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UNIVERSITAS MUHAMMADIYAH YOGYAKARTA, INDONESIA, 09-
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Meet Our Keynote

Prof. Dr. Christian Blum



Professor Christian Blum is a native of Germany and is highly regarded in the field of Hybrid Metaheuristics. His educational journey led him to obtain his DEA and Ph.D. in 2002 and 2004, respectively, from Universite Libre de Bruxelles in Belgium, laying the foundation for his impressive career. Throughout his academic path, he served as an Associate Professor at Universitat Politecnica de Catalunya until 2012, followed by the notable position of an Ikerbasque Research Professor at the University of the Basque Country until 2016. Currently, he contributes his expertise to groundbreaking research at the Artificial Intelligence Research Institute of the Spanish National Research Council in Barcelona. With a portfolio of over 200 articles published in prestigious journals, Professor Blum fosters international collaboration through his fluency in five languages.

Advancements in Optimization Techniques: A Survey on Swarm Intelligence and Hybrid Metaheuristics

Abstract

The talk focuses on optimization, which plays a crucial role in various fields, including electronic and electrical engineering. Progress in industry and science heavily relies on effective solutions to optimization problems. Thus, ongoing research on optimization techniques holds significant importance. The Keynote Speaker will provide an overview of his group's recent work in swarm intelligence and hybrid metaheuristics for solving combinatorial optimization problems. Swarm intelligence leverages intelligent behaviors exhibited by social insects, birds, or fish to address technical problems. On the other hand, hybrid metaheuristics combine algorithmic components from different optimization research areas, creating synergistic algorithms. The presentation will conclude with a brief introduction to the group's ongoing projects.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Assoc. Prof. Dr. Khoirul Anwar, S.T., M.Eng.



Assoc. Prof. Dr. Khoirul Anwar, S.T., M.Eng. is a dedicated researcher in the field of electrical engineering and telecommunications. He graduated (cum laude) from Institut Teknologi Bandung (ITB), Indonesia in 2000 and earned his Master and Doctor Degrees from Nara Institute of Science and Technology (NAIST), Japan. Dr. Anwar has been honored with visiting professorships at esteemed institutions worldwide and presently holds the position of associate professor at Telkom University, Indonesia.

His pioneering work in multi-carrier-based transmission techniques has been recognized and adopted by the International Telecommunication Union (ITU). Dr. Anwar is actively engaged in leadership roles, chairing working groups, and serving as Vice-Chairman of Asia Pacific Telecommunity Wireless Group (AWG). Throughout his career, Dr. Anwar has received various awards, humbly acknowledging his significant contributions to research and innovation. His research interests encompass error correction coding, network information theory, quantum communications, among others. As a senior member of IEEE, Dr. Anwar continues to make valuable contributions to the fields of wireless communications, coding theory, and signal processing.

Advancing Telecommunications: Pioneering Insights in Wireless Communications and Network Technologies

Abstract

The field of wireless communications is facing a number of challenges, including the increasing demand for bandwidth, the growing number of connected devices, and the need for more secure and reliable communications. These challenges are being compounded by the emergence of new technologies, such as quantum computing and molecular communications, which could be used to create even more demanding applications. However, there are also a number of opportunities for improving wireless communications. New technologies, such as quantum communications and molecular communications, could be used to create more secure, reliable, and efficient systems. Additionally, the increasing awareness of the importance of wireless communications is leading to the development of new best practices and standards. In this keynote speech, I will discuss the challenges and opportunities facing wireless communications in the future. I will argue that the future of wireless communications is bright, but that there are challenges that need to be addressed.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Ir. Muhammad Akhsin Muflikhun, S.T., MSME., Ph.D



Dr. in Mechanics of Composite Materials from The University of Tokyo (2020). Currently, he serves as a lecturer at Gadjah Mada University, specializing in Fracture Mechanics, Hybrid laminates, Nano-Micro technology, and Advanced Manufacturing. He received JICA scholarships for his Master's and Ph.D.,

was a guest lecturer at Universitat Autònoma de Barcelona (funded by Erasmus Mundus) in 2017 and Vytautas Magnus University, Lithuania in 2023, attended a summer school at Peking University, China in 2019, and worked as a guest researcher at the Hamburg Institute of Technology in 2021-2022 (funded by DADD).

The Interconnection Between Composite Laminates and Additive Manufacturing

Abstract

The hybrid laminates, consist of different materials and manufacturing process can be produced and give opportunity to its lamination system. The combining process, in term of fused deposition modeling (FDM) based material extrusion (ME) and liquid crystal display (LCD) based vat photopolymerization (VP) and its characteristics have been evaluated successfully. Furthermore, study related to hybrid laminates consist of composite hand-lay-up technique and additive manufacturing was also determined. The model was manufactured via 3D printing fused deposition modelling (FDM) and then reinforced with glass fiber-reinforced polymers (GFRP). The study showed that the hybrid figure eight lamination with polylactic acid (PLA) and GFRP material could increase the tensile strength by more than two times higher. In the study, several tests were conducted, including tensile, flexural, hardness, density, and surface roughness tests, to determine the characteristics and properties of the laminates. Based on the study, the performance of hybrid laminates depends on its constituent material type, and the hybrid multi-material showed the potential reinforced model for various applications. For instance, the tensile strength of the hybrid materials (HM) was 4.4 % higher than the SP-LCD. Moreover, the flexural strength of HM was 76.13 % higher than SP-LCD. Further applications of the hybrid laminates can be applied in wider scope from automotive, aerospace, sport equipment, and structural engineering.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Prof. Dr. Hsing-Chung Chen



Dr. Hsing-Chung Chen (Jack Chen) is the Associate Professor of the Department of Computer Science and Information Engineering at Asia University, Taiwan. Since 2014–present, he is also the Research Consultant of Dept. of Medical Research, China Medical University Hospital, China Medical University Taichung, Taiwan. In addition, since Feb 2015–present, he is also the Permanent Council Member of Taiwan Domain Names

Association (Taiwan DNA), Taiwan. Currently, his current research interests include Cryptography, Role-based Access Control, Information and Network Security, Mobile and Wireless Communications, Information Management and Technology Law.

The Future of Information Security

Abstract

The field of information security is facing a number of challenges, including the increasing sophistication of cyberattacks, the growing amount of sensitive data that is stored online, and the increasing reliance on connected devices. These challenges are being compounded by the emergence of new technologies, such as quantum computing and artificial intelligence, which could be used to break current encryption methods and create even more sophisticated cyberattacks. However, there are also a number of opportunities for improving information security. New technologies, such as blockchain and 5G, could be used to create more secure and reliable systems. Additionally, the increasing awareness of the importance of information security is leading to the development of new best practices and security standards. In this talk, the Speaker will discuss the challenges and opportunities facing information security in the future. He will argue that the future of information security is bright, but that there are challenges that need to be addressed. By working together, we can create a more secure future for our information.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Associate Professor Waleed Ejaz, Ph.D., P. Eng.



Waleed Ejaz is an Associate Professor at Lakehead University, Canada. He previously served as an Assistant Professor at Thompson Rivers University. Waleed held academic and research roles at Ryerson, Carleton, and Queen's University. He holds B.Sc. and M.Sc. degrees in Computer Engineering from universities in Pakistan and a Ph.D. in Information and Communication Engineering from Sejong University, South Korea. Waleed co-authored over 90 papers and 3 books, focusing on IoT, energy harvesting, 5G, and mobile edge computing.

He is an Associate Editor for IEEE Communications Magazine, IEEE Canadian Journal of Electrical and Computer Engineering, and IEEE ACCESS. He is a registered Professional Engineer and a senior member of IEEE and ACM, also serving as an ACM distinguished speaker.

Enabling Technologies for Internet of Things in 6G Networks

Abstract

Future wireless networks (beyond fifth generation (5G)/sixth generation (6G) networks) are envisioned to connect satellite, aerial, terrestrial, and sea networks to provide connectivity everywhere and all the time. The objective is to provide connectivity to a large number of devices (known as massive connectivity), to support substantial traffic demands, and expand coverage. In addition, United Nations (UN) Sustainable Development Goals (SDGs) also call for 6G's contribution. However, the success of SAGSI networks is constrained by several challenges, including resource optimization, when the users are resource-constrained and have diverse requirements and applications. In this talk, I will start with a brief overview of the requirements and challenges in 6G networks. I will discuss the enabling technologies in 6G research. As examples, I will share my recent research on resource management schemes for massive connectivity in future terrestrial networks, aerial networks, and self-sustainable networks (SSNs) while considering different objectives and constraints, including network scalability, reliability, latency, efficiency (spectral usage and energy consumption), and complexity. The focus is to design novel algorithms and communication protocols for the Internet of things (IoT) networks that have both (i) enhanced network performance in terms of spectrum efficiency, coverage, and energy efficiency and (ii) satisfied a wide range of IoT devices' requirements and constraints. I will then share future research challenges to develop efficient and low-complexity resource management schemes to tackle the challenges of seamless connectivity of heterogeneous devices anytime and anywhere.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Conference Schedule Day 1, Wednesday 9 August 2023

Time	Agenda	Place
07.30 – 08.00	AIRoSIP 2023 Participant Registration	The Ground Floor of AR Fachruddin B Building https://bit.ly/UMYConference Meeting ID: 823 8286 5043 Passcode: 2023
08.00 – 11.30	ICOSI 2023 Opening Ceremony	The Fifth Floor of AR Fachruddin B Building
11.30 – 13.00	Lunch Break	Building F1/F4
AIRoSIP Plenary session		
13.00 – 13.15	The Engineering Faculty's Conferences Opening Ceremony	Studium Generale Room https://bit.ly/Conference_plenary_session <i>Meeting ID: 913 6940 7633</i> <i>Passcode: 986266</i>
13.15 – 13.45	Welcome Speeches by Chairpersons: 1. Teddy Nurcahyadi, S.T., M.Eng., Ph.D. (ICITAMEE) 2. Dr. Nur Hayati, S.ST., M.T. (ICE3IS) 3. Slamet Riyadi, S.T., M.Sc., Ph.D. (AIRoSIP) 4. Ir. Eko Prasetyo, M.Eng., Ph.D. (ICITCOM)	Studium Generale Room https://bit.ly/Conference_plenary_session <i>Meeting ID: 913 6940 7633</i> <i>Passcode: 986266</i>
13.45 – 14.00	Welcome Speech by: Ir. Aris Widyo Nugroho, M.T., Ph.D. (the Dean of the Engineering Faculty)	Studium Generale Room https://bit.ly/Conference_plenary_session <i>Meeting ID: 913 6940 7633</i> <i>Passcode: 986266</i>
14.00 – 15.00	Keynote Speech by: Prof. Dr. Christian Blum (Moderator: Teddy Nurcahyadi, S.T., M.Eng., Ph.D.)	Studium Generale Room https://bit.ly/Conference_plenary_session <i>Meeting ID: 913 6940 7633</i> <i>Passcode: 986266</i>
15.00 – 15.30	Coffee Break	Building F1/F4
15.30 – 17.00	Parallel Session 1	Studium Generale Room & Ruang Sidang Teknik https://bit.ly/Conference_Engineering_meeting <i>meeting ID: 941 2295 9381</i> <i>password: umy2023</i>



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Conference Schedule Day 2, Thursday 10 August 2023

Time	Agenda	Place
07.00 – 08.00	AIRoSIP 2023 Participant Registration	Studium Generale Room
08.00 – 10.00	Parallel Session 2	Studium Generale Room
10.00 – 10.15	Coffee Break	Studium Generale Room
10.15 – 12.00	Parallel Session 3	Studium Generale Room
12.00 – 13.00	Lunch Break	Studium Generale Room
13.00 – 15.00	Keynote Speeches (offline) by: <ol style="list-style-type: none">Assoc. Prof. Dr. Khoirul Anwar, S.T., M.Eng. (Moderator: Widyasmoro, S.T., M.Sc.)Ir. Muhammad Akhsin Muflikhun, S.T., MSME., Ph.D. (Moderator: Drs. Sudarisman, M.S.Mechs., Ph.D.)	Studium Generale Room https://bit.ly/Day2InternationalConference_FTUMY Meeting ID: 859 048 0578 Passcode: ice3is2023
13.00 – 15.00	Keynote Speeches (online) by: <ol style="list-style-type: none">Prof. Dr. Hsing-Chung Chen (Moderator: Cahya Damarjati, S.T. M.Eng., Ph.D.)Assistant Prof. Waleed Ejaz, Ph.D., P.Eng. (Moderator: Dr. Noraisyah Mohd Shah.)	Lab Multimedia Lanjut <i>(These online Keynote Speeches will be presented in parallel with the offline ones)</i> https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381 password: umy2023
15.00 – 15.30	The Engineering Faculty's Conferences Closing Ceremony	Studium Generale Room
15.30 – 16.20	Break	Building F1/F4
16.20 – 17.00	ICOSI 2023 Closing Ceremony	The Fifth Floor of AR Fachruddin B Building



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Parallel Session Schedule

Parallel Session 1
Day 1 Wednesday, August 9th, 2023

Time	Session Code	Person in Charge	Room	Link Zoom
Western Indonesia Time / WIB (GMT+7)				
Parallel Session 1				
15.30-17.00	AI.1 Artificial Intelligence and Automation 1	Dr. Siti Nurul Aqmariah Mohd Kanafiah	Room 1 AI.1	https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381 password: umy2023
15.30-17.00	AI.2 Artificial Intelligence and Automation 2	Dr. Zambri Harun	Room 2 AI.2	https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381 password: umy2023
15.30-17.00	RO.2 Robotics Mechatronics and Computer Vision 3	Assoc. Prof. Dr. Allan Melvin Andrew	Room 3 RO.2	https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381 password: umy2023
15.30-17.00	SP.1 Signal and Image Processing 1	Dr. Hasimah Ali	Room 4 SP.1	https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381 password: umy2023
15.30-17.00	SP.2 Signal and Image Processing 2 (Offline)	Dr. Mohamad Nur Khairul Hafizi Rohani	Ruang Sidang Teknik	https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381 password: umy2023

Parallel Session 2, 3
Day 2 Thursday, August 10th, 2023

Time	Agenda	Person in Charge	Room	Link Zoom
Western Indonesia Time / WIB (GMT+7)				
Parallel Session 2				
08.00-10.00	AI. 3 Artificial Intelligence and Automation 3	Dr. Marni Azira Markom	Room 1 AI. 3	https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381
08.00-10.00	RO.1 Robotics Mechatronics and Computer Vision1	Dr. Siti Marhainis Othman	Room 2 RO.1	https://bit.ly/Conference_Engineering meeting ID: 941 2295



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

				9381
08.00-10.00	SP.3 Parallel Session.2 Signal and Image Processing 3	Dr. Siti Noraini Sulaiman	Room 3 SP.3	https://bit.ly/Conference Engineering meeting ID: 941 2295 9381 9381
Parallel Session 3				
10.15-12.00	AI.4 Artificial Intelligence and Automation 4	Laila Ma'rifatul Azizah, S.Kom., M.I.M.	Room 1 AI.4	https://bit.ly/Conference Engineering meeting ID: 941 2295 9381
10.15-12.00	AI.5 Artificial Intelligence and Automation 5	Dr. Sazwan Syafiq Mazlan, Is Ts	Room 2 AI.5	https://bit.ly/Conference Engineering meeting ID: 941 2295 9381
10.15-12.00	SP.4 Signal and Image Processing 4	Dr. Mohd Nasir Ayob	Room 3 SP.4	https://bit.ly/Conference Engineering meeting ID: 941 2295 9381
10.15-12.00	RO.3 Robotics Mechatronics and Computer Vision 3	Anna Nur Nazilah Chamim, S.T., M.Eng.	Ruang Sidang Teknik	https://bit.ly/Conference Engineering meeting ID: 941 2295 9381 password: umy2023



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Guideline for Zoom Meeting

1. Check the conference schedule. You can find it on the website or in the program book.



Chairman of International Conference on Artificial Intelligence Robotics, and Signal Processing (AIRoSIP)



2. Find your parallel code. You can find it on the Edas home page, website, or program book.

Edas:

Status	Edit	Add and delete authors	Withdraw or unwithdraw	Session	Copyright
Accepted		+	×	RO.3: <i>Offline 2</i> from Wed, August 9, 2023 23:15 EDT until 01:00 (5th paper) in Ruang Sidang Teknik (10 min.)	©

Website:



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

PARALLEL SESSION 1

AI.1
Session Chair: Dr. Siti Nurul Aqmariah Mohd Kanafiah
Time: 09 August, 15.30-17.00 WIB
Link Zoom : https://bit.ly/Conference_Engineering

Program Book:

Parallel Session 1 Schedule Day 1

AI.1
Session Chair: Dr. Siti Nurul Aqmariah Mohd Kanafiah
Time: 09 August, 15.30-17.00 WIB
Link Zoom : https://bit.ly/Conference_Engineering

3. If you have entered the Zoom Meeting room, be sure to change your username with the following format:
Your Parallel Code_Your First name. Ex: AI.1_Wikan
4. Make sure to turn off your microphone when the presenter and moderator are speaking.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Parallel Session 1 Schedule Day 1

AI.1

Session Chair: Dr. Siti Nurul Aqmariah Mohd Kanafiah

Time: 09 August, 15.30-17.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570879722	Cognitive communication and networking	Akula Navya; Renuka Chintamu; Sk Ashraf Ali; Aniruddha Bhattacharjya	Akula Navya, Renuka Chintamu and Sk Ashraf Ali (Koneru Lakshmaiah Education Foundation, India); Aniruddha Bhattacharjya (SGT University, India)
2	1570879947	An exploratory study on healthcare applications for remote patients	Servepalli Moushmi Deekshith; Niharika Kandepu; Adapa Akanksha Sri Karthika; Gunji Deepika; Aniruddha Bhattacharjya	Servepalli Moushmi Deekshith, Niharika Kandepu, Adapa Akanksha Sri Karthika and Gunji Deepika (Koneru Lakshmaiah Education Foundation, India); Aniruddha Bhattacharjya (SGT University, India)
3	1570901871	Sentiment Analysis of the Relocation Indonesia Capital City Nusantara Using Support Vector Machine Algorithm	Muhammad Ilham Alhari	Muhammad Ilham Alhari (Telkom University, Indonesia)
4	1570917093	Smart Hydroponic-Based IoT Using Fuzzy Bayes to Control Vapor Pressure Deficit (VPD) in Lettuce Plant	Mohammad Asad Rosyadi; Muhammad Fauzan Edy Purnomo; Setyawan Sakti	Mohammad Asad Rosyadi (Universitas Brawijaya & UB, Indonesia); Muhammad Fauzan Edy Purnomo and Setyawan Sakti (Brawijaya University, Indonesia)
5	1570918180	Violence Detection over online social networks using YOLOV5 and SVM	Abas K. Saber; Ibraheem Nadher Ibraheem; Methaq Talib Gaata	Abas K. Saber (Al-Mustansiriyah University, Iraq); Ibraheem Nadher Ibraheem (Mustansiriyah University, Iraq & Faculty of Basic Education, Iraq); Methaq Talib Gaata (University of Al-Mustansiriyah, Iraq)
6	1570918232	Automated Thorax Classification System in Computed Tomography Images using Deep Convolutional Neural Network	Mohd Firdaus Abdullah; Siti Noraini Sulaiman; Muhammad Khusairi Osman; Noor Khairiah A. Karim; Adi Izhar Che Ani; Nina Madzhi	Mohd Firdaus Abdullah (Universiti Teknologi MARA, Cawangan Pulau Pinang, Malaysia); Siti Noraini Sulaiman (Universiti Teknologi MARA, Malaysia); Muhammad Khusairi Osman (Universiti Teknologi Mara (UiTM), Malaysia); Noor Khairiah A. Karim (Universiti Sains Malaysia, Malaysia); Adi Izhar Che Ani (Universiti Teknologi MARA, Malaysia); Nina Madzhi (Universiti Teknologi MARA, Shah Alam, Malaysia)



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7	1570918178	Deep Learning Optimizer Evaluation in Blur Detection of Digital Breast Tomosynthesis Images using CNN Constructed from Scratch	Nur Athiqah Binti Harron; Siti Noraini Sulaiman; Muhammad Khusairi Osman; Iza Sazanita Isa; Noor Khairiah A. Karim; Yessi Jusman	Nur Athiqah Binti Harron (Universiti Teknologi MARA, Cawangan Pulau Pinang Pulau Pinang, Malaysia); Siti Noraini Sulaiman (Universiti Teknologi MARA, Malaysia); Muhammad Khusairi Osman (Universiti Teknologi Mara (UiTM), Malaysia); Iza Sazanita Isa (Universiti Teknologi Mara, Malaysia); Noor Khairiah A. Karim (Universiti Sains Malaysia, Malaysia); Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia)
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AI.2

Session Chair: Dr. Zambri Harun

Time: 09 August, 15.30-17.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570918892	Internet Of Things-based Botnet Traffic Detection And Analysis Using Deep Convolutional Neural	Doaa M Majed; Abbas Abdulazeez Abdulhameed; Methaq Talib Gaata	Doaa M Majed (Mustansiriyah University, Iraq); Abbas Abdulazeez Abdulhameed (University of Mustansiriyah, Iraq); Methaq Talib Gaata (University of Al-Mustansiriyah, Iraq)
2	1570922972	A Comparison of Seasonal Auto Regressive Integrated Moving Average and Long Short Term Memory in Forecasting Demand Time Series	Karel Tan; Kevin Tanoto; Nobert Pratama; Heruna Tanty	Karel Tan (Bina Nusantara University, Indonesia); Kevin Tanoto (Bina Nusantara, Indonesia); Nobert Pratama and Heruna Tanty (Bina Nusantara University, Indonesia)
3	1570921374	Brain Tumor Segmentation from MRI scans using 2D U-Net and other U-Net-based models	Ma Sheila A Magboo; Andrei Coronel	Ma Sheila A Magboo (University of the Philippines Manila, Philippines); Andrei Coronel (Ateneo de Manila University, Philippines)
4	1570922406	Electronic Nose with Artificial Neural Network Method on Raspberry Pi 4 for Detecting Pork and Beef	W. S. Mada Sanjaya; Akhmad Roziqin; Thirida Febrilian Putra; Agung Wijaya Temiesela; M. Fauzi Badru Zaman; Fillah Alamsyah; Ahsani Taqwim; Faris Haidar Mubasyir; Nur Azizah Maulina Purnama Sari; Putri Sintia; Samsul Gustamal; Dyah Anggraeni	W. S. Mada Sanjaya (UIN Sunan Gunung Djati Bandung, Indonesia & Bolabot Techno Robotic Institute, Indonesia); Akhmad Roziqin, Thirida Febrilian Putra, Agung Wijaya Temiesela, M. Fauzi Badru Zaman, Fillah Alamsyah, Ahsani Taqwim, Faris Haidar Mubasyir, Nur Azizah Maulina Purnama Sari, Putri Sintia and Samsul Gustamal (UIN Sunan Gunung Djati Bandung, Indonesia); Dyah Anggraeni (UIN Sunan Gunung Djati & Bolabot Techno Robotic Institute, Indonesia)
5	1570925935	Tree Counting and Health Assessment in Central Jakarta, Indonesia Using Aerial Imagery Data with Deep Learning	Rafael Edwin Hananto Kusumo; Adella Gravita, Ms.; Ricky Prasajo; Edy Irwansyah	Rafael Edwin Hananto Kusumo, Adella Gravita, Ms., Ricky Prasajo and Edy Irwansyah (Bina Nusantara University, Indonesia)
6	1570919587	Digital survey for customer satisfaction of Regional Drinking Water Companies (PDAM) Using the mWater	Wilarso Wilarso; Nurkholis Nurkholis; Pria Sukamto Sukamto; Mohamad Anas Sobarnas; Shahrizan Jamaludin; Umar Tsani Abdurrahman	Wilarso Wilarso, Nurkholis Nurkholis, Pria Sukamto Sukamto and Mohamad Anas Sobarnas (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia);



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		Application and the Slovin Formula Method		Shahrizan Jamaludin (Universiti Kebangsaan Malaysia, Malaysia); Umar Tsani Abdurrahman (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia)
7	1570935834	Classification of Community Responses to Service Offices Using a Combined CNN-LSTM Algorithm and Random Forest	Alya Rohalia; Zahir Zainuddin; Zulkifli Tahir	Alya Rohalia, Zahir Zainuddin and Zulkifli Tahir (Hasanuddin University, Indonesia)

