

# 11<sup>th</sup> **icict** 2023

The 11<sup>th</sup> International Conference on Information & Communication Technology

23-24 AUGUST 2023

**“ACCELERATING DIGITAL TRANSFORMATION  
FOR HUMAN WELL-BEING”**

TECHNICALLY CO-SPONSORED:



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# 11<sup>th</sup> International Conference on Information and Communication Technology (ICoICT 2023)

Accelerating Digital Transformation for Human Well-Being

## CONFERENCE INFORMATION

<b>Dates:</b>	23 – 24 August 2023
<b>Organizer:</b>	Multimedia University, Malaysia
<b>Co-organizer:</b>	Telkom University, Indonesia
<b>Venue:</b>	Virtual conference
<b>Secretariat:</b>	Faculty of Information Science and Technology Multimedia University Jalan Ayer Keroh Lama 75450, Bukit Beruang Melaka, Malaysia
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## WELCOME MESSAGE

On behalf of the Organizing and Technical Program Committees, we cordially invite you to the International Conference on Information and Communication Technology (ICoICT) 2023, which is held on August 23-24, 2023. ICoICT was initiated and organized by Telkom University since year 2013, aiming to present to present their research and innovations. It also offers good opportunity to enhance international academic exchange on related topics and to provide a platform for further ICT among researchers. This year marks the 11<sup>th</sup> ICoICT 2023 which is jointly organized by Multimedia University Malaysia, and Telkom University Indonesia, in collaboration with IEEE Systems, Man and Cybernetics Society (SMC) Malaysia Chapter.

The technical agenda for the 11<sup>th</sup> ICoICT 2023 includes four keynotes, three tutorials, and 20 parallel sessions of 5 tracks on "Accelerating Digital Transformation for Human Well-Being". In ICoICT2023, we have received 201 paper submissions from 16 countries with 114 accepted. All submitted papers have through a rigorous peer-review procedure that assesses their importance, originality, and technical excellence. Each paper was examined independently by at least three expert reviewers.

ICoICT 2023 is conducted virtually from the campus of Multimedia Melaka. The organising committee has worked hard to create a virtual conference that will be beneficial and interesting to both presenters and attendees. The entire conference format combines synchronous live presentation for the keynote and tutorial sessions, as well as asynchronous participation with pre-recorded video presentation and live Q&A for all parallel sessions.

We thank everyone who has contributed to and supported our efforts in various ways, as well as everyone who helped make this event a reality and a success. We would like to express our gratitude to the management of Multimedia University Malaysia and Telkom University Indonesia, and IEEE SMC Malaysia for entrusting their support to the ICoICT2023 event. Also, for the members of the Organizing Committee and Technical Committee, as well as our colleagues, for their assistance with the organization and execution of this conference. We would like to pay tribute to all of our keynote speakers, tutorial speakers, moderator, session chairs, student helpers and all presenters. We also wish to acknowledge all paper reviewers, who went through the arduous task of reviewing all submissions.

We recognise that the world of information and communication technology is vast, dynamic, and constantly changing. In response to this shift, the 11<sup>th</sup> ICoICT 2023 aims to provide a forum for experts, researchers, and enthusiasts to share their perspectives, challenges, and breakthroughs. Welcome to our virtual conference and we all hope that you learn a lot and have a great experience as well!

**Prof. Dr. Ong Thian Song**  
**General Chair of ICoICT 2023**



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**Ronald Adrian**, Universitas Gadjah Mada  
**Roy Chang**, Multimedia University  
**Satria Mandala**, Universitas Telkom  
**Shadia Suhaimi**, Multimedia University  
**Sharifah Saon**, Universiti Tun Hussein Onn Malaysia  
**Shier Nee Saw**, Universiti Malaya  
**Shih Yin Ooi**, Multimedia University  
**Shing Chiang Tan**, Multimedia University  
**Shing Chyi Chua**, Multimedia University  
**Si Na Kew**, Universiti Teknologi Malaysia

**Siew Chin Chong**, Multimedia University  
**Sin Yin Tan**, Multimedia University  
**Siow Hooi Tan**, Multimedia University  
**Siti Fatimah Abdul Razak**, Multimedia University  
**Siti Hafizah Ab Hamid**, University of Malaya  
**Siti Sa'adah**, Telkom University  
**Siti Zakiah Melatu Samsi**, Multimedia University  
**SM Namal Senanayake**, Multimedia University  
**Sook Ling Lew**, Multimedia University  
**Sook Mei Khor**, Universiti Malaya  
**Su Luan Wong**, Universiti Putra Malaysia  
**Suganthi Ramasamy**, Multimedia University  
**Su-Mae Tan**, Multimedia University  
**Sumendra Yogarayan**, Multimedia University  
**Syahrul Junaini**, Universiti Malaysia Sarawak  
**Tajul Rosli Razak**, Universiti Teknologi MARA  
**Tee Suan Chin**, Multimedia University  
**Tenia Wahyuningrum**, Institut Teknologi Telkom Purwokerto  
**Thian Song Ong**, Multimedia University  
**Tian Swee Tan**, Universiti Teknologi Malaysia  
**Tohari Ahmad**, Institut Teknologi Sepuluh Nopember  
**Tze Wei Liew**, Multimedia University  
**Vik Tor Goh**, Multimedia University  
**Wai Kit Wong**, Multimedia University  
**Wan Nural Jawahir Hj. Wan Yussof**, Universiti Malaysia Terengganu  
**Warih Maharani**, Telkom University  
**Wassnaa Al-Mawee**, Western Michigan University  
**Wee How Khoh**, Multimedia University  
**Wikky Al Maki**, Telkom University  
**Wiwin Suwarningsih**, National Research and Innovation Agency  
**Yahdi Siradj**, Telkom University  
**Yean Li Ho**, Multimedia University  
**Yee Kit Chan**, Multimedia University  
**Yee Yen Yuen**, Multimedia University  
**Yi-Fei Tan**, Multimedia University  
**Ying Han Pang**, Multimedia University  
**Yudha Arman**, Universitas Tanjungpura  
**Yudhistira Nugraha**, Telkom University  
**Yudi Wibisono**, Indonesia University of Education  
**Yuliant Sibaroni**, Telkom University  
**Z. k. a. Baizal**, Telkom University  
**Zauwiyah Ahmad**, Multimedia University

## GENERAL INSTRUCTIONS

ICoICT 2023 will be a fully virtual conference hosted by **Google Meet (GM)**. In ICoICT 2023, there are three types of sessions: keynote speeches, tutorials, and parallel sessions (paper presentations). Each session will have a co-host (a student helper), and a moderator or session chair, presenters, and attendees. The co-host will be the person in charge of facilitating the use of Google Meet. The moderator/session chair/MC is present to manage the Q&A and coordinate the session.

### ACCESS TO SESSIONS

- Opening Ceremony, Keynote speeches and tutorials will be held in the main room, which has a large capacity (200 pax), and will also be live streamed via YouTube so that the public can freely access them.
- Parallel paper presentations will be held in the GM Meeting rooms (Room A – D), which have a smaller capacity and can only be attended by registered paper presenters and authors.

### BASIC SESSION STRUCTURE

- 15 minutes before the Session: The co-host will start the designated Google Meet session.
- 2 minutes before the Session: The co-host will start the recording.
- 1 minute before the Session: The moderator or session chair introduces the session.
- Beginning of the Session: The moderator or session chair will introduce the presenter (5 minutes).
- The talk followed by live Q&A. The duration of each presentation by type are listed below:
  - a) **Keynote speech (1 hour)**
    - Live talk or recorded presentation = 40 - 50 minutes
    - Live Q&A = 10 - 20 minutes
  - b) **Tutorial (1.5 hours)**
    - Live tutorial or recorded video = 40 – 60 minutes
    - Live Q&A = 10 - 20 minutes
  - c) **Parallel Paper presentation (20 minutes for each presenter)**
    - Recorded presentation (video) = 15 minutes
    - Live Q&A = 5 minutes
- End of the Session: The moderator will conclude the session (5 minutes), and check attendance, then the co-host will end the session.

### SCHEDULE AND TIME

All time in the program schedule is in Malaysia Time (MYT; UTC+8). Please adjust the time stated in the schedule into your local time. The current time in MYT is available at <https://time.is/MYT>.

## CONFERENCE SCHEDULE

All time in the program schedule is in Malaysia Time (MYT; UTC+8). Please adjust the time stated in the schedule into your local time. The current time in MYT is available at <https://time.is/MYT>.

### Day 1: Wednesday, 23 August 2023

Time (MYT)	Room	Activity
09:00 – 09:15		Greeting and Welcome
09:15 – 09:25		Welcoming Speech by General Chair of ICoICT2023 <b>Prof. Dr. Ong Thian Song</b>
09:25 – 09:35	Main Room	Speech by the Chairperson of IEEE SMC Malaysia <b>Ts. Dr. Sazalinsyah Razali</b>
09:35 – 10:00		Opening Speech by Dean of Faculty of Information Science and Technology, Multimedia University Malaysia <b>Prof. Ts. Dr. Lau Siong Hoe</b>
10:00 – 10:05		Photo Sessions
10:05 – 10:15		Break
10:15 – 11:30	Main Room	<b>Keynote Speech 1: Prof. Dr. Seong G. Kong</b> Sejong University
11:30 – 12:45		<b>Keynote Speech 2: Dr. Mazlan Abbas</b> CEO Favoriot Sdn Bhd
12:45 – 14:00		Break
	Main Room	Tutorial Session 1 <b>Dr. Sumendra Yogarayan</b> Multimedia University
14:00 – 16:00	Room A	Parallel Session 1A: <b>Quality of Life and Smart Living</b> Session Chair: Dr. Chong Siew Chin
	Room B	Parallel Session 1B: <b>Big Data and Analytics</b> Session Chair: Dr. Vera Suryani
	Room C	Parallel Session 1C: <b>Digital Community and Society</b> Session Chair: Assoc. Prof. Dr. Tan Choo Kim
	Room D	Parallel Session 1D: <b>Digital Healthcare</b> Session Chair: Dr. Kusuma Ayu Laksitowening

16:00 – 18:00	Main Room	Tutorial Session 2 <b>Assoc. Prof. Dr. Bayu Erfianto</b> Telkom University
	Room A	Parallel Session 2A: <b>Machine Intelligence</b> Session Chair: Assoc. Prof. Dr. Tee Connie
	Room B	Parallel Session 2B: <b>Quality of Life and Smart Living</b> Session Chair: Dr. Niken Dwi Wahyu Cahyani
	Room C	Parallel Session 2C: <b>Big Data and Analytics</b> Session Chair: Dr. Lim Jit Yan
	Room D	Parallel Session 2D: <b>Digital Community and Society</b> Session Chair: Dr. Lim Kian Ming
18:00	End of Day 1 Session	



## Day 2: Thursday, 24 August 2023

Time (MYT)	Room	Activity
09:00 – 10:15	Main Room	Keynote Speech 3: <b>Prof. Dr. Chan Yee Kit</b> Multimedia University
10:15 – 11:30		Keynote Speech 4: <b>Prof. Dr. Suyanto</b> Telkom University
09:00 – 11:00	Room A	Parallel Session 3A: <b>Digital Healthcare</b> Session Chair: Dr. Chong Lee Ying
	Room B	Parallel Session 3B: <b>Machine Intelligence</b> Session Chair: Dr. Sumendra Yogarayan
	Room C	Parallel Session 3C: <b>Quality of Life and Smart Living</b> Session Chair: Dr. Nungki Selviandro
	Room D	Parallel Session 3D: <b>Big Data and Analytics</b> Session Chair: Dr. Dana Sulisityo Kusumo
11:30 – 13:30	Main Room	Tutorial Session 3: <b>Mr. Lee Jee Shen</b> CEO, Softinn Solutions Sdn. Bhd
	Room A	Parallel Session 4A: <b>Digital Community and Society</b> Session Chair: Dr. Rio Nurtantyana
	Room B	Parallel Session 4B: <b>Digital Healthcare</b> Session Chair: Dr. Sumendra Yogarayan
	Room C	Parallel Session 4C: <b>Machine Intelligence</b> Session Chair: Dr. Bedy Purnama
	Room D	Parallel Session 4D: <b>Quality of Life and Smart Living</b> Session Chair: Dr. Muhammad Johan Alibasa
13:30 – 14:00		Break
14:00 – 16:00	Room A	Parallel Session 5A: <b>Big Data and Analytics</b> Session Chair: Dr. Tay Siok Wah
	Room B	Parallel Session 5B: <b>Digital Community and Society</b> Session Chair: Dr. Ema Rachmawati

Room C	Parallel Session 5C: <b>Machine Intelligence</b> Session Chair: Dr. Warih Maharani
Room D	Parallel Session 5D: <b>Hybrid 1</b> Session Chair: Prof. Dr. Tan Shing Chiang

16:00 – 16:15

Break

16:15 – 16:30

Best Paper Awards by TPC Chairs  
**Assoc. Prof. Dr. Lew Sook Ling** and **Dr. Rikfi Wijaya**

16:30 – 16:40

Main Room

ICoICT2024 Presentation  
**Dr. Kemas Rahmat Saleh Wiharja**

16:40 – 16:50

Closing Speech by Dean of School of Computing  
 Telkom University  
**Dr. Z.K. Abdurahman Baizal**

17:00

End of Day 2 Session

## GOOGLE MEET LINKS AND LIVE CHANNELS

### Google Meet Links

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**Main Room:** <https://meet.google.com/qbe-edrq-cyp>

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**Room A:** <https://meet.google.com/ssv-axja-ydo>

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**Room B:** <https://meet.google.com/ueh-yvuc-hfg>

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**Room C:** <https://meet.google.com/kzx-vmcn-jse>

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**Room D:** <https://meet.google.com/dhh-mpvu-ida>

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### YouTube Live Channels:

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**Day 1 Morning**  
**(9:00am - 12:45pm MYT):** <https://youtube.com/live/NTSiOtUJlnw>

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**Day 1 Afternoon**  
**(2:00pm - 6:00pm MYT):** <https://youtube.com/live/U2J53tYKGAc>

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**Day 2 Morning**  
**(9:00am - 1:30pm MYT)** <https://youtube.com/live/zHcmzVRZ5D4>

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**Day 2 Afternoon**  
**(4:15pm - 5:00pm MYT):** <https://youtube.com/live/iCyz3Y839CQ>

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# INSTRUCTION FOR MODERATORS AND SESSION CHAIRS

To have a well-organized conference with a good academic environment, we need your assistance in the following aspects:

## Program

- Please have general idea of the schedule of your assigned session. Please get in touch us immediately if there is any problem.
- The Opening Ceremony, Keynote speeches, and tutorials will be held in the main room, which has a large capacity (200 pax).

