study 1 - 3 M molasses draw solution were used. The feed solution and the draw solution passed through a semipermeable membrane to separate the water contained in the milk so that the milk will become more concentrated. In this study, the NF 270 membranes was used. Determine the optimum conditions in the operating process by comparing the water flux, reverse flux, specific reverse flux and rejection. Various flow rate used are 0.5 - 1 LPM. The quality of the concentrated milks were analyzed for its water content, protein content, and fat content. The research results show that the maximum water flux (Jw) obtained is 4.26 LMH at an operating condition of a flow rate of 1 LPM and a molasses concentration of 3 M. The minimum Reverse Flux (Js) is 0.4 g.m-2h-

1 at a flow rate of 0.5 LPM and a molasses concentration of 1 M. The minimum Specific Reverse Flux (SRF) is 0.47 g.L-1 at a flow rate of 0.5 LPM and a molasses concentration of 3 M. The maximum %Rejection is 98.08% at a flow rate of 0.5 LPM and a molasses concentration of 3 M.

76. **Analysis of Residual Chlorine Distribution in Sigajah Drinking Water Supply System of PDAM Tirta Aji -** ***Farhan Bagus Adhari, Iwan Juwana***

Water is a basic human need, whether it is used for drinking or other daily activities. This study analyzes the distribution of residual chlorine in the Sigajah Water Supply System managed by Perusahaan Air Minum Daerah Tirta Aji in Wonosobo District, Indonesia. The analysis used EPANET software to simulate the hydraulic behavior and distribution of residual chlorine in the network. Field measurements of residual chlorine were used as a comparison. The two residual chlorine values will be compared to determine the extent to which the model is close to the actual conditions. The results show that 75.44% of the service area is below the recommended residual chlorine standard of 0.2 mg/L - 0.5 mg/L. The model showed a good match with the field data, with an RMSE value of 0.058 and a correlation coefficient of 0.894. Factors potentially affecting the difference between the modeled and measured values include the age of the pipes, which can increase the roughness coefficient (C) , intermittent water distribution patterns, water usage patterns, and pipe leakage. Keywords: Residual chlorine, water distribution, drinking water, EPANET.

77. **Model of Supply Chain Collaboration of Fresh Vegetable Agroindustry : A Systematic Literature Review and Research Agenda -** ***Arief Irfan Syah Tjaja, Machfud, Marimin, Elisa Anggareni***

Indonesia is one of the countries that depends on agricultural products, where these agricultural products can be processed by companies that carry out production in the food and agricultural industries. The production of fresh produce can generate huge profits, and in recent decades, some of these products have been exported abroad because of increasing demand. In a situation like this, cooperation between various entities in the supply chain is essential to improve the overall performance of the supply chain. A systematic literature review with meta-analysis methodology (PRISMA) was conducted to evaluate related articles regarding the development of collaborative performance systems in the supply chain of the fresh vegetable agroindustry. The objective of this study is to measure and develop a collaborative performance system in the supply chain of the fresh vegetable agroindustry. .The review of documents indexed by Scopus in the form of articles, conference papers, reviews totaling 866, then a process of selection, grouping, classification and summarization was carried out so that 87 articles were further analyzed in accordance with the purpose of the Systematic Literature Review study. The bibliometric network of the 87 articles under investigation was ascertained by this study using bibliometric analysis as well. VOS viewer software was used for mapping and grouping in bibliometric study. The

application of the Soft System Methodology (SSM) approach to the measurement and development of a collaborative performance system for the fresh vegetable agroindustry supply chain are two research gaps that were identified from the study's results and can be used as a basis for future research agendas.

78. Absorbance spectral slopes of CDOM and inorganic nitrogen for monitoring shallow ground water quality in urban setting - Mohamad Rangga Sururi, Isnaini Nur Hafizah, Bella Christina, Khairunnisa Dwita Lestari, Mila Dirgawati and Muammar Qadafi

In West Java, Septic tank (ST) is often utilized in urban dense area, this condition potentially deteriorates groundwater quality. Meanwhile there are so many people use shallow well in dense urban area. The aim of this study is to compare the trend of common parameters such as nitrate and ammonium with chromophoric organic matter (CDOM) parameters such as spectral slope absorbance in shallow ground water. This study was conducted in two sampling locations in Cimahi City. Citeureup and Cigugur Tengah were representing sub-district with a low level of sanitation risk and a high level of sanitation risk respectively. The distance between the shallow well and ST In Citereup were 6,6.3, and 8 m, meanwhile in Cigugur Tengah the distances were 8,9,9.5 m. Key parameters of water quality such as Ammonium, nitrate and UV VIS absorbance with a wavelength ranging from 200 to 600 nm at 5 nm increments were measured. The spectral slopes were calculated by linear regression of the natural log-transformed absorption spectra. We found, the shallow ground water in urban area was polluted by domestic wastewater, and the distance between shallow well and ST were not affected to the ground water quality in dense urban area.