RO.2

Session Chair: Assoc. Prof. Dr. Allan Melvin Andrew

Time: 09 August, 15.30-17.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570905555	Development of Automatic Rice Cookers With Washing system	Hendriko Hendriko; Shifa Raysa; Made Rahmawaty; Nur Khamdi; Tsanil Salsamara	Hendriko Hendriko, Shifa Raysa, Made Rahmawaty, Nur Khamdi and Tsanil Salsamara (Politeknik Caltex Riau, Indonesia)
2	1570920976	Design of Baby Incubator Equipped with PID Temperature Controller and Body Weight Sensor	Hanifah Rahmi Fajrin; Muhammad Ahdan Fawwaz Nurkholid; Muhammad Rifqi Nurrachman	Hanifah Rahmi Fajrin, Muhammad Ahdan Fawwaz Nurkholid and Muhammad Rifqi Nurrachman (Universitas Muhammadiyah Yogyakarta, Indonesia)
3	1570936442	Audiometry Prototype with Examination Diagnostics	Erika Loniza; Vera Komalasari; Kurnia Chairunnisa	Erika Loniza and Vera Komalasari (Universitas Muhammadiyah Yogyakarta, Indonesia); Kurnia Chairunnisa (Muhammadiyah University of Yogyakarta, Indonesia)
4	1570936456	Rheumatic Compress Therapy Tool with Fuzzy Logic Mamdani	Erika Loniza	Erika Loniza (Universitas Muhammadiyah Yogyakarta, Indonesia)
5	1570936361	Hybrid Force and Position Control of the KUKA IIWA Robotic Manipulator	Meet Parmar; Himanshu K. Patel	Meet Parmar (Nirma University, India); Himanshu K. Patel (Nirma University & International Society of Automation, India)
6	1570933888	An Analysis on the Energy Consumption of Coverage Path Planning Algorithms on Multiple UAVs	Norrima Mokhtar	Norrima Mokhtar (University of Malaya, Malaysia)
7	1570933898	A Study on the Effects of Increasing Obstacles on Path Generation Time, Energy and Steps Count using Rapidly Exploring Random Tree* (Asterisk) Algorithm	Mr Anees ul Husnain	Anees ul Husnain, Noraisyah Mohamed Shah, Norrima Mokhtar, et. al (University of Malaya, Malaysia)



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

SP.1

Session Chair: Dr. Hasimah Ali

Time: 09 August, 15.30-17.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570901874	Analysis Quality of Service (QoS) Wifi 2.4 Ghz Network Study Case: Telkom University Dormitory Hall	Muhammad Ilham Alhari	Muhammad Ilham Alhari (Telkom University, Indonesia)
2	1570914522	Malaria Early Diagnosis Based on Transfer Learning and CNN Architecture	Zul Indra; Yessi Jusman; Elfizar Elfizar	Zul Indra (Universitas Riau, Indonesia); Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Elfizar Elfizar (Universitas Riau, Indonesia)
3	1570917946	Unsafe Actions Detection for humans using YOLOv7	Mohammed Fathi Abbad; Ibraheem Nadther Ibraheem	Mohammed Fathi Abbad and Ibraheem Nadther Ibraheem (Al-Mustansiriya University, Iraq)
4	1570901878	A Future IT Roadmap Information Architecture Using TOGAF ADM: Towards Smart Village Concept	Muhammad Ilham Alhari	Muhammad Ilham Alhari (Telkom University, Indonesia)
5	1570917884	Brain Tumor Classification Based On MRI Image Processing Using Convolutional Neural Network (CNN) With ResNet Architecture	Divo Ilhamdi; Yunendah Fuadah; Sofia Sa'idah; Zhafeni Arif	Divo Ilhamdi (Telkom University, Indonesia); Yunendah Fuadah (Telkom University & Image and Computer Vision (IMV Laboratory), Indonesia); Sofia Sa'idah and Zhafeni Arif (Telkom University, Indonesia)
6	1570918634	Implementation of Deep Learning Algorithm with Residual U-Net Architecture for Building Detection	Ananda Ilyasa Putra; Esti Suryani; Wiharto Wiharto	Ananda Ilyasa Putra (Universitas Sebelas Maret, Indonesia); Esti Suryani (University of Sebelas Maret, Indonesia); Wiharto Wiharto (Universitas Sebelas Maret, Indonesia)
7	1570919381	Digital Image Encryption Analysis Using the Rikitake Chaotic System	W. S. Mada Sanjaya; Akhmad Roziqin; Agung Wijaya Temiesela; M. Fauzi Badru Zaman; Aria Dewa Wibiksana; Dyah Anggraeni	W. S. Mada Sanjaya (UIN Sunan Gunung Djati Bandung, Indonesia & Bolabot Techno Robotic Institute, Indonesia); Akhmad Roziqin, Agung Wijaya Temiesela, M. Fauzi Badru Zaman and Aria Dewa Wibiksana (UIN Sunan Gunung Djati Bandung, Indonesia); Dyah Anggraeni (UIN Sunan Gunung Djati & Bolabot Techno Robotic Institute, Indonesia)
8	1570937982	Determine Traffic Accidents Based on Changes in Driving Patterns	Andi Syarwani, AS; Amil Ahmad Ilham; Syafaruddin Syafaruddin	Andi Syarwani, AS and Amil Ahmad Ilham (Universitas Hasanuddin, Indonesia); Syafaruddin Syafaruddin (Universitas Hasanuddin Makassar, Indonesia)



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

SP.2

Session Chair: Assoc. Prof. Dr. Mohamad Nur Khairul Hafizi Rohani

Time: 09 August, 15.30-17.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

Offline : Ruang Sidang Teknik

No.	ID Paper	Title		Authors
1	1570930249	Compressive Sensing (CS) on Wireless Sensor Network for Manufacturing Process Monitoring	Signal and Image Processing	Muhammad Chaerullah (Politeknik Astra & Telkom University, Indonesia)
2	1570920256	Evaluation of Partial Discharge Signal Propagation Using Finite Element Method in Power Transformer	Mohamad Nur Khairul Hafizi Rohani; Muhammad Alleef Abd Jalil; Afifah Shuhada Rosmi; Abdullahi Abubakar Mas'ud; Firdaus Muhammad-Sukki; Kumuthawathe Ananda-Rao	Mohamad Nur Khairul Hafizi Rohani, Muhammad Alleef Abd Jalil and Afifah Shuhada Rosmi (Universiti Malaysia Perlis, Malaysia); Abdullahi Abubakar Mas'ud (Jubail Industrial City & Jubail Industrial College, Saudi Arabia); Firdaus Muhammad-Sukki (Edinburgh Napier University, United Kingdom (Great Britain)); Kumuthawathe Ananda-Rao (University Malaysia Perlis, Malaysia)
3	1570936241	Application of Autonomous Robotics for En-Masse coolant channel Replacement Program	Rajat Jayantilal Rathod; Himanshu K. Patel; Priyank Jayantilal Rathod	Rajat Jayantilal Rathod (Nirma University, India & Eeio Solutions Private Limited, India); Himanshu K. Patel (Nirma University & International Society of Automation, India); Priyank Jayantilal Rathod (Eeio Solutions Pvt Ltd, India)



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

Parallel Session 2 Schedule Day 2

AI.3

Session Chair: Dr. Marni Azira Markom

Time: 10 August, 08.00-10.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570919469	Monkeypox Skin Lesion Detection using Transfer Learning Methods	Vincent Peter C Magboo; Ma Sheila A Magboo	Vincent Peter C Magboo and Ma Sheila A Magboo (University of the Philippines Manila, Manila, Philippines)
2	1570919530	Machine Condition Monitoring System Based on IoT Platform for Intelligent Maintenance	Mastang Mastang; Wilarso Wilarso; Muhamad Ali Pahmi Pahmi; Dan Mugisidi; Norhana Arsad	Mastang Mastang, Wilarso Wilarso and Muhamad Ali Pahmi Pahmi (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia); Dan Mugisidi (Universitas Muhammadiyah UHAMKA, Indonesia); Norhana Arsad (Universiti Kebangsaan Malaysia, Malaysia)
3	1570930059	Predicting Market Manipulation In Stock Market Using Supervised Machine Learning: Case Study From The Indonesia Stock Exchange Unusual Market Activity Cases	Muhammad Ghozy UI Haq; Kodrat Mahatma; Betty Purwandari	Muhammad Ghozy UI Haq (University of Indonesia & Indonesia Financial Service Authority, Indonesia); Kodrat Mahatma and Betty Purwandari (Universitas Indonesia, Indonesia)
4	1570926515	Application of Support Vector Machine (SVM) Method for Photovoltaic Condition Classification Based on Characteristic Curve Indicators	Imam Faried Assalam; Indar Chaerah Gunadin; Syafaruddin Syafaruddin	Imam Faried Assalam (Universitas Hasanuddin, Indonesia); Indar Chaerah Gunadin (Hasanuddin University, Indonesia); Syafaruddin Syafaruddin (Universitas Hasanuddin Makassar, Indonesia)
5	1570928240	Optimization of Hybrid Generation (PVs, Batteries, and Generators) in an Off-Grid Area Using a Multi-Objective Optimization Approach	Dianti Utamidewi; Indar Chaerah Gunadin; Syafaruddin Syafaruddin	Dianti Utamidewi (Universitas Hasanuddin, Indonesia); Indar Chaerah Gunadin (Hasanuddin University, Indonesia); Syafaruddin Syafaruddin (Universitas Hasanuddin Makassar, Indonesia)
6	1570928318	Deep Learning Model for Classifying Public Opinions on Energy Sector IHSG Stocks on the Twitter Social Media Platform	Bambang Sulistio; Yaya Heryadi; Lukas Lukas; Wayan Suparta; Ilvico Sonata	Bambang Sulistio and Yaya Heryadi (Bina Nusantara University, Indonesia); Lukas Lukas (Universitas Katolik Indonesia Atma Jaya, Indonesia); Wayan Suparta (Institut Teknologi Nasional Yogyakarta, Indonesia & Bina Nusantara University, Indonesia); Ilvico Sonata (BINUS University, Indonesia)
7	1570928573	Poverty Level Prediction Based on Time Series Data using Auto Arima	Nadine Aulia Fazrina; Dedy Rahman Wijaya; Sari Dewi Budiwati; Budhy Aditya Hadie	Nadine Aulia Fazrina, Dedy Rahman Wijaya and Sari Dewi Budiwati (Telkom University, Indonesia); Budhy Aditya Hadie (Diskominfo Bandung, Indonesia)
8	1570929656	Prediction of Internet Broadband Connectivity Classification in West Java Indonesia Using Machine Learning	Wahyu H Kusuma Atmaja; Yaya Heryadi; Ilvico Sonata; Lukas Lukas; Wayan Suparta	Wahyu H Kusuma Atmaja (Bina Nusantara University & PLN Icon plus, Indonesia); Yaya Heryadi (Bina Nusantara University, Indonesia); Ilvico Sonata (BINUS University, Indonesia); Lukas Lukas (Universitas Katolik Indonesia Atma Jaya, Indonesia); Wayan Suparta (Institut Teknologi Nasional Yogyakarta, Indonesia & Bina Nusantara University, Indonesia)



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9	1570930291	Aerial Image-Based Semantic Segmentation for Forest Fire Identification	Nadilla Asyifa Salma; Mahmud Dwi Sulistiyo; Risnandar Risnandar; Febryanti Sthevanie; Gia Septiana Wulandari	Nadilla Asyifa Salma (Telkom University, Indonesia); Mahmud Dwi Sulistiyo (Telkom University, Indonesia & Nagoya University, Japan); Risnandar Risnandar (The IVDA-Research Group-Research Center for Information and Data Sciences-BRIN, Indonesia); Febryanti Sthevanie and Gia Septiana Wulandari (Telkom University, Indonesia)
10	1570928597	Improving Radar-Based Rainfall Estimation with Ensemble Learning: A Comparative Analysis with the ZR Equation	Rashifa Khairani Setianegara; Maulana Putra; Djati Handoko; Mohammad Rosid	Rashifa Khairani Setianegara, Maulana Putra and Djati Handoko (Universitas Indonesia, Indonesia); Mohammad Rosid (University of Indonesia, Indonesia)

RO.1

Session Chair: Dr. Siti Marhainis Othman

Time: 10 August, 08.00-10.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570938828	Classification of Water Apple (Syzygium aqueum) Leaf Varieties Using Transfer Learning	Agus Pratondo; Toufan Tambunan; Astri Novianty	Agus Pratondo, Toufan Tambunan and Astri Novianty (Telkom University, Indonesia)
2	1570929767	Classification of Hypertension Based on Machine Learning	Ayu Sekar Safitri; Thalita Dewi Rahmaniar; Indah Indriani; Yunendah Fuadah; Sofia Saidah; Tody Wibowo	Ayu Sekar Safitri and Thalita Dewi Rahmaniar (Telkom University, Indonesia); Indah Indriani (Telkom Unveristy, Indonesia); Yunendah Fuadah (Telkom University & Image and Computer Vision (IMV Laboratory), Indonesia); Sofia Saidah and Tody Wibowo (Telkom University, Indonesia)
3	1570929491	Investigating the Impact of Data Augmentation for Fine-Grained Grocery Product Classification based on Vision Transformer	Rissa Rahmania; Yaya Heryadi; Lukas Lukas; Wayan Suparta; Ilvico Sonata	Rissa Rahmania and Yaya Heryadi (Bina Nusantara University, Indonesia); Lukas Lukas (Universitas Katolik Indonesia Atma Jaya, Indonesia); Wayan Suparta (Institut Teknologi Nasional Yogyakarta, Indonesia & Bina Nusantara University, Indonesia); Ilvico Sonata (BINUS University, Indonesia)
4	1570930032	Classification of Cataract Fundus Images Using Convolutional Neural Network (CNN) Method EfficientNet-B0 Architecture	Erni Yanthy Pardede; Alvian Pandapotan Sitohang; Yunendah Fuadah; Farah Hanifah; Nur Alifia Azzahra; Rita Magdalena; Sofia Saidah	Erni Yanthy Pardede and Alvian Pandapotan Sitohang (Telkom University, Indonesia); Yunendah Fuadah (Telkom University & Image and Computer Vision (IMV Laboratory), Indonesia); Farah Hanifah, Nur Alifia Azzahra, Rita Magdalena and Sofia Saidah (Telkom University, Indonesia)
5	1570935962	Unleashing the Power of Deep Neural Networks for Breast Cancer Diagnosis	Ohood F Ismael; Maryim Omran ALkuzaay; Monji Kherallah; Fahmi Kammoun	Ohood F Ismael (University of Sfax, Iraq); Maryim Omran ALkuzaay (University of Kufa, Iraq); Monji Kherallah (Academia, Tunisia); Fahmi Kammoun (FSS, Tunisia)



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6	1570935929	Off-grid Multi-carrier Microgrid System Design using Moth-flame Optimization Algorithm in Polytechnic University of the Philippines-Manila	Joeneill De Leon; Mark Laurence Lazatin; Mikka Geroleo; Ryan John Dagatan; Lady Xyrille S.A Galvez; Jeffrey E. Sabornido; Manuel M Muhi; Orland D Tubola	Joeneill De Leon, Mark Laurence Lazatin, Mikka Geroleo, Ryan John Dagatan, Lady Xyrille S.A Galvez, Jeffrey E. Sabornido, Manuel M Muhi and Orland D Tubola (Polytechnic University of the Philippines, Philippines)
7	1570938814	Enhancing Object Detection and Navigation for Visually Impaired Individuals: A YOLOv3-Based Approach with GPS Integration	Thifal Bariq Athallah; Anhar Risnumawan	Thifal Bariq Athallah and Anhar Risnumawan (Politeknik Elektronika Negeri Surabaya, Indonesia)
8	1570938894	Inverted Pendulum Balance Control With PID Method Based on Open PLC	Marcellino Mandala Saputra; Eko Budi Utomo	Marcellino Mandala Saputra and Eko Budi Utomo (Politeknik Elektronika Negeri Surabaya, Indonesia)
9	1570936819	Prediction of preferences for public transport car types using machine learningp	Agus Pratondo; A. P. Sujana	Agus Pratondo and A. P. Sujana (Telkom University, Indonesia)
10	1570936827	Deep Learning-Based Classification of Duku Fruit Varieties (Lansium domesticum)	Agus Pratondo; Astri Novianty	Agus Pratondo and Astri Novianty (Telkom University, Indonesia)

SP.3

Session Chair: Dr. Siti Noraini Sulaiman

Time: 10 August, 08.00-10.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570924616	Predicting Microbial Populations In Seafood Using Support Vector Regression Algorithms And Electronic Nose	Emung Zakaria; Dedy Rahman Wijaya; Tedi Gunawan	Emung Zakaria, Dedy Rahman Wijaya and Tedi Gunawan (Telkom University, Indonesia)
2	1570920987	Machine Learning for Speech Emotion Recognition	Darwindra Darwindra; Sofia Sa'idah; Bambang Hidayat	Darwindra Darwindra, Sofia Sa'idah and Bambang Hidayat (Telkom University, Indonesia)
3	1570920991	Glaucoma Detection on Eye Fundus Image using Machine Learning Method	Dhimas Chandra Bagaskara; Sofia Sa'idah; Rita Magdalena	Dhimas Chandra Bagaskara, Sofia Sa'idah and Rita Magdalena (Telkom University, Indonesia)
4	1570929585	Prediction of Colon Cancer Using DenseNet121, CNN, and REsNET50 Machine Learning Models and Using Image Processing Techniques	Mahadi Hasan; Jahirul Islam; Minhaz Ahmed; Md Maruf Hasan	Mahadi Hasan (The University of Tennessee at Chattanooga, USA); Jahirul Islam (New Mexico Institute of Mining and Technology, USA); Minhaz Ahmed (Amazon.com, USA); Md Maruf Hasan (University of South Dakota, USA)
5	1570930046	Convolutional Neural Network (CNN) for Quality of Coffee Beans Classification System	Nadillah Rahmatia Kautsari	Nadillah Rahmatia Kautsari (Telkom University, Indonesia)
6	1570932205	Potential of Aggregation and Selection of Cellular Network Carrier to Support Mobile Subscribers	Indar Surahmat; Widyasmoro Widyasmoro	Indar Surahmat and Widyasmoro Widyasmoro (Universitas Muhammadiyah Yogyakarta, Indonesia)



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7	1570930734	Adversarial Learning for Text to Image Semantic Consistency using Deep Fusion(DF-GAN)	Sujata Sachin Virulkar	Sujata Sachin Virulkar (AISSMS IOIT Pune, India)
8	1570935700	Implementation of MobileNetV2 SSD FPN-Lite CNN Model for Real-time Detection of Spinach Leaf Diseases	Rosmiati Jamiah, Jr; Ingrid Nurtanio; Andani Achmad	Rosmiati Jamiah, Jr, Ingrid Nurtanio and Andani Achmad (Hasanuddin University, Indonesia)
9	1570926015	Numerical Analysis on River Slope Reinforcement System for Erosion Control Using Finite Element Method	Kezia Samantha; Adhitya Yoga Purnama; Devi Oktaviana Latif; Pinta Astuti; Bayu Ilham Nasukha	Kezia Samantha, Adhitya Yoga Purnama and Devi Oktaviana Latif (Universitas Gadjah Mada, Indonesia); Pinta Astuti (Universitas Muhammadiyah Yogyakarta, Indonesia); Bayu Ilham Nasukha (Universitas Gadjah Mada, Indonesia)
10	1570937459	Analysis of Effect Self-Healing on Corrosion Concrete Using Ultrasonic Method	Rivky Afanda; Ahmad Zaki	Rivky Afanda (Muhammadiyah University of Yogyakarta, Indonesia); Ahmad Zaki (Universitas Muhammadiyah Yogyakarta, Indonesia)
11	1570894060	Common Mode Noise Reduction Strategies in Radar Devices	Tjahjo Adiprabowo	Tjahjo Adiprabowo (BRIN, Indonesia); Yuyu Wahyu (Indonesia Institute of Science LIPI, Indonesia); Budi Prawara and Nasrullah Armi (BRIN, Indonesia); Budiman Putra Asma'ur P. A. Rohman (National Research and Innovation Agency, Indonesia); Puput Dani Prasetyo Adi (National Research and Innovation Agency (BRIN-RI), Indonesia)



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Parallel Session 3 Schedule Day 2

AI.4

Session Chair: Laila Ma'rifatul Azizah

Time: 10 August, 10.15-12.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570930328	Enhancing Movie Recommendations: A Hybrid Filtering Approach Combining Collaborative and Content-Based Filtering	Esther Vemberly; Eugenia Ancilla; Anderies Anderies; Andry Chowanda	Esther Vemberly and Eugenia Ancilla (BINUS University, Indonesia); Anderies Anderies and Andry Chowanda (Bina Nusantara University, Indonesia)
2	1570936166	Artificial Intelligence-Driven Conceptual Framework to Generate Value from the Data in the Banking Industry: A Systematic Review	Idha Kristiana; Ford Gaol; Suhono Harso; Benny Ranti	Idha Kristiana (Bina Nusantara University, Indonesia); Ford Gaol (Bina Nusantara University, Jakarta, Indonesia); Suhono Harso (Indonesia); Benny Ranti (Bina Nusantara University, Indonesia)
3	1570933561	Classifying Tweet Sentiment Analysis on Airlines using Random Forest Classifier, Naïve Bayes Classifier and K-Nearest Neighbors Classifier Algorithm	Ivan Alexander	Ivan Alexander (Bina Nusantara University, Indonesia)
4	1570932046	Investigation on Machine Learning Based Approaches for Estimating the Critical Temperature of Superconductors	Fatin Abrar Shams; Rashed Hasan Ratul; Ahnaf Islam Naf; Syed Shaek Hossain Samir; Mirza Muntasir Nishat; Fahim Faisal; Md. Ashrafu Hoque	Fatin Abrar Shams (IUT, Bangladesh); Rashed Hasan Ratul (Islamic University of Technology (IUT), Bangladesh); Ahnaf Islam Naf and Syed Shaek Hossain Samir (IUT, Bangladesh); Mirza Muntasir Nishat, Fahim Faisal and Md. Ashrafu Hoque (Islamic University of Technology, Bangladesh)
5	1570933023	Smart Closed-Loop Jamming System	Hosam Alamlah; Peter Joseph	Hosam Alamlah (University of North Carolina Wilmington & Louisiana Tech University, USA); Peter Joseph (University of North Carolina Wilmington, USA)
6	1570933391	IoT Model for Rescue Operations Among First Responders for Disaster Management	Swarnamouli Majumdar; Sonny Kirkley	Swarnamouli Majumdar (University of Massachusetts Lowell, USA); Sonny Kirkley (Indiana University, USA)
7	1570935933	Predicting the Rooftop Solar Energy Potential of the City of Manila Using an Artificial Neural Network based System Utilizing Geographic Features	Jeheu Jesse Dela Cruz; Casey Amirel Bundoc; Redgienald Allen D. De Guzman; Hector V Dionisio; Michelle Anne G. Tumarong; Carl Francis A Veloso; Orland D Tubola; Manuel M Muhi	Jeheu Jesse Dela Cruz, Casey Amirel Bundoc and Redgienald Allen D. De Guzman (Polytechnic University of the Philippines, Philippines); Hector V Dionisio (Polytechnic University of the Philippines - Manila, Philippines); Michelle Anne G. Tumarong (Polytechnic University of the Philippines, Philippines); Carl Francis A Veloso (Polytechnic University of the Philippines - Manila, Philippines); Orland D Tubola and Manuel M Muhi (Polytechnic University of the Philippines, Philippines)
8	1570935734	Deep Learning-Based Short-Term Power Output Prediction for Calatagan Solar Farm using CNN-LSTM Hybrid Model	Pristine Louise A. Villaflor; John Paulo Andal; Ferolyn A Aytona; Maria Chelzea Anne A. Duque; Jessie Niño C Marquez; Geoffrey T Salvador; Orland D Tubola	Pristine Louise A. Villaflor (Philippines); John Paulo Andal and Ferolyn A Aytona (Polytechnic University of the Philippines, Philippines); Maria Chelzea Anne A. Duque and Jessie Niño C Marquez (Philippines); Geoffrey T Salvador and Orland D Tubola (Polytechnic University of the Philippines, Philippines)



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9	1570933884	Utilizing Non Linear Modeling Techniques for Fugitive Gas Emissions Data in Environmental Monitoring Applications	Norrima Mokhtar	Norrima Mokhtar (University of Malaya, Malaysia)