## During the Session

- 1 minute before the Session: Introduce each paper's title and speaker/presenter.
- After introducing the session and the speaker/presenter, you can turn off the video so that the attendees can focus on the speaker/presenter's video/presentation.
- Host the Question & Answer part after each presentation/video playback. Inform participants if they have a question, please click "raise hand". Please ensure that at least a question Will be asked, else, Moderator/Session Chair should ask at least a question.
  - There may be an audience who type in the chat. Please orally ask on behalf of the audience.
- **For Session Chair:** score each presentation according to the items in Moderation Form. Please ensure the evaluation is submitted at the session's end.

## Time Control

- **For Moderator:** Each Keynote speaker has 40-50 minutes to present and 10-20 minutes for Q&A while each tutorial speaker has 50-60 minutes to present and 10-20 minutes for Q&A.
- **For Session Chair:** Each presenter has 15 minutes to present and 5 minutes for Q&A.
- Please remind the speaker/presenter of time control.
- All time in the program schedule is in Malaysia Time (MYT; UTC+8). Please adjust the time stated in the schedule into your local time. The current time in MYT is available at <https://time.is/MYT>.

## End of Session

- The moderator/session chair will conclude the session (5 minutes), and take a screenshot of attendees, then the co-host will end the session.

## INSTRUCTION FOR PRESENTERS

- Organizer will send you an invitation link as a presenter via email. Just click on the link to join the Google meet session.
- Please join at least 5 minutes before your designated time slot and be present during the video playback as well as the live Q&A session.
- As organizers, we would like to ensure a smooth and productive virtual conference. Following the video presentation there is a short Q&A session.
- Your microphone will be muted during the video playback.
- During the replay of the presentation video, attendees or other presenters will ask questions related to the presentation through the Q&A panel (for attendees) or chat panel (for other presenters).
- You are encouraged to keep an eye on the questions so to answer them during the Q&A Session.
- At the end of the pre-recorded presentation, the host will unmute your microphone and shares your webcam. The moderator or session chair will then ask you to answer some of the questions in a sequence that were submitted and within the allotted Q&A period.
- The moderator or session chair will try to cover as many questions as possible depending on the allotted time. In case, some of the questions have not been answered attendees may want to discuss with the presenter off-line.
- You are welcome to stay in the session as an attendee when not presenting.
- When you are not presenting your paper, you can also ask questions to other presenters via chat panel. Begin your text with “[ASK]” to indicate it as a question to the presenter. Send it to the session chair (or all panelist if you prefer to do so).
- Stand up and stretch, get a snack, come back refreshed!
- If you leave your Google Meet on, make sure that your microphone is muted during the break.



## KEYNOTE SPEAKER 1

### Profile:



**Prof. Dr. Seong G. Kong**  
**Sejong University**

Prof. Dr. Seong G. Kong received the B.S. and M.S. degrees from Seoul National University, Seoul, Korea, in 1982 and 1987, respectively, and the Ph.D. degree from the University of Southern California, Los Angeles, CA, USA, in 1991, all in electrical engineering. He was an Associate Professor in the Department of Electrical and Computer Engineering, The University of Tennessee, Knoxville, TN and Temple University, Philadelphia, PA, USA. He is currently a Professor of Computer Engineering at Sejong University, Seoul, Korea. His research interests include image processing, computer vision, and intelligent systems. Dr. Kong was a recipient of the *Most Cited Paper Award* from the COMPUTER VISION AND IMAGE UNDERSTANDING journal in 2007 and 2008, the Honorable Mention Paper Award from American Society of Agricultural and Biological Engineers in 2005. His professional services include an Associate Editor of the IEEE TRANSACTIONS ON NEURAL NETWORKS AND LEARNING SYSTEMS, a Guest Editor of a special issue of INTERNATIONAL JOURNAL OF CONTROL, AUTOMATION AND SYSTEMS and JOURNAL OF SENSORS.

### Title of Presentation: Machine Learning for Computer Vision

### Abstract:

Computer vision research attempts to provide computers with human-like perception capabilities so that they can sense surrounding environments, understand the contents of sensed data, and take appropriate actions. There has been increasing demand for computer vision systems to cope with “real-world” object detection and recognition problems. Many such applications require computer vision algorithms and systems to work under partial occlusion, highly cluttered background, low contrast, and varying illumination conditions. This requires that the vision techniques should be robust and flexible to optimize the performance in uncertain environments. Machine learning technology has demonstrated strong potential to contribute to the development of robust and intelligent vision algorithms, thus improving the performance of practical computer vision systems. The field of machine learning is driven by the idea that computer vision algorithms can improve their future performance with time by learning from experiences. More specifically, machine learning offers effective methods for computer vision for automating model acquisition, updating processes, adapting task parameters and representations, and using the experience to generate, verify, and modify hypotheses. This talk addresses the use of machine learning techniques into computer vision applications from the idea of boosting to deep learning. An innovative combination of computer vision algorithms and machine learning techniques is expected to be able to overcome the limitation of existing computer vision approaches. The effective use of machine learning technology in real-world computer vision problems requires the understanding of application

domain, abstraction of a learning problem from a given computer vision task, and the selection of appropriate representations for the input and internal parameters of the system. Some of these aspects will be discussed from a perspective on the use of machine learning to capture the variations in visual appearances.

## KEYNOTE SPEAKER 2

### Profile:



**Dr. Mazlan Abbas**  
**CEO, FAVORIOT Sdn. Bhd.**

Dr. Mazlan is the co-founder and CEO of FAVORIOT Sdn Bhd. He is listed by Analytica Report “Who’s Who in IoT” (May 2022). He is ranked among Top 50 Global Thought Leaders on the Internet of Things (February 2019) and Digital Disruption (October 2019) by Thinkers360, Top 50 Most Impactful Smart Cities Leaders by World CSR Congress 2017, ranked Top 10 in IoT Top 100 Influencers by Postscapes 2017 & 2018, ranked No. 20th Thought Leader in IOT by 2014 Analytica Report – “The Internet of Things – Top 100 Thought Leaders” and UTM Alumni Industry Personality 2016. Before FAVORIOT, he spent 2.5 years as CEO of REDtone IOT and 8 years in MIMOS Berhad as Senior Director Wireless Communications Cluster. He also spent 13 years in CELCOM (mobile operator), handling many senior management positions. Prior to Celcom, he spent 10 years as an Assoc. Professor at Universiti Teknologi Malaysia. He was the Adjunct Professor for UTM from 2008 to 2013, UTHM (2004-2005, 2013-2016), Universiti Teknologi Petronas (2018-2019) and Universiti Sultan Zainal Abidin (UniSZA) (2017-2018), Universiti Malaysia (UniMY) (2017-2019) and MJIIT, UTM (2020-2022). Currently, he is the Adjunct Professor for Faculty of Information Science and Technology, MMU (2022-2024). Dr. Mazlan is a frequent speaker at many major & established IOT, IR 4.0, Smart Cities and telco conferences locally and globally. He sits in Industry Advisory Panel (IAP) for several local universities. He graduated from Universiti Teknologi Malaysia with a BEE (1984), University of Essex (UK) with MSc. in Telematics (1986) and Universiti Teknologi Malaysia with a Ph.D. in Telecommunications (1993). He also received an Honorary Doctorate in Electrical Engineering from UTHM (2017). He is also a TEDx Speaker.

**Title of Presentation:** Humanizing IoT – Placing People at the Centre of Technology

### Abstract:

This abstract discusses the concept of Humanizing IoT, which places humans at the center of technology to make it more accessible and user-friendly. It involves combining technologies such as AI, machine learning, and IoT to create a personalized experience for users. Humanizing IoT has significant impacts on our lives, making technology more intuitive and integrated into various aspects of our lives, from healthcare to home automation. In businesses, the adoption of humanizing IoT is transforming operations, improving customer satisfaction, and loyalty while increasing productivity and reducing

costs. The benefits of humanizing IoT include a natural and intuitive interface, personalized experiences, and increased efficiency, making it a promising area of technological advancement that is worth watching closely.

## KEYNOTE SPEAKER 3

### Profile:



**Prof. Ir. Dr. Chan Yee Kit**  
**Multimedia University**

Prof. Ir. Dr. Chan Yee Kit received his B.Eng (Hons) in Electrical Engineering from the University of Malaya. He obtained his MEngSc and PhD in Microwave Engineering from the Multimedia University, Malaysia. He is currently the Deputy Dean and Professor of Faculty of Engineering and Technology, Malaysia. He is a registered Professional Engineer with Board of Engineer Malaysia and Professional Technologist with Malaysia Board of Technologist. He is also the Senior Member of Institute of Electrical and Electronics Engineers (IEEE), Professional Member of Institution of Geospatial and Remote Sensing Malaysia (IGRSM), and Senior Member of The Institution of Engineers, Malaysia. In year 2021, he has awarded the Top Research Scientists Malaysia (TRSM) by Academy of Sciences Malaysia (ASM), and recently admitted as Fellow of ASEAN Academy of Engineering & Technology in year 2022. Prof. Chan is presently the Honorary Treasurer of the IEEE Geoscience and Remote Sensing Society Chapter, Malaysia Section. His research interest includes microwave remote sensing, synthetic aperture radar design, radar sensor development and RF system design.

### Title of Presentation: Precision Agriculture using Remote Sensing

### Abstract:

Precision agriculture using remote sensing can be traced back to 1980's with various handheld sensors as well as sensors mounted on satellite and airborne platform. It is a farming management concept which combines conventional farming method with new technologies including information technology. Unlike conventional farming, precision agriculture integrates a suite of technological tools such as radar images, agriculture monitoring system, and high technology machines into farming practice. The aim is to minimize the crops production costs and maximize the production outputs all in benefiting the farmers. Remote sensing is an extremely useful tool for agriculture industry to monitor the temporal and spatial changes of morphological and physiological conditions which supports real and practical application. In this session, the speaker will take about the overview of remote sensing, application of remote sensing for precision agriculture and one case study on the drone based hyperspectral imaging system for precision agriculture.



## KEYNOTE SPEAKER 4

### Profile:



**Prof. Dr. Suyanto**  
**Telkom University**

Prof. Dr. Suyanto, S.T., M.Sc. born in Jombang, East Java, Indonesia in 1974. He received a Bachelor of Engineering degree from the Department of Informatics Engineering STT Telkom (now Telkom University), Bandung, in 1998. He got a Master of Science degree in Complex Adaptive Systems from Chalmers University of Technology, Göteborg, Sweden, in 2006. He obtained a Doctor in Computer Science from Gadjah Mada University, Yogyakarta, in 2016. In 2021, he received a professor in Artificial Intelligence. Since 1999 he has been a lecturer and actively conducting research in Artificial Intelligence and Swarm Intelligence. He has produced 113 scientific publications indexed by Scopus with an h-index of 19, making his name on the List of the 2% Most Influential Scientists in the World, published by Stanford University and Elsevier BV in October 2021. In addition, he has registered nine patents, obtained thirty three copyrights, and published twelve textbooks related to the field of Artificial Intelligence.

**Title of Presentation: Fourth Generation AI for Industry 5.0**

### Abstract:

Artificial Intelligence (AI) is a field of research proposed since 1956 with a simple symbolic or rule-based model. In the 1980s, machine learning was developed as a second generation of AI. In 2012, AI was revolutionized with a deep learning (DL) model named AlexNet, which won the ImageNet object recognition challenge with a significantly lower error rate than the runner-up ML-based method. Since then, DL has dominated AI as the third-generation model. However, today researchers and developers realize DL has main problems: reliance on vast amounts of labeled data and the need for high computing power. Hence, they create several models for the fourth generation of AI, such as Adaptive Learning, Transformer Networks, and Self-supervised Deep Learning. All models are designed to reduce the amounts of labeled data and decrease the model sizes to support Industry 5.0.

## TUTORIAL SPEAKER 1

### Profile:



**Ts. Dr. Sumendra A/L  
Yogarayan**  
**Multimedia University**

Sumendra Yogarayan is currently a Lecturer in the Faculty of Information Science and Technology, Multimedia University. He received his B.IT (Hons) in Security Technology and Master of Science (I.T.) degrees from Multimedia University. He completed his Doctor of Philosophy (Ph.D.) in Information Technology at Multimedia University (MMU) in 2022. He currently holds the positions of Deputy Chairperson for the Center of Intelligent Cloud Computing (CICC) and Deputy Chairperson for the Industrial Training Programme/i-Cadet. He is a MBOT Professional Technologist since 2020 and a member of International Association of Engineers since 2022. His research and teaching interests includes wireless communication, ad hoc networks, internet of things, embedded device and image processing.

**Title of Presentation:** Intelligent Transportation Systems: Advancements and Future Directions in VANETs

### Abstract:

As cities grow, the need for intelligent transportation systems (ITS) becomes increasingly important. Vehicular ad hoc networks (VANETs) are one such ITS technology that has been gaining significant attention in recent years. VANETs use wireless communication between vehicles and infrastructure to exchange information, enabling a range of safety, mobility, and environmental applications. This tutorial will provide an overview of the recent advancements in Vehicular Ad hoc Networks (VANETs), a crucial component of Intelligent Transportation Systems (ITS). VANETs utilize wireless communication between vehicles and infrastructure to enhance safety, mobility, and environmental sustainability. The tutorial will review new communication protocols and security mechanisms developed for VANETs, as well as their impact on ITS effectiveness and efficiency. Furthermore, the tutorial will explore future directions for VANET research, including the integration of artificial intelligence and emerging communication technologies such as 5G. Finally, the tutorial will examine the challenges and opportunities of implementing VANETs in real-world transportation systems.