79.* Assessment of the Potential Application of the 4Rs (Reduce, Reuse, Recycle, Recovery) at Bakery Factory X in Bandung - *Dinda Dwi Paramita, Iwan Juwana

The bread production process at Bakery Factory X produces solid, liquid, and gaseous waste. The factory has implemented waste management principles by reusing and recycling some of its waste. This factory has the potential to carry out other waste management, such as reducing waste (reduce) and restoring the production process and work environment (recovery) to create quality improvements in environmental aspects, product quality, and employee safety. Therefore, in this study, the preparation of a mass balance and evaluation of the production process and work environment of Bakery Factory X was carried out to determine alternative 4R (reduce, reuse, recycle, recovery) applications that are suitable for implementation at Bakery Factory X by considering the advantages and disadvantages based on technical, economic, and environmental aspects. The reduce principle can be applied by reducing the length of the kopyor bread packaging. The principle of reuse has been applied by reusing the remaining dough, kopyor, and the remaining slices of kopyor bread. The principle of recycling can be done by selling expired bread to breeders and the remaining packaging to collectors and waste banks for recycling. The recovery

principle can be carried out by using room heaters and humidifiers in the fermentation room, using masks for all employees, increasing the number of racks for baking trays, using anti-slip shoes for all employees, using automatic bread cutting tools, using automatic bread packaging tools, using plastic curtains for the entrance, cooling room, slicing, and packaging rooms, cleaning production equipment using soap and hot water, building a communal WWTP to treat wastewater from the Babakan Rahayu Bread Center, also sorting and using waste containers.

80. **Construction Cost Estimation in Pier Structural Design at Jinato Port, South Sulawesi: A Comparison of Conventional Approaches and BIM Methods** - ***Fitri Suciaty, Muhammad Zaky Zakaria, Erma Desmaliana, Nessa Valiantine Diredja, Siti Rania Usemahu***

The present study was conducted to compare the efficiency of 3D Building Information Modeling (BIM) software particularly Tekla Structures with conventional methods in construction cost estimation. It also underscores the significance of precise work volume computation and unit cost analysis as errors can cause project budget overruns. The Pier at Jinato Port construction project research illustrates how BIM could improve the reliability of cost estimates by creating more accurate volume calculations. The study showed that when compared with traditional methods, a BIM-based cost estimate conducted using Tekla had the potential to save 2.61% of overall lifecycle costs for pier structural work by reducing construction costs and increasing efficiency as well.

81. **Improvement of Operational Systems in Drinking Water Treatment Plants based on Climate-Resistant Drinking Water Safety Plans (RPAM)** - ***Mohamad Rangga Sururi, Mila Dirgawati, Adila Shalahuddin Nur, Prama Setia Putra***

Polluted rivers that cross urban areas are often used as a source of raw water for drinking water. The purpose of this study was to identify the performance of Drinking Water Treatment Plants as a basis for implementing organic compound-based and climate-resistant Water Safety Plans (RPAM). At this stage, performance identification was carried out by measuring the performance of key parameters through measurements at each IPAM units (Intake-PresedimentationCoagulation-Flocculation-Sedimentation-Rapid sand filter-Disinfection-Reservoir). These parameters are turbidity, residual chlorine and pH which are measured at each unit, as well as parameters according to drinking water quality standards which are measured at treated drinking water. The results of the study showed that the quality of drinking water produced did not meet the quality standards for the parameters of turbidity, color, aluminum, residual chlorine, iron, total Coliform, and E.Coli, each with values of 26.5 NTU; 35 TCU; 0.7 mg/L; 0.58 mg/L; 64 MPN/100mL; and 23 MPN/100mL.