AI.5

Session Chair: Dr. Sazwan Syafiq Mazlan, Is Ts

Time: 10 August, 10.15-12.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570936655	Federated Learning in IoT: A Survey from a Resource-Constrained Perspective	Ishmeet Kaur; Adwaita Janardhan Jadhav	Ishmeet Kaur (USA); Adwaita Janardhan Jadhav (Apple, USA)
2	1570936460	Utilizing Artificial Neural Networks to Evaluate the Bioenergy Potential of Coconut as a Primary Power Generator in the CALABARZON Region	Thomas Felix P Balbaboco; Lemuel V Bassig; Coleen B Capuno; Jhubean Harold Quetua; Nathaniel John F Raya; Hugh Gerard Michel M Santos; Nicole D Umali; Orland D Tubola	Thomas Felix P Balbaboco (Polytechnic University of the Philippines & None, Philippines); Lemuel V Bassig, Coleen B Capuno, Jhubean Harold Quetua, Nathaniel John F Raya, Hugh Gerard Michel M Santos, Nicole D Umali and Orland D Tubola (Polytechnic University of the Philippines, Philippines)
3	1570936461	Knowledge Acquisition from Student Lecture Reflection Data: Leveraging Large Language Models and Tacit Knowledge	Bacharuddin Adieb Pratama; Kemas Wiharja; Gia Septiana Wulandari	Bacharuddin Adieb Pratama, Kemas Wiharja and Gia Septiana Wulandari (Telkom University, Indonesia)
4	1570936464	Cyberbullying Detection on Twitter using Convolutional Neural Network (CNN) and Gated Recurrent Unit (GRU)	Nur Wakhidah Fitri Amalia; Erwin B. Setiawan	Nur Wakhidah Fitri Amalia and Erwin B. Setiawan (Telkom University, Indonesia)
5	1570940491	A Smart Intravenous Infusion Dosing System	Mayur Rele; Dipti Patil	Mayur Rele (ISACA, ISC2, IEEE & Parachute Health, USA); Dipti Patil (University of Cumberlands, USA)
6	1570936670	List-wise Learning To Rank Approach Using Bert For Question-Answering System	Sheeba Naz; Aditi Sharan	Sheeba Naz and Aditi Sharan (Jawaharlal Nehru University, India)
7	1570940398	Arabic Dialect Identification On Social Media: Mini Review	Enas Alqulaity; Wael Yafooz; Abdullah Alsaeedi	Enas Alqulaity, Wael Yafooz and Abdullah Alsaeedi (Taibah University, Saudi Arabia)
8	1570940445	An Overview of Artificial Intelligence in the Detection of Suspicious Arabic Text on Social Media Platforms	Amal Albalawi; Wael M.S Yafooz	Amal Albalawi (University of Prince Mugrin & Taibah University, Saudi Arabia); Wael M.S Yafooz (Taibah University, Saudi Arabia)



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

SP.4

Session Chair: Dr. Mohd Nasir Ayob

Time: 10 August, 10.15-12.00 WIB

Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: 941 2295 9381

password: umy2023

No.	ID Paper	Title	Presenter	Authors
1	1570935957	Simulation and Analysis of Solar Energy Potential Along South Luzon Expressway (SLEX): Integrating Solar Photovoltaic Systems for Sustainable Roadway Power Generation	Eddie S. Antonio, Jr.; Joshua Ramon E Benigno; Hanri James C Care; Hans Patrick Q. Carlos; Mekaella D Pascua; Mark Vincent H. Santelices; Orland D Tubola; Manuel M Muhi	Eddie S. Antonio, Jr., Joshua Ramon E Benigno, Hanri James C Care, Hans Patrick Q. Carlos, Mekaella D Pascua, Mark Vincent H. Santelices, Orland D Tubola and Manuel M Muhi (Polytechnic University of the Philippines, Philippines)
2	1570936074	Banana-based Biomass Power Plant Site Suitability Analysis through GIS mapping in Davao del Norte	Kian Xavier J. Agustin; Chad Henry S Cabalonga; Isaac F. Esmale; John Christian R. Valencia; Michael Neo Angelo F Tinay; Orland D Tubola; Ria Garnette A Buhat; Shane Kelly N Amoroso	Kian Xavier J. Agustin and Chad Henry S Cabalonga (Polytechnic University of the Philippines, Philippines); Isaac F. Esmale (Philippines); John Christian R. Valencia (Polytechnic University of the Philippines - Manila, Philippines); Michael Neo Angelo F Tinay (Polytechnic University of the Philippines-Manila, Philippines); Orland D Tubola (Polytechnic University of the Philippines, Philippines); Ria Garnette A Buhat (Polytechnic University of the Philippines- Manila, Philippines); Shane Kelly N Amoroso (Polytechnic University of the Philippines, Philippines)
3	1570936337	ADHD Mental Health Symptoms Detection Based on Facial Landmark Tracking	Christian Nash; Rajesh Nair; Syed Mohsen Naqvi	Christian Nash (Newcastle University, United Kingdom (Great Britain)); Rajesh Nair (CNTW-NHS Foundation Trust, United Kingdom (Great Britain)); Syed Mohsen Naqvi (Newcastle University, United Kingdom (Great Britain))
4	1570933706	Classification of Building Structure Fragility Levels with Machine Learning Based on Hue and Zernike Moment Invariant Methods	Muhammad Fajrul Faiz; Yessi Jusman; Ahmad Zaki	Muhammad Fajrul Faiz, Yessi Jusman and Ahmad Zaki (Universitas Muhammadiyah Yogyakarta, Indonesia)
5	1570940345	Analysis of Shear Strength Reduction Effect on Slope Stability Due to Expansive Soil Using Three-Dimensional Finite Element Method	Adhitya Yoga Purnama; Bayu Ilham Nasukha; Devi Oktaviana Latif; Pinta Astuti; Gumbert Maylda Pratama	Adhitya Yoga Purnama, Bayu Ilham Nasukha and Devi Oktaviana Latif (Universitas Gadjah Mada, Indonesia); Pinta Astuti (Universitas Muhammadiyah Yogyakarta, Indonesia); Gumbert Maylda Pratama (Universitas Atmajaya Yogyakarta, Indonesia)
6	1570941105	Analysis of Corroded Concrete Using Radiography Method	Ahmad Zaki; Tania Tasya Meutia; Ni Nyoman Kencanawati; Syarizal Fonna; Zainah Ibrahim	Ahmad Zaki and Tania Tasya Meutia (Universitas Muhammadiyah Yogyakarta, Indonesia); Ni Nyoman Kencanawati (University of Mataram, Indonesia); Syarizal Fonna (Universitas Syiah Kuala, Indonesia); Zainah Ibrahim (University of Malaya, Malaysia)
7	1570941110	Brain Tumor Evaluation Calculate Volume	Dwi Swasono Rachmad	Dwi Swasono Rachmad (JI Melati III No 21 Kav Perwirasari RT 002 RW 008 Kelurahan Perwira Kec Bekasi Utara Kota Bekasi & PT ADA APA LAGI, Indonesia)
8	1570941179	5G Small Cell Design for Nusantara's Roadways	Fasya Tiarani; Anna Christina Situmorang; Dadang Gunawan	Fasya Tiarani, Anna Christina Situmorang and Dadang Gunawan (Universitas Indonesia, Indonesia)



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9	1570935938	Classification of Spine Images Using Texture based DWT for Normal and Scoliosis	Hasimah Ali; Siti Nurul Aqmariah Mohd Kanafiah; Mohamed Elshaikh	Hasimah Ali (University Malaysia Perlis, Malaysia); Siti Nurul Aqmariah Mohd Kanafiah (Universiti Malaysia Perlis, Malaysia); Mohamed Elshaikh (UniMAP, Malaysia)
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RO.3

Session Chair: Anna Nur Nazilah Chamim

Time: 10 August, 10.15-12.00 WIB

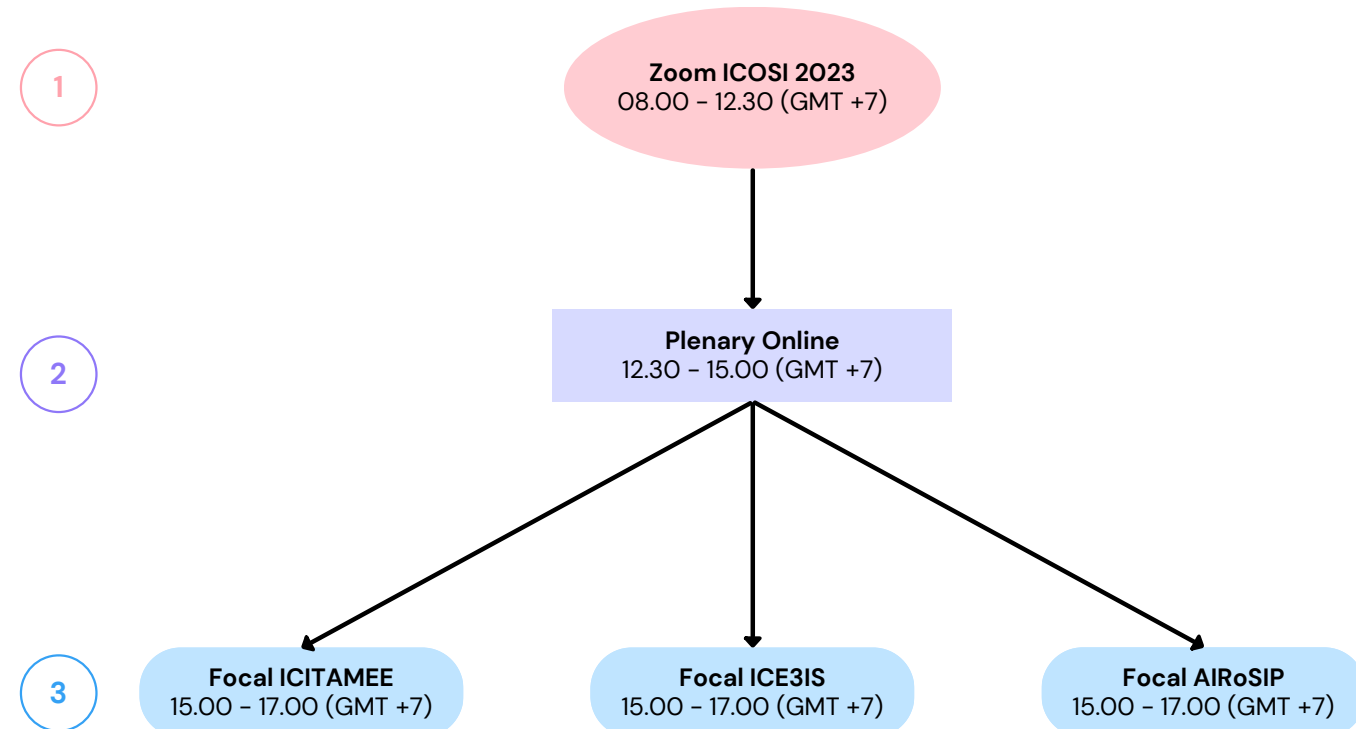
Link Zoom : https://bit.ly/Conference_Engineering

meeting ID: **941 2295 9381**

password: **umy2023**

No.	ID Paper	Title	Presenter	Authors
1	1570915922	Spinal disorders classification system based on the Hu and Zernike Moment Invariant and Machine Learning methods	Anna Nur Nazilah Chamim; Yessi Jusman; Ibnu Rahmat Siddik; Mohd Imran Yusof; Hasimah Ali; Siti Nurul Aqmariah Mohd Kanafiah	Anna Nur Nazilah Chamim, Yessi Jusman and Ibnu Rahmat Siddik (Universitas Muhammadiyah Yogyakarta, Indonesia); Mohd Imran Yusof (Universiti Sains Malaysia, Malaysia); Hasimah Ali (University Malaysia Perlis, Malaysia); Siti Nurul Aqmariah Mohd Kanafiah (Universiti Malaysia Perlis, Malaysia)
2	1570897766	Classification of Prostate Cancer Staging using VGG-19 and GoogLeNet Transfer Learning Models	Yessi Jusman; Shafa Cahyaningtyas; Feriandri Utomo	Yessi Jusman and Shafa Cahyaningtyas (Universitas Muhammadiyah Yogyakarta, Indonesia); Feriandri Utomo (Universitas Abdurrah, Indonesia)
3	1570931016	Predicting PM2.5 Levels Using AIoT Sensory Node in a Smart Campus Environment	Karisma Putra	Karisma Putra (Universitas Muhammadiyah Yogyakarta, Indonesia)
4	1570913133	Classification of Abnormalities in Spine Curvature Based on Shape Features using Machine Learning	Yessi Jusman; Masayu Alya Nuraini; Fikran Aulia; Anna Nur Nazilah Chamim; Siti Nurul Aqmariah Mohd Kanafiah; Mohd Imran Yusof	Yessi Jusman, Masayu Alya Nuraini, Fikran Aulia and Anna Nur Nazilah Chamim (Universitas Muhammadiyah Yogyakarta, Indonesia); Siti Nurul Aqmariah Mohd Kanafiah (Universiti Malaysia Perlis, Malaysia); Mohd Imran Yusof (Universiti Sains Malaysia, Malaysia)
5	1570936209	Neural Network Backpropagation Breast Cancer And Thyroid Classification System Using Scaled Conjugation Backpropagation, LavenbergMarquardt, and Bayesian Regularization	Yessi Jusman; Muhammad Albik Ghalela	Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Muhammad Albik Ghalela (University of Muhammadiyah Yogyakarta, Indonesia)

ICOSI Online Day-1

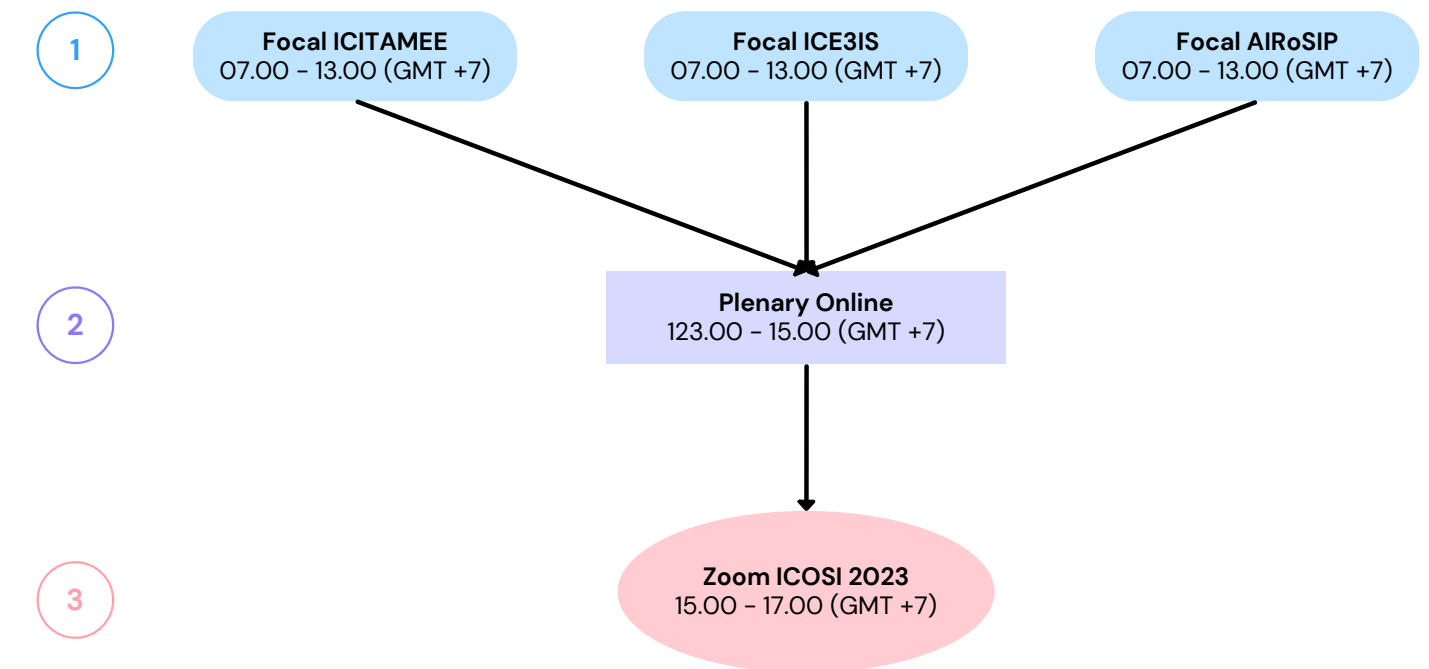


ZOOM'S DETAIL

Here are the links for every step and Session
(Please refer to each steps' color code)

MEETING LINK	DETAIL
https://us02web.zoom.us/j/82382865043?pwd=NTE4SWMvTU1yROhTSGdCQzArLOd1dzO9	Meeting ID: 823 8286 5043 Passcode: 2023
https://telkonsel.zoom.us/j/91369407633?pwd=YWxlZ3lhdIRqSTJEZ2t6emZDeGZZZzO9	Meeting ID: 913 6940 7633 Passcode: 986266
ICITAMEE: https://telkonsel.zoom.us/j/91369407633?pwd=YWxlZ3lhdIRqSTJEZ2t6emZDeGZZZzO9	Meeting ID: 913 6940 7633 Passcode: 986266
ICE3IS: https://telkonsel.zoom.us/j/8590480578?pwd=RVpBNTNTODIDRFdZRVl3dU9MemxodzO9	Meeting ID: 859 048 0578 Passcode: ice3is2023
AIRoSIP: https://telkonsel.zoom.us/j/96039808420?pwd=TU5sbDhaWDAycXJLRkRFWGtOOWhXQT09	Meeting ID: 960 3980 8420 Passcode: 492365

ICOSI Online Day-2



ZOOM'S DETAIL

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MEETING LINK	DETAIL
ICITAMEE: https://telkonsel.zoom.us/j/91369407633?pwd=YWxlZ3lhdIRqSTJEZ2t6emZDeGZZZzO9	Meeting ID: 913 6940 7633 Passcode: 986266
ICE3IS: https://telkonsel.zoom.us/j/8590480578?pwd=RVpBNTNTODIDRFdZRVl3dU9MemxodzO9	Meeting ID: 859 048 0578 Passcode: ice3is2023
AIRoSIP: https://telkonsel.zoom.us/j/96039808420?pwd=TU5sbDhaWDAycXJLRkRFWGtOOWhXQT09	Meeting ID: 960 3980 8420 Passcode: 492365
https://telkonsel.zoom.us/j/96039808420?pwd=TU5sbDhaWDAycXJLRkRFWGtOOWhXQT09	Meeting ID: 960 3980 8420 Passcode: 492365
https://us02web.zoom.us/j/82382865043?pwd=NTE4SWMvTU1yROhTSGdCQzArLOd1dzO9	Meeting ID: 823 8286 5043 Passcode: 2023



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

AI.1 (Parallel Session.1 Artificial Intelligence and Automation 1)

Session time	Wednesday, 15:30 until 17:00
Location	https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381 password: umy2023, Link Room 1
Talk time	10
Chaired by	Siti Nurul Aqmariah Mohd Kanafiah (Universiti Malaysia Perlis, Malaysia)

15:30: *Cognitive communication and networking*

Akula Navya (Koneru Lakshmaiah Education Foundation, India); Renuka Chintamu (Koneru Lakshmaiah Education Foundation, India); Sk Ashraf Ali (Koneru Lakshmaiah Education Foundation, India); Aniruddha Bhattacharjya (SGT University, India)

Abstract: The effective management of expanding complexity is a well-known problem in the domain of communication networks. The cognitive network (CN) can be a beacon light for this problem. In this paper, we have studied the current researches on cognitive networks, along with that, we also studied the associated and enabling methods and tools. We have found that through analysis and learning, the cognitive communication network (CCN) can recognize both internal and external changes. Also, our studies have found cognitive communication networks automatically adjust the communication capabilities and resources distributed across each layer in accordance with user demands. It also can be intelligently adaptable to the changing environments and user demands.

15:40: *An exploratory study on healthcare applications for remote patients*

Servepalli Moushmi Deekshith (Koneru Lakshmaiah Education Foundation, India); Niharika Kandepu (Koneru Lakshmaiah Education Foundation, India); Adapa Akanksha Sri Karthika (Koneru Lakshmaiah Education Foundation, India); Gunji Deepika (Koneru Lakshmaiah Education Foundation, India); Aniruddha Bhattacharjya (SGT University, India)

Abstract: Healthcare has experienced massive changes as a results of the development of technologies. It is a basic requirement for human life. Nowadays online platforms are continuously growing in the field of healthcare and helping millions in the world. The innovative technologies such as Virtual reality, artificial intelligence, data analysis, Blockchain and mixed reality are not only interesting but they are increasingly applied in the field of healthcare. The objective of this research is to study healthcare applications that are suitable for patients who reside far away. The aim of this research is to explore the advantages and challenges of implementing healthcare applications for people living in remote places, looking at the variables that influence the adoption of these applications, and offer suggestions for improving these applications more. A qualitative research methodology was used to conduct the study. The Virtual developments in healthcare can reduce the overall global healthcare spending and they are very much hassle-free to use for patients. These developments will cause major changes in the healthcare in upcoming decades. The study has found that remote patients can certainly benefit from healthcare applications, including improved treatment accessibility, cost savings, and convenience. Unfortunately, a variety of challenges, including technological problems, privacy issues, and a lack

of understanding, prevent the broader use of these applications. These healthcare applications provide authentications and scalable structures.

15:50: Sentiment Analysis of the Relocation Indonesia Capital City Nusantara Using Support Vector Machine Algorithm

Muhammad Ilham Alhari (Telkom University, Indonesia)

Abstract: Currently, social media is rapidly expanding on the internet, with Twitter being one of the most popular platforms. Twitter is widely used to discuss various topics, including economics, politics, social issues, culture, and law. One of the prominent subjects being debated on Twitter is the relocation of Indonesia's capital city, which has sparked controversy among supporters and opponents with differing perspectives. This phenomenon of Twitter debates reflects the collective concern about public discourse on the issue. Sentiment analysis, which involves extracting, understanding, and processing unstructured data to determine sentiment in opinion sentences, is commonly used to analyze social media data. Among the different machine learning methods used for sentiment analysis, the Support Vector Machine (SVM) method is proposed in this study for sentiment classification of tweets related to the topic of relocating Indonesia's capital city on Twitter. The classification is done into two classes, positive and negative sentiments. Testing on a dataset of 1,116 tweets (404 positive and 832 negative) related to the topic using SVM yielded an accuracy of 96.68%, precision of 95.82%, recall of 94.04%, and AUC (Area Under the Curve) of 0.979.

16:00: Smart Hydroponic-Based IoT Using Fuzzy Bayes to Control Vapor Pressure Deficit (VPD) in Lettuce Plant

Mohammad As'ad Rosyadi (Universitas Brawijaya & UB, Indonesia); Muhammad Fauzan Edy Purnomo (Brawijaya University, Indonesia); Setyawan Sakti (Brawijaya University, Indonesia)

Abstract: Vegetable crops can be affected by a Vapor Pressure Deficit (VPD). VPD value affects plant growth and development. There are many Internet of Things (IoT) devices that can help in the agricultural sector, but there is a lack of devices that can detect, especially VPD problems. For this reason, it is necessary to calibrate the VPD value using the fuzzy algorithm and the Bayes method via IoT. In this study, we used temperature, humidity, water quality, pH, soil moisture, and oxygen sensors to determine the VPD value and control growth. The readings from all sensors are processed by ESP 32 and sent to the MySQL database, then the process of fuzzy Bayes runs on the server. Based on that study, based on this study, lettuce plants that underwent control produced taller plants, more leaves, and higher fresh weight. In addition, this method achieves a success rate of up to 87% and is faster than manual calculations.

16:10: Violence Detection over online social networks using YOLOV5 and SVM

Abas K. Saber (Al-Mustansiriyah University, Iraq); Ibraheem Nadher Ibraheem (Mustansiriyah University & Faculty of Basic Education, Iraq); Methaq Talib Gaata (University of Al-Mustansiriyah, Iraq)

Abstract: 7.9 fatality per 10,000 persons worldwide are caused by acts of human aggression on a yearly average basis. The majority of human violence occurs suddenly or in remote locations. Stopping such acts is severely hampered by the information delay in this case. The detection method is employed in this work to focus on this problem. One of the most efficient computer vision algorithms is the one for moving object detection from CCTV. There are currently CCTV cameras on each street, which is incredibly beneficial for solving cases. For predicting and detecting action and video-based features, computer vision uses certain deep learning (DL) methods. Police arrive in violent locations in real time, check the CCTV footage, and begin their investigation. This investigation is specifically intended to identify aggressive behavior captured on CCTV. The research consists of four DL models that are utilized to create a system for detecting violent acts in videos using the YOLOV5 algorithm and Support Vector Machine (SVM) classification models. This model is real-time-capable. The research's findings revealed that the suggested model achieves 99% accuracy.