## TUTORIAL SPEAKER 2

### Profile:



**Assoc. Prof. Dr. Bayu  
Erfianto**  
**Telkom University**

Bayu Erfianto graduated from the Department of Mathematics, majoring in Computer Sciences, Universitas Padjadjaran (UNPAD), Bandung, Indonesia in 1999 for his Bachelor of Sciences (S.Si.). He continued his Master Degree in Telematics, Universiteit Twente, the Netherlands from 2002 to 2004 with thesis topics in formal protocol specification for telemedicine. He also continued his Master Degree in Information Technology in Universiti Teknologi Petronas Malaysia 2007 to 2009 with thesis topic in formal method for context-aware system. He received his Doctoral Degree in Electrical Engineering and Informatics majoring in Cooperative Control from School of Electrical Engineering and Informatics (STEI), Institut Teknologi Bandung in 2017 with thesis topic in cooperative control for multi-agent robots. Dr. Bayu was also as Postdoctoral researcher in School of Electrical Engineering and Informatics (STEI) in 2017-2018. Bayu is with the school of computing (Fakultas Informatika), Telkom University, Bandung, Indonesia as Lecturer since 2002 (a.k.a.STT Telkom). His current research interests are in the field of Cyber-physical System, including human motion analysis & control using sensor & machine vision.

**Title of Presentation: Biomechanical Analysis Using Vision-based Pose Estimation**

### Abstract:

This tutorial session discusses biomechanical analysis based on pose estimation method using computer vision. Pose estimation is a technique in computer vision that is used to estimate body poses and their orientation in images or videos. In the context of biomechanical analysis, pose estimation method can be used to estimate the poses and movements (kinematics) of human body. This tutorial session discusses several pose estimation techniques that can be used in biomechanical analysis, including the use of virtual skeletons and keyjoints and their dynamics to generate biomechanical signals. We also discuss some practical applications of the pose estimation method in biomechanical analysis, such as analysis of human movement in walking (gait analysis) and physical rehabilitation. The results our research show that the computer vision-based pose estimation method is promising method to can replace sensor devices to provide valuable information about the poses and movements of the human body. Using this techniques, we can gain a better understanding of biomechanics of the human body and develop more effective methods for improving performance analysis, post-injury recovery and health monitoring.

## TUTORIAL SPEAKER 3

### Profile:



**Mr. Lee Jee Shen**  
**CEO, Softinn Solutions**  
**Sdn. Bhd.**

JeeShen is an entrepreneur with over ten years of experience in the hotel technology industry. As the founder and CEO of Softinn, he has revolutionized the ways hotels operate and interact with guests through innovative technology solutions. JeeShen is a trained electronic engineer. He got his start in the hotel technology industry while helping in his friend's hotel business. He quickly recognized the potential for technology to improve the guest experience and streamline hotel operations. Under JeeShen's leadership, Softinn has developed a range of cutting-edge products and services that enable hotels to enhance the guest experience, optimize operations, and increase revenue. From hotel self-check-in kiosk to advanced operation automation tools, Softinn's innovative solutions have been embraced by hotels of all sizes and types. When he's not working, JeeShen enjoys spending time with his family, playing basketball, and exploring new technology trends.

### Title of Presentation: Hotel Technology Stacks and Hotel Self-Check-In Kiosk

### Abstract:

The hotel industry relies on various technology stacks to manage operations, enhance the guest experience, and improve business outcomes. Some technology stacks commonly used in the hotel industry are PMS, Channel Manager, and Revenue Management System.

What happens (behind the scene) when a customer books a hotel room through an online travel agency (OTA)? The booking information is transmitted electronically from the OTA to the hotel property management system (PMS) through a process called channel management.

What happens (behind the scene) before a guest arrives at the hotel, and how do various systems work together to solve repetitive tasks? Hotel automates and streamlines various aspects of hotel operations using technologies. This can include everything from room temperature and lighting controls to security systems, check-in and check-out processes, and even guest requests and room service.

How does a small team of programmers iterate the product development cycles? Deliver values to the users through short development cycle - prototype, ship, and collect user feedback. Adopting new architecture in tandem with user growth.

## TECHNICAL PARALLEL SESSION SCHEDULE

All time in the program schedule is in Malaysia Time (MYT; UTC+8). Please adjust the time stated in the schedule into your local time. The current time in MYT is available at <https://time.is/MYT>.

### DAY 1: 23 AUGUST 2023

ROOM A: PARALLEL SESSION 1A: QUALITY OF LIFE AND SMART LIVING		23 AUGUST 2023
SESSION CHAIR: DR. CHONG SIEW CHIN		14:00 – 16:00
14:00	Comparison of DQN and DDPG Learning Algorithm for Intelligent Traffic Signal Controller in Semarang Road Network Simulation	Idham Ananta
14:20	NFC Integrated IoT based Attendance with Data Analytics	Lillian Yee Kiaw Wang
14:40	Analysis and Implementation of Digital Signature Algorithm in PDF Document	Muhammad Rizqi Ramadhan
15:00	DDoS Attack Detection Analysis Using Ensemble Learning with XGBoost and AdaBoost Algorithms	Gian Firdaus
15:20	Video Injection Attack Detection on CCTV Using Ensemble Learning with Random Forest Classification	Wana Iwan
Google Meet Link: <a href="https://meet.google.com/ssv-axja-ydo">https://meet.google.com/ssv-axja-ydo</a>		

ROOM B: PARALLEL SESSION 1B: BIG DATA AND ANALYTICS		23 AUGUST 2023
SESSION CHAIR: DR. VERA SURYANI		14:00 – 16:00
14:00	Big Data for Financial Analysis: Inflation Rate Forecasting using Random Forest	Christopher Limawan
14:20	Feature Importance on Text Analysis for a Novel Indonesian Movie Recommender System	Nur Alamsyah
14:40	Recommendation of Tour Route Schedules Using the Cat Swarm Optimization Algorithm (Case Study of Yogyakarta)	Moch. Nauval Nasril
15:00	The Development of Indonesian Paraphrase Datasets for Automatic Paraphrase Generation System	Ryan Abdurrohman
15:20	Ontology-based Conversational Recommender System for Smartphone Domain	Mohamad Hegiansyah
Google Meet Link: <a href="https://meet.google.com/ueh-yvuc-hfg">https://meet.google.com/ueh-yvuc-hfg</a>		



**ROOM C: PARALLEL SESSION 1C: DIGITAL COMMUNITY AND SOCIETY****23 AUGUST 2023****SESSION CHAIR: ASSOC. PROF. DR. TAN CHOO KIM****14:00 – 16:00**

14:00	The Impact of Influencer Credibility on Purchase Intention of TikTok Users	Jasmine Rivai; Aimee Haryanto; Kezia Tehila
14:20	Insights on Online Food Delivery of Mobile Application User Behavior in Indonesia's Large Cities	Sevenpri Candra
14:40	Improving UX Problem Solution through Divergent and Convergent Design Thinking in UX Journey	Wahyu Kusuma
15:00	Client-Side Virtual Camera Impersonation Attacks Detection on Automatic Proctoring Exam	Muhammad Nugroho
15:20	Examining the influence of service quality on the factors that affect consumer satisfaction in cloud-based payment systems in Australia	Domingos Mondego

Google Meet Link: <https://meet.google.com/kzx-vmcn-jse>**ROOM D: PARALLEL SESSION 1D: DIGITAL HEALTHCARE****23 AUGUST 2023****SESSION CHAIR: DR. KUSUMA AYU LAKSITOWENING****14:00 – 16:00**

14:00	Detection of Myocardial Infarction in Coronary Artery Disease Patients Based on Phonocardiogram Signal Using Ensemble Learning	Gilang Rizky
14:20	Myocardial Infarction Prediction Using RNN Deep Learning Algorithm on Phonocardiogram Signals	Sabilla Amini
14:40	Multi-Years Diabetes Prediction Using Machine Learning and General Check-Up Dataset	Alfian Gozali
15:00	The prediction of health information quality perception using machine learning and deep learning techniques	Yusef Baqraf
15:20	Combination of Local Outlier Factor and Winsorization for Clustering Outlier in Medical Records	Gohan Sinaga

Google Meet Link: <https://meet.google.com/dhh-mpvu-ida>



**ROOM A: PARALLEL SESSION 2A: MACHINE INTELLIGENCE****23 AUGUST 2023****SESSION CHAIR: ASSOC. PROF. DR. TEE CONNIE****16:00 - 18:00**

16:00	Facial Expression Recognition Through Deep Learned Features	Shi Xuan Ng; Chong Siew Chin
16:20	Customer Perception of AI Presence and Intention Toward AI-Recommended Products	Bình Nghiêm-Phú
16:40	Facial Expression Recognition with Machine Learning	Jia Xiu Chang
17:00	HGR-ResNet: Hand Gesture Recognition with Enhanced Residual Neural Network	Chun Keat Tan
17:20	Handwritten Character and Digit Recognition with Deep Convolutional Neural Networks: A Comparative Study	Chui En Mook
17:40	Semantic Segmentation of Anatomical Structures in Posterior-Anterior Chest X-Ray Image Using U-Net	Bagja Kurniawan

Google Meet Link: <https://meet.google.com/ssv-axja-ydo>**ROOM B: PARALLEL SESSION 2B: QUALITY OF LIFE AND SMART LIVING****23 AUGUST 2023****SESSION CHAIR: DR. NIKEN DWI WAHYU CAHYANI****16:00 - 18:00**

16:00	Synthetic Data with Nested Markov Chain for CIMA-Based Smart Lighting Control Deployment Simulation	Aji Putrada
16:20	Fire Detection Warning System in House Fire Accident Prevention	Rizka Pahlevi
16:40	iPlant: Implementation of An Automatic Plant Watering System Using NodeMcu ESP8266 and Blynk	Anderies Anderies
17:00	A Review Study of IEEE 802.11p On-Board Unit for V2X Deployment	Chan Chi Fung; Sumendra Yogarayan
17:20	Semantic Similarities for Honeypot Collected Linux Shell Commands	Kevin Hobert; Charles Lim; Eka Budiarto
17:40	SmartHatch: An Internet of Things-Based Temperature and Humidity Monitoring System for Poultry Egg Incubation and Hatchability	Ronaldo Maaño; Roselyn Maaño

Google Meet Link: <https://meet.google.com/ueh-yvuc-hfg>

**ROOM C: PARALLEL SESSION 2C: BIG DATA AND ANALYTICS****23 AUGUST 2023****SESSION CHAIR: DR. LIM JIT YAN****16:00 - 18:00**

16:00	Revolutionizing Banana Grading with ResNeXt and SVM: An Automated Approach	Dicky Farhansyah
16:20	Comparative Analysis of CNN and LSTM Performance for Hate Speech Detection on Twitter	Artisa Bunga Syahputri
16:40	Adapting Faster R-CNN and Video Inpainting for Badminton Player Detection	Isnan Rifai
17:00	Travel Planning Recommender System by Using Artificial Bee Colony Algorithm: A Case Study in Yogyakarta	Jane Raihan
17:20	Inflation Rate Prediction by Involving Interest Rate Using Vector Autoregression Model	Azriel Aulia
17:40	Logistic Regression and Random Forest Comparison in Predicting Students' Qualification Based on Students' Half-Semester Performance	Douglas Nugroho
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**ROOM D: PARALLEL SESSION 2D: DIGITAL COMMUNITY AND SOCIETY****23 AUGUST 2023****SESSION CHAIR: DR. LIM KIAN MING****16:00 - 18:00**

16:00	Pedagogical Agent in Improving Students' Performance in Discrete Mathematics	Clara Susaie; Tan Choo Kim
16:20	Challenges in the Implementation of Information and Communication Technology for Effective Education Dissemination Post Covid-19	Chandra Gupta
16:40	A Case Study of eSports Participation: An Interview Approach	Yen Nee Goh
17:00	Digital EdTech: Design Criteria and Parents' Perception of 3D Animated Posters in Educating Children about Air Pollution	Dapeng Yao
17:20	A Study on Students' Perspectives Towards Online Learning and Face-to-Face Learning in Post-Pandemic Context	Liyen Lim
17:40	User Interface Design for A University E-Library Mobile App Using User-Centered Design	Muhammad Almeriztama Fauzan
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## DAY 2: 24 AUGUST 2023

### ROOM A: PARALLEL SESSION 3A: DIGITAL HEALTHCARE

24 AUGUST 2023

SESSION CHAIR: DR. CHONG LEE YING

9:00 – 11:00

09:15	COVID-19 Identification and Analysis with CT scan Images using DenseNet and Support Vector Machine	Yu Jie Lim
09:35	Yoga Pose Estimation with Machine Learning	Jun Zhi Tan
09:55	COVID-19 Chest X-Ray Classification Using Compact Convolutional Transformer	Jit Yan Lim
10:15	COVID-19 Chest X-Ray Classification Using Residual Network	Jit Yan Lim
10:35	ViTMed: Vision Transformer for Medical Image Analysis	Yu Jie Lim

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### ROOM B: PARALLEL SESSION 3B: MACHINE INTELLIGENCE

24 AUGUST 2023

SESSION CHAIR: DR. SUMENDRA YOGARAYAN

9:00 – 11:00

09:15	Food Detection and Recognition with Deep Learning: A Comparative Study	Siao Wah Tan
09:35	Obstacle-aware Simultaneous Task and Energy Planning with Ordering Constraints	Di Wang
09:55	A Comparative Study of Learning-based Approaches for Chinese Character Recognition	Jia Min Lim
10:15	DDoS Attack Detection on MQTT Protocol Using Semi-supervised DBSCAN and Support Vector Machine Model	Muhammad Ikhsanudin
10:35	Flower Species Recognition using DenseNet201 and Multilayer Perceptron	Kian Ming Lim

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**ROOM C: PARALLEL SESSION 3C: QUALITY OF LIFE AND SMART LIVING****24 AUGUST 2023****SESSION CHAIR: DR. NUNGKI SELVIANDRO****9:00 – 11:00**

09:15	Analyzing Adversary's Attack on Ethereum Collected from Honeypots	Dimas Subhan
09:35	A Survey on Privacy Preservation Methods in Future Vehicular Networks	Richard Huynh; Turan Hasanli; Shayan Eghtessad; Kidus Workneh
09:55	A Review of Privacy-preserving and Efficient Data Collection and Aggregation in Smart Grids	William Donnelly; Paulina Keifer; Robert Minor; Uthra Muthukumaran; Bryan Parolek; Brandon Tuck
10:15	The Role of Trust in Predicting Behavioral Intention to Use Electric Car-sharing Services: Evidence from China	Teng Yu
10:35	Comparison Analysis of Intrusion Detection using Deep Learning in IoT Networks	Syariful Ikhwan