82. Moringa Oleifera Seed Waste Based-Activated Carbon as an Efficient Adsorbent for Dye Removal - Widi Astuti, Irene Nindita Pradnya, Triastuti Sulistyaningsih, Megawati, Mohammad Faizal Widi Hidayat, Muthi'ah Kurnia Rahmah, Luluk Arvi Cahyaning Suwandi, Afifah Sagita Fitria Wati, Zulfa Ajrina Fitri

Dye waste from the textile industry, particularly methyl violet 2B, poses significant environmental concerns due to its persistence, toxicity, and resistance to biodegradation. One effective treatment method for such dye waste is adsorption, a physical process commonly implementing activated carbon as an adsorbent. In this study, activated carbon was synthesized from moringa seed waste containing lignin, hemicellulose, and cellulose, making it a suitable raw material for producing activated carbon. This research aimed to identify the activated carbon derived from moringa oleifera seeds and evaluate its efficiency in adsorbing methyl violet 2B dye. Activated carbon was produced using KOH as an activating agent and heated in a muffle furnace at 500°C and 600°C. Characterizing the activated carbon revealed the presence of functional groups such as O-H, C=C, C=O, and C-O, with the carbon structure showing variations depending on the activation conditions. Adsorption tests indicated that the optimal conditions were pH of 9 and adsorption time of 180 minutes.

83.* Hydrochemical Characteristic of Surface Water in Upstream Watershed Citarum River, Bandung Regency - *Adie Taufiqurrahman, Iwan Juwana, Rizka Maria

Water is an important environmental component for human needs, and is widely used by the people in Bandung Regency as a daily water source. However, its quality has been declining. The upstream Citarum water is also affected by human activities. This study utilizes the Piper diagram to identify chemical facies and to track the change in hydrochemical parameters of groundwater and surface water in Bandung Regency. The Gibbs diagram was used to identify the source of ion present in the upstream Citarum River. A total of 20 surface water samples were analyzed for temperature, pH, TDS, and EC, as well as major cations (Na^+, K^+, Ca^{2+}, Mg^{2+}) and anions (HCO_3^-, Cl^-, SO_4^{2-}). The study found the water classified as freshwater. Additionally, four chemical facies were identified: Ca-Na-HCO3, Ca-HCO3, Ca-Mg-Cl, and Na-Cl. Furthermore, chemical mechanisms of surface water were found to be influenced by rock dominance due to interactions between surface water and surrounding soil/rock, as well as evaporation influences.

84.* 'Re-Architecture-Ing' Traditional Markets in Post-Pandemic Era: Perspective from Aging Community - *Mustika Kusumaning Wardhani, Asep Saefulloh

The spread of the pandemic affects all aspects of life, including architecture and urban design. Several consequences and design strategies try to meet the minimum standards of the health and safety protocols. Re-thinking the pandemic situations using the design strategies can become an alternative to preparing conditional probability in the future. Traditional public markets in

developing countries such as Indonesia have become the main pillars of daily trading activities. In various cities in Indonesia, traditional markets are reported to be the epicenter of the spread of the pandemic in September 2020, as happened in Yogyakarta and Semarang City. This phenomenon will be raised as a problem in this study: How do we re-organize traditional markets responsive to post-pandemic conditions? The methodology chosen is a mixed-methods research with a phenomenology approach for data interpretation. The research aims to provide design recommendations for post-pandemic public facilities, especially traditional markets that are responsive to the needs of the elderly. The study's novelty is the finding of many criteria for consideration in designing the traditional market. These include multi-purpose dimensions, proper ventilation, adaptive outer space, optimized circulation, and landscape strategy. This study can provide an overview of how traditional market building designs can accommodate the preferences of the aging society in the future.

85. **Government and Community Responses for Sustainability of Flood-Prone Village in Lamajang Peuntas, Dayeuhkolot, Bandung Regency, West Java Province, Indonesia -** ***Juarni Anita, Dwi Kustianingrum, Ratu Sonya Mentari Haerdy, Muhammad Nibraas Naazhir, Locita Prajna K.***

Floods are a disaster that is considered common in Dayeuhkolot because floods often occur in the area. Floods really disrupt people's lives, both socially and economically. This of course causes huge losses, including disrupting community activities and damaging many buildings and road infrastructure. Lumajang Pentas Village is in a low basin area in Dayeuhkolot District. Its location surrounded by the Cigede River makes this village subject to flooding every year. Several problems arise related to the efforts made by the government and society to reduce the risk of flooding. The aim of this research is to identify vulnerabilities at the research location and the response of the government and community to reduce the risk of flood hazards. This is important for the sustainability of Lamajang Peuntas Village, Dayeuh Kolot, in Bandung Regency, West Java Province. The research method uses qualitative method. Data was collected through surveys, documentation and interviews with community leader conducted in April 2024. The results of the research show that Lamajang Peuntas has environmental vulnerabilities in the form of a lack of green space between the Cigede River and residents' houses and shallow river. Physical vulnerabilities include the lack of infrastructure to support river walls and roads. Social vulnerabilities because the majority of people have low income. The government's response was quite good by issuing various policies for the sustainability of the Dayeuhkolot and building a polder system. The community responded by raising their houses and changing their behavior.

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