16:20: Automated Thorax Classification System in Computed Tomography Images using Deep Convolutional Neural Network

Mohd Firdaus Abdullah (Universiti Teknologi MARA, Cawangan Pulau Pinang, Malaysia); Siti Noraini Sulaiman (Universiti Teknologi MARA, Malaysia); Muhammad Khusairi Osman (Universiti Teknologi Mara (UiTM), Malaysia); Noor Khairiah A. Karim (Universiti Sains Malaysia, Malaysia); Adi Izhar Che Ani (Universiti Teknologi MARA, Malaysia); Nina Madzhi (Universiti Teknologi MARA, Shah Alam, Malaysia)

Abstract: Lung cancer can lead to death and has become the second most common cancer worldwide. Based on CT scan images, the images will detect the body's overall parts, including the thorax and non-thorax parts. However, lung lesions related to lung cancer are found in the thorax region. To develop a fully automated system for analysing lung lesions, there is a need to separate the slices of the thorax and non-thorax in overall CT images. Recently, an Artificial Neural Network (ANN) called Deep Convolutional Neural Network (DCNN) was introduced to extract features automatically from a given dataset. Convolutional Neural Network (CNN) is a type of DCNN used in image recognition and processing. This study proposes the Deep Convolution Neural Network (DCNN) as a machine learning method to classify the thorax and non-thorax region from CT scan images of lung cancer. Three different DCNN architecture models have been developed, and the result shows that the DCNN 3 has a good performance compared to other DCNN models, with a testing accuracy of 99.6%.

16:30: Deep Learning Optimizer Evaluation in Blur Detection of Digital Breast Tomosynthesis Images using CNN Constructed from Scratch

Nur Athiqah Binti Harron (Universiti Teknologi MARA, Cawangan Pulau Pinang Pulau Pinang, Malaysia); Siti Noraini Sulaiman (Universiti Teknologi MARA, Malaysia); Muhammad Khusairi Osman (Universiti Teknologi Mara (UiTM), Malaysia); Iza Sazanita Isa (Universiti Teknologi Mara, Malaysia); Noor Khairiah A. Karim (Universiti Sains Malaysia, Malaysia); Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia)

Abstract: Identifying breast cancer at an early stage is an important part of determining a suitable treatment plan but is often challenging due to the image quality. Digital Breast Tomosynthesis (DBT) is a method that extends digital mammography to detect breast cancer beyond areas of density. However, the series of projection images of the breast from various angles of the DBT system X-ray source results in blurry and low-contrast effect images. Due to this issue, the identification of abnormalities among DBT series is tedious and time-consuming. Therefore, there is an urgent need for automatic image quality analysis techniques on DBT images. This study proposed a Deep Learning (DL) based approach for blur image detection in DBT series of images. A Convolutional Neural Network (CNN) was constructed from scratch and then used in hybrid with a support vector machine (SVM) classifier to detect blur in DBT images. The performance of the obtained model was attempted to be improved by training with various deep-learning optimizers including Sgdm, Adam, and RMSProp. For a comprehensive evaluation, training accuracy, validation accuracy, F1-score, and the number of epochs (required to converge training and validation plots) were compared. From the experiments, the proposed constructed CNN architecture trained with the Adam optimizer attained the highest validation accuracy and F1-score of 98.04% and 0.9796 respectively at 50 epochs which is comparatively better than other optimizers. The finding of this study shows that DL optimizer evaluation is necessary to get the optimal performance of the CNN model.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

AI.2 (Parallel Session .1 Artificial Intelligence and Automation 2)

Session time	Wednesday, 15:30 until 17:00
Location	https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381 password: umy2023, Link Room 2
Talk time	10
Chaired by	Zambri Harun (Universiti Kebangsaan Malaysia, Malaysia)

15:30: Internet Of Things-based Botnet Traffic Detection And Analysis Using Deep Convolutional Neural

Doaa M Majed (Mustansiriyah University, Iraq); Abbas Abdulazeez Abdulhameed (University of Mustansiriyah, Iraq); Methaq Talib Gaata (University of Al-Mustansiriyah, Iraq)

Abstract: Botnets are among the biggest dangers on the internet. They are intentionally used to weaken the cornerstones of network security. specifically, Confidentiality, Integrity, and Availability, to effectively find and protect against botnets. We have proposed deep learning methods namely Convolutional Neural Networks (CNN), and Long Short-Term Memory (LSTM) used to detect botnets and assessed them using the BOT- IOT botnet dataset. And we use a variety of performance metrics, including accuracy, sensitivity, specificity, precision, and F1 score to assess how well each model performs when it comes to the classification of known botnet traffic patterns. The result shows the efficacy and accuracy of our suggested method for detecting known botnet traffic.

15:40: A Comparison of Seasonal Auto Regressive Integrated Moving Average and Long Short Term Memory in Forecasting Demand Time Series

Karel Tan (Bina Nusantara University, Indonesia); Kevin Tanoto (Bina Nusantara, Indonesia); Nobert Pratama (Bina Nusantara University, Indonesia); Heruna Tanty (Bina Nusantara University, Indonesia)

Abstract: Time series forecasting has been used in many subjects. While planning, the more accurately we predict the future, the better we can position ourselves for it. For some time ago, to forecast the time series we used Moving Average, Exponential Smoothing, and foremost among them is Auto Regressive Integrated Moving Average (ARIMA). As technology advances, we continue to employ the conventional methods on a regular basis, but machine learning has led many firms to desire higher profits with lower expenses. For demand forecasting, a variety of statistical models and machine learning have been widely used. This paper will investigate whether the traditional statistic model Auto Regressive Integrated Moving Average (ARIMA) performs better in forecasting demand time series with the advanced model of machine learning such as Long Short-Term Memory (LSTM). Some papers suggest that machine learning is not always better than traditional model in forecasting time series. The dataset is taken from a publicly used data resource such as Kaggle. The Mean Absolute Percentage Error (MAPE) was used as the evaluation metric. The results show that Seasonal ARIMA performs better in forecasting time series than LSTM model.

15:50: Brain Tumor Segmentation from MRI scans using 2D U-Net and other U-Net-based models

Ma Sheila A Magboo (University of the Philippines Manila, Philippines); Andrei Coronel (Ateneo de Manila University, Philippines)

Abstract: In this study four deep learning-based image segmentation models were constructed to segment brain tumors from FLAIR and T1ce MRI modalities. The four models were 2D U-Net, and the three 2D U-Net based variants which are the U-Net VGG19, U-Net ResNet50, and U-Net InceptionV3. Both qualitative and quantitative methods of assessment were used to evaluate model performance. Qualitative methods include visual presentation of ground truth vis-à-vis the predicted segmentation in order to see how similar is the prediction vis-à-vis the ground truth. As for the quantitative metrics Dice coefficients of the whole tumor, necrotic/core, edema, and enhancing tumors were obtained along with the Mean IOU, Precision, Sensitivity, and Specificity. Generally, all models achieved good performance however in this study 2D U-Net emerged as the best model for getting the highest scores in almost all metrics. Clinical decision-support tools like this can provide timely and accurate information to help radiologists come up with more informed decisions associated with assessment of the tumor's aggressiveness, potential interventions or therapies, and in monitoring of treatment response over time.

16:00: Electronic Nose with Artificial Neural Network Method on Raspberry Pi 4 for Detecting Pork and Beef

W. S. Mada Sanjaya (UIN Sunan Gunung Djati Bandung & Bolabot Techno Robotic Institute, Indonesia); Akhmad Roziqin (UIN Sunan Gunung Djati Bandung, Indonesia); Thirda Febrilian Putra (UIN Sunan Gunung Djati Bandung, Indonesia); Agung Wijaya Temiesela (UIN Sunan Gunung Djati Bandung, Indonesia); M. Fauzi Badru Zaman (UIN Sunan Gunung Djati Bandung, Indonesia); Fillah Alamsyah (UIN Sunan Gunung Djati Bandung, Indonesia); Ahsani Taqwim (UIN Sunan Gunung Djati Bandung, Indonesia); Faris Haidar Mubasyir (UIN Sunan Gunung Djati Bandung, Indonesia); Nur Azizah Maulina Purnama Sari (UIN Sunan Gunung Djati Bandung, Indonesia); Putri Sintia (UIN Sunan Gunung Djati Bandung, Indonesia); Samsul Gustamal (UIN Sunan Gunung Djati Bandung, Indonesia); Dyah Anggraeni (UIN Sunan Gunung Djati & Bolabot Techno Robotic Institute, Indonesia)

Abstract: As the country with the largest Muslim population, Indonesia promotes the adoption of a halal lifestyle, encompassing various aspects of life, including food. This research aims to differentiate between beef and pork using an E-Nose system, both in their pure form and when combined. The E-Nose system utilizes eight gas sensors (MQ 135, MQ 9, MQ 8, MQ 7, MQ 6, MQ 4, MQ 3, MQ 2) to measure the levels of gases commonly found in the process of distinguishing between beef and pork. The detected gases in beef and pork are converted into ADC signals by Arduino and then into PPM. The tested PPM values are stored in a database located on Raspberry Pi 4. Beef and pork are classified using the artificial neural network (ANN) method, and the analysis includes accuracy, precision, recall (sensitivity), true negative rate (specificity), F1-score, confusion matrix, and Principal Component Analysis (PCA). The predictions from the artificial neural network show correspondence with the training data. The results of this research indicate that the E-Nose system with the ANN method is able to differentiate between beef and pork with an accuracy of 99.77%. With this research, it is expected to effectively distinguish between beef and pork, both in their pure form and when combined, enabling individuals to avoid consuming forbidden (haram) food and addressing dishonest practices by traders.

16:10: Tree Counting and Health Assessment in Central Jakarta, Indonesia Using Aerial Imagery Data with Deep Learning

Rafael Edwin Hananto Kusumo (Bina Nusantara University, Indonesia); Adella Gravita, Ms. (Bina Nusantara University, Indonesia); Ricky Prasojito (Bina Nusantara University, Indonesia); Edy Irwansyah (Bina Nusantara University, Indonesia)

Abstract: Trees play a crucial role as one of the primary oxygen producers. They have particular significance in urban areas, where they contribute to residents physical and mental well-being by providing a healthy living

environment. With the important role that trees play in the ecosystem, it becomes imperative to maintain and monitor tree populations. Counting and mapping existing trees is a fundamental step in this process, and deep learning methods offer a practical solution. This research employed the DeepForest algorithm, a Python package capable of detecting trees in aerial RGB imagery. Specifically, this study utilized aerial imagery data to study the Gelora Bung Karno (GBK) area and TPU Karet Bivak in Central Jakarta, Indonesia. The results using the DeepForest algorithm yielded F1 scores of 21% accuracy for the first GBK area, 60% accuracy for the second GBK area, and 70% accuracy for the TPU Karet Bivak area. The lower accuracy in GBK area is influenced by the dense canopy, making it more difficult to detect individual trees. Alongside the DeepForest algorithm, this study also includes tree health assessment by using Visible Atmospherically Resistant Index (VARI) calculation. The VARI analysis relies on the tree counting results from TPU Karet Bivak due to its higher accuracy. The analysis categorizes trees into different classes based on their different levels of health, enabling a more comprehensive review and maintenance process. Specifically, the study identifies 27 trees in needs inspection, 41 trees in declining health, 15 trees in moderate health, and 2 trees identified as healthy.

Bio for Ricky Prasajo: As the main presenter

16:20: Digital survey for customer satisfaction of Regional Drinking Water Companies (PDAM) Using the mWater Application and the Slovin Formula Method

Wilarso Wilarso (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia); Nurkholis Nurkholis (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia); Pria Sukamto Sukamto (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia); Mohamad Anas Sobarnas (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia); Shahrizan Jamaludin (Universiti Kebangsaan Malaysia, Malaysia); Umar Tsani Abdurrahman (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia)

Abstract: A digital survey is a method for obtaining data and customer opinions regarding the products or services they have received. To determine how pleased PDAM (Regional Water Supply Company) customers are with the support they received from the mWater application in this case, digital surveys might be used. Questions about PDAM services, such as response time, water quality, and amenities provided, may be included in this digital survey. Customers can remark or rate products using a scale to react. Since conventional methods, which continue to use paper media to collect respondent data, are still employed to conduct surveys, there are still a lot of filling errors. Overall, utilizing the A successful and efficient technique is to perform a customer satisfaction survey using the mWater app and the Slovin formula. The MWater program, which is based on a geographic information system (GIS), enables PDAMs to quickly and efficiently develop survey forms and obtain survey results. The required sample size from the customer population is computed using the slovin formula. The results of the survey can then be applied to raise customer service standards.

16:30: Classification of Community Responses to Service Offices Using a Combined CNN-LSTM Algorithm and Random Forest

Alya Rohalia (Hasanuddin University, Indonesia); Zahir Zainuddin (Hasanuddin University, Indonesia); Zulkifli Tahir (Hasanuddin University, Indonesia)

Abstract: This study analyzes urban issues by examining people's social media responses. The government requires public feedback to assess its performance in addressing these issues. The study employs a combined CNN-LSTM & RF method to classify the responses into 16 agency categories based on their respective responsibilities. We utilize Continuous Bag-of-Words (CBOW) to convert text into vector form, conduct feature extraction using Convolutional Neural Network (CNN) followed by Long Short-Term Memory (LSTM) combination, and then perform classification with Random Forest (RF). This research contributes to developing a practical combination algorithm for analyzing and classifying public responses. The combined results of these

algorithms provide a multi-class service classification with 83% precision, 80% recall, and 81% F1 score, which enhances accuracy compared to separate models.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

RO.2 (*Parallel Session.1 Robotics Mechatronics and Computer Vision 2*)

Session time	Wednesday, 15:30 until 17:00
Location	https://bit.ly/Conference_Engineering meeting ID: 941 2295 9381 password: umy2023, Laboratorium TI, Link Room 3
Talk time	10
Chaired by	Allan Melvin Andrew (Universiti Malaysia Perlis, Malaysia)

15:30: *Development of Automatic Rice Cookers With Washing system*

Hendriko Hendriko (Politeknik Caltex Riau, Indonesia); Shifa Raysa (Politeknik Caltex Riau, Indonesia); Made Rahmawaty (Politeknik Caltex Riau, Indonesia); Nur Khamdi (Politeknik Caltex Riau, Indonesia); Tsanil Salsamara (Politeknik Caltex Riau, Indonesia)

Abstract: Rice is one of the essential foods in the world, especially in Indonesia. Before being processed to become food, the rice should be washed first. Mainly the process of washing the rice is done manually and separated from the cooking process. This paper was developed on an automatic rice cooker. The Automatics system began when the water was inserted into the rice tank to wash the rice. The volume of the water was controlled automatically based on the weight of the rice to be processed. The washing process was conducted twice to ensure the cleanliness of the rice. The dirty water from the washing process was removed using a solenoid valve. After the washing process finishes, the cooking process starts by filling the water in the rice tank. The cooking process was controlled using a limit switch. A limit switch was used to detect the level of water. A series of tests have been carried out to define parameters used by the control system, such as the time required by the pump to fill the tank. The test was also conducted to check the performance of the rice cooker. The rotation speed of the stirrer drops significantly when 90 minutes of cooking time and even totally stops starting for 3 kg of weight. The result shows that the rice cooker could be used to cook the rice, even though the time spent cooking the rice is relatively long.

15:40: *Design of Baby Incubator Equipped with PID Temperature Controller and Body Weight Sensor*

Hanifah Rahmi Fajrin (Universitas Muhammadiyah Yogyakarta, Indonesia); Muhammad Ahdan Fawwaz Nurkholid (Universitas Muhammadiyah Yogyakarta, Indonesia); Muhammad Rifqi Nurrachman (Universitas Muhammadiyah Yogyakarta, Indonesia)

Abstract: This study added weight parameters to monitor the baby's weight development and a PID control system to maintain the temperature value at the set point. This study aims to develop a temperature control PID system in the baby incubator so that the chamber temperature can be stable and a weight sensor to monitor the baby's weight development. This study uses the Arduino Mega Pro 2560 as the mainboard, the Ds18b20 sensor as the skin and chamber sensor, and the loadcell sensor as the weight sensor. Based on the test results on the chamber temperature parameter, the highest error value was at chamber temperature of 0.62% at 32 °C. The highest overshoot value at room temperature was 0.93% at 32 °C. In the skin temperature parameter, the

highest error value was 0.26% at 36 °C, and in the skin sensor test, an error of 0.06% was obtained. Then in the weight parameter test, the largest error value was found at 1 kg with an error value of 4%. From the data obtained, it can be seen that the baby incubator, with the development of the PID temperature control system and body weight sensor, has worked quite well because the error value of each parameter is still within the tolerance value limit.

15:50: *Audiometry Prototype with Examination Diagnostics*

Erika Loniza (Universitas Muhammadiyah Yogyakarta, Indonesia); Vera Komalasari (Universitas Muhammadiyah Yogyakarta, Indonesia); Kurnia Chairunnisa (Muhammadiyah University of Yogyakarta, Indonesia)

Abstract: Technology in the environment can unknowingly be a factor in causing ear problems and damaging the hearing system. Noise levels that exceed the threshold value can affect hearing loss and the risk of damage to the ear, both temporary and permanent. To diagnose a problem with the ear, need a test using an audiometer. An audiometer is a medical device with a relatively high selling price. Therefore, this study aims to make an audiometer with a low budget, but the tools made are similar in function to tools sold freely in the market. The test method used is to compare the frequency generated by the instrument with a comparison tool in the form of an oscilloscope and the intensity of the sound coming out of the headphones using a standard instrument in the form of a Sound Level Meter. The results of the frequency test produced the highest error value at a frequency of 8000 Hz, namely 2.37%, while in the sound intensity test compared to a sound level meter, there was a significant difference in the range of 10-30 db because the room at the time of testing was inadequate with an error value of $\pm 1\%$. The resulting error value is still within the tolerance threshold of 5%. Therefore, it can be said that the audiometer that has been made can function correctly. The development of this audiometry instrument can help health workers in the diagnostic field to be able to diagnose patients correctly.

Bio for Erika Loniza: Erika Loniza received a Bachelor of Engineering degree from the Department of Electrical Engineering Universitas Muhammadiyah Yogyakarta in 2006, a Master's Engineering degree from the Department of Electrical and Information Technology Engineering, Universitas Gajah Mada Yogyakarta, Indonesia in 2016. She is a lecturer in the Department of Electromedical Engineering, Vocational Program, Universitas Muhammadiyah Yogyakarta, Indonesia. Her research interests are electrical engineering, instrumentation, and control.

16:00: *Rheumatic Compress Therapy Tool with Fuzzy Logic Mamdani*

Erika Loniza (Universitas Muhammadiyah Yogyakarta, Indonesia); Fakhru Dewantoro (Universitas Muhammadiyah Yogyakarta, Indonesia); Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Kurnia Chairunnisa (Muhammadiyah University of Yogyakarta, Indonesia)

Abstract: Rheumatoid arthritis pain is a symptom of the disease that most often prompts people to seek treatment. One intervention that can be used is the use of warm compresses. To help the elderly and health workers in treating warm compresses, research is carried out with innovation and compression does not need to be done repeatedly using fuzzy Mamdani logic control which will be processed using a microcontroller. The results of the 39°C Temperature Test obtained the temperature began to reach according to the setting within 2 minutes 30 seconds with a temperature of 39.19° C, an initial temperature of 29.51oC, an average deviation value of 0.29 and a measurement error of 0.51%. The results of the 40°C Temperature Test found that the temperature began to reach the setting within 3 minutes with a temperature of 40.06°C, an initial temperature of 29.13 °C, an average deviation value of 0.23 and a measurement error of 0.43%. The results of the 4°C Temperature Test found that the temperature will begin to reach the setting within 3 minutes 45 seconds with a temperature of 41.06°C, an initial temperature of 28.88°C, an average deviation value of 0.23 and a measurement error of 0.43%. The results of the 42°C Temperature Test found that the temperature will begin to reach the setting within 4 minutes with a temperature of 42.13°C, an initial temperature of 29.25°C, an average deviation value of 0.23 and a measurement error of 0.43%.

Bio for Erika Loniza: Erika Loniza received a Bachelor of Engineering degree from the Department of Electrical Engineering Universitas Muhammadiyah Yogyakarta in 2006, a Master's Engineering degree from the Department of Electrical and Information Technology Engineering, Universitas Gajah Mada Yogyakarta, Indonesia in 2016. She is a lecturer in the Department of Electromedical Engineering, Vocational Program, Universitas Muhammadiyah Yogyakarta, Indonesia. Her research interests are electrical engineering, instrumentation, and control.

16:10: Hybrid Force and Position Control of the KUKA IIWA Robotic Manipulator

Meet Parmar (Nirma University, India); Himanshu K. Patel (Nirma University & International Society of Automation, India)

Abstract: The paper describes the current methodology used for the trajectory tracking. Due to the environment and handling textural uncertainties current designs have limitations to adjust error in the control system. This change has been a prerequisite to identify a new design of a position controller for better trajectory planning and tracking. A new control system design associated with a robot that controls and is able to react quickly to such changes. This necessitates the management of abrupt signal fluctuations in sensor data. The controller can react quickly to unexpected changes in the environment while maintaining excellent position and force tracking performance. A KUKA IIWA manipulator's hybrid force and position controller can be utilised to control the force using an adaptive control method for an unknown uneven surface. This control system has been verified using dynamic simulation for the KUKA IIWA robot in Simulink Simscape library. Using the MATLAB Simulink, the controlling algorithm has been developed to control the robot that has a feedback system to contact the force subsystem with the feedback reaction torque system.

16:20: A Study on the Effects of Increasing Obstacles on Path Generation Time, Energy and Steps Count using Rapidly Exploring Random Tree* (Asterisk) Algorithm

Noraisyah Mohd Shah (Universiti Malaya, Malaysia); Norrima Mokhtar (University of Malaya, Malaysia)

Abstract: Collision avoidance in complex or dynamic environments has been under the light for quite some time in robotic research. This article presents the study of Rapidly Exploring Random Tree (RRT) and its variation in an environment containing dynamic obstacles to avoid collision and reach a target location. A simulation was established consisting of a multi-obstacle environment resembling real-world complexities of an indoor environment. The objective of the study was the feasibility of the path generated for the robot, considering the limitations like maximum turning angle, acceleration or deceleration, number of maneuvers. The smoothness of the generated path plays critical role for the robots, therefore, this case study of RRT highlights this issue and eventually recommends the consideration of hardware limitations in robots or a threshold of smoothness for autonomous collision avoidance path planning algorithms.

16:30: An Analysis on the Energy Consumption of Coverage Path Planning Algorithms on Multiple UAVs

Norrima Mokhtar (University of Malaya, Malaysia); Takao Ito (Hiroshima University, Japan)

Abstract: One of the greatest limitations that aerial vehicles face nowadays is the limitation in flight durations. This issue becomes more critical in search applications where a specific area is required to be covered through drone using Coverage Path Planning (CPP) algorithms. Searching in bigger regions multiple drones are often deployed to cover an area. This work utilized multiple combinations of UAVs using different CPP algorithms to find the most optimal choice to cover a region. There were four simulation scenarios with the above-mentioned combinations which were evaluated for multiple parameters. These parameters include coverage completeness, coverage time, battery consumption and the number of maneuvers required to cover the region using ROS Gazebo Simulation and Qground Control. The data retrieved from the simulation results were then compared to determine the best CPP method. It was observed from the results that the Expanding Spiral method proved to be the fastest CPP method with the least coverage time, lowest battery consumption and least number of turns.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

SP.1 (*Parallel Session.1 Signal and Image Processing 1*)

Session time Wednesday, 15:30 until 17:00

Location Link Room 3

Talk time 10

Chaired by

15:30: Analysis Quality of Service (QoS) Wifi 2.4 Ghz Network Study Case: Telkom University Dormitory Hall

Muhammad Ilham Alhari (Telkom University, Indonesia)

Abstract: Internet facilities in Dormitory Hall Telkom University use a 2.4 Ghz wireless network. This facility is used by staff, employees, educators, and students. Therefore, bandwidth management is needed to maintain stability, distribute traffic evenly, and maintain connectivity. The method used is the Network Development Life Cycle (NDLC). The purpose of this study is to stabilize bandwidth usage in the Simple Network Management Protocol (SNMP) protocol, distribute upload and download speeds evenly, improve Quality of Service (QoS) through throughput, delay, jitter, and packet loss parameters. The results of this study provide quantitative output for each objective and QoS parameters that can be used as a reference for determining the distribution of bandwidth in accordance with the bandwidth capacity that is owned without disturbing QoS on wireless networks.