Google Meet Link: <https://meet.google.com/kzx-vmcn-jse>**ROOM D: PARALLEL SESSION 3D: BIG DATA AND ANALYTICS****24 AUGUST 2023****SESSION CHAIR: DR. DANA SULISITYO KUSUMO****9:00 – 11:00**

09:15	Analysis of the Performance of ANN and CNN on the COVID-19 Spread Classification Prediction Model with Time-Based Feature Expansion	Dita Noviyanti; Sri Suryani; Yuliant Sibaroni
09:35	Bloom, Xor, and Cuckoo Filter Comparison for Database's Query Optimization	Mochamad Maulana
09:55	Hoax Detection in Social Media using Bidirectional Long Short-Term Memory (Bi-LSTM) and 1 Dimensional-Convolutional Neural Network (1D-CNN) Methods	Arvinda Dwi Safira
10:15	Hoax Detection on Social Media with Convolutional Neural Network (CNN) and Support Vector Machine (SVM)	Manuel Benedict
10:35	Interactive Simulation Tool for Spatiotemporal Data of Climate-related Fires over Borneo	Furqon Muttaqien

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**ROOM A: PARALLEL SESSION 4A: DIGITAL COMMUNITY AND SOCIETY****24 AUGUST 2023****SESSION CHAIR: DR. RIO NURTANTYANA****11:30 - 13:30**

11:30	Distance Learning Interaction Design Recommendations for Blind Students to Achieve Learnability	Nisrina Citaningtyas
11:50	Analysis of User Satisfaction Levels in the My Tel-U Application Using the E-Servqual and Importance Performance Analysis (IPA) Methods	Malvin Fathur; Muhammad Al Makky; Hilal Nuha
12:10	Comparative Analysis of the Quality of Tiket.com Applications and Traveloka Applications Using the E-Servqual Method on User Satisfaction	Fathoni Al Fajri; Rio Guntur Utomo; Muhammad Al Makky
12:30	E-commerce factors that motivate consumers' purchasing decisions: A cross-regional study and local attractors and sustainers for personalization	Chien-Sing Lee
12:50	Credit Card Fraud Detection using TabNet	Chee Meng Chew
13:10	Blockchain-based Mutual Authentication Model for Customer Services	Tey Fu Chen

Google Meet Link: <https://meet.google.com/ssv-axja-ydo>**ROOM B: PARALLEL SESSION 4B: DIGITAL HEALTHCARE****24 AUGUST 2023****SESSION CHAIR: DR. SUMENDRA YOGARAYAN****11:30 - 13:30**

11:30	A Composite Sentiment Summarizer Score for Patient Reviews: Extending RoBERTa	Zi-Yi Lai; Lee-Yeng Ong
11:50	Medical Image-based Prediction of Brain Tumor by Using Convolutional Neural Network Optimized by Cuckoo Search Algorithm	Farishadi Azizy
12:10	On Improving Malaria Parasite Detection from Microscopic Images: A Comparative Analytics of HE-commerce factors that motivate consumers hybrid Deep Learning Models	Antora Dev
12:30	Optimizing MEG-EEG Mapping in Resource-Constrained Non-Intrusive Bio-Magnetic Sensing Systems: A Data-Driven Approach	Mohamed Elshafei
12:50	Diagnosis of Lung Diseases from Chest X-Ray Images Using Different Fusion Techniques	Fatma Mostafa
13:10	Face Mask Wearing Detection: A Comparative Analysis	Jia You Ong

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**ROOM C: PARALLEL SESSION 4C: MACHINE INTELLIGENCE****24 AUGUST 2023****SESSION CHAIR: DR. BEDY PURNAMA****11:30 - 13:30**

11:30	Scam Calls Detection Using Machine Learning Approaches	Brendan Hong; Tee Connie
11:50	Hoax Identification On Social Media Using Recurrent Neural Network (RNN) And Long Short term Memory (LSTM) Methods	Rania Zahra; Erwin B. Setiawan
12:10	ARES: An Automated Rotten Egg Sorter Utilizing the Egg's Physical Properties and Artificial Neural Network	Jeheu Jesse Dela Cruz; Mark Laurence Lazatin
12:30	Finger Vein Presentation Attack Detection using Block-wise Variance-based Image Quality Assessment	Nurul Nabihah Ashari; Thian Song Ong
12:50	Day Driving and Night Driving Behavior Detection using Deep Learning Models	Muhammad Firdaus Ishak
13:10	Sentiment Analysis Using Learning-based Approaches: A Comparative Study	Jing Xiang Ng

Google Meet Link: <https://meet.google.com/kzx-vmcn-jse>**ROOM D: PARALLEL SESSION 4D: QUALITY OF LIFE AND SMART LIVING****24 AUGUST 2023****SESSION CHAIR: DR. MUHAMMAD JOHAN ALIBASA****11:30 - 13:30**

11:30	Smart Camping Management Asset using Frequent Pattern-Growth Algorithm	Hussain Hussain
11:50	Intelligent-Based SIEM Security Email Alert	Chyun Horng Chi
12:10	Optimising Video Transmission Performance in 5G New Radio Technology for Vehicle-to-Network (V2N) Application: A Comprehensive Analysis	Saifuddin Khalid
12:30	Robot and Human Interaction using Natural Language Understanding in Indonesian based on Mental Image Based Understanding	Muhammad Abrari
12:50	Performance Comparison Analysis of Virtual Router Redundancy Protocol (VRRP) with Gateway Load Balancing Protocol (GLBP) on a DMVPN Network	Ferdinan Wibowo
13:10	Smart Waste Monitoring System Using Machine Learning for IoT-Enabled Smart Green Campus	Kenny Ramasawmy

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**ROOM A: PARALLEL SESSION 5A: BIG DATA AND ANALYTICS****24 AUGUST 2023****SESSION CHAIR: DR. TAY SIOK WAH****14:00 – 16:00**

14:00	Fake News (Hoax) Detection on Social Media Using Convolutional Neural Network (CNN) and Recurrent Neural Network (RNN) Methods	Reyhan Asta
14:20	Experimental Study using Unsupervised Anomaly Detection on Server Resources Monitoring	Ting-Wei Lee; Lee-Yeng Ong
14:40	Road Density Prediction Based on City Transport GPS Time Series Data using a Support Vector Machine	Nurul Putri. M; Rifki Wijaya; Imelda Atastina
15:00	A Comparative Study for Language Recognition using Learning-based Approaches	Ching Hong Lew
15:20	Prediction of Road Density Based on Time Series of City Transportation GPS Data Using Method Artificial Neural Network	Nirmalasari Seqip; Rifki Wijaya; Imelda Atastina
15:40	Gold Prices Forecasting Using Bidirectional LSTM Model Based on SPX500 Index, USD Index, Crude Oil Prices and CPI	Stephen Chuan-Yi Ngu

Google Meet Link: <https://meet.google.com/ssv-axja-ydo>**ROOM B: PARALLEL SESSION 5B: DIGITAL COMMUNITY AND SOCIETY****24 AUGUST 2023****SESSION CHAIR: DR. EMA RACHMAWATI****14:00 – 16:00**

14:00	Consumer Behavior in Using Instant Funds: Insights from a Triandis Model Analysis	Andhika Purnomo; A Condrobimo; Hendry Hartono
14:20	The Influence of Users' Perception Of Security, Privacy, and Trust In Using Online Dating Applications	Agnes Panjaitan; Rio Guntur Utomo
14:40	Analysis of Clock Synchronization with Different Topology in Wireless Sensor Network (WSN)	Kevin Fajrin
15:00	Sentiment Analysis of the Indonesia Presidential Election 2024 with Ensemble Learning for Reducing Disinformation on Social Media	Jihan Hakim
15:20	Gamification in Live Streaming Platform: A Systematic Literature Review	Taufik Anantha
15:40	A Novel Airfare Dataset to Predict Travel Agent Profits Based On Dynamic Pricing	Nur Alamsyah

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**ROOM C: PARALLEL SESSION 5C: MACHINE INTELLIGENCE****24 AUGUST 2023****SESSION CHAIR: DR. WARIH MAHARANI****14:00 – 16:00**

14:00	Face Recognition and Physiological Signal for Impaired Drivers: A Review	Lee Jian Seong; Sumendra Yogarayan
14:20	Intrusion Detection System Using Incremental Learning Method	Fadjri Kuswara
14:40	Development of Stress Detection System Based on Heart Rate Using Artificial Neural Network	Muhammad Thoriq
15:00	Fire Detection on Video Using Multi-Feature Fusion and Support Vector Machine	Kurniawan Ramadhani
15:20	A Correct Face Mask Usage Detection Using YOLOv4 Framework	Kurniawan Ramadhani
15:40	Driver Drowsiness Detection Using Deep Learning Models Based On Different Camera Positions	Ismail Danish Rozaimi

Google Meet Link: <https://meet.google.com/kzx-vmcn-jse>**ROOM D: PARALLEL SESSION 5D: HYBRID 1****24 AUGUST 2023****SESSION CHAIR: PROF. DR. TAN SHING CHIANG****14:00 – 16:00**

14:00	Comparative Analysis and Simulation of MPLS Ipv6 Network QOS Using OSPFv3, IS-IS, and EIGRP Routing Protocols for Triple Play Services	Sendy Delphi
14:20	Evaluation of the Hybrid Classification and Regression Tree (CART) - LDA (Linear Discriminant Analysis) Algorithm for Predicting DDoS Attacks	Muhammad Aziz
14:40	IoT-Based Smart Green Campus Leveraging Machine Learning	Kasarajen Mootien
15:00	Intrusion Detection on Unmanned Aerial Vehicle (UAV) using Binary Decision Tree	Muhammad Akbar
15:20	A Study on the Implementation of YOLOv4 Algorithm with Hyperparameter Tuning for Car Detection in Unmanned Aerial Vehicle Images	Muhammad Ramadhani

Google Meet Link: <https://meet.google.com/dhh-mpvu-ida>

## **ABSTRACTS: PARALLEL SESSION 1A**

### **DIGITAL HEALTH SERVICES**

# Comparison of DQN and DDPG Learning Algorithm for Intelligent Traffic Signal Controller in Semarang Road Network Simulation

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## Abstract

Congestion is one of the most common problems, particularly in large cities. The Adaptive Traffic Signal Controller is supposed to help by reducing intersection wait times. However, deciding which algorithm to use is difficult because there are so many options. In this study, we compare the performance of discrete-based and continuous-based algorithms in small lanes local intersections to better understand how they work. In five scenarios, the Deep Q-Network (DQN) and Deep Deterministic Policy Gradient (DDPG) algorithms are used with vehicle limits of 90, 150, 300, 600, and 900. The waiting time simulations of the two algorithms revealed that DDPG was 7.5% to 9.7% faster and more stable than DQN.

# NFC Integrated IoT based Attendance with Data Analytics

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## Abstract

This paper introduces a smart attendance system that integrates NFC and IoT technologies to enhance the monitoring and analysis of attendance data in classrooms. The study aims to examine the effectiveness of this system in improving attendance tracking and reducing teacher workload. Two research questions are addressed: 1) Does the integration of NFC and IoT technologies enhance attendance monitoring and analysis? 2) Does the proposed system significantly improve attendance tracking efficiency and reduce teacher workload? The study proposes two hypotheses: Hypothesis 1 suggests that the integration of NFC and IoT technologies significantly enhances attendance monitoring and analysis, while Hypothesis 2 states that the proposed system significantly improves attendance tracking efficiency and reduces teacher workload. The proposed smart attendance system's conceptual contribution lies in its integration of IoT and NFC technologies, offering an efficient and reliable attendance tracking solution with data analytics capabilities. It contributes to the IoT field by showcasing the effectiveness of IoT devices and data analytics in an educational context. Moreover, it enhances the education field by enabling better monitoring and analysis of students' attendance and performance. The methodology involves a novel approach that combines IoT and NFC technologies for attendance tracking. The system's performance will be evaluated through experiments to determine its effectiveness in enhancing attendance tracking and reducing teacher workload. This empirical evidence will provide insights into the potential of the proposed system to optimize educational processes and outcomes.

# Analysis and Implementation of Digital Signature Algorithm in PDF Document

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## Abstract

A digital signature is a cryptographic tool used to sign and verify messages to provide authentication, integrity, and non-repudiation of an electronic document. Digital signatures have been widely used in commercial systems, especially since the Corona Virus Disease 2019 (COVID-19) pandemic forced many people to do work from home, so they had to send documents between people digitally. Many digital signature algorithms have been proposed before, however, the most suitable algorithm for Portable Document Format (PDF) documents from the point of view of security and digital signature processing time are unknown. Apart from this, the available digital signature service systems are relatively expensive. To overcome this, this study proposes an analysis of digital signature algorithms in terms of security, memory usage, and processing time on PDF documents. This study also proposes the development of prototype web service digital signatures that use the best digital signature algorithms that have been analyzed as proof of concept as a result of the analysis made by this study. The methods used in this study are study of the literature on digital signature algorithms, Analysis of digital signature algorithms, Development of prototypes, Performance testing, and analysis. The outcome of this research is that ECDSA is an algorithm that can sign PDF documents with good processing time and memory usage. This research succeeded in creating a digital signature web using the ECDSA algorithm which can perform digital signatures on PDF documents and verify digital signatures on PDF documents.



# DDoS Attack Detection Analysis Using Ensemble Learning with XGBoost and AdaBoost Algorithms

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## Abstract

Cyber attacks have been growing rapidly in every area of human life. A security system is necessary to prevent cyber attacks from causing chaos in the networks. DDOS is a well-known cyber attack that may intrude the networks. These attacks may leak sensitive data or disrupt operational performance causing enormous financial loss to the victim. The ensemble model is an important tool to enhance the learning process of machine learning models. This model will combine XGBoost and AdaBoost algorithms using XGBoost Classifier, AdaBoost Classifier, Decision Tree Classifier, and Voting Classifier. XGBoost and AdaBoost algorithms are used to analyze the data test, which will then be compared with the ensemble model. The best outcomes from the ensemble model yielded 94.88% accuracy, the XGBoost algorithm yielded 92.92% accuracy and the AdaBoost algorithm yielded 92.96% accuracy. An ensemble model produces an enhanced significant accuracy around 2.03% - 2.06% concluding to the experiment results.