15:40: Malaria Early Diagnosis Based on Transfer Learning and CNN Architecture

Zul Indra (Universitas Riau, Indonesia); Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Elfizar Elfizar (Universitas Riau, Indonesia)

Abstract: Malaria has spread worldwide since the early 20th century and causes nearly half a million deaths each year. Malaria is actually a curable and preventable disease if treatment initiatives are carried out early and effectively. Confirming the presence of the malaria parasite earlier would make treatment of the disease more effective in reducing mortality. Unfortunately, this disease is often ignored because it is considered the common cold and is only diagnosed when it has reached a critical phase. This research is expected to be an alternative for early diagnosis of malaria. This study aims to develop a computer-assisted disease diagnosis (CAD) system enriched with deep learning algorithms to help diagnose malaria. This CAD system has the potential to provide rapid, inexpensive and reliable diagnosis of malaria, avoiding common detection errors. In making CAD applications, this study applies the CNN algorithm which will undergo modification of the architecture. In addition to accelerating training, this study applies Transfer Learning with models that have been trained on ImageNet data. Based on the results obtained, this study succeeded in surpassing previous research benchmarks with an accuracy value above 97%.

15:50: Unsafe Actions Detection for humans using YOLOv7

Mohammed Fathi Abbad (Al-Mustansiriya University, Iraq); Ibraheem Nadther Ibraheem (Al-Mustansiriya University, Iraq)

Abstract: unsafe actions detection is crucial because of its applications in security and law enforcement activities and reducing violence in public places. In order to recognize unsafe human activities in videos, this paper uses the YOLOv7 algorithm. Then, as the original YOLOv7 method had only partially recognized unsafe human activities in particular video frames, this work offered a better version of the methods. The the main objective of this paper is to help detect and keep an eye on any two or more persons who act out in unsafe behaviors in real-time, such as punching, kicking, pointing, pushing up, and hugging. The primary problem with an intelligent surveillance the system is the capacity to detect and recognize unsafe human behavior in real-time in a video surveillance system. The classification performance of the behavior detection models is insufficient because the scene's complexity impacts behavior recognition for video surveillance systems. We created a deep learning model based on a YOLOv7 multiscale feature the combination that reduces the effects of constant appearance changes, background clutter, and pedestrian occlusion to improve the network's processing effectiveness and address the the problem of low classification accuracy of a human unsafe action detection. This model effectively detects any unsafe activities. Because we obtained good results and excellent accuracy, The results of the experiment indicate that our model has a mean average precision (mAP) of 99%.

16:00: A Future IT Roadmap Information Architecture Using TOGAF ADM: Towards Smart Village Concept

Muhammad Ilham Alhari (Telkom University, Indonesia)

Abstract: The improvement of the digital ecosystem in the village government environment with the application of the adoption of information communication technology (ICT) in the development of the smart village architecture enterprise model is important for the strategy of developing digital technology in the village government environment to realize government with aspects of integrity values that synergize with the objectives of developing a digital ecosystem based on aspects of improving public services. The object of research this research focuses on village governments in Indonesia, so that the concept of designing smart villages in the digital public service domain can be implemented and synergize with the sustainable development goals for the convenience and efficiency of all business process flows. The method used in this study used the adoption of the TOGAF framework. The Digital Ecosystem is very necessary for the development of smart villages to make a description in the form of an IT roadmap as a reference material in the implementation and guidelines in the implementation of the digital village service program, the expected output of this research is in the form of an IT Roadmap Blueprint smart village concept in the digital village service domain to the village. Keywords- Village, Enterprise

16:10: Brain Tumor Classification Based On MRI Image Processing Using Convolutional Neural Network (CNN) With ResNet Architecture

Divo Ilhamdi (Telkom University, Indonesia); Yunendah Fuadah (Telkom University & Image and Computer Vision (IMV Laboratory), Indonesia); Sofia Sa'idah (Telkom University, Indonesia); Zhafeni Arif (Telkom University, Indonesia)

Abstract: This research aims to classify brain tumors into four classes, namely Glioma, Meningioma, Pituitary, and Non-tumor using a system. The system will use Convolutional Neural Network (CNN) with ResNet architecture. The ResNet that will be used is ResNet-18. As the name implies, ResNet18 has 18 layers consisting of 17 convolutional layers and 1 fully-connected layer. The dataset in this paper is obtained from Kaggle totaling 7,043 data. This data is processed into 4 different datasets, namely the original dataset, dataset using CLAHE preprocessing, dataset using Canny preprocessing, and dataset using Sobel preprocessing. The results obtained on the four datasets are not much different, but the best performance is obtained on the original dataset using the Adam optimizer, learning rate 0.0001, batch size 32, and iterations of 20 epochs. The system can detect and classify four classes of brain tumors on the original dataset with an accuracy performance value of 96.49%, precision value of 96.18%, recall value of 96.49%, F-1 score of 96.33%.

16:20: Implementation of Deep Learning Algorithm with Residual U-Net Architecture for Building Detection

Ananda Ilyasa Putra (Universitas Sebelas Maret, Indonesia); Esti Suryani (University of Sebelas Maret, Indonesia); Wiharto Wiharto (Universitas Sebelas Maret, Indonesia)

Abstract: Automatic building detection from satellite imagery plays a crucial role in rapidly developing areas. Building detection can assist in illegal building detection, population estimation, and so on. U-Net is a convolutional neural network architecture that is commonly used to detect buildings from satellite imagery. However, the U-Net's deep layer structure makes it vulnerable to vanishing gradients and may affect model performance. To address this issue, residual blocks are applied in the U-Net architecture to overcome the vanishing gradient problem to produce a more accurate model for detecting buildings from satellite imagery. Training and testing on the Massachusetts Building Dataset demonstrate that Residual U-Net achieves an F1 score of 0.842 and an IoU of 0.728, outperforming U-Net with an F1 score of 0.814 and an IoU of 0.688. Moreover, Residual U-Net surpasses other architectures such as FCN, Seg-Unet, and HFSA U-Net in terms of performance.

16:30: Digital Image Encryption Analysis Using the Rikitake Chaotic System

W. S. Mada Sanjaya (UIN Sunan Gunung Djati Bandung & Bolabot Techno Robotic Institute, Indonesia); Akhmad Roziqin (UIN Sunan Gunung Djati Bandung, Indonesia); Agung Wijaya Temiesela (UIN Sunan Gunung Djati Bandung, Indonesia); M. Fauzi Badru Zaman (UIN Sunan Gunung Djati Bandung, Indonesia); Aria Dewa Wibiksana (UIN Sunan Gunung Djati Bandung, Indonesia); Dyah Anggraeni (UIN Sunan Gunung Djati & Bolabot Techno Robotic Institute, Indonesia)

Abstract: In today's digital era, ensuring the security of data has become increasingly important due to the vast amount of crucial information stored in digital formats. The Rikitake chaotic system offers a potential solution for data security. This study focuses on investigating the Rikitake system through the analysis of its phase diagrams, time series, bifurcation diagrams, and Poincaré maps. The system's chaotic behavior is harnessed as a random number generator, serving as a key in the XOR method to generate cipher data. The effectiveness of the algorithm for image encryption is assessed through various analyses, including histogram analysis, correlation analysis, entropy analysis, sensitivity analysis, and noise attack analysis. The findings indicate that the Rikitake system can be effectively utilized as a technique for masking data transmission. The paper includes numerical simulations conducted in Python to provide supporting evidence for this proposition.

16:40: Determine Traffic Accidents Based on Changes in Driving Patterns

Andi Syarwani, AS (Universitas Hasanuddin, Indonesia); Amil Ahmad Ilham (Universitas Hasanuddin, Indonesia); Syafaruddin Syafaruddin (Universitas Hasanuddin Makassar, Indonesia)

Abstract: A visual surveillance system in detecting accident occurrences is crucial to minimize the risk of fatalities caused by delays in handling accident victims. This research aims to identify accidents by observing changes in driving patterns through CCTV video recordings. The research method utilizes machine learning techniques to learn the features of the direction and speed of vehicles under normal traffic conditions and during accidents. Farneback optical flow obtains each tracked vehicle object's velocity and direction values. The classification algorithm then studies these data to build a model for determining accident occurrences. Based on the testing results, the model achieved an accuracy of 86%, precision of 92%, and recall of 85% using the Random Forest algorithm. Additionally, the classification performance evaluation using the ROC curve yielded an AUC value of 86% for Random Forest. Thus, the speed and direction features of vehicles provide valuable information about driving patterns, serving as parameters in determining accident occurrences.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

SP.2 (*Parallel Session.1 Offline 1*)

Session time Wednesday, 15:30 until 17:00

Location Ruang Sidang Teknik

Talk time 10

Chaired by

15:30: Compressive Sensing (CS) on Wireless Sensor Network for Manufacturing Process Monitoring

Muhammad Chaerullah (Politeknik Astra & Telkom University, Indonesia)

Abstract: Efficient monitoring of the manufacturing process is crucial for achieving smart manufacturing objectives. This research focuses on smart manufacturing monitoring using wireless sensors to collect vibration data from CNC machines in the X-Y-Z axes. Challenges in data transmission, such as limited bandwidth and interference, require advanced compression techniques. Compressive Sensing (CS) emerges as a promising solution to address these challenges. By compressing the vibration data before transmission, CS optimizes resource utilization. The study investigates the use of Toeplitz matrices as an alternative to random sensing matrices for data compression. Results show that Toeplitz matrices exhibit higher compression rates while maintaining signal quality. This research contributes to improved smart manufacturing monitoring with efficient wireless vibration signal compression. The insights gained pave the way for enhanced manufacturing processes in real-time.

15:40: Application of Autonomous Robotics for En-Masse coolant channel Replacement Program

Rajat Jayantilal Rathod (Nirma University & Eeio Solutions Private Limited, India); Himanshu K. Patel (Nirma University & International Society of Automation, India); Priyank Jayantilal Rathod (Eeio Solutions Pvt Ltd, India)

Abstract: The paper summarizes current knowledge and practices used in India's En-Masse coolant channel replacement (EMCCR) program. The requisite of coolant channel replacement of the Indian pressurized heavy water reactor (PHWR) or Canadian Deuterium Uranium (CANDU) reactor type is essential which faces a big challenge in the current methodology. Current development uses partial automation and a power manipulator to do remote maintenance work in the EMCCR program. This program and process require various improvements to maintain international standards and operating procedures. Working in a high radiation area creates a lot of challenges to perform a critical components replacement and maintenance process. With the help of robotics and automation, the operation time and efforts of radiation workers in the radiation environment can be reduced. This paper describes available knowledge of various processes, measurement tools, mechanical components, and techniques used for standard safety practice in nuclear reactor components. It also suggests the implementation of robotics and automation systems to do autonomous operation and maintenance work in the industry. Primary research results of implementing automation, and robotics systems can be helpful to add additional safety for such a high radiation environment. The development can also reduce the time and cost applied for operation and maintenance work in nuclear power plants. This research will help industries to propose new designs and development of robotic manipulators, and automation systems for the operation and maintenance work in the nuclear industry.

15:50: Evaluation of Partial Discharge Signal Propagation Using Finite Element Method in Power Transformer

Mohamad Nur Khairul Hafizi Rohani (Universiti Malaysia Perlis, Malaysia); Muhammad Alleef Abd Jalil (Universiti Malaysia Perlis, Malaysia); Afifah Shuhada Rosmi (Universiti Malaysia Perlis, Malaysia); Abdullahi Abubakar Mas'ud (Jubail Industrial City & Jubail Industrial College, Saudi Arabia); Firdaus Muhammad-Sukki (Edinburgh Napier University, United Kingdom (Great Britain)); Kumuthawathe Ananda-Rao (University Malaysia Perlis, Malaysia)

Abstract: Partial discharge is a phenomenon that can occur in power transformers which can lead to the degradation of the insulation system that resulting the failure of the power transformer. The power transformer use oil as its insulation medium. An acoustic pressure wave generated by a partial discharge in oil can be detected by using Acoustic Emission (AE) sensors. However, the position of AE sensors needs to determine to ensures that the sensors can effectively detect and capture the signals produced by partial discharges occurring within the transformer. The acoustic emission sensor can identify the PD between 100 and 300 kHz. This paper presents the simulation of acoustic waves for oil propagation in model transformer tank and its pressure that detected by AE sensor using finite element method (FEM) approach. In these research, two locations of AE sensors are simulated which is on the wall of transformer and inside the power transformer tank. Based on the acoustic pressure and time of arrival, the propagation of the acoustic PD signal is being examined. The result shows the the acoustic pressure wave is getting bigger as the time increase. Its amplitude is decreasing when the radius of the acoustic pressure wave increases. The time of arrival of AE sensor for internal placement is shorter than the sensor located outside of the transformer.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

R2.2 (*Day 2 Registration AIRoSIP*)

Session time Thursday, 07:00 until 08:00

Location Stadium General



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

AI.3 (Parallel Session.2 Artificial Intelligence and Automation 3)

Session time	Thursday, 08:00 until 10:00
Location	Laboratorium TI, Link Room 1
Talk time	10
Chaired by	Marni Azira Markom (Universiti Malaysia Perlis, Malaysia)

08:00: *Monkeypox Skin Lesion Detection using Transfer Learning Methods*

Vincent Peter C Magboo (University of the Philippines Manila, Manila, Philippines, Philippines); Ma Sheila A Magboo (University of the Philippines Manila, Manila, Philippines, Philippines)

Abstract: The World Health Organization has declared monkeypox outbreak a Public Health Emergency of International Concern (PHEIC). The Center for Disease Control has reported 87,545 confirmed monkeypox cases, with more than 85,000 in locations that have not reported monkeypox in history as of May 2023. This highly contagious outbreak has shown human-to-human community spread in non-endemic countries, more particularly in men who have sex with men. Rapid and early detection of cases is crucial to prevent community transmission of monkeypox. The goal of the study is to assess the diagnostic capacity of convolutional neural networks using transfer learning in the appraisal of monkeypox skin lesions. Several models were applied namely: InceptionV3, Xception, VGG19, ResNet50, DenseNet121 and EfficientNetB3. The model with the most superior performance was generated by InceptionV3 with outstanding metrics (95.56% accuracy, 95.00% sensitivity, 96.00% specificity, 95.00% precision, 95.00% F1-score and a 0.910 normalized Matthews Correlation Coefficient). These pre-trained models with excellent performance for detecting monkeypox can be useful adjunct for improved surveillance and control. This is highly applicable particularly during outbreaks where rapid non-invasive non-contact detection can lead to prompt therapeutic intervention and patient isolation and thus effectively prevent community transmission. The outcomes of this study indicated the deep learning models' capacity as a credible, rapid, and dependable initial tool to facilitate decision-making by the healthcare professionals which can further enhance their decision skills in the assessment of skin lesions for monkeypox. This research study generated positive and favorable results which could be integrated routinely in clinical practice.

08:10: *Machine Condition Monitoring System Based on IoT Platform for Intelligent Maintenance*

Mastang Mastang (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia); Wilarso Wilarso (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia); Muhamad Ali Pahmi Pahmi (Sekolah Tinggi Teknologi Muhammadiyah Cileungsi, Indonesia); Dan Mugisidi (Universitas Muhammadiyah UHAMKA, Indonesia); Norhana Arsad (Universiti Kebangsaan Malaysia, Malaysia)

Abstract: The Internet of Things (IoT) in an industrial automation system is a new strategy for keeping machines operational during production. Conventional approaches to machinery condition monitoring are labor-intensive, time-consuming, and disrupt production processes that will affect productivity. It is very important to have an IoT solution set up for remote machine monitoring. Productivity can be achieved by continuous monitoring of

machine performance in real-time. For condition monitoring, real-time machine data were gathered from the many external sensors and PLC systems networked to the gateway through the data acquisition board. The control panel of the IoT system was connected to the different devices. An IoT platform created by Python was evaluated and made sense of the acquired data. Linear Regression was used as an algorithm to detect the machine abnormality in normal operating conditions. The implemented algorithm for predicting machine failure extends the machine's remaining usable life, enhances safety, minimizes production time lost to maintenance, and lowers the cost of auxiliary components and items. Real-time data visualization inspired the development of an augmented reality virtual environment based on picture targets that allow the manufacturer to track the system's health and locate malfunctioning components. The overall equipment efficiency (OEE) and theoretical tool life are shown in real-time from a distant location to enable intelligent maintenance.

08:20: Predicting Market Manipulation in Stock Market Using Supervised Machine Learning: A Case Study from the Indonesia Stock Exchange Unusual Market Activities

Muhammad Ghozy Ul Haq (University of Indonesia & Indonesia Financial Service Authority, Indonesia); Betty Purwandari (Universitas Indonesia, Indonesia); Kodrat Mahatma (Universitas Indonesia, Indonesia)

Abstract: Illegal practices that cause stock prices to change have implications for individual investors and can create a bigger problem if they are related to other financial companies. Due to the limitations of the traditional method, regulators and supervisory bodies have limitations in informing the public about abnormal price movements, such as the lack of timely information and adaptation to fast-moving market conditions. In this study, five supervised machine learning algorithms were evaluated, including Naive Bayes, Decision Tree, Support Vector Machine (SVM), Random Forest, and Gradient Boosted Trees, to predict market manipulation based on the list of stocks marked by the Indonesian Stock Exchange as having Unusual Market Activity (UMA). Synthetic Minority Oversampling Technique (SMOTE) was used to address imbalanced data. The empirical findings of this research demonstrate that the developed model is highly accurate. Random Forest has the highest accuracy, with a three-day historical price of 97 percent.

08:30: Application of Support Vector Machine (SVM) Method for Photovoltaic Condition Classification Based on Characteristic Curve Indicators

Imam Faried Assalam (Universitas Hasanuddin, Indonesia); Indar Chaerah Gunadin (Hasanuddin University, Indonesia); Syafaruddin Syafaruddin (Universitas Hasanuddin Makassar, Indonesia)

Abstract: The percentage of degradation rate is a major factor in power reliability indicators in photovoltaic. To evaluate the reliability, a condition analysis is performed which includes hotspot, bypass diode failure, and short circuit by measuring the characteristic curve. This research aims to apply the Support Vector Machine (SVM) method in applying a multi-classification process that will be validated and combined with the Naïve Bayes (NB) and K-Nearest Neighbors (KNN) methods. In the analysis conducted, various SVM methods with kernel variations such as Linear SVM, Polynomial SVM, and Gaussian SVM were evaluated and combined with NB and KNN. The results showed that the Polynomial SVM-KNN, Gaussian SVM-KNN, and KNN methods provided excellent accuracy rates in the multi-classification process based on the specified data while the combination with NB showed that it did not provide significant advantages in improving the accuracy rates. In this case, the Polynomial SVM-KNN method achieved an accuracy rate of 98.33% train and 87.00% test, while the Gaussian SVM-KNN method achieved an accuracy rate of 97.62% train and 88.00% test. In addition, the KNN method also provides a very high level of accuracy with a train value of 98.33% and a test of 92.00%. This research provides recommendations for using Polynomial SVM-KNN, Gaussian SVM-KNN, or KNN methods in the classification of photovoltaic conditions with a high level of accuracy.

08:40: Optimization of Hybrid Generation (PVs, Batteries, and Generators) in an Off-Grid Area Using a Multi-Objective

Optimization Approach

Dianti Utamidewi (Universitas Hasanuddin, Indonesia); Indar Chaerah Gunadin (Hasanuddin University, Indonesia); Syafaruddin Syafaruddin (Universitas Hasanuddin Makassar, Indonesia)

Abstract: Renewable energy is a solution for electricity supply in remote areas. However, due to its intermittent nature, many researchers have proposed a hybrid system using energy storage. Many studies have been conducted to show the optimization of hybrid generation with various methods. This study aims to show the results of optimizing hybrid generators (PVs, batteries, and generators) in an off-grid area in Indonesia, namely the Borneo Orangutan Survival Foundation (BOSF), Kalimantan. This paper combines two methods to obtain the best results. The first method is to analyze different PV and battery brands and decide the best brand using the multi-objective optimization by ratio analysis (MOORA) method, considering the watt-peak (Wp) and price for PVs and capacity (Ah) and price for batteries. The second method is to demonstrate the best hybrid system for this location using particle swarm optimization (PSO), considering power output, price, and carbon emission. The result shows that for this hybrid system, the best PV is Jinko Solar 555Wp and the best battery is Narada Battery REXC 600Ah. Furthermore, the PSO calculation shows that the hybrid system runs optimally with 743 solar panels, 141 batteries, and 1 generator. When compared with the actual data, this research has shown a difference in costs of \$150,706, or a savings of 33.97% from the actual costs.

08:50: Deep Learning Model for Classifying Public Opinions on Energy Sector IHSB Stocks on the Twitter Social Media Platform

Bambang Sulistio (Bina Nusantara University, Indonesia); Yaya Heryadi (Bina Nusantara University, Indonesia); Lukas Lukas (Universitas Katolik Indonesia Atma Jaya, Indonesia); Wayan Suparta (Institut Teknologi Nasional Yogyakarta & Bina Nusantara University, Indonesia); Ilvico Sonata (BINUS University, Indonesia)

Abstract: Capital market transactions provide an opportunity for investors to acquire ownership of company shares and capital gains, as well as dividends. However, alongside the benefits, there are risks of capital loss and liquidation, leading to stress and depression due to profit targets and decision-making errors. To mitigate the risk of decision-making errors in investment, data analysis is needed, including sentiment analysis, which influences stock prices. This study aims to develop a new deep learning model to classify Indonesian public opinion on JCI stocks, especially the Energy sector, obtained from the Twitter social media platform. The model will perform sentiment analysis and categorize opinions as negative, neutral, or positive. We created a dataset that was trained using Bidirectional Encoder Representations from Transformers (BERT) to summarize the analysis of public sentiment above so that it can assist investors in studying public sentiment as a reference for investing with a yield precision of 76%, Recall of 77%, and F1-score on 76%.

09:00: Poverty Level Prediction Based on Time Series Data using Auto Arima

Nadine Aulia Fazrina (Telkom University, Indonesia); Dedy Rahman Wijaya (Telkom University, Indonesia); Sari Dewi Budiwati (Telkom University, Indonesia); Budhy Aditya Hadie (Diskominfo Bandung, Indonesia)

Abstract: National Economic Survey (Susenas) data is used by Statistics Indonesia to calculate the poverty rate in Bandung. However, the traditional data collection method of interviewing households one by one is time consuming, expensive, and may not capture a representative sample. Therefore, this research explores the use of Time Series models, specifically AutoArima, Croston, and Exponential Smoothing algorithms to predict the poverty rate in Bandung city. Based on this problem, a prediction is needed to determine the poverty rate in Bandung City. The poverty dataset used is sourced from the Bandung City Data Portal with test data from 2010 to 2018. This research will use 3 error parameters to evaluate the results of the poverty rate in Bandung City, namely MAE, MSE and MASE. Based on the tests conducted, the dataset produces the AutoArima model as the best method with MAE = 0.183, MSE = 0.053, MASE = 0.797, for the Croston model produces an error with MAE = 0.456, MSE = 0.374, MASE = 1.985. Meanwhile, the ExponentialSmoothing model produces an error with MAE

= 0.410, MSE = 0.215, MASE = 1.786. From the three tests, it was concluded that the AutoArima model successfully predicted the poverty rate in Bandung City with good results.

09:10: Prediction of Internet Broadband Connectivity Classification in West Java Indonesia Using Machine Learning

Wahyu H Kusuma Atmaja (Bina Nusantara University & PLN Icon plus, Indonesia); Yaya Heryadi (Bina Nusantara University, Indonesia); Ilvico Sonata (BINUS University, Indonesia); Lukas Lukas (Universitas Katolik Indonesia Atma Jaya, Indonesia); Wayan Suparta (Institut Teknologi Nasional Yogyakarta & Bina Nusantara University, Indonesia)

Abstract: A location's Take-up Rate was significantly influenced by its Internet connectivity and availability. The purpose of this research is to answer concerns about internal Internet Service Provider issues that affect Internet connectivity in clusters of West Java, Indonesia. It also aims to evaluate the results of models that forecast how these internal factors will affect internet connectivity. According to the research findings, the FTTH Cluster has eight significant Internet predictor connectivity out of 18 elements. Activation delay and Administration Documentation of Activation with Connectivity were the two major parameters modeled out of the 18 components. Artificial Neural Network (ANN), Support Vector Machine (SVM), and Decision Tree (DT) models were used to predict Internet Broadband Connectivity Classification based on the two most important variables. According to the study, ANN is the best model, with 99% accuracy and 99.6% precision when compared to SVM and DT. Furthermore, it exceeds previous studies that used the ANN model and achieved 97.92% accuracy.

09:20: Aerial Image-Based Semantic Segmentation for Forest Fire Identification

Nadilla Asyifa Salma (Telkom University, Indonesia); Mahmud Dwi Sulistiyo (Telkom University, Indonesia & Nagoya University, Japan); Risnandar Risnandar (The IVDA-Research Group-Research Center for Information and Data Sciences-BRIN, Indonesia); Febryanti Sthevanie (Telkom University, Indonesia); Gia Septiana Wulandari (Telkom University, Indonesia)

Abstract: Fire is a serious disaster because it can endanger the safety of living things and cause great losses. Detection of forest fires using sensor-based devices or through analysis of weather data becomes less efficient because it is not real-time, its scope depends on sensor deployment, and sometimes it misses small fire spreads that are potentially dangerous. The key idea in this paper is to utilize a semantic segmentation approach to precisely detect forest fires and thus prevent the spread of larger fires. The proposed method uses aerial images since it is a practical way to tackle problems in fire monitoring and detection. Since similar research is still limited, let alone necessary to be implemented in countries potentially susceptible to forest fires, this study demonstrates deep learning-based semantic segmentation methods as preliminary research for identifying forest fires. We analyzed the implementation of the well-known FCN and U-Net models with some backbone options and used the FLAME dataset to train the models and evaluate them quantitatively. Based on the experimental results, FCN with VGG-16 backbone became the model with the highest Mean IoU value of 0.825. We also tested the best model on several aerial images arbitrarily taken from the internet to see the qualitative performance and analyze its possibility of being applied to situations outside the research dataset.

Bio for Mahmud Dwi Sulistiyo: I am a lecturer at Telkom University, Indonesia, and was graduated from Nagoya University, Japan. My research fields include computer vision, machine learning, and intelligent systems.

09:30: Improving Radar-Based Rainfall Estimation with Ensemble Learning: A Comparative Analysis with the ZR Equation

Rashifa Khairani Setianegara (Universitas Indonesia, Indonesia); Maulana Putra (Universitas Indonesia, Indonesia); Djati Handoko (Universitas Indonesia, Indonesia); Mohammad Rosid (University of Indonesia, Indonesia)

Abstract: Rainfall has a significant impact on various sectors of life and the environment. For example, rainfall helps increase productivity in agriculture, ensuring food reserves and water. In addition, rainfall also affects

drought and the soil water cycle. Therefore, knowing how to estimate rainfall in an area accurately is essential. In this study, rainfall estimation was carried out in an area with local rainfall types in Gorontalo City. This estimation is done by comparing the accuracy of two methods: the Z-R equation and machine learning algorithms. The Z-R equation used is the Z-R Equation by Marshall-Palmer ($A=200$, $b=1.6$) and Rosenfeld ($A=250$, $b=1.2$), while the machine learning algorithm used is gradient boosting. The comparison results show that gradient boosting provides a more accurate estimation than the two Z-R equations. The gradient boosting algorithm estimation results provide RMSE, MAE, and R2 values of 0.606, 0.173 and 0.857, respectively. The Marshall-Palmer Z-R equation obtained RMSE, MAE, and R2 values of 8.136, 3.66051, and -0.19278. The estimation of Rosenfeld's Z-R equation resulted in RMSE, MAE, and R2 values of 8.180, 3.70939, and -0.2058. From these three metrics, it is concluded that gradient boosting provides the most accurate estimate for rainfall in areas with localized rainfall types in Gorontalo City.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

RO.1 (*Parallel Session.2 Robotics Mechatronics and Computer Vision1*)

Session time	Thursday, 08:00 until 10:00
Location	Laboratorium TI, Link Room 3
Talk time	10
Chaired by	Siti Marhainis Othman (University Malaysia Perlis, Malaysia)

08:00: *Classification of Water Apple (Syzygium aqueum) Leaf Varieties Using Transfer Learning*

Agus Pratondo (Telkom University, Indonesia); Toufan Tambunan (Telkom University, Indonesia); Astri Novianty (Telkom University, Indonesia)

Abstract: Water apple (*Syzygium aqueum*) is a fruit with several varieties, and good leaf differentiation requires correct identification of these variants. This study examines the classification of water apple leaf variants using the VGG16 deep learning model. The goal was to differentiate between seven distinct water apple leaf varieties, including bol, citra, dalhari, deli merah, king rose, kiojok, and susu. A complete dataset containing a balanced distribution of 99 to 100 leaf photos per variety was compiled. The study consisted of two experiments: one with random weight initialization and the other using ImageNet-trained weights. The results demonstrated the significant impact of pre-trained weights initialization, as the model achieved an impressive accuracy of 91.69% compared to 47.79% with random weight initialization. The high accuracy, precision, recall, and F1-Score values indicated the model's effectiveness in accurately classifying the water apple leaf variants. This achievement holds promising potential for diverse practical applications in agriculture, botanical research, education, and conservation efforts.

08:10: *Classification of Hypertension Based on Machine Learning*

Ayu Sekar Safitri (Telkom University, Indonesia); Thalita Dewi Rahmianar (Telkom University, Indonesia); Indah Indriani (Telkom Unveristy, Indonesia); Yunendah Fuadah (Telkom University & Image and Computer Vision (IMV Laboratory), Indonesia); Sofia Saidah (Telkom University, Indonesia); Tody Wibowo (Telkom University, Indonesia)

Abstract: Hypertension is a severe medical condition that can potentially increase the risk of disease in other organs. Therefore, to help monitor hypertension, this study classified Hypertension disease using Machine Learning based on gender, age, height, weight, SBP, DBP, heart rate, and BMI. Machine learning models were created to classify four classes of hypertension (Prehypertension, Normal, Hypertension Stage 1, and Hypertension Stage 2) with the help of a Grid Search to determine the parameters in each model. Machine Learning model comparison is carried out in 4 models: K-Nearest Neighbor (K-NN), Support Vector Machine (SVM), Decision Tree, and Naïve Bayes. The determination of the developed model will be seen from the performance value of each model. The Machine Learning model will see the accuracy, precision, recall, and F1 Score value. From the comparison that has been done, the Machine Learning Decision tree model with an F1-score value of 1.00 is the best classification model, followed by the SVM model with an F1 Score value of 97.78.

08:20: Investigating the Impact of Data Augmentation for Fine-Grained Grocery Product Classification based on Vision Transformer

Rissa Rahmania (Bina Nusantara University, Indonesia); Yaya Heryadi (Bina Nusantara University, Indonesia); Lukas Lukas (Universitas Katolik Indonesia Atma Jaya, Indonesia); Wayan Suparta (Institut Teknologi Nasional Yogyakarta & Bina Nusantara University, Indonesia); Ilvico Sonata (BINUS University, Indonesia)

Abstract: The existence of fine-grained image classification supporting smart retail provides effectiveness in recognizing products with high similarity. However, the generic classification method performs poorly in identifying products from a subordinate category. This paper aims to identify augmentation techniques to leverage the Vision Transformer (ViT) model to classify the fine-grained grocery product, which involves embedding patches and transformer encoders to extract the main features. First, we develop a fine-grained image dataset with ColorJitter, CutOut, and combining both augmentations. Secondly, we perform experiments and analysis of ViT size, embedded patch size and image size in the patch embedding process. Lastly, the ViT model are evaluated according to the image sizes 224, 384, and 512 in accuracy, loss, and confusion matrix. The highest accuracy was obtained at 0.9922. The ColorJitter and CutOut improved the confusion matrix in ViT-B/16 and ViT-L/16 with an image size of 384 and 512. The results show that both augmentations in the ViT model are able to distinguish fine-grained grocery products.

08:30: Classification of Cataract Fundus Images Using Convolutional Neural Network (CNN) Method EfficientNet-B0 Architecture

Erni Yanthy Pardede (Telkom University, Indonesia); Alvian Pandapotan Sitohang (Telkom University, Indonesia); Yunendah Fuadah (Telkom University & Image and Computer Vision (IMV Laboratory), Indonesia); Farah Hanifah (Telkom University, Indonesia); Nur Alifia Azzahra (Telkom University, Indonesia); Rita Magdalena (Telkom University, Indonesia); Sofia Saidah (Telkom University, Indonesia)

Abstract: Based on world report data by the World Health Organization (WHO) in 2019, cataracts are the leading cause of blindness. Cataract is an eye disease that attacks the lens of the eye to become cloudy and can cause blindness in sufferers if not treated properly. Causes of cataracts include active and passive smoking, other effects of diabetes, and intense sun exposure. Early cataracts are difficult to detect with the naked eye. Therefore, this study was conducted to create a cataract classification system with fundus images using the Convolutional Neural Network (CNN) method of EfficientNetB0 architecture to classify cataracts based on their maturity level consisting of normal eyes, immature cataracts, mature cataracts, and hypermature cataracts. The purpose of this research is to create automation in cataract early detection. The dataset used amounted to 2000 data after segmentation for four classes. The dataset consists of 1280 training data, 320 validation data, and 400 test data. The dataset was taken from Cicendo Hospital in Garut, West Java. The parameters used are epoch, learning rate, batch size, and optimizer. On data training using 5-folds cross validation to get the best results. The best results obtained from model experiments are using epoch 100, batch size 64, learning rate 0.001 and adamax optimizer with 99.5% accuracy and loss 0.0130. Through this research, it is hoped that the rate of blindness can decrease so that the level of community life increases.

08:40: Unleashing the Power of Deep Neural Networks for Breast Cancer Diagnosis

Ohood F Ismael (University of Sfax, Iraq); Maryim Omran ALkuzayy (University of Kufa, Iraq); Monji Kherallah (Academia, Tunisia); Fahmi Kammoun (FSS, Tunisia)

Abstract: Breast cancer occurs when cells or tissues of the breast grow abnormally. All over the world, In the United States, cancer is one of the leading causes of death, and among women, The most common type of cancer. According to the American Cancer Society, more than 266,000 women will be diagnosed with invasive breast cancer in 2020. The disease can also affect men. This paper proposes a method that relies on deep

learning and convolutional neural networks is proposed for the classification of breast tissue images. Mammogram classification can help doctors detect cancer early. As part of this study, "a convolutional neural network" was trained (AlexNet and VGG16) using breast cancer images from the dataset for invasive ductal carcinoma (IDC), the most common and aggressive form of breast cancer. According to the results of training the VGG16 network, disease detection of 88.95%. AlexNet excelled in accuracy, with an accuracy of 90.06%.

08:50: Off-grid Multi-carrier Microgrid System Design using Moth-flame Optimization Algorithm in Polytechnic University of the Philippines-Manila

Joeneill De Leon (Polytechnic University of the Philippines, Philippines); Mark Laurence Lazatin (Polytechnic University of the Philippines, Philippines); Mikka Geroleo (Polytechnic University of the Philippines, Philippines); Ryan John Dagatan (Polytechnic University of the Philippines, Philippines); Lady Xyrylle S.A Galvez (Polytechnic University of the Philippines, Philippines); Jeffrey E. Sabornido (Polytechnic University of the Philippines, Philippines); Manuel M Muhi (Polytechnic University of the Philippines, Philippines); Orland D Tubola (Polytechnic University of the Philippines, Philippines)

Abstract: Nowadays, smart grid operators are gearing their attention on multi-vector energy due to its ability to integrate multiple types of energy sources. Multi-carrier microgrids (MCMG) are one of the concepts that can integrate several energy carriers including electricity, heat, fuel, and wind that can supply energy demands in acceptable range of affordability. In this regard, the study proposed a design of an off-grid MCMG that can meet cooling and electricity demand of Polytechnic University of the Philippines (PUP)-Manila. The off-grid MCMG system design is composed of photovoltaic solar panel (PV), micro turbine (MT), battery energy storage (BES), and air conditioning units for classroom cooling. The researchers employed a simulated daily load profile, and this served as the weighting mechanism to generate a representative load profile for each month from the aggregated load data spanning the years 2012 to 2020. The researcher used Moth-Flame Optimization Algorithm (MFOA) to calculate the optimal number of components and the amount of fuel that will be used. The results show that the proposed design can supply the energy demand of PUP-Manila and it has proven to be beneficial for the institution because of its cost-effectiveness.

09:00: Enhancing Object Detection and Navigation for Visually Impaired Individuals: A YOLOv3-Based Approach with GPS Integration

Thifal Bariq Athallah (Politeknik Elektronika Negeri Surabaya, Indonesia); Zaqiatud Darojah (Politeknik Elektronika Negeri Surabaya, Indonesia); Anhar Risnumawan (Politeknik Elektronika Negeri Surabaya, Indonesia)

Abstract: This study focuses on enhancing the life quality of visually impaired individuals by innovatively upgrading the functionalities of Electronic Travel Aids (ETAs). Our research focuses on creating a unique approach that caters to their navigation challenges by integrating object recognition, Global Positioning System (GPS) technology, and communication infrastructures in ETAs. We have utilized the engineered YOLOv3 algorithm for real-time multi-object detection and a GPS-powered location system that accurately informs caregivers about their loved one's exact position ensuring enhanced safety for them in unknown places or times. This approach has been validated through rigorous mechanisms such as Precision, Recall, F1-Score, Intersection over Union (IoU), and an impressive Mean Average Precision (mAP) score of 99.42%, with an average distance difference of 6.1 meters from the last location. Implementing this novel ETA design can significantly augment outdoor navigation safety while improving independence levels among visually impaired individuals.

09:10: Inverted Pendulum Balance Control With PID Method Based on Open PLC

Marcellino Mandala Saputra (Politeknik Elektronika Negeri Surabaya, Indonesia); Eko Budi Utomo (Politeknik Elektronika Negeri Surabaya, Indonesia); Nofria Hanafi (Electronic Engineering Polytechnic Institute of Surabaya (EEPIS), Indonesia)

Abstract: The inverted pendulum system is a system that is widely used to test methods and theories of control systems. The inverted pendulum system has the characteristics of an unstable system. A simple concept that can explain why the pendulum system is unstable system is when we try to balance the stick on our index finger or palm. The position of our hands must continue to move to keep the stick upright. An inverted pendulum system is the same thing. However, it is limited to one axis while the case of balancing the stick with our hands can move in all directions Evidence that also proves that the inverted pendulum system is unstable is that even a small disturbance in the pendulum or a slight force applied to the carriage can cause the pendulum to fall. This is due to the effect of gravity acting naturally on the pendulum and the frictional force caused by the movement of the train on the track. Automatic control is needed to keep the inverted pendulum upright. One of the most widely used automatic controls is the PID control. The main advantages of PID control are improving the transient response, which is better in settling time and rise time, reducing steady-state errors, and dampening oscillations. Seeing this, the author intends to use a PID control which will be used as a control in the inverted pendulum system

09:20: Prediction of preferences for public transport car types using machine learning

Agus Pratondo (Telkom University, Indonesia); A. P. Sujana (Telkom University, Indonesia)

Abstract: Understanding consumers' preferences across different modes, such as "angkot" (public minivans) and buses, is critical for optimizing transportation services, given the importance of public transit to urban mobility. Using the Random Forest method, we did a prediction analysis to determine the preferences of consumers between "angkot" and buses. The objective of the study was to discover relevant factors that influence user selection and to assess the model's performance in terms of Precision, Recall, F1-Score, and Accuracy. The research employed a comprehensive data collection containing numerous user preferences, demographics, and travel patterns. The transportation preferences of consumers were modeled using Random Forest, an ensemble learning technique noted for its efficacy in categorization tasks. The investigation yielded encouraging results, with the prediction model obtaining high levels of accuracy. The model's outstanding Precision of 0.979 indicates the precision of the model's positive predictions (preferring "angkot"). In addition, the model achieved a Recall of 1.000, indicating its ability to correctly identify positive events (correctly predicting "angkot" preferences). The F1-Score was calculated to be 0.989, which represents the model's overall performance. In addition, the study effectively discovered a number of critical characteristics that greatly influenced the classification of "angkot" and buses. These crucial factors offer valuable insights into the underlying reasons behind users' preferences and provide transportation authorities with guidance to enhance public transit planning and service optimization.

09:30: Deep Learning-Based Classification of Duku Fruit Varieties (*Lansium domesticum*)

Agus Pratondo (Telkom University, Indonesia); Astri Novianty (Telkom University, Indonesia)

Abstract: The classification of duku fruit types is essential for the agricultural sector, market segmentation, and customer satisfaction. The VGG-16 and Inception V3 models are especially used in this study to investigate the use of deep learning techniques for the classification of duku varieties. The work uses transfer learning and fine-tuning techniques to take advantage of the pre-trained models and modify them for the purpose of duku fruit categorization. The performance of the models was tested by experiments using samples of the duku condet, matesih, and Palembang variations. The results are encouraging, with Inception V3 attaining the greatest accuracy rate of 95.30%, followed by VGG-16 with an accuracy rate of 84.26%. These accuracy percentages show that the models are capable of correctly classifying different duku fruit varieties based on their outward appearance. The study emphasizes the importance of transfer learning in improving the performance of the models by utilizing the information gained from previously trained models on substantial datasets.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

SP.3 (*Parallel Session.2 Signal and Image Processing 3*)

Session time	Thursday, 08:00 until 10:00
Location	Link Room 2
Talk time	10
Chaired by	

08:00: Predicting Microbial Populations In Seafood Using Support Vector Regression Algorithms And Electronic Nose

Emung Zakaria (Telkom University, Indonesia); Dedy Rahman Wijaya (Telkom University, Indonesia); Tedi Gunawan (Telkom University, Indonesia)

Abstract: Seafood is a dish that comes from processing plants and animals that come from the sea. Seafood is known to be high in protein and rich in omega-3. This content makes seafood have many health benefits, such as maintaining heart health or uterine health. Fishermen must know the prime quality of processed seafood before being distributed to the public. while the official testing standard for determining the freshness and safety of meat and seafood is TVC. The laboratory test process takes 24-72 hours with a high cost for one test. To deal with this problem, a system is needed to ensure that seafood is safe or not for distribution by predicting the microbial population present in seafood. The system uses an electronic nose (e-nose) and is combined with the SVR (Support Vector Machine Regression Technique) algorithm which enables a regular approach to predict microbial populations in seafood based on seafood quality standards. The results of this prediction produce an accuracy value as indicated by the RMSE results of 0.012 and R2 of 0.98.

08:10: Machine Learning for Speech Emotion Recognition

Darwindra Darwindra (Telkom University, Indonesia); Sofia Sa'idah (Telkom University, Indonesia); Bambang Hidayat (Telkom University, Indonesia)

Abstract: Speech Emotion Recognition (SER) has been under the scrutiny of researchers for many years. The emotion recognition system through speech is the ability to identify the type of emotion from a human speech to create a natural interaction between humans and machines (computers). This research uses the Linear Predictive Coding (LPC) feature extraction method with orders of 1, 8, and 16. Then the classification method used is the Hidden Markov Model (HMM) and K-Nearest Neighbor (KNN) methods. Based on the testing process carried out, the best system performance in identifying the type of emotion is when using the LPC parameter of order 16. The average level of accuracy obtained is 96.88% for the KNN classification with the number of neighbors 1, 3, and 5. Meanwhile, when using HMM classification, the highest level of accuracy obtained is 62.50% with the number of states 10.

08:20: Glaucoma Detection on Eye Fundus Image using Machine Learning Method

Dhimas Chandra Bagaskara (Telkom University, Indonesia); Sofia Sa'idah (Telkom University, Indonesia); Rita Magdalena (Telkom University, Indonesia)

Abstract: Glaucoma is an eye disease caused by continuous pressure on the optic nerve papillae. It can be caused by an unbalanced cycle of the aqueous humor fluid. People with glaucoma have a reduced field of view of sight that can lead to blindness depending on the severity. Glaucoma can be detected in several ways, there are Confocal Scanning Laser Ophthalmoscopy (CSLO), Heidelberg Retinal Tomography (HRT), and Optical Coherence Tomography (OCT). However, these methods are expensive. Another alternative to early detection of glaucoma is using detection on digital fundus images which are faster and require lower costs. In this research, a system of digital fundus image detection was designed using a machine learning model with the Gray Level Co-occurrence Matrix (GLCM), Decision Tree, and Random Forest algorithms. GLCM algorithm is used to perform feature extraction. Meanwhile, Decision Tree and Random Forest algorithms are used to classify fundus images into glaucoma or normal. The purpose of this research is to assist conducting early detection of glaucoma quickly and accurately. The accuracy value obtained in this research is 85%.

08:30: Prediction of Colon Cancer Using DenseNet121, CNN, and REsNET50 Machine Learning Models and Using Image Processing Techniques

Mahadi Hasan (The University of Tennessee at Chattanooga, USA); Jahirul Islam (New Mexico Institute of Mining and Technology, USA); Minhaz Ahmed (Amazon.com, USA); Md Maruf Hasan (University of South Dakota, USA)

Abstract: Colon cancer is a matter of great importance in the field of global health, as it stands as one of the primary contributors to mortality rates associated with cancer. The timely identification and precise prognostication of colon cancer have the potential to significantly enhance patient outcomes and diminish mortality rates. The global public health systems face a significant challenge in addressing the impact of colon cancer, which underscores the need for efficient screening and prediction techniques. Machine learning techniques present potential solutions by utilizing extensive datasets to detect intricate patterns that may be imperceptible to human observers. This study investigates the viability of employing machine learning techniques to predict colon cancer by utilizing a dataset consisting of 10,000 colonoscopy images that have been classified into two categories: cancerous and non-cancerous cases. The main aim of this study is to assess the efficacy of various machine learning algorithms, namely DenseNet-121, CNN, and ResNet50, in the prediction of colon cancer. The models' performance was comprehensively assessed in terms of their accuracy in predicting colon cancer. Among the models that were evaluated, DenseNet-121 demonstrated exceptional performance, achieving the highest accuracy of 99.6%.

08:40: Convolutional Neural Network (CNN) for Quality of Coffee Beans Classification System

Nadillah Rahmatia Kautsari (Telkom University, Indonesia)

Abstract: Coffee contributes a significant amount of foreign exchange to the country as it is one of Indonesia's plantation commodities that enters the export market. The selection of high-quality coffee beans requires precision in order to achieve consistent taste and compete in the business world. The selection of good coffee beans refers to the Indonesian National Standard (SNI) 01-2907-2008 through the National Standardization Agency (BSN) based on physical quality testing. The dataset was divided into 3 classes, namely specialty (grade 1), exclusive (grade 2), and premium (grade 3). The system was developed to identify quality of coffee beans using the Convolutional Neural Network (CNN). The architecture model use MobileNetV2 and adam optimizer with a learning rate 0.0001.

08:50: Potential of Aggregation and Selection of Cellular Network Carrier to Support Mobile Subscribers

Indar Surahmat (Universitas Muhammadiyah Yogyakarta, Indonesia); Widyasmoro Widyasmoro (Universitas Muhammadiyah Yogyakarta, Indonesia)

Abstract: The fulfillment of a reliable connection especially for mobile devices is very important. In users' side which only rely on an operator, they often do not get an optimum signal strength in a particular area. On the

other hand, they may need a sufficient bandwidth for high demand application. Regarding this, this paper discusses the potential of carrier aggregation by utilizing the measurement data of signal strength from several operators received by the customers. Then, a network selection process was done to get the best signal strength. The data are the result of measurement at the 1800 MHz frequency which used for LTE band 3 service. The result of aggregation and selection shows that users can get an improvement of signal strength up to 10 dB.

09:00: Adversarial Learning for Text to Image Semantic Consistency using Deep Fusion(DF-GAN)

Sujata Sachin Virulkar (AISSMS IOIT Pune, India)

Abstract: Painting is not just a visual art, but also a human creation. Researchers have been hard at work developing AI systems that can mimic human intellect and carry out tasks previously thought impossible, such as facial recognition, text production, and even artistic creation. Meanwhile, deep convolutional generative adversarial networks (GANs) have started producing visually arresting pictures in select categories. To achieve these goals, we present a Deep Fusion Generative Adversarial Networks that is both easier to implement and more successful in its applications (DF-GAN). To be more precise, we propose (i) a novel deep text-image fusion block, which deepens the fusion process to make a full fusion between text and images (without introducing additional networks), (ii) a novel Target-Aware Discriminator composed of Matching Aware Gradient Penalty and One-Way Output, which improves the text-image semantic consistency without introducing extra networks, and (iii) a novel one-stage text-to-image We find that our proposed DF-GAN outperforms the state-of-the-art algorithms on popular datasets, while being more straightforward and efficient in its ability to generate natural-looking and text-matching synthetic pictures.