# Video Injection Attack Detection on CCTV Using Ensemble Learning with Random Forest Classification

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## Abstract

CCTV cameras, often known as surveillance cameras, are among the most sophisticated security systems now available. Even though surveillance cameras (CCTV) are a security tool, it is common for them to be targeted to conceal a crime caught on camera. Video injection is one of the methods used to compromise surveillance cameras (CCTV). Video injection attacks insert live video feeds, resulting in a loss of data integrity that can impede or even alter the absolute truth. This paper employs the ensemble learning approach to recognize video injection attempts on security cameras. Ensemble learning utilized here is random forest and support vector machine (SVM) estimators. The Random Forest estimator-based model yields a f1-score value of 91% and an accuracy of 93% with a total dataset of 600 data, while the Support Vector Machine (SVM) estimator yields a f1-score value of 84% and an accuracy of 87% with a total dataset of 12000 data. The accuracy of Random Forest is fairly high and may be used to identify video injection attacks.

**ABSTRACTS: PARALLEL SESSION 1B**  
**BIG DATA AND ANALYTICS**

# Big Data for Financial Analysis: Inflation Rate Forecasting using Random Forest

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## Abstract

Approaching the end year of 2022, the increasing inflation rate causes the world to be in turmoil. Abnormal goods and services pricing affects consumer buying power, which disrupts the capital flows of the country. To prevent the disruption, the inflation rate must be predicted each month, in purpose of implementing financial policy before the capital flows disruption happens. This paper seeks to predict the inflation rate from goods and services data in Indonesia using Random Forest model for regression. To predict the inflation rate, this paper will discuss the data source that was gathered for prediction input, data preprocessing, split dataset to training and testing, and applying the machine learning model. The experiment result shows that random forest in the forecasting inflation rate, tuned and not tuned, show better results than GBT, proven with better RMSE at 0.681693034 (without tuning) and 0.631512634 (with tuning). But for MAE, does not show better results than GBT and GLR at 0.553645579 (without tuning) and 0.516586905 (with tuning).

# Recommendation of Tour Route Schedules Using the Cat Swarm Optimization Algorithm (Case Study of Yogyakarta)

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## Abstract

Tourism plays a significant role in supporting the development of a country. One popular region among tourists is Yogyakarta. With the advancement of digital information, it has become easier for tourists to find information about attractions they want to visit. However, many tourists still rely on information from others to use as a reference in planning their travel schedule for several days. To address this issue, we propose a system that can recommend a personal travel itinerary within a few days of tour visit. We can consider that determining a tourist route is the same as finding the optimal solution to the traveling salesman problem (TSP). Various algorithms can be used to solve TSP, including the Cat Swarm Optimization Algorithm (CSO). In our research, we develop a system that can generate optimal recommendations for scheduling tourist routes in Yogyakarta using the CSO algorithm by combining the concept of Multi-Attribute Utility Theory to meet the needs of users based on various criteria such as ratings, cost, and time. Our experiment uses Simulated Annealing (SA) as the base model. The proposed method showed that the CSO algorithm performed better than the SA in optimality and computational efficiency. Specifically, the CSO algorithm produced itineraries that are 1.67% more optimal than SA when considering multi-criteria and faster than SA in computation time when considering single-criteria. These findings suggest that the CSO algorithm is an effective and efficient method for generating optimal tours.

# The Development of Indonesian Paraphrase Datasets for Automatic Paraphrase Generation System

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## Abstract

Paraphrasing can be defined as the expression of a text using different diction but referring to the same meaning. Systems capable of automatically generating paraphrases play a crucial role in Natural Language Processing (NLP). In previous research, the generated paraphrase dataset was extracted using machine translation, assuming that text pairs inherently possess semantic similarity. Consequently, the applied filter focused solely on differences in diction variety. As a result, the produced dataset tended to be unsatisfactory in terms of lexical diversity and semantic similarity. Therefore, this study aimed to generate a paraphrase dataset by utilizing a task other than machine translation, specifically Abstractive Summarization on the Liputan6 dataset. Human-generated summaries within the Liputan6 dataset were paired with system-generated summary texts. Subsequently, text pairs were filtered based on the average of semantic similarity using BERTScore and lexical diversity using inverseSacreBLEU. The resulting dataset was then evaluated as training data for a paraphrase generator and manually assessed by humans. The employed filtration process proved successful in enhancing lexical diversity compared to previous research, as demonstrated by the increase in inverseSacreBLEU scores from 57.42 to 72.76. While the resulting dataset from Liputan6 (146,030 data) was nearly 40 times smaller than in previous research (5,753,296 data), it exhibited higher semantic similarity and lexical diversity scores with an improvement of 1-2 points. This indicates the superior quality of the dataset produced in comparison to prior studies.



# Ontology-Based Conversational Recommender System for Smartphone Domain

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## Abstract

The development of the smartphone industry is growing very rapidly, as well as information about this product. Nowadays, smartphones have become a necessity for everyone. With so many smartphone products on the market, people need a tool to assist in buying a smartphone. Many Conversational recommender systems (CRS) have been developed to recommend smartphones. However, most of those CRS still interact in technical features. Meanwhile, most people still do not understand about the technical features. In this study, we develop CRS using the CRS framework based on high-level requirements that is proposed by previous works. In this study, we call this high-level requirements as functional requirements. An example of a functional requirement is, “a user wants a smartphone to play ultra-mode games without having to know the required specifications”. The CRS framework consists of ontology and the agent for generating interaction. Ontology acts as the knowledge that maps functional requirements to technical specifications of the product. In this study, we propose the CRS for smartphone domain based on functional requirements with updated knowledge. Attributes taken from the smartphone domain contain network technology, display type, display size, display resolution, etc. For evaluation, we measure the system performance and user satisfaction. Based on the evaluation results, the system performance score is 88.87% and the user satisfaction score reaches 0.88. So that our proposed CRS recommend the product accurately and satisfying the users.

**ABSTRACTS: PARALLEL SESSION 1C**  
**DIGITAL COMMUNITY AND SOCIETY**

# The Impact of Influencer Credibility on Purchase Intention of TikTok Users

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## Abstract

This study aims to fill the research gap related to influencers on the TikTok platform in Generation Z, which will give different results because each generation and platform user has a different character. Researchers are interested in determining if the attributes of influencers (trustworthiness, expertise, and attractiveness) have a significant effect on developing trust, brand image, and purchase intention among brand users on TikTok, particularly Generation Z. This study uses partial least squares (PLS) in analyzing the sample data of 203 respondents which were obtained through an online survey from 14 April to 20 April, 2022. This study found that several dimensions had no significant effect on brand image and trust. Brand image was found to not affect purchase intention, so the mediating role of a brand image becomes insignificant, followed by the mediating role of trust and purchase intention. However, the other hypotheses were supported. The results of the research contributed to expanding the literature on digital marketing and enabled practitioners to help them choose the right influencers according to the brands and platforms they use.

# Insights on Online Food Delivery of Mobile Application User Behavior in Indonesia's Large Cities

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## Abstract

The rise of application services is increasing, followed by the growth of lifestyle businesses and competitive businesses in the food and beverage industry. There is a rising need for the ordering process to be simplified so that customers may more easily enjoy their meals and beverages. The improvement that has been made comes as a result of the Covid19 outbreak that was experienced in Indonesia. In the course of the Covid-19 epidemic, this research investigated the elements that impact customers' behavioral intention towards the use of online meal delivery applications. In this research, the snowball sampling approach is utilized, and multiple regression analysis is used to answer the research questions and test the hypotheses. This study is based on the legitimate responses of five hundred different respondents. The findings of research, a perceived ease of use, a focus on time savings, a convenience incentive, and a concern for privacy and security all play a role in behavioral intention. Although privacy and security are still becoming weaker issues, convenience is becoming a strong motive that pushes consumers to complete transactions through online meal delivery services.

# Improving UX Problem Solution through Divergent and Convergent Design Thinking in UX Journey

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## Abstract

Design solves the problem because the design positively correlates with performance improvement and simplifies some problems. Design thinking is a formal solution that solves problems creatively to increase product innovation. Frequently, to create solutions, developers will see from the perspective of products that are already on the market or use the latest technology to create design solutions; however, design thinking is a solution that uses the creativity of developers to create opportunities based on creativity from what already exists and can imagine the novelty of the product. The contradiction between solution and direction innovation emphasizes that both require variant design thinking practices. This research investigates several issues (i) the relationship between design thinking practices and constructs a value from a problem, and (ii) how to increase the value of this relationship to be moderated when the goal is determined to be solution innovation or direction innovation. This research contributes to providing increased value from the relationship between solution innovation and direction innovation according to the context of the problems faced. Moreover, developers can determine creative solutions that have value from a problem. By involving 137 freelance developers, researchers succeeded in proving that the UX Journey, a flexible design thinking-inspired model, can show that there is a positive relationship between the practice of user need elicitation and the value generated through design thinking is stronger for solution innovation than for direction innovation, with an average value of the solution is one (0.9136).

# Client-Side Virtual Camera Impersonation Attacks Detection on Automatic Proctoring Exam

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## Abstract

Online proctored exams require authentication and face verification before students access the exams. However, using an impersonation attack model, students can bypass the face verification phase using a virtual webcam. We aim to propose an approach that detects cameras based on their Hardware ID. In addition, our approach includes a log engine that collects device information, such as the total number of webcams and the number of webcams in the student device. This detection model prevents impersonation attacks on online proctoring and runs on the client-side browser. Based on our experiment, our suggested approach can detect virtual cameras on students' devices during user verification and online-proctoring examinations by integrating client-side virtual webcam detection. Index Terms—automatic proctored exams, impersonation attacks, virtual webcam, client-side.



# Examining the influence of service quality on the factors that affect consumer satisfaction in cloud-based payment systems in Australia

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## Abstract

Cloud-based payments, also known as online payments, have experienced a significant global increase in recent years. These payment systems offer greater convenience and flexibility compared to traditional methods and are considered a step forward in the payment process. However, in Australia, adoption rates of cloud-based payment systems (CBPS) are lower than in other countries. This may be due to dissatisfaction with current payment methods or a lack of awareness of the advantages of using cloud-based payment systems. To gain insight into this issue, a qualitative research method using semi-structured interviews was employed, based on the Technology Acceptance Model (TAM) constructs of perceived usefulness and perceived ease of use. The results pointed out that while Australians generally trust their banks, they are concerned about extra fees and the lack of education on mobile payment usage. Electronic devices are found to be convenient, useful, and easy to use. The study suggests that financial service providers can improve service quality by implementing advanced technologies and enhancing security measures. Overall, the findings suggest that while Australians generally report satisfaction with their financial service providers, there is still scope for enhancing the service quality and education regarding new payment methods.

## **ABSTRACTS: PARALLEL SESSION 1D**

### **DIGITAL HEALTHCARE**

# Detection of Myocardial Infarction in Coronary Artery Disease Patients Based on Phonocardiogram Signal Using Ensemble Learning

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## Abstract

Coronary Artery Disease (CAD) is one of the most deadly types of heart disease in the world. CAD is triggered by narrowing or blockage of the coronary arteries by plaque. CAD can lead to a more dangerous disease, Myocardial Infarction (MI) or well known as a heart attack. A heart attack occurs when blood flow to the heart stops completely, causing damage to the heart muscles due to lack of oxygen supply to the heart muscles. Phonocardiogram (PCG) is one type of signal that is commonly used to detect cardiovascular disease. There have been many studies related to cardiovascular disease detection based on PCG signals. However, studies related to MI detection are still rare. Generally, MI detection procedures must go through various laboratory tests which are quite long while patients need fast and accurate treatment. To overcome this problem, in this study, a model was built to detect MI. There are several feature extraction methods used, such as Mel-Frequency Cepstral Coefficients, Energy Entropy and Discrete Wavelet Transform. By using bagging, boosting and stacking technique as classifier, the highest specificity, sensitivity and accuracy from the experiment are 99.28%, 99.64% and 99.64% respectively.

# Myocardial Infarction Prediction Using RNN Deep Learning Algorithm on Phonocardiogram Signals

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## Abstract

Myocardial Infarction (MI) is a cardiovascular disease characterized by the death of the heart muscle. Blockage of blood vessels is one of the causes of myocardial infarction. MI causes blood flow to the heart to become blocked. In the worst case, it causes cardiac death. In general, the screening of cardiovascular disease can be performed using an electrocardiogram (ECG), phonocardiogram (PCG), and photoplethysmogram (PPG). Among these three signals, PCG detection is rarely used in MI detection. In fact, PCG signal has advantages such as non-invasive, efficient, and low-cost. Deep learning is also one of the methods used by many previous researchers to classify an object. However, from several previous research, the implementation of deep learning algorithms on PCG signals, especially in cases of myocardial infarction, has yet to be carried out. As a solution to the problem, this research proposes developing a deep-learning model to predict myocardial infarction based on PCG signals. This research uses the Recurrent Neural Network (RNN) model to classify PCG signal data. PCG signal data was obtained from Hasan Sadikin Hospital Bandung, Indonesia. The experiments showed that the RNN model had a good performance, which resulted in a sensitivity of 95.4%, specificity of 95.2%, and accuracy of 95.3%.

# Multi-Years Diabetes Prediction Using Machine Learning and General Check-Up Dataset

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## Abstract

Diabetes mellitus (DM) is a severe chronic health condition affecting millions worldwide. Left untreated, it can lead to various debilitating and potentially life-threatening complications. Predicting DM cannot be overstated, as early detection and prevention can help reduce the risk of long-term health problems. Recent advances in machine learning have enabled the development of powerful predictive models that accurately diagnose diabetes. However, most current research in DM prediction is limited to predicting one year. This paper is a comprehensive study of multi-year DM prediction using machine learning and general check-up (GCU) as its dataset. This research conducted two main experiments to achieve this goal: finding the best machine-learning technique for DM prediction among nine standard techniques and analyzing its performance using a multi-year GCU dataset. The first experiment concluded that the decision tree is the best machine learning technique for DM prediction. The second experimental results demonstrate that the decision tree yielded significantly high confidence when predicting up to four years ahead.

# The Prediction of Health Information Quality Perception Using Machine Learning and Deep Learning Techniques

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## Abstract

With the substantial rise in the number of people seeking health information online, manually evaluating their perceptions of the quality of health information has become increasingly difficult. These perceptions can impact the acceptance or rejection of the information. To address this issue, the study has employed deep learning and machine learning models to automatically identify consumer perceptions of health information. Furthermore, the study used a survey to collect data from 253 individuals to train the models, measuring the perception of 18 dimensions related to health information quality. This will help health information providers to provide personalized health information that aligns with individual preferences. The RandomForest and neural network model are found to have achieved the best performance among all the algorithms with an Accuracy of over 90% in all the quality dimensions. In sum, our findings show that automating the identification of consumer perception is feasible, which is an essential step toward providing online health information that matches consumer perception and increases the willingness to use it. Keywords—health information quality, health information seeking, online health information, information quality.



# Combination of Local Outlier Factor and Winsorization for Clustering Outlier in Medical Records

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## Abstract

In medical records, the doctors need to stay updated about the condition of their patients, but it would make a problem for the medical records. The medical records would be inconsistent due to changes in information regarding the result of examinations and leads to data that contains noises and outliers. But in medical records, the data sometimes can be mistaken as noise and it cannot be deleted as it is, because the medical records might contain one or more important information. In this research, the medical records are taken from one of the Regional Public Hospital in North Sumatera with limited work of ethics, and efforts will be made to solve the outlier problem in medical records by clustering the outliers into normal cluster by combining the Local Outlier Factor and Winsorization technique. The dataset consists 2 medical record data which contains data on outpatients and inpatients with various types of diagnoses in the last 3 years, and the variable that will be used are Gender, Date of Birth, and the Diagnosis, but it will be reduced into 2 variables, which is Diagnosis and Age (Years Old). In the end, the results are evaluated using a Confusion Matrix to see the percentage of performance for the proposed combination between the Local Outlier Factor method and the Winsorization technique, and the results are: Precision 96.8%, Recall 99.8%, Accuracy 96.9%, F1 Score 98.3%. The results have achieved the best percentage between the K-values.

**ABSTRACTS: PARALLEL SESSION 2A**  
**MACHINE INTELLIGENCE**

# Facial Expression Recognition Through Deep Learned Features

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## Abstract

This paper investigates improving facial expression recognition (FER) using Convolutional Neural Networks (CNNs) by fine-tuning parameters. The research objectives are to achieve high accuracy, compare different models, and identify the most suitable model for FER. Deep learning methods, especially CNNs, have shown promise in addressing FER challenges. We explore several models on the FER2013 dataset and propose a CNN model with ReLU activation functions, Softmax output layers, Adam and RMSprop optimization, achieving high accuracy with fewer epochs. We analyze strengths and weaknesses of other models, providing insights for future research. The study aims to advance FER systems for enhanced human-computer interaction and emotional analysis in various applications. Results show that the CNN-MLP and VGG-16 models perform moderately, while the CNN-XAI model achieves around 57% accuracy. While addressing overfitting, the proposed CNN model stands out for its accuracy. Future work includes exploring different architectures, hyperparameters, and incorporating alternative evaluation metrics like ROC and AUC for further improvements.

# Customer Perception of AI Presence and Intention Toward AI-Recommended Products

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## Abstract

Artificial intelligence (AI) has been widely employed in many fields in recent years. In marketing and business, AIs have been incorporated into product design and production to create environmentally friendly robots to remove waste and pollutants and track invasive species. AIs can also collect and analyze customer data and provide personalized information to customers. However, theoretical discussions about the opportunities and challenges of AI-based marketing and business dominate the literature. Empirical research on AI-related products and customers' perceptions of AI technology and AI-related products still is limited. In addition, how customers perceive the presence of AIs and the information generated by AIs and how these perceptions can affect their intention toward the products or services recommended by AIs have been largely unaddressed. As a result, the appropriateness and effectiveness of using AIs in information provision and promotion cannot be confirmed. Therefore, this study examined potential customers' opinions concerning AI presence, AI-generated information, and AI-recommended products. Preliminary data was gathered from a small young customer sample in Japan ( $n = 84$ ) in June 2022. Later analysis in SmartPLS suggested a linear correlation among the variables measured: perceived AI presence – thoughts about AI-generated information (creative and customized) – feelings about AI-generated information (amazed, amused, and surprised) – purchasing intention. Implications for further adopting AI in marketing were drawn from these findings.

# Facial Expression Recognition with Machine Learning

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## Abstract

Human facial expressions play a crucial role in communication and enhancing interactions between humans and computers. This paper presents a novel approach for facial expression recognition using an ensemble classifier consisting of pre-trained models and vision transformers. The ensemble classifier comprises four models: VGG-19, VGGFace, ViT-B/16, and ViT-B/32. To evaluate the performance, the ensemble classifiers employ hard majority voting on three widely-used public datasets: CK+, FER2013, and JAFFE. The experimental results demonstrate that our proposed ensemble classifiers surpass the state-of-the-art methods across all datasets. Notably, we achieve outstanding accuracy rates, reaching 100% accuracy on the cleaned CK+ dataset, 76.30% accuracy on the cleaned FER-2013 dataset, and 100% accuracy on the cleaned JAFFE dataset.

# HGR-ResNet: Hand Gesture Recognition with Enhanced Residual Neural Network

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## Abstract

Hand Gesture Recognition (HGR) has garnered increasing attention in recent years due to its potential to enhance human-computer interaction (HCI) and facilitate communication between individuals who are mute or deaf and the wider public. HGR can facilitate non-contact interaction between humans and machines, offering an effective interface for recognizing sign language used in everyday communication. This paper proposes a novel approach for static HGR using transfer learning of ResNet152 with early stopping, adaptive learning rate, and class weightage techniques, referred to as HGR-ResNet. Transfer learning enables the model to utilize previously acquired knowledge from pre-training on a large dataset, allowing it to learn from pre-extracted image features. Early stopping serves as a regularization technique, halting the training process before overfitting occurs. Adaptive learning rate adjusts the learning rate dynamically based on the model's error rate during training, promoting faster convergence and improved accuracy. Additionally, the class weightage technique is employed to address the issue of class imbalance in the data, ensuring fair representation and mitigating biases during the training process. To assess the effectiveness of the proposed model, we conduct a comparative analysis with multiple existing methods using three distinct datasets: the American Sign Language (ASL) dataset, ASL with digits dataset, and the National University of Singapore (NUS) hand gesture dataset. HGR-ResNet achieves remarkable results, with an average accuracy of 99.20% across all three datasets, and individual accuracies of 99.88% for the ASL dataset, 98.93% for the ASL with digits dataset, and 98.80% for the NUS hand gesture dataset.



# Handwritten Character and Digit Recognition with Deep Convolutional Neural Networks: A Comparative Study

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## Abstract

Handwritten character or digit recognition involves automatically classifying handwritten characters or digits from images. Previous studies focused on specific datasets and did not thoroughly compare different CNN architectures. This paper addresses these limitations by presenting a comparative study of six popular CNN architectures (VGG16, Xception, ResNet152V2, InceptionResNetV2, MobileNetV2, and DenseNet201) on three diverse datasets: English Handwritten Characters, Handwritten Digits, and MNIST. The experimental results demonstrate that the InceptionResNetV2 model with data augmentation achieves the highest accuracy across all datasets, with accuracies of 93.26%, 97.16%, and 99.71% on the English Handwritten Characters, Handwritten Digits, and MNIST datasets, respectively.

# Semantic Segmentation of Anatomical Structures in Posterior-Anterior Chest X-Ray Image Using U-Net

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## Abstract

The need for X-ray imaging analysis, especially on the thorax or chest area, is increasing during the pandemic. However, understanding an X-ray image requires particular expertise, Things that not everyone can understand and do. Therefore, this research was conducted to assist nonprofessionals in understanding the structural anatomy of the thorax via a Posterior-Anterior Chest X-ray image. This research uses a computer vision and deep learning-based approach, which has become a trend in recent years, including its use in the medical world. Using a U-Net-based neural network architecture, we perform semantic segmentation tasks to identify human organs, including the heart, bronchi, left lung, and right lung. Our proposed system trained U-Net models and achieved a satisfactory performance with 72% of mean IoU with total 850 images as data train and validation, much better than a comparative model, in carrying out the organ anatomical semantic segmentation task to assist users in medical imaging analysis.

**ABSTRACTS: PARALLEL SESSION 2B**  
**QUALITY OF LIFE AND SMART LIVING**

# Fire Detection Warning System in House Fire Accident Prevention

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## Abstract

House fires can cause enormous losses and threaten safety. Employing passive infrared (PIR) and gas sensors is vulnerable to false alarms. Machine learning with camera-based convolutional neural networks (CNN) is a suitable solution. While there are many studies on this problem, they tend to focus only on detection accuracy without considering mobility. Employing an embedded system could improve mobility due to the device's small size. However, implementing the existing solution in embedded systems becomes challenging due to limited computation and memory. Therefore, there is room for improvement to develop a mobile device to prevent house fires. This research aims to create an indoor camera-based fire detection system using CNN in embedded systems. TensorFlow Lite serves as the framework for machine learning to run CNN, the Yolov5 Model as a fire detection pre-training model, and a Raspberry Pi 4 as a data processor and controller for this system. Our proposed approach can be executed on embedded systems. The test scenario involves installing the embedded systems with cameras in a room with fire and without fire and sampling 30 times in each test. From the tests conducted, our system's sensitivity (recall) is 83%, with a precision of 86% and an accuracy of 85%. Moreover, we utilized a Telegram Bot to notify the client about the current condition. Our research contributes to the fire detection systems in embedded systems and cameras with better mobility capability without significantly compromising the accuracy of fire detection.

# iPlant: Implementation of An Automatic Plant Watering System Using NodeMcu ESP8266 and Blynk

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## Abstract

This paper presents the design and implementation of an automatic crop irrigation system based on a NodeMcu ESP8266 microcontroller integrated with the Blynk platform. The system is designed to water plants efficiently and maintain plant health by providing a controlled and consistent amount of water. The NodeMcu ESP8266 serves as the main controller, and the Blynk platform provides an easy-to-use remote monitoring and control interface. The system features sensors for soil moisture level monitoring and a flexible watering schedule based on the monitored soil moisture conditions at all times. In addition, we detected the soil moisture to determine whether the visible plants needed water or not. Our test results show that the system is highly effective and efficient. This paper highlights the potential use of NodeMcu ESP8266-based systems integrated with Blynk for automated crop irrigation and successfully making automation with 3 activity which turn on pump based on the sensor, turn on based on command button and sending data to Blynk and has increased. The soil water content ranged from 4% to 80% throughout the experiment demonstrating good humidity level.

# A Review Study of IEEE 802.11p On-Board Unit for V2X Deployment

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## Abstract

Intelligent transportation systems (ITS) are increasing in popularity as a way to improve road safety and efficiency. A critical component of ITS is the use of wireless communication systems, such as the dedicated short-range communication (DSRC) IEEE 802.11p standard, to enable communication between vehicles and infrastructure. This project aims to evaluate the performance of an on-board unit (OBU) utilizing the IEEE 802.11p standard in a vehicular communication system. The project contributes to a better understanding of the capabilities and limitations of the IEEE 802.11p standard in the context of ITS applications. The project will certainly also be useful for researchers and the community working in this field. Besides, the project also provides valuable insights into the performance of an OBU utilizing the IEEE 802.11p standard and can be used to convey the optimization and improvement of vehicular communication systems for the use of ITS applications.



# Semantic Similarities for Honeypot Collected Linux Shell Commands

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## Abstract

Shell commands are among the most popular tools used by attackers to execute cyber-attacks, given that most servers in the world run on Linux and operate using shell commands. Understanding how attackers work can be a challenge for researchers and investigators, particularly when it comes to filtering out malicious commands from a vast amount of data. Honeypots are one type of deception solution used to trap attackers without damaging the inter-connected system. Furthermore, we will be able to learn behaviors from the attacker and understand the correlation between one attack pattern and another. In cyber security, finding links between different event of attacks can be helpful for doing cyber attribution. Similarities in cyber-attack can provide evidence of several attacks coming from the same source. In this paper, we propose a method for identifying similarities between attackers based on Linux commands they used using semantic perspective represented in vector format.

# SmartHatch: An Internet of Things–Based Temperature and Humidity Monitoring System for Poultry Egg Incubation and Hatchability

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## Abstract

Poultry farming involves monitoring, regulating, and sustaining chick production. Poultry farming yields chicken eggs, which can be increased by combining traditional methods with technology. Monitoring, regulating, and sustaining chick production are all part of the poultry egg incubation process. Temperature-humidity monitoring during poultry egg incubation requires a long-term energy source for optimum performance and operation. This study involved designing and developing an IoT-based poultry egg incubator temperature and humidity monitoring system. The prototype comprises Arduino MKR 1000 microcontroller and DHT 11 temperature humidity sensor. The Arduino IoT Cloud serves as a cloud-based platform for managing and monitoring the real-time status of temperature and humidity to prevent hatching failure. The success rate of fifty tilted eggs was evaluated, and the result shows that the hatchability rate is 95.24%.

**ABSTRACTS: PARALLEL SESSION 2C**  
**BIG DATA AND ANALYTICS**

# Revolutionizing Banana Grading with ResNeXt and SVM: An Automated Approach

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## Abstract

Various deep learning and machine learning techniques were developed and used for classifying fruit grade or ripeness. However, these methods often require a large amount of training data and computational costs to produce reliable models. In this study, in order to address this issue, we propose a method that combines a ResNeXt-50 convolutional neural network with a support vector machine and optimizes it using an artificial bee colony as a metaheuristic optimizer in order to automate empirical tuning while finding an optimal solution. This approach achieved excellent results with 100% accuracy and a fast-training time of only 0.01 seconds, demonstrating the effectiveness of combining a convolutional neural network as a feature extractor with a support vector machine as a classifier in reducing the training data and computational costs of the model. Results suggest that this method could be a helpful tool for accurately and efficiently classifying fruit grade and ripeness.

# Comparative Analysis of CNN and LSTM Performance for Hate Speech Detection on Twitter

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## Abstract

The internet's current development has become one factor that gives social media users opportunities to leave comments and posts containing hate speech. Detecting hate speech on social media, particularly on Twitter, has recently become a widely researched topic. Research that has been conducted usually applies a standard machine learning approach. The deep learning approach has become popular because it provides better and more effective results. However, it's still rare to be applied to detect hate speech in Indonesian language texts. This research shows the results of a performance comparison from the deep learning approach using CNN, LSTM, and CNN+LSTM architecture models for detecting hate speech in tweets using the Indonesian language. The dataset used is divided into a general dataset which is the entire dataset and a specific topic dataset that deals with the topic of government, which was taken from the general dataset. The research shows better results when the CNN architecture model is implemented on Indonesian language tweet data compared to the results obtained from the LSTM architecture model and the combination of CNN+LSTM with accuracy and F1-score reaching 81%. Furthermore, the implementation of deep learning models in detecting hate speech performs better than previous research using the same dataset but applying machine learning models with feature extraction. This research also shows that specific data discussing a particular topic significantly impact the model's performance. Thus the version of the model becomes better when applied to data with a general topic and a more extensive vocabulary.

# Adapting Faster R-CNN and Video Inpainting for Badminton Player Detection

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## Abstract

In badminton matches, player recognition and tracking can give crucial information to help coaches make better decisions in future matches. Consequently, it is also challenging to manually observe player movement in badminton video matches. Several visual tracking techniques have previously been adopted in sports to improve the analyzing process. In the current study, the authors focused on identifying badminton players that use Faster R-CNN method (Faster Region Convolutional Neural Network) in the video of the badminton game. To speed up the preparation of the dataset, Video Inpainting method is applied. Video Inpainting helps to eliminate the area that interrupts the detection process and also turns badminton video match into 540 image frames for training, evaluating, and testing the model. The dataset was collected from three badminton video matches with 4, 6, and 8 seconds long and 29,7 FPS, respectively. As a result, Faster R-CNN can recognize the player with impressive. The average accuracy value was obtained by up to 0.8048.



# Travel Planning Recommender System by Using Artificial Bee Colony Algorithm: A Case Study in Yogyakarta

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## Abstract

Tourism is an industry that offers unique and enjoyable experiences for tourists through travel and provides positive economic and social contributions. One of the famous tourist destinations in Indonesia is Yogyakarta. Tourists who want to visit an area they have never been to need guidance to plan their travel itinerary usually. Therefore, in this research, we developed a system that can recommend the optimal tourist route in the destination city for several days of visits. We propose using the Artificial Bee Colony (ABC) Algorithm to produce the optimal route. In addition, we utilize the Multi-attribute Utility Theory (MAUT) to accommodate user needs based on three criteria: tourist attraction popularity, budget, and the travel duration. To develop this system, we used data consisting of 100 hotels and 99 tourist attractions in Yogyakarta. The experiments' results indicate that our proposed system shows an increase in the optimal score of 2.22% compared to the Simulated Annealing (SA) algorithm in the singlecriteria scenario. Furthermore, ABC is superior in the number of tourist attractions visited and computation time for the multi-criteria scenario. This result indicates that ABC can produce an optimal schedule for tourist visits.

# Inflation Rate Prediction by Involving Interest Rate Using Vector Autoregression Model

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## Abstract

In 2022, the majority of countries experienced a significant increase in inflation, and it is predicted that the phenomenon of high inflation rates will continue to hit the world in 2023. A high inflation rate encourages a country to raise its interest rate, which on the other hand has a risk of limiting economic growth and increasing the possibility of a country's recession. With so many uncertainties in macroeconomics in the future, this could result in excessive public concern. So, a time series model that can predict fluctuations in Indonesia's inflation rate is very needed. Therefore, this study proposes forecasting Indonesia's inflation using the Vector Autoregression (VAR) method by involving an interest rate dataset based on a strong Granger relationship from interest rates to inflation. The VAR model is used because the Akaike Information Criteria (AIC) value obtained is the smallest among other Vector Autoregression Moving Average (VARMA) models, indicating it to be the most optimal model in terms of both goodness of fit and model complexity. The prediction results will be evaluated using the Mean Absolute Percentage Error (MAPE). According to research, the proposed predictions from the VAR model show that the VAR(5) method can be said to be the optimal method to predict Indonesia's inflation rate, with a MAPE value of 10.2%.

# Logistic Regression and Random Forest Comparison in Predicting Students' Qualification Based on Students' Half-Semester Performance

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## Abstract

The main aim of this paper is to utilize machine learning algorithms for predicting and identifying students who are more likely to fail in university examinations at an early stage, based on their performance during the learning process. The objective is to prevent the risk of failing. This paper compares and reports the use of two machine learning algorithms: Logistic Regression (LR) and Random Forest (RF) for classifying students' success and failure, with the major goal being to achieve better prediction accuracy of the classifier. After conducting experiments using the Laboratory Operations Dataset, which includes valuable features like student attendance, subject difficulty level, and mid-score, the results show that Logistic Regression outperforms Random Forest with an accuracy of 70.8%, precision of 40.4%, and recall of 97.0%, whereas Random Forest achieves an accuracy of 74.7%, precision of 59.8%, and recall of 82.7%. Furthermore, the evaluation metric using the "Not Passed" class recall is applied as the primary focus to evaluate the certainty in predicting students who will fail in their learning process.

**ABSTRACTS: PARALLEL SESSION 2D**  
**DIGITAL COMMUNITY AND SOCIETY**

# Pedagogical Agent in Improving Students' Performance in Discrete Mathematics

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## Abstract

This research investigated the impact of pedagogical agents on the mathematics performance of undergraduate students. The study randomly assigned 89 students to either an experimental group, which received the platform integrated with the pedagogical agent, or a control group, which received instruction without the assistance of a pedagogical agent. The objective of this research is to create and implement an online learning platform that incorporates a pedagogical agent to deliver mathematics subjects. Additionally, the study aims to assess the impact of the pedagogical agent on students' mathematics performance in the context of online learning. The results indicated that the experimental group has significant improvement after using the online learning platform which was integrated with the pedagogical agent. These findings suggest that the use of pedagogical agents can effectively improve mathematics learning outcomes for undergraduate students. With the motivation and encouragement phrases by the pedagogical agent, the students were able to perform better in the post-test. Further research is recommended to examine the potential of pedagogical agents in different contexts and with diverse student populations.

# Challenges in the Implementation of Information and Communication Technology for Effective Education Dissemination Post Covid-19

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## Abstract

Information and communication technologies (ICT) have played a critical role in disseminating education worldwide. The coronavirus disease of 2019 (COVID-19) made every institution further realize the usefulness of ICT in the dissemination of education at every level. Besides primary, secondary, and higher education, research conferences are now also conducted in hybrid mode. ICT is now vigorously used in the educational sector. From educators to students to administrators, everyone is relying on ICT for the teaching-learning process. With new variants of the coronavirus emerging periodically, there is no option for the institutions but to adopt ICT continuously for the dissemination of education. This calls for ICT tool training and development for educators, which will enable them to implement ICT tools for the dissemination of education in a seamless manner. This is a descriptive study in an attempt to discover the challenges faced by institutions in ICT implementation. The present data from Statista.com shows that the internet penetration rate in India still hovers around fifty percent, with an expected six hundred and fifty million internet users by 2023, which is almost half of the present Indian population. The findings of the study suggest that educators are unwilling or partially willing to upgrade their knowledge about ICT tools. Another finding suggests that higher education institutions are unwilling to spend money on upgrading the digital infrastructure.



# A Case Study of eSports Participation: An Interview Approach

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## Abstract

eSports has penetrated Malaysia and growing steadily. As a result, the Malaysian government has implemented several initiatives to nurture players, such as financial support and establishing Malaysian universities to provide eSport courses. However, the number of active pro players is still deficient compared to Malaysia's total population. The study reveals that youths engage more in eSports gameplay. Therefore, a study is needed to investigate the enablers to influence youth participation in eSports in Malaysia. A systematic literature review has revealed that vicarious achievement, aesthetic aspects, physical attractiveness, drama, escape, acquisition of knowledge, appreciation of the player skills and social interaction are the enablers to influence eSports participation. Subsequently, semi-structured interviews were conducted with six professionals in the eSports industry. The result shows that six participants agreed that vicarious achievement, aesthetic aspects, and social interaction significantly influence youth participation in eSports in Malaysia. Besides, physical attractiveness, drama, escape, acquisition of knowledge and appreciation of the player's skills obtained mixed results. This study will aid the stakeholders in the eSports ecosystem in drafting better marketing strategies and game designs to encourage potential players to participate in eSports and retain the existing players to participate in eSports.

# Digital EdTech: Design Criteria and Parents' Perception of 3D Animated Posters in Educating Children about Air Pollution

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## Abstract

This paper explores the criteria as well as parents' acceptance of 3-Dimensional (3D) animated posters to engage children in early environmental education and raise awareness about the health effects of air pollution. A quantitative study was implemented involving 76 parents from diverse provinces and cities across China. Although 3D Animation is a widely acknowledged medium for education, data showed that parents have conflicting opinions about its efficacy. While some see its potential and are fully supportive of its application, others express concerns and are less confident. Nevertheless, there is a potential that 3D animated posters can be used as an educational learning aid for children to understand complex environmental issues and become aware of the impact of climate change on their health.

# A Study on Students' Perspectives Towards Online Learning and Face-to-Face Learning in Post-Pandemic Context

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## Abstract

The reopening of the campus marks the transition from virtual learning to traditional face-to-face classroom setups in Malaysian higher learning institutions, due to the influence of the COVID-19 pandemic. Upon returning to campus, both students and lecturers must adapt to this change in learning mode. This paper focuses on the perspectives of students regarding online learning and face-to-face learning. It examines students' opinions on preferences, flexibility, interaction, and learning experience in both modes of learning. To gather data, an online questionnaire was administered to Multimedia University (MMU) students in Malaysia. The results indicated that students were uncertain about their preference for physical learning versus online learning. Furthermore, the study highlighted the significance students attribute to the flexibility offered by online learning. However, the findings revealed that students perceived the importance of interaction and learning experience during face-to-face learning. These findings have practical implications for educators and policymakers in designing post-pandemic learning delivery approaches in higher education institutions.

# User Interface Design for A University E-Library Mobile App Using User-Centered Design

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## Abstract

In the university environment, electronic libraries (e-libraries) are widely used to improve the accessibility of university library collections. This study specifically investigates Open Library (Telkom University's e-library), which only provided web-based electronic libraries with low usability when the study was conducted. Based on the interview conducted with e-library users, it was found that the e-library website is challenging to access using a smartphone, and a mobile application is required by users. Interview results also show that e-library users have high mobility. Therefore, this research was conducted to design an e-library mobile application. In this research, the method used is User-Centered Design (UCD) which involves the user in every process. For design evaluation, researchers conducted a test using the Single Ease Question (SEQ), which contained 7 tasks to measure the ease or difficulty of the task being tested, and the System Usability Scale (SUS) included 10 questions to calculate the usability score. The evaluation results show that the usability score obtained is appropriate (SUS score = 88.50), so it can be concluded that the UCD method can produce application designs with good usability score.

## **ABSTRACTS: PARALLEL SESSION 3A**

### **DIGITAL HEALTHCARE**

# COVID-19 Identification and Analysis with CT Scan Images using DenseNet and Support Vector Machine

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## Abstract

Medical image analysis is the process of analyzing and interpreting medical images to diagnose diseases, assess disease progression, surgical planning and guide medical treatments by extracting clinically useful information from medical images. Medical image analysis serves an important role in applications in healthcare. With the advancement of deep learning techniques, the utilization of artificial intelligence for medical image analysis has experienced a notable surge, leading to improved accuracy and efficiency in diagnoses and treatment planning. In the present work, a pre-trained transfer learning model, DenseNet201 as a feature extractor, with a classifier of Support Vector Machine (SVM) is aimed to address the classification challenge associated with COVID-19 chest CT images. The evaluation of the proposed DenseNet201-SVM model has been conducted on three benchmark datasets: SARSCoV-2 CT images, COVID-CT and Integrative CT images and CFs for COVID-19 (iCTCF) datasets and achieved accuracy of 98.99%, 93.33% and 99.25% respectively. The total number of images for each dataset are 2482, 746 and 19685. There are only two classes in first and second datasets, whereas the third dataset has three classes. The result is compared with other existing methods and the proposed DenseNet201-SVM model has outperformed other methods.



# Yoga Pose Estimation with Machine Learning

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## Abstract

Yoga pose estimation involves the use of computer vision algorithms to automatically identify and track yoga poses from images or videos. This study focuses on improving the accuracy and performance of pose estimation systems through the application of OpenPose keypoint detection, SMOTE, and LightGBM classification. OpenPose is utilized for keypoint detection, enabling the identification of specific points on the body and resulting in more precise pose estimation. To address class imbalance issues, SMOTE is employed to ensure a balanced representation of poses by oversampling minority classes. Additionally, LightGBM classification is utilized to enhance model performance, benefiting from its ability to handle large datasets, faster training speed, and high accuracy. The research utilizes two datasets: the Yoga Pose Image Classification dataset and a self-collected dataset, consisting of 5994 and 5431 images, respectively. The proposed method achieved an accuracy of 56.18% on the Yoga Pose Image Classification dataset with 107 classes and 71.47% on the self-collected dataset with 50 classes, outperforming existing models.

# COVID-19 Chest X-Ray Classification Using Compact Convolutional Transformer

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## Abstract

The outbreak of Covid-19 in 2019 had a significant impact worldwide, causing long-term breathing problems in many affected individuals. Some people may experience white spots on their lungs after recovering from Covid-19, which can be difficult to identify. One promising approach for identifying abnormal lungs is through image classification. In this work, we utilize three datasets for image classification: the COVID-19 Radiography Dataset, the Chest X-ray Dataset, and the COVID-19 Dataset. To achieve accurate classification, a pre-trained Compact Convolution Transformer (CCT) has been utilized with transfer learning. Our results show that the COVID-19 Radiography Dataset achieved an accuracy of 89.28%, the Chest X-ray Dataset achieved 95.11% accuracy, and the COVID-19 X-ray Dataset achieved an impressive 97.50% accuracy. These findings demonstrate the potential of using image classification to identify abnormal lungs and pave the way for further research in this area.

# COVID-19 Chest X-Ray Classification Using Residual Network

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## Abstract

In 2019, the Covid-19 pandemic has spread across the globe and causing significant disruptions to daily life. Those who have tested positive for Covid-19 may experience long-term respiratory problems as the virus can damage the lungs. Specifically, patients who have recovered from Covid-19 may develop white spots on their lungs. This can be difficult to distinguish from normal lung tissue. Consequently, researchers have conducted extensive studies on image classification of Covid-19 chest x-rays, which has become a popular topic of investigation over the past two years. In this research, four datasets were utilized for image classification including COVID-19 Radiography, Chest X-ray, COVID-19, and CoronaHack datasets. All these datasets were sourced from Kaggle. The pre-trained ResNet152 model was used in conjunction with a transfer learning technique. Results indicated that the pretrained ResNet152 with early stopping provided the highest accuracy among the techniques tested. In this research, the COVID-19 Radiography dataset achieved an accuracy of 95.61%, while the Chest X-ray dataset achieved an accuracy of 97.59%. CoronaHack dataset and COVID-19 X-ray dataset achieved accuracies of 93.59% and 100%, respectively.

# ViTMed: Vision Transformer for Medical Image Analysis

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## Abstract

The COVID-19 global health crisis has presented daunting challenges to medical professionals, making accurate and efficient diagnoses more important than ever. In view of this, this paper proposes a Vision Transformer model, ViTMed, with an attention mechanism to classify the CT scan images for more effective diagnosis of COVID-19. Given the input CT scan images, it is represented as sequences of tokens and a transformer is utilized to capture global and local dependencies between features by utilizing self-attention mechanism. The core element in ViTMed is the transformer encoder with multiheaded attention (MHA) mechanism and feed-forward network. This enables model to learn hierarchical representation of image and make more informed predictions. The proposed ViTMed achieves promising performance with fewer parameters and computations than conventional Convolutional Neural Networks. From the experimental results, the proposed ViTMed outperforms state-of-the-art approaches for all three public benchmark datasets of COVID-19, 98.38%, 90.48%, and 99.17% accuracy for SARS-CoV-2-CT, COVID-CT, and iCTCF datasets, respectively. The number of samples collected for each dataset are 2482, 746, 19685. The datasets consist of two to three classes, which are Covid, Non-Covid and Non-informative cases.

## **ABSTRACTS: PARALLEL SESSION 3B**

### **MACHINE INTELLIGENCE**

# Food Detection and Recognition with Deep Learning: A Comparative Study

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## Abstract

Food detection and recognition involves the use of computer vision and machine learning techniques to identify and classify food items in images or videos. It has numerous applications, such as dietary tracking, nutrition analysis, and inventory management. This research paper presents a comparative study of six deep learning models (SSD (VGG-16), Faster-RCNN (Resnet-50), Faster-RCNN (Mobilenet-V3), Faster-RCNN (Mobilenet-V3\_320), RetinaNet (Resnet-50), and YOLOv5) for food detection and recognition. The models' performance is evaluated using three publicly available datasets: School Lunch Dataset, UEC FOOD 100, and UEC FOOD 256. Notably, Faster R-CNN (Mobilenet-V3) achieved mAP of 0.931 in the School Lunch Dataset, while YOLOv5 achieved 0.774 and 0.701 mAP in the UEC FOOD 100 and UEC FOOD 256 Datasets, respectively. YOLOv5 demonstrates comparable results to Faster R-CNN but with a smaller input image size and a larger batch size in food detection.



# Obstacle-aware Simultaneous Task and Energy Planning with Ordering Constraints

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## Abstract

To improve the practical performance of task planning for unmanned ground vehicles, geographical features, limited onboard energy, and ordering constraints are urgent to be considered. This paper studies the simultaneous task and energy planning (STEP) problem considering obstacles and ordering constraints. The STEP problem is a sequential decision-making problem using the Markov decision process. A new multi-head self-attention-based deep reinforcement learning (DRL) method is proposed to solve this problem. A distance estimator calculates the distance between any two task points considered obstacles. A relational network pairs ordering constraints with feature vectors of each task to reason their relationships. The simulations compare solutions of our method, a recurrent neural network (RNN) based DRL, and the CPLEX method. Results demonstrate that our approach can obtain approximated performance compared with RNN-based DRL but in a shorter training time.

# A Comparative Study of Learning-based Approaches for Chinese Character Recognition

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## Abstract

This paper presents a comprehensive comparison study of various learning-based approaches for Chinese Character Recognition (CCR). The study examines eight types of models that belong to the machine learning model and deep learning model categories. These models include Bagging k-Nearest Neighbor, Random Forest, Support Vector Machine (SVM), Bagging Decision Tree, Xception, LeNet, Multi-Layer Perceptron (MLP), and Visual Geometry Group 16 (VGG16). To conduct the study, a dataset of handwritten Chinese characters is collected. The dataset consists of 5,000 samples distributed across 10 classes of Chinese characters. From the experiment results, we conclude that the best-performing algorithm for the classification model is VGG16, which achieved the highest accuracy score among the eight learning-based models tested in the study. Specifically, VGG16 scored a remarkable accuracy of 99.20%, outperforming the other seven learning-based models. These findings demonstrate the potential of deep learning models, such as VGG16, to improve Chinese character recognition algorithms and enhance their accuracy and performance.

# DDoS Attack Detection on MQTT Protocol Using Semi-supervised DBSCAN and Support Vector Machine Model

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## Abstract

Internet of Things (IoT) is a system of connected objects with sensors, software, control systems and protocols. One of the protocols widely used in IoT is Message Queue Telemetry Transport (MQTT). Considering that users of these IoT devices can control their devices from anywhere makes them susceptible to various types of attacks. Distributed Denial of Service (DDoS) is a common attack vector in the IoT. Among the methods that can be applied for identifying this attack is machine learning. In previous research, DDoS detection was accomplished using a singular SVM. The precision and f1-score generated by this solitary SVM are still inadequate. This research combines SVM with other machine learning techniques in an effort to enhance SVM's accuracy and f1-score. In this research, semi-supervised DBSCAN and SVM models were utilized. We use three datasets in this research, namely IoTID20, simulation, and CICDDOS2018. The proposed model has the ability to detect DDoS attacks with a 99.6% accuracy, 99.6% f1-score, and 0.8% false alarm rate, respectively.

# Flower Species Recognition using DenseNet201 and Multilayer Perceptron

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## Abstract

Flower species recognition is the task of identifying the species of a flower from an image. It involves using computer vision techniques and machine learning algorithms to analyze the visual features of the flower in the image and match them to a known database of flower species. Flower species recognition is a challenging task due to the variations in color, shape, and size among different flower species. Accurate flower species recognition has important applications in fields such as agriculture, botany, and environmental conservation. In view of this, this research paper presents a deep learning approach for flower species recognition using a combination of DenseNet201 and MLP. The proposed model leverages the strengths of both models for enhanced performance in recognizing flower species. DenseNet201 is known for its ability to capture complex features in images, while MLP is a powerful tool for learning nonlinear relationships between features. The model achieves impressive classification results on multiple datasets, including 94.47% accuracy on Kaggle, 98.23% and 97.35% on Oxford17 for two different protocols, and 79.13% on Oxford102.

**ABSTRACTS: PARALLEL SESSION 3C**  
**QUALITY OF LIFE AND SMART LIVING**

# Analyzing Adversary's Attack on Ethereum Collected from Honeypots

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## Abstract

With the increasing reliance on digital infrastructure and the transmission of sensitive information online, the necessity for robust cybersecurity measures has become urgent. This research paper explores the effectiveness of employing honeypots and the MITRE ATT&CK framework to detect adversary behaviors in the context of email and cryptocurrency attacks. Through the deployment of honeypots, a diverse range of attack data was captured, enabling the identification of recurring patterns such as phishing and scamming in email, as well as account hijacking in cryptocurrency. By mapping this data to the MITRE ATT&CK framework, we were able to identify the Tactics, Techniques, and Procedures (TTP) utilized by adversaries, which can guide security strategies and mitigate future attacks. Our analysis underscores the value of honeypots in detecting and analyzing adversaries' TTP, emphasizing the need for ongoing research to enhance our comprehension of emerging threats. Keywords—Cyber security, Honeypot, Ethereum, MITRE ATT&CK, Adversary Behaviors.



# A Survey on Privacy Preservation Methods in Future Vehicular Networks

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## Abstract

As increasing vehicular technology is becoming more popular due to global climate change and the promotion of renewable energy sources, electric vehicles (EVs) with an array of improved features are becoming increasingly prevalent in the realm of automobile technology. As EVs require frequent charging sessions, it is integral to consider the potential privacy and security risks associated with the extensive data collected when charging or discharging from smart grids, smart buildings, or other EVs. This sensitive data includes users' locations, driver's licenses, and more. Therefore, preserving their privacy is a major concern. This paper investigates the existing privacy preserving solutions developed in the literature to address these issues, including blockchain technology which is essential in protecting user data and thwarting privacy attacks around the charging station-to-vehicle (CS2V) and vehicle-to-vehicle (V2V). Additionally, privacy-preserving context-based online dispatching systems (PCOEDS) are presented as an effective strategy to authenticate users' information and protect their privacy in the context of vehicle-to-building (V2B) charging/discharging. Finally, a thorough comparison of the existing works is presented along with future research directions that will serve to further enhance the security levels of future EV transportation systems.

# A Review of Privacy-preserving and Efficient Data Collection and Aggregation in Smart Grids

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## Abstract

The smart grid fuses the traditional electrical power grid with smart technology to allow for a more distributed, bidirectional flow of communication, data, and electricity. Its advanced metering infrastructure (AMI) of smart meters (SMs) and sensors can efficiently collect data from end users and send it to utility companies. It also allows for near-instantaneous detection of problems in the grid so there can be a quick recourse to fix them. The strength of the SMs is that they can provide reports showing electrical usage to both consumers and utility companies, allowing users to act accordingly to decrease their bill while allowing utility companies to accurately manage billing by reviewing near real-time supply and demand. This paper will explore the specific issues that arise in the smart grid with respect to aggregating consumers' data and sending it to utility companies and will also propose solutions to these issues. The two primary solutions in this paper focus on the use of homomorphic encryption and a lightweight data aggregation scheme, which decrease computational costs, improve scalability, and improve security—all while simultaneously preserving the customer's privacy. Finally, a thorough comparison of the existing works is presented along with future research directions that will serve to further enhance the security levels of future AMI smart metering systems.

# The Role of Trust in Predicting Behavioral Intention to Use Electric Car-sharing Services: Evidence from China

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## Abstract

The present study aims to examine the determinants that impact the behavioral intention of Chinese consumers towards utilizing electric car-sharing services (ECS). The research identifies conditional value, personal attitude, and sustainability as the primary determinants of behavioral intention towards the use of ECS among users in Guangzhou, China. Additionally, the research indicates that trust serves as a moderator in the relationship between personal attitude and behavioral intention, as well as between conditional value and behavioral intention. The findings indicate that companies operating in the ECS sector ought to prioritize accentuating the contingent worth of their offerings, advocating favorable individual dispositions towards ECS, and underscoring the importance of sustainability as a means of drawing in users within the Chinese market. The results suggest that establishing trust is a crucial factor in promoting the utilization of ECS services among Chinese users.

# Comparison Analysis of Intrusion Detection using Deep Learning in IoT Networks

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## Abstract

This study focuses on network security for Internet of Things (IoT) devices, which are particularly vulnerable to attack due to limited security measures. To protect IoT networks from attackers, the research implemented intrusion detection on the networks. The study compared several Deep Learning algorithms, including DNN, CNN, LSTM, and AE, to identify the most effective algorithm for solving network security problems using intrusion detection. The research used the UNSW-NB15 dataset for testing and employed binary classification for evaluation. The results showed that the DNN algorithm achieved an accuracy value of 99.76% and a loss value of 0.006%, outperforming the other algorithms. This study highlights the importance of implementing intrusion detection in protecting IoT devices and networks and demonstrates the efficacy of the DNN algorithm in detecting and preventing network security breaches.

**ABSTRACTS: PARALLEL SESSION 3D**  
**BIG DATA AND ANALYTICS**

# Analysis of the Performance of ANN and CNN on the COVID-19 Spread Classification Prediction Model with Time-Based Feature Expansion

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## Abstract

Since early 2020, COVID-19 has spread to Indonesia. Bandung is one of the cities in Indonesia with the number of confirmed cases reaching 103,560 people and tends to continue to increase. The increase in the number of cases can be controlled if the factors that influence it are known from the start. One solution is to create a predictive model that can classify the spread of COVID-19 cases in the future. In this study, a prediction model was built for the classification of confirmed cases of COVID-19 with ANN and CNN Time-Based Feature Expansion. The scenarios carried out build models with feature expansion based on two, three, four, and five months prior to the class target. The results obtained state that the best classification prediction model comes from ANN with an accuracy of 90%. The number of feature combinations used is 36 features derived from time-based feature expansion. Based on the results obtained, it can be seen the prediction of the classification of the distribution of COVID-19 cases in Bandung in the next few months. This research contributes to the development of a classification prediction model in Deep Learning with time-based feature expansion. With the prediction results of the classification of the spread of COVID 19 cases, the public, government and health institutions can prepare the best prevention for the future.



# Bloom, Xor, and Cuckoo Filter Comparison for Database's Query Optimization

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## Abstract

This paper proposes the use of probabilistic data structure filters to optimize database systems for IT micro, small, and medium-sized enterprises (MSMEs) and startups in Indonesia. The efficiency of various filters, including the Classic Bloom filter, Partitioned Bloom filter, Counting Bloom filter, Cuckoo filter, and Xor filter, are compared in terms of their computing time, cost, and resource usage for both write and read operations. The findings show that while the use of filters led to a slight increase in insertion and query time for existing keys in the database, it also resulted in a significant decrease in query time for nonexistent keys. The Cuckoo filter was found to be the most efficient. This research provides valuable insights for IT MSMEs and startups in Indonesia, enabling them to make informed decisions in optimizing their database systems through filter selection.

# Hoax Detection in Social Media using Bidirectional Long Short-Term Memory (Bi-LSTM) and 1 Dimensional-Convolutional Neural Network (1D-CNN) Methods

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## Abstract

Technology