09:10: Implementation of MobileNetV2 SSD FPN-Lite CNN Model for Real-time Detection of Spinach Leaf Diseases

Rosmiati Jamiah (Hasanuddin University, Indonesia); Ingrid Nurtanio (Hasanuddin University, Indonesia); Andani Achmad (Hasanuddin University, Indonesia)

Abstract: Early detection of disease in spinach plants is critical in preventing the spread of infection and yield losses. The main objective of this research is to develop an application that is effective, fast, and accurate in detecting diseases on spinach leaves by utilizing Convolutional Neural Network (CNN) technology MobileNetV2 SSD FPN-Lite and Tensorflow-Lite models for implementation on the Android platform and knowing the inference time of the model used in detecting diseases. The dataset used in this study is an image of spinach leaves infected with white rust disease, curly virus, and manganese deficiency. The model training process is carried out using the transfer learning method on the dataset that has been created. This research contributes by providing a disease detection application with high accuracy and fast inference time and consumes less computing resources. The results showed that the model created could detect diseases in spinach leaves with an average value of inference and inference timing in testing using 290 images of 12784 (μ s) and 39406.2 (μ s), and accuracy reached 89.65%. With high accuracy and good computational efficiency, this application can be an effective and efficient solution to support farmers and agricultural experts in the early detection of spinach plant diseases.

09:20: Numerical Analysis on River Slope Reinforcement System for Erosion Control Using Finite Element Method

Kezia Samantha (Universitas Gadjah Mada, Indonesia); Adhitya Yoga Purnama (Universitas Gadjah Mada, Indonesia); Devi Oktaviana Latif (Universitas Gadjah Mada, Indonesia); Pinta Astuti (Universitas Muhammadiyah Yogyakarta, Indonesia); Bayu Ilham Nasukha (Universitas Gadjah Mada, Indonesia)

Abstract: Two different slope reinforcements were implemented on opposite banks of the Cikeas River. Sheet pile concrete is being utilized on the left bank of the river, whilst the right bank is being reinforced with geoframe. The evaluation of the two slope reinforcements is important to figure out the comparative efficacy of each in protecting the slopes. The evaluation was conducted utilizing the Finite Element Method (FEM) in a two-

dimensional (2D) design at three specific locations, specifically STA 0+825, 0+900, and 0+975. It is necessary to implement countermeasures for the reinforcement of river slopes to mitigate erosion and minimize landslide. Based on the research that was performed of the two slope reinforcements, it has been determined that the implementation of sheet pile reinforcement results in a 6% improvement in the slope safety factor compared to the existing condition. However, it is important to note that this reinforcing method also leads to a significant 58% increase in the average displacement. The use of the geoframe technology results in a significant 60% reduction in displacement when compared to the existing condition. However, it is important to note that this improvement in displacement comes at the cost of a 7% reduction in the safety factor. Both slope reinforcements meet the safety factor standards of being more than 1.5 and have a displacement of less than 2.54 cm.

09:30: Analysis of Effect Self-Healing on Corrosion Concrete Using Ultrasonic Method

Rivky Afanda (Muhammadiyah University of Yogyakarta, Indonesia); Ahmad Zaki (Universitas Muhammadiyah Yogyakarta, Indonesia)

Abstract: Corrosion is one of the main causes of structural failure and involves high costs for repairs. From this problem, self-healing technology can have a positive impact. This paper presents an assessment of corroded concrete and self-healing using the NDT Ultrasonic Pulse Velocity method. The results of the UPV testing showed that during corrosion, the highest average velocity value obtained was 4263. After self-healing, the highest average velocity value obtained was 4701. These results indicate that the increase in velocity is due to the healing agent covering the internal damage in the concrete.

09:40: Common Mode Noise Reduction Strategies in Radar Devices

Tjahjo Adiprabowo (BRIN, Indonesia); Yuyu Wahyu (Indonesia Institute of Science LIPI, Indonesia); Budi Prawara (BRIN, Indonesia); Nasrullah Armi (BRIN, Indonesia); Budiman Putra Asma'ur P. A. Rohman (National Research and Innovation Agency, Indonesia); Puput Dani Prasetyo Adi (National Research and Innovation Agency (BRIN-RI), Indonesia)

Abstract: Improving signal quality and radar system performance is a top priority in the development of modern radar equipment. One of the factors that can interfere with radar performance is Common Mode Noise (CMN) which distorts the signal and reduces detection sensitivity. In this proceeding, we discuss common mode noise reduction strategies in radar devices with a focus on efficient grounding design, use of filters, proper PCB design, and selection of components with low noise performance. Improving signal quality and radar system performance is a top priority in the development of modern radar equipment. One of the factors that can interfere with radar performance is Common Mode Noise (CMN) which distorts the signal and reduces detection sensitivity. In this proceeding, we discuss common mode noise reduction strategies in radar devices with a focus on efficient grounding design, use of filters, proper PCB design, and selection of components with low noise performance.



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

CB (*Coffee Break*)

Session time Thursday, 10:00 until 10:15

Location Stadium General



AIRoSIP'23: 2023 International Conference on Artificial Intelligence Robotics, Signal and Image Processing (AIRoSIP)

AI.4 (Parallel Session.3. Artificial Intelligence and Automation 4)

Session time	Thursday, 10:15 until 12:00
Location	Laboratorium TI, Link Room 1
Talk time	10
Chaired by	Laila Ma'rifatul Azizah (Universiti Malaysia Perlis, Malaysia & Universitas Muhammadiyah Yogyakarta, Indonesia)

10:15: Enhancing Movie Recommendations: A Hybrid Filtering Approach Combining Collaborative and Content-Based Filtering

Esther Vemberly (BINUS University, Indonesia); Eugenia Ancilla (BINUS University, Indonesia); Anderies Anderies (Bina Nusantara University, Indonesia); Andry Chowanda (Bina Nusantara University, Indonesia)

Abstract: This research paper presents a hybrid filtering approach that combines collaborative filtering (CF) and content-based filtering (CBF) to provide movie recommendations. The methodology involves data acquisition, cleaning, partitioning, and the design of collaborative, content-based, and hybrid models. The evaluation is based on the MovieLens 100K Dataset, using Root Mean Squared Error (RMSE) and Fraction of Concordant Pairs (FCP) metrics. Results show that the collaborative filtering model obtains a training RMSE of 0.9006 and a test RMSE of 0.9446, demonstrating accurate predictions with a slight amount of overfitting. With a training RMSE of 0.9552 and a higher test RMSE of 1.1460, the content-based filtering model could have difficulties accurately predicting movie recommendations. However, the hybrid filtering model outperforms both approaches with a training RMSE of 0.7801 and a test RMSE of 0.9977. It demonstrates more excellent concordance with user preferences, achieving higher FCP values of 0.751256 and 0.641928 in the training and testing sets, respectively. The hybrid model offers a comprehensive solution by integrating CF and CBF, addressing the "cold-start" problem, and delivering accurate and diverse movie recommendations. Future studies can focus on improving the hybrid model and exploring other evaluation metrics for a more thorough review.

10:25: Artificial Intelligence-Driven Conceptual Framework to Generate Value from the Data in the Banking Industry: A Systematic Review

Idha Kristiana (Bina Nusantara University, Indonesia); Ford Gaol (Bina Nusantara University, Jakarta, Indonesia); Suhono Harso (Indonesia); Benny Ranti (Bina Nusantara University, Indonesia)

Abstract: This paper presents a comprehensive analysis of an artificial intelligence-driven (AI-driven) conceptual framework to generate value from the data in the banking industry. The study provides a literature review to investigate the challenges of an AI-driven conceptual framework in the banking industry. Data quality management, data privacy and security, infrastructure capability, data governance and regulatory compliance, and talent and expertise have been identified as challenges. Based on a systematic review of the literature, this paper proposes Exploration, Classification, Protection, and Value (ECPV) and Explore, Understand, Act, and

Engage (EUAE) as key parts of a conceptual framework driven by artificial intelligence to get value from data in the banking industry. The ECPV and EUAE address the identified challenges and offer a structured methodology for managing an AI-driven conceptual framework in the banking industry. It emphasizes the exploration of data sources, classification based on sensitivity and relevance, implementation of comprehensive data protection and privacy measures, and value extraction from data using artificial intelligence approaches. By using an AI-driven conceptual framework called Explore, Understand, Act, and Engage (EUAE) for customer-centric analytics, we give customers a full picture of their bank account activity and more control over how they manage their money. This improves customer engagement by giving customers insights and suggestions.

10:35: Classifying Tweet Sentiment Analysis on Airlines using Random Forest Classifier, Naïve Bayes Classifier and K-Nearest Neighbors Classifier Algorithm

Ivan Alexander (Bina Nusantara University, Indonesia)

Abstract: Opinion has always affected businesses and individuals especially from the Public. People react through social media and spread it incompletely. The situation was then accepted as public opinion. There are three categories of opinion i.e., positive, negative, and neutral. Sentiment analysis can be used to explore public opinion on a particular topic of interest. This experiment focuses on American public opinion about airline tweets, by proposing a solution to solve text classification problem. We propose a solution to solve the text classification problem using three machine learning classifiers: Random Forest Classifier, Naïve Bayes Classifier, and K-Nearest Neighbors Classifier to classify a tweet as positive, negative, or neutral. We compare the performance in terms of accuracy, average of precision, average of recall, and average of f-1 score between three machine learning classifiers. The results show that the Random Forest Classifier has the best performance among the machine learning classifiers, which yields 76% accuracy, 74% average of precision, 76% average of recall, and 74% average of f1-score.

10:45: Investigation on Machine Learning Based Approaches for Estimating the Critical Temperature of Superconductors

Fatin Abrar Shams (IUT, Bangladesh); Rashed Hasan Ratul (Islamic University of Technology (IUT), Bangladesh); Ahnaf Islam Naf (IUT, Bangladesh); Syed Shaek Hossain Samir (IUT, Bangladesh); Mirza Muntasir Nishat (Islamic University of Technology, Bangladesh); Fahim Faisal (Islamic University of Technology, Bangladesh); Md. Ashraful Hoque (Islamic University of Technology, Bangladesh)

Abstract: Superconductors have been among the most fascinating substances, as the fundamental concept of superconductivity as well as the correlation of critical temperature and superconductive materials have been the focus of extensive investigation since their discovery. However, superconductors at normal temperatures have yet to be identified. Additionally, there are still many unknown factors and gaps of understanding regarding this unique phenomenon, particularly the connection between superconductivity and the fundamental criteria to estimate the critical temperature. To bridge the gap, numerous machine learning techniques have been established to estimate critical temperatures as it is extremely challenging to determine. Furthermore, the need for a sophisticated and feasible method for determining the temperature range that goes beyond the scope of the standard empirical formula appears to be strongly emphasized by various machine-learning approaches. This paper uses a stacking machine learning approach to train itself on the complex characteristics of superconductive materials in order to accurately predict critical temperatures. In comparison to other previous accessible research investigations, this model demonstrated a promising performance with an RMSE of 9.68 and an R2 score of 0.922. The findings presented here could be a viable technique to shed new insight on the efficient implementation of the stacking ensemble method with hyperparameter optimization (HPO).

10:55: Smart Closed-Loop Jamming System

Hosam Alamleh (University of North Carolina Wilmington & Louisiana Tech University, USA); Peter Joseph (University of North Carolina Wilmington, USA)

Abstract: The world has witnessed a rapid surge in wireless technology and mobile device adoption, but this growth has brought along significant cybersecurity vulnerabilities. This paper is centered around the dangers posed by unauthorized communication and data leakage through smartphones. It delves into the challenge of covert communication and the potential weaknesses that allow sensitive information to be leaked. To address these concerns, the paper introduces a specialized smart system aimed at countering unauthorized communication and preventing data leakage effectively. This proposed system disrupts unauthorized communication channels, safeguarding against potential breaches. A fully functional prototype is developed using software-defined radio technology and extensively tested with real-world cellular communications scenarios to demonstrate its operational effectiveness. By highlighting these vulnerabilities and providing a robust solution, this paper aims to fortify the security of wireless technology and enhance protection against unauthorized access and data breaches via smartphones.

Bio for Hosam Alamleh: Hosam Alamleh he received the Ph.D. degree in Engineering from Louisiana Tech University, Ruston, LA, in 2019. Before that, he received his Ms. in electrical Engineering in 2014. His employment experience included consulting and optimizing the radio frequency systems in different wireless communication companies in Jordan, UAE and USA. Furthermore, he worked for a location technology company in Mountain View, CA for 3 years.

11:05: IoT Model for Rescue Operations Among First Responders for Disaster Management

Swarnamouli Majumdar (University of Massachusetts Lowell, USA); Sonny Kirkley (Indiana University, USA)

Abstract: While few studies exist in the use of Internet of Things (IoT) in indoor disaster management scenarios, there is a significant absence of research and scalable products in voice command assistant based IoT solutions for public safety and emergency responder situations like mass transit accident, floods, active shooter, and other incidents where just-in-time response and immediate aid are essential. Public safety is the cornerstone of our research study. Social networks drive consumer adoption of IoT technology because users seek feedback from peers, family, and social media influencers to lessen IoT product or service uncertainty. Prior research has demonstrated that customer trust affects IoT adoption. With the advance in Industrial IoT (IIOT) in disaster management, we have solutioned Zenext-IoT (ZIOT) which runs on a core voice command technology for public safety personnel. The goal of this research is to evaluate the degree to which first responders are willing to use the Internet of Things-based disaster management framework that has been proposed. This research aims to solve an urgent and imminent solution of providing the target segment of public safety officials and rescue worker with hands-free voice command virtual assistant IoT model. Our target users are emergency responders and rescue workers for whom technology needs to be simple to use and just-intime.

Bio for Swarnamouli Majumdar: Experienced Data Scientist/Product Analyst with 6+ years of experience in wrangling data, and deriving business reports with actionable insights from complex datasets. Skilled at analyzing and interpreting large data sets to provide action-oriented and data-driven approaches to drive business growth. An inquisitive problem-solver with critical thinking skills and demonstrated ability to lead teams in delivering solutions addressing real-world challenges and expanding business opportunities. Currently pursuing a Ph.D. in Management Information Systems with focus on Machine Learning and Business Analytics.

11:15: Predicting the Rooftop Solar Energy Potential of the City of Manila Using an Artificial Neural Network based System Utilizing Geographic Features

Jeheu Jesse Dela Cruz (Polytechnic University of the Philippines, Philippines); Casey Amirel Bundoc (Polytechnic University of the Philippines, Philippines); Redgienald Allen D. De Guzman (Polytechnic University of the Philippines, Philippines); Hector V Dionisio (Polytechnic University of the Philippines - Manila, Philippines); Michelle Anne G. Tumarong (Polytechnic University of the Philippines, Philippines); Carl Francis A Veloso (Polytechnic University of the Philippines - Manila, Philippines); Orland D Tubola (Polytechnic University of the Philippines, Philippines); Manuel M Muhi (Polytechnic University of the Philippines, Philippines)

Abstract: Although access to electricity in the Philippines is increasing, the country continues to struggle with energy scarcity. Solar PV systems have been recognized as a suitable and alternative energy source for the

Philippines, with the potential to increase economic growth and energy sources and distribution. The researchers created an ANN model to forecast roof solar energy potential from solar photovoltaic systems in Metro Manila and compared it to other regression models such as LR and SVM. The ANN model is superior to the other models when all features are used. Using three features, the MLR outperforms the other two. The NREL-generated and ANN-forecast results show no significant difference in the forecasted roof solar energy potential of City of Manila. The potential roof solar energy in the City of Manila is forecasted to be 70, 898,330 kWh/year.

11:25: Deep Learning-Based Short-Term Power Output Prediction Using Hybrid CNN-LSTM Model for Calatagan Solar Farm, Philippines

Pristine Louise A. Villaflor (Philippines); John Paulo Andal (Polytechnic University of the Philippines, Philippines); Ferolyn A Aytona (Polytechnic University of the Philippines, Philippines); Maria Chelzea Anne A. Duque (Philippines); Jessie Niño C Marquez (Philippines); Geoffrey T Salvador (Polytechnic University of the Philippines, Philippines); Orland D Tubola (Polytechnic University of the Philippines, Philippines)

Abstract: Solar energy is heavily reliant on solar radiation, which complicates the optimization of the system resulting in power output variability. To address this issue, forecasting techniques were implemented to predict power output for efficient energy planning. This paper presents a hybrid CNN-LSTM forecasting model using an estimated year-long worth of hourly solar PV power output of Calatagan Solar Farm, generated from the National Renewable Energy Laboratory (NREL) PVWatts® Calculator. Dataset was split into 75-15-10 for training, validation, and testing, respectively. In the training and testing phase, the trends for both the forecasted values and the NREL data during 3-day and 7-day forecasts were compared. The model's performance was then evaluated utilizing RSME and MAE in the validation phase. Results showed that the 3-day forecast demonstrated a tolerable deviation with 0.2684 MAE and 0.3707 RMSE, which was marginally better than the 7-day forecast having the values of 0.2956 and 0.3964, respectively. The model demonstrated the capability of forecasting the solar PV power output that can help market participants make informed decisions regarding energy trading and market operations. For future research, atmospheric conditions should be included as one of the features to minimize the discrepancies between the values.

11:35: Utilizing Non Linear Modeling Techniques for Fugitive Gas Emissions Data in Environmental Monitoring Applications

Norrima Mokhtar (University of Malaya, Malaysia)

Abstract: Air pollution is a pressing issue with implications for climate change and public health. Monitoring and estimating fugitive emissions is crucial for taking appropriate measures to mitigate this crisis. This study investigated the performance of different predictive models in estimating gas concentrations as part of air quality monitoring systems. This study considers Multilayer Perceptron (MLP) and Radial Basis Function (RBF) for the experiment data collected from previous studies. The architecture of these models was optimized considering each parameter in every model for the missing points in the gas concentrations data. The performance was evaluated for estimation accuracy and error measurement. Comparative analysis based on performance indicators demonstrates that the RBF model is the most accurate and best fitted model overall for emission estimation.



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AI.5 (Parallel session 3. Artificial Intelligence and Automation)

Session time	Thursday, 10:15 until 12:00
Location	Link Room 3
Talk time	10
Chaired by	Sazwan Syafiq Mazlan, Is Ts (Infrastructure University Kuala Lumpur & IUKL, Malaysia)

10:15: *Federated Learning in IoT: A Survey from a Resource-Constrained Perspective*

Ishmeet Kaur (USA); Adwaita Janardhan Jadhav (Apple, USA)

Abstract: The IoT ecosystem is able to leverage vast amounts of data for intelligent decision-making. Federated Learning (FL), a decentralized machine learning technique, is widely used to collect and train machine learning models from a variety of distributed data sources. Both IoT and FL systems can be complimentary and used together. However, the resource-constrained nature of IoT devices prevents the widescale deployment FL in the real world. This research paper presents a comprehensive survey of the challenges and solutions associated with implementing Federated Learning (FL) in resource-constrained Internet of Things (IoT) environments, viewed from 2 levels, client and server. We focus on solutions regarding limited client resources, presence of heterogeneous client data, server capacity, and high communication costs, and assess their effectiveness in various scenarios. Furthermore, we categorize the solutions based on the location of their application, i.e., the IoT client, and the FL server. In addition to a comprehensive review of existing research and potential future directions, this paper also presents new evaluation metrics that would allow researchers to evaluate their solutions on resource-constrained IoT devices.

Bio for Ishmeet Kaur: I am Ishmeet Kaur, a software engineer at Apple. I reside in San Diego, CA. I obtained a bachelor's degree from Purdue University, USA where I majored in Computer Engineering and minored in Management.

10:25: *Utilizing Artificial Neural Networks to Evaluate the Bioenergy Potential of Coconut as a Primary Power Generator in the CALABARZON Region*

Thomas Felix P Balbaboco (Polytechnic University of the Philippines & None, Philippines); Lemuel V Bassig (Polytechnic University of the Philippines, Philippines); Coleen B Capuno (Polytechnic University of the Philippines, Philippines); Jhubean Harold Quetua (Polytechnic University of the Philippines, Philippines); Nathaniel John F Raya (Polytechnic University of the Philippines, Philippines); Hugh Gerard Michel M Santos (Polytechnic University of the Philippines, Philippines); Nicole D Umali (Polytechnic University of the Philippines, Philippines); Orland D Tubola (Polytechnic University of the Philippines, Philippines)

Abstract: The transition to sustainable energy sources plays a vital role in decreasing the release of greenhouse gases and addressing the challenges of climate change. Biomass, particularly coconut waste biomass, appears as a viable renewable energy source because of its availability, cost-effectiveness, and minimal environmental impact. This research looks at the possibilities of coconut-based bioenergy systems in the Philippines'

CALABARZON area. Coconuts' bioenergy feasibility as a major energy source is evaluated using Artificial Neural Networks (ANNs). The study investigates the potential of coconut biomass, energy generation from agricultural leftovers, and the use of ANNs in energy analysis. The study's findings emphasize the significant energy potential of coconut waste biomass and illustrate the efficiency of ANNs in predicting renewable energy output. The model yielded an R value of 0.99843, R² value of 0.99686 for the coefficient of determination, and MSE of 2.0166e4. Coconut bioenergy exhibits a higher LCOE of ₱29.749/MWh of power generation. In comparison, fossil fuels have an LCOE of ₱1.2105/MWh. The results indicate that coconut bioenergy presents a higher LCOE for power generation.

Bio for Thomas Felix P Balbaboco: Electronics Engineering Student

10:35: Knowledge Acquisition from Student Lecture Reflection Data: Leveraging Large Language Models and Tacit Knowledge

Bacharuddin Adieb Pratama (Telkom University, Indonesia); Kemas Wiharja (Telkom University, Indonesia); Gia Septiana Wulandari (Telkom University, Indonesia)

Abstract: This research paper addresses a pertinent challenge encountered by lecturers in higher education institutions efficiently managing and analyzing the substantial volume of student lecture reflection data. To overcome this issue, we propose a novel knowledge acquisition system that amalgamates the capabilities of Large Language Models (LLM) with the invaluable tacit knowledge possessed by lecturers, enabling the inference of solutions. The process involves meticulously extracting textual information from student reflections and applying a multilingual BERT model for precise categorization. The acquired knowledge is subsequently stored within a sophisticated web-based platform, yielding an impressive acquisition rate of 73.85%, with 13.07% attributed to LLM and 60.78% emanating from lecturers' tacit knowledge. This study effectively showcases the potential of synergizing cutting-edge language models with human expertise, augmenting knowledge acquisition in educational environments. Furthermore, the proposed system furnishes a comprehensive and easily accessible resource, presenting insights into frequently encountered challenges and corresponding resolutions, benefiting students and lecturers.

10:45: Cyberbullying Detection on Twitter using Convolutional Neural Network (CNN) and Gated Recurrent Unit (GRU)

Nur Wakhidah Fitri Amalia (Telkom University, Indonesia); Erwin B. Setiawan (Telkom University, Indonesia)

Abstract: Social media sites, most notably Twitter, have become active centers of community participation, knowledge sharing, and communication in the modern digital era. However, this initial expansion has been followed by an alarming rise in cyberbullying, a ubiquitous problem. Cyberbullying is a broad term that refers to various harmful actions that take place online, such as aggressive bullying, harassment, and intimidation. Those who experience cyberbullying frequently struggle with extreme stress, prolonged sadness, and intense emotional upheaval, which can dangerously deteriorate their mental health. The unsettling link between cyberbullying and its harmful impacts on mental health highlights the urgent need for efficient detection and support methods, especially on intricate and expansive platforms like Twitter. This study assesses four techniques: CNN, GRU, CNN - GRU hybrid, and GRU - CNN hybrid, for detecting cyberbullying on Twitter. GloVe and TF-IDF were employed for feature expansion and extraction. Evaluating each strategy's effectiveness is crucial for identifying instances of cyberbullying. Test results reveal accuracy levels: GRU (80.58%), CNN - GRU hybrid (80.41%), GRU - CNN hybrid (80.37%), and CNN (80.30%). This research contributes to cyberbullying detection on intricate platforms like Twitter, emphasizing the urgency of mitigating its impact.

10:55: IoT Based Smart Intravenous Infusion Dosing System

Mayur Rele (ISACA, ISC2, IEEE & Parachute Health, USA); Dipti Patil (University of Cumberland, USA)

Abstract: Using an intravenous (IV) infusion system, the patient's vein can be fed with the infusion fluid. The IVs are used for blood transfusions or to provide drugs directly into the bloodstream. The mobile application and

texts will warn the nurse when the intravenous fluid level falls below a certain threshold. The Bluetooth program will send an alarm if the liquid level is below 100%, and this procedure will continue until the fluid in the bottle runs out. The solenoid valve will automatically hold the fluid flow if no staff member can change the bottle. In the hospital, many departments need a comparable automatic monitoring and indication system. This system benefits home health care, small, medium, and big hospitals, and this monitoring technology will reduce patient risk and improve the quality of hospital healthcare. This research would provide great value in the healthcare industry; automation makes life easier for social workers and nurses who work in healthcare professions. Since it is impossible to check the level of the bottles often physically when there is a need to address other patients, this initiative helps in adding significant value to monitoring patients at night. Because air bubbles in the blood can rapidly kill a patient, the considerable risk of it entering the bloodstream is avoided.

Bio for Mayur Rele: 13+ years of experience in cloud, security, virtualization, and automation environments, which involves Planning, Budgeting, Enterprise-class strategies, Cloud Migrations, Hybrid Cloud Designs, and technical generalists (SME) for multiple cloud, network, and automation upgrades and migrations. A proven history of implementing, deploying, and administrating a secure environment. Maintaining and auditing compliance requirements (HITRUST, HIPAA, SOC 2 Type 2, PCI, ISO, and SOC 1 Type 2) Research interests: EV, Artificial intelligence, machine learning, data science, cyber security, and healthcare. Contributed to 10+ research publications and conference papers. Member: IEEE, ISACA, and ISC2. Affiliation: Senior Director, IT & Cybersecurity - Parachute Health.

11:05: Listwise Learning To Rank Approach Using Bert For Question Answering System

Sheeba Naz (Jawaharlal Nehru University, India); Aditi Sharan (Jawaharlal Nehru University, India)

Abstract: Efficient search is an essential aspect of a question-answer system with the number of answers related to a question. Every day, millions of users seek answers that meet their needs. Thus, displaying the most relevant answers at the highest level would enhance the user experience. This paper provides a unique method for ranking answers based on a user question by combining a transformers-based model with a listwise loss function. We use the Bert model on a non-factoid question-answer dataset and then fine-tune it using the listwise loss function. The architecture is created using a list-wise technique that trains a ranking function by taking individual lists of answers to a question as instances and minimizing a loss function defined on both the predicted and ground-truth labels. The proposed framework is evaluated using the public dataset SemEval (2016), obtaining a MAP of 90.77%. The Paper demonstrates a considerable improvement over state-of-the-art techniques with extensive experiments.

11:15: Arabic Dialect Identification On Social Media: Mini Review

Enas Alqulaity (Taibah University, Saudi Arabia); Wael Yafooz (Taibah University, Saudi Arabia); Abdullah Alsaedi (Taibah University, Saudi Arabia)

Abstract: Arabic dialect identification plays a crucial role in natural language processing. It serves as a foundational step in various language processing applications like machine translation, Sentiment Analysis, and cross-language text generation. Therefore, in the last decade, interest has increased in addressing the problem of Arabic dialect identification. In the context of social media Arabic dialect identification poses unique challenges due to the close relationship and shared vocabulary among the dialects This comprehensive survey paper presents an overview of researches on Arabic dialect identification in written texts, encompassing challenges, available annotated resources, and a review of literatures employing traditional machine learning, deep learning architectures, and hypered learning approaches. The outcomes of this systematic review offer valuable insights into the current trends in Arabic dialect identification research and serve as an essential reference for scholars in the field of Arabic Natural Language Processing

11:25: An Overview of Artificial Intelligence in the Detection of Suspicious Arabic Text on Social Media Platforms

Amal Albalawi (University of Prince Mughrin & Taibah University, Saudi Arabia); Wael M.S Yafooz (Taibah University, Saudi Arabia)

Abstract: This study examines the difficulties of detecting and classifying offensive language in Arabic, with a focus on natural language processing (NLP) methods. Arabic's distinctive linguistic characteristics, such as its extensive morphology, present substantial obstacles to correctly classifying offensive content. This paper evaluates the approaches currently in use in this field and conducts a critical analysis of publicly accessible datasets frequently used to detect offensive language in Arabic. In addition to highlighting areas for more study and growth in the detection of Arabic offensive language, the aim is to offer insights into the state-of-the-art methodologies already being used. Throughout the analysis of public datasets, this paper evaluates their suitability for offensive language detection tasks in Arabic, taking into account factors such as dataset size, annotation quality, and representation of diverse offensive language categories. Furthermore, this paper investigates the existing methods utilized for detecting and classifying offensive language in Arabic. By examining range of NLP approaches used in the context of detecting Arabic offensive language, including machine learning algorithms, deep learning architectures, and linguistic aspects. To address the specific challenges associated with the offensive language detection in the Arabic vernacular. Our investigation emphasizes the need for customized algorithms that take into consideration Arabic's particular linguistic characteristics. Future research should focus on developing advanced models that incorporate domain-specific knowledge, handle dialectal variations, and effectively capture the intricacies of Arabic morphology.

11:35: Neural Network Backpropagation Breast Cancer And Thyroid Classification System Using Scaled Conjugation Backpropagation, LavenbergMarquardt, and Bayesian Regularization

Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Muhammad Albik Ghalela (University of Muhammadiyah Yogyakarta, Indonesia)

Abstract: This neural network research is aiming to classify breast cancer and thyroid. The methods used in these experiments are scaled conjugation backpropagation, lavenberg-marquardt, and bayesian regularization within 10 cross-validation training. The average accuracy of breast cancer classification is 96,92% with scaled conjugation backpropagation, 97,08% with lavenberg-marquadt, and 99,59% for bayesian regularization. While average accuracy of thyroid classification with 94,18% with scaled conjugation backpropagation, 98,78% with lavenberg-marquardt, and 99,59% with bayesian regularization. Finally, the result of this study is the differential of each neural network algorithm that can be useful for image medical classification in both breast cancer and thyroid.



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RO.3 (Offline 2)

Session time Thursday, 10:15 until 12:00

Location Ruang Sidang Teknik

Talk time 10

Chaired by Anna Nur Nazilah Chamim (Universitas Muhammadiyah Yogyakarta, Indonesia)

10:15: Spinal disorders classification system based on the Hu and Zernike Moment Invariant and Machine Learning methods

Anna Nur Nazilah Chamim (Universitas Muhammadiyah Yogyakarta, Indonesia); Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Ibnu Rahmat Siddik (Universitas Muhammadiyah Yogyakarta, Indonesia); Mohd Imran Yusof (Universiti Sains Malaysia, Malaysia); Hasimah Ali (University Malaysia Perlis, Malaysia); Siti Nurul Aqmariah Mohd Kanafiah (Universiti Malaysia Perlis, Malaysia)

Abstract: Spinal disorders are a common kind of sickness that affects the spine. Medical workers often use X-ray technology beams to identify numerous abnormalities in the human body that are not visible to the naked eye, such as spinal abnormalities. Using the Hu and Zernike moment invariant and machine learning approaches, we will construct a system that can conduct feature extraction and classification of spinal anomalies in this study. Hu Moment Invariant is a feature extraction approach used to create seven moments (features) that describe an object, while Zernike Moment Invariant is an alternate way of doing Hu Moment's extraction that uses geometry and complex moments to avoid mathematical issues. A Support Vector Machine (SVM) seeks to find the best hyperplane separating two classes in the input space; K-Nearest Neighbor (KNN) classifies data based on a comparison of the distance values of its nearest neighbors; and a Decision Tree (DT) is one method of processing data in predicting the future by building a classification or regression model in the form of a tree structure. By using the DT Fine classification model from the Hu Moment extraction results, this system can categorize research data with an accuracy of 89.9% (the best) and a running time of 0.79037s, which was developed using one-minute feature extraction. By using the DT Medium model classification from the Zernike Moment extraction results, the (best) accuracy and running time are 87.0% and 1,28988s, respectively.

10:25: Classification of Prostate Cancer Staging using VGG-19 and GoogLeNet Transfer Learning Models

Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Shafa Cahyaningtyas (Universitas Muhammadiyah Yogyakarta, Indonesia); Feriandri Utomo (Universitas Abdurrab, Indonesia)

Abstract: Prostate cancer attacks the men's urinary system. Many studies on prostate cancer and other diseases have utilized artificial intelligence (AI). Moreover, evaluating the models employed in disease classification is crucial to serving as a reference for other researchers in determining an appropriate model. This study applied two preserved models: VGG-19 and GoogLeNet. With an accuracy of 95.47% during training, VGG-19 outperformed GoogLeNet, acquiring 94.44%. Nevertheless, compared to VGG-19, GoogLeNet's training time was significantly shorter at an average of 7 minutes and 46 seconds. In contrast, VGG-19 required a relatively long time, clocking in at 56 minutes and 38 seconds. VGG-19 also performed better in testing than GoogLeNet,

unveiled by a confusion matrix assessment. In other words, VGG-19 performed significantly better than GoogLeNet in classifying prostate cell images

10:35: Predicting PM2.5 Levels Using AIoT Sensory Node in a Smart Campus Environment

Karisma Putra (Universitas Muhammadiyah Yogyakarta, Indonesia)

Abstract: The implementation of AIoT-enabled environmental prediction systems in a smart campus setting serves as a valuable tool for early warning and addressing the long-term health implications of PM2.5 air pollution. However, the dynamic nature of variables and limited monitoring periods in environmental systems pose significant challenges that hinder accurate predictions. Despite the widespread deployment of AIoT-enabled PM2.5 sensory nodes in smart campus environments, existing prediction systems face accuracy issues when estimating PM2.5 levels across the campus. To address this, our research introduces a novel AIoT-based machine learning (ML) model utilizing a multi-layer long short-term memory (ML-LSTM) architecture. Furthermore, we compare the performance of our proposed AIoT-ML model with traditional ML approaches such as linear regression (LR) and nearest neighbor regression (NNR). Experimental results validate the superiority of our proposed AIoT-ML model, exhibiting approximately 3.7% higher predictive accuracy than the NNR model and 25.4% higher accuracy than the SVR model, as evaluated by the R-squared metric. By leveraging the capabilities of AIoT and the ML-LSTM architecture, our model demonstrates almost the same accuracy as the regular ML framework but with a dramatically reduced model capacity.

10:45: Classification of Abnormalities in Spine Curvature Based on Shape Features using Machine Learning

Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Masayu Alya Nuraini (Universitas Muhammadiyah Yogyakarta, Indonesia); Fikran Aulia (Universitas Muhammadiyah Yogyakarta, Indonesia); Anna Nur Nazilah Chamim (Universitas Muhammadiyah Yogyakarta, Indonesia); Siti Nurul Aqmariah Mohd Kanafiah (Universiti Malaysia Perlis, Malaysia); Mohd Imran Yusof (Universiti Sains Malaysia, Malaysia)

Abstract: The spine serves a crucial role as a support and protective organ for the spinal cord, enabling communication between the brain and the body. Prompt and accurate actions and treatments are necessary to diagnose spinal damage. However, the scarcity of medical professionals specializing in spinal disorder diagnosis creates difficulties in patient care. Recognizing spinal disorders is a time-consuming process, prompting this study to develop a system that utilizes digital image processing and Artificial Intelligence to identify spinal disorders using X-ray images. The expanding application of technology, such as image processing, has the capability to identify and track objects in real time, including assessments based on images. We use a Histogram of Oriented Gradients to extract the features on the spine image based on shape. Classification using SVM and KNN present the best result at an accuracy of 93% and 92%, respectively



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SP.4 (*Parallel Session,3 Signal and Image Processing 4*)

Session time Thursday, 10:15 until 12:00

Location Laboratorium TI, Link Room 2

Talk time 10

Chaired by

10:15: Simulation and Analysis of Solar Energy Potential Along South Luzon Expressway (SLEX): Integrating Solar Photovoltaic Systems for Sustainable Roadway Power Generation

Eddie S. Antonio, Jr. (Polytechnic University of the Philippines, Philippines); Joshua Ramon E Benigno (Polytechnic University of the Philippines, Philippines); Hanri James C Care (Polytechnic University of the Philippines, Philippines); Hans Patrick Q. Carlos (Polytechnic University of the Philippines, Philippines); Mekaella D Pascua (Polytechnic University of the Philippines, Philippines); Mark Vincent H. Santelices (Polytechnic University of the Philippines, Philippines); Orland D Tubola (Polytechnic University of the Philippines, Philippines); Manuel M Muhi (Polytechnic University of the Philippines, Philippines)

Abstract: This paper explores the potential of integrating solar panels into the road dividers of the South Luzon Expressway (SLEX) in the Philippines as a solution to address rising electricity costs and increasing energy demand. The main objective of this study is to assess the impact of incorporating solar panels into the SLEX and determine various aspects, such as the solar energy potential, the implementation costs, and the levelized cost of electricity (LCOE). Data from the Global Solar Atlas is utilized to assess solar irradiance and other environmental factors in the area. This study employed both Google Earth Pro and QGIS software applications for the analysis and assessment of the area. The simulation of the PV system was conducted using PVsyst software. This paper presents the array-losses analysis, system production, performance ratio, energy balances, and cost analysis. Integrating solar panels into the SLEX results in an annual energy production of approximately 49,930,381 kWh. Additionally, the analysis of the levelized cost of energy unveils a calculated value of 11.34 Php/kWh, representing a reduction in price compared to the current commercial cost of 11.91 Php/kWh for energy consumption. These findings indicate that the integration of solar PV systems in the SLEX road dividers contributes to clean electricity generation and reduces dependence on non-renewable sources by effectively lowering the cost of energy.

10:25: Banana-based Biomass Power Plant Site Suitability Analysis through GIS mapping in Davao del Norte

Kian Xavier J. Agustin (Polytechnic University of the Philippines, Philippines); Chad Henry S Cabalonga (Polytechnic University of the Philippines, Philippines); Isaac F. Esmale (Philippines); John Christian R. Valencia (Polytechnic University of the Philippines - Manila, Philippines); Michael Neo Angelo F Tinay (Polytechnic University of the Philippines-Manila, Philippines); Orland D Tubola (Polytechnic University of the Philippines, Philippines); Ria Garnette A

Buhat (Polytechnic University of the Philippines- Manila, Philippines); Shane Kelly N Amoroso (Polytechnic University of the Philippines, Philippines)

Abstract: Given the abundance of biomass resources in the Philippines, particularly in its agricultural sector, it becomes crucial to assess these resources for their potential in bioenergy production. A key aspect of this assessment is site suitability analysis, which considers various factors such as Road accessibility, Slope of land, water bodies, Built-up Areas, constrained areas, and Banana cultivation area. Notably, Davao del Norte boasts the largest banana plantation in the country, offering ample agricultural residues. With an increasing population residing at a considerable distance from these croplands, there is an opportunity for efficient electricity utilization. Therefore, this study employs Geographic Information Systems (GIS) to develop a methodology for identifying suitable locations for biomass power plant development in Davao del Norte, Philippines. Multi-Criteria Decision Analysis (MCDA) is incorporated into the QGIS platform for the analysis. The municipality of Asuncion is the most suitable location for biomass power plant development, according to the results of this analysis.

10:35: ADHD Mental Health Symptoms Detection Based on Facial Landmark Tracking

Christian Nash (Newcastle University, United Kingdom (Great Britain)); Rajesh Nair (CNTW-NHS Foundation Trust, United Kingdom (Great Britain)); Syed Mohsen Naqvi (Newcastle University, United Kingdom (Great Britain))

Abstract: Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent mental health conditions in the world. If undiagnosed during childhood, there is a high chance of the individual leading a subpar livelihood. With low diagnosis rates and long wait times for a diagnosis appointment, there is motivation to support clinicians. This paper proposes a novel system that can analyse facial behaviour with machine learning to detect ADHD in humans. To analyse facial landmarks and movement of the facial features, a Long Short Term Memory (LSTM) network is exploited. We present a novel multi-modal dataset that contains 8 ADHD subjects and 12 controls with over 20 hours of recordings. By using this novel dataset, we identify facial behaviour differences between ADHD subjects and controls. By applying the facemesh on the video data, the facial behaviour difference between ADHD subjects and controls is also proposed. The proposed approach provides a validated average classification accuracy of $88.24\% \pm 3.93\%$ for detecting ADHD. With diagnosis being a subjective decision from a clinician, we aim to introduce a robust objective measure with the proposed work.

10:45: Analysis of Shear Strength Reduction Effect on Slope Stability Due to Expansive Soil Using Three-Dimensional Finite Element Method

Adhitya Yoga Purnama (Universitas Gadjah Mada, Indonesia); Bayu Ilham Nasukha (Universitas Gadjah Mada, Indonesia); Devi Oktaviana Latif (Universitas Gadjah Mada, Indonesia); Pinta Astuti (Universitas Muhammadiyah Yogyakarta, Indonesia); Gumbert Maylda Pratama (Universitas Atmajaya Yogyakarta, Indonesia)

Abstract: A slope failure occurred in East Kalimantan, which contains expansive soil capable of swelling and shrinking. This swelling and shrinking of the expansive soil cause a decrease in soil shear strength parameters, which ultimately leads to the failure of the underlying soil-retaining structures. However, the water content influences the reduction in soil shear strength parameters and is not uniform across all locations. Some areas of the slope contain cracks, which enable water to infiltrate more rapidly than in areas without cracks. To determine the cause of the issue, a numerical analysis is conducted using the Finite Element Method (FEM) in three-dimensional approach to examine the process by which the slope collapsed in the field. The analysis results indicate that the 3D FEM can simulate slope failures with variable displacements at each location. This 3D FEM analysis is essential for future in-depth research on the influence of expansive soil on slope stability.

10:55: Analysis of Corroded Concrete Using Radiography Method

Ahmad Zaki (Universitas Muhammadiyah Yogyakarta, Indonesia); Tania Tasya Meutia (Universitas Muhammadiyah Yogyakarta, Indonesia); Ni Nyoman Kencanawati (University of Mataram, Indonesia); Syarizal Fonna (Universitas Syiah Kuala, Indonesia); Zainah Ibrahim (University of Malaya, Malaysia)

Abstract: Reinforced concrete structures are widely used in construction due to their high strength and relatively low production costs. However, the quality of reinforced concrete must always be considered due to the corrosion risk of the reinforcing steel. Corrosion-induced damage can be detrimental to the structural integrity and safety of reinforced concrete that was previously deemed secure. Therefore, an evaluation of the concrete is necessary to prevent potential negative impacts. This research utilizes radiography methods to detect steel corrosion by observing changes in diameter in the concrete steel reinforcement before and after corrosion. Radiography methods allow for clear visualization of damage indications in the concrete and can be used for various materials, including reinforced concrete. The specimens used in this study consist of 8 reinforced concrete samples with varying levels of corrosion at 5%, 10%, 15%, and 20%. The research involves Radiography testing before and acceleration corrosion. The results obtained in this study show a reduction in the diameter of the reinforcement in several measurements, indicating corrosion. However, some measurements do not align with an increase in the diameter of the reinforcement after corrosion. This can be attributed to inadequate calibration or inaccurate measurement points.

11:05: *Brain Tumor Evaluation Calculate Volume*

Dwi Swasono Rachmad (JI Melati III No 21 Kav Perwirasari RT 002 RW 008 Kelurahan Perwira Kec Bekasi Utara Kota Bekasi & PT ADA APA LAGI, Indonesia); Iqbal Mohammad (Gunadarma University & Université de Bourgogne, Indonesia); Johan Harlan (Gunadarma University, Indonesia)

Abstract: MRI is the finest tool for diagnosing brain lesions. The applicability of MRI is limited by interpretation, analysis time, and visualization. The location of brain tumors is determined based on their characteristics and the calculation of their area and volume. Segmentation Active contouring with manual volume calculations using ellipsoids, hemi-ellipsoids, tada formulas, and hematomas, as well as research employing a combination of the Otsu method and the feature region method. The level of accuracy of each process from Active Contour Segmentation and Otsu Active Contour is determined by the level of separation between the object under study and the other objects. The processes have different stages, but both have in common the calculation of the same volume using the values of ellipsoids, hemi-ellipsoids, Tada Formulas, and Hematoma to determine the volume of the tumor object's shadow. Comparing the Otsu Active Contour value, which has a very high value without dilatation and erosion processes, and the Morphological Active Contour value, which has a very high value without the laborious process of determining tumor volume, yields an average accuracy of 98%.

Bio for Dwi Swasono Rachmad: student

11:15: *5G Small Cell Design for Nusantara's Roadways*

Fasya Tiarani (Universitas Indonesia, Indonesia); Anna Christina Situmorang (Universitas Indonesia, Indonesia); Dadang Gunawan (Universitas Indonesia, Indonesia)

Abstract: The fifth generation (5G) represents the latest advancement in telecommunications technology. Many countries have implemented this technology due to its exceptional bandwidth and efficiency. To expedite the digital transformation process in Indonesia, the capital city must adopt 5G technology. The deployment of small cell base stations is necessary to ensure network coverage and capacity for implementing 5G technology in Nusantara, Indonesia's newly established state capital. These base stations are essential for supporting the area's communication needs of public utilities. This study aims to develop a strategy for determining the quantity and spatial distribution of small cell cellular units in the region of Nusantara to mitigate network coverage gaps and ensure consistent network performance. At a frequency of 3.5 GHz, data processing, simulation, and analysis resulted in the identification of 63 small cells. These small cells were found to have a maximum distance of 421.703 m between them. Similarly, at a frequency of 28 GHz, 67 small cells were detected, with a maximum distance of 409.704 m observed between them. As mentioned above, the arrangement yielded uplink speeds of 26.048 Mbps and downlink rates of 11.736 Mbps. The Nusantara central government core area can potentially employ this small cell for V2X and mobile communication purposes.

11:25: Classification of Building Structure Fragility Levels with Machine Learning Based on Hue and Zernike Moment Invariant Methods

Muhammad Fajrul Faiz (Universitas Muhammadiyah Yogyakarta, Indonesia); Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia); Ahmad Zaki (Universitas Muhammadiyah Yogyakarta, Indonesia)

Abstract: One of the causes of damage to building structures is cracks in concrete. Cracks in concrete structures are a condition where there is a rupture or separation of a structure intact or imperfect, so it is necessary to conduct a concrete test. There are several ways to determine the type of crack in a building. Concrete structure testing can be done by building a machine learning system based on image data of concrete surface cracks. The model system to be built can classify the type of building cracks consisting of 3 classes, namely, Normal, Fine Cracks, and Severe Cracks with the Hue Moment feature extraction method, Zernike Moment and SVM-KNN algorithm. The best accuracy results are obtained using the Hue Moment Gaussian Medium SVM feature extraction method with an accuracy of 70% with a running time of 36.136s. The best accuracy of Zernike Moment feature extraction method is obtained by Medium Gaussian SVM with an accuracy of 50.9% running time 57.723s, while for the combined extraction method (Hue Moment + Zernike Moment Moment) obtained an accuracy of 57.6% running time 102.18s.

11:35: Classification of Spine Images Using Texture based DWT for Normal and Scoliosis

Hasimah Ali (University Malaysia Perlis, Malaysia); Siti Nurul Aqmariah Mohd Kanafiah (Universiti Malaysia Perlis, Malaysia); Mohamed Elshaikh (UniMAP, Malaysia); Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia)

Abstract: Scoliosis is a common spinal disorder characterized by an abnormal curvature of the spine, typically in a lateral or sideways direction. Early detection and accurate diagnosis of scoliosis are crucial for timely intervention and appropriate treatment planning. This study aims to investigate the characteristic of normal and scoliosis spine images based on the texture features by using Discrete Wavelet Transform (DWT). In addition, the goal also is to evaluate the performance of normal and scoliosis spine images using k-NN classifier. In order to achieve that, image preprocessing is required firstly to enhance the quality of the spine image. Conversion from RGB to grayscale image is applied. Next is to apply histogram equalization, image scaling and image filtering before proceeding for the feature extraction process. The main feature extraction method that has been used is DWT where it help by capturing important image characteristics at different scales. The detail coefficients highlight local image details, such as edges, textures, or patterns, while the approximation coefficients provide a global representation of the image. These coefficients can be utilized as input for KNN classifier. The findings demonstrate that the DWT technique offers good accuracy of 97.5%, thus considered as a promising approach.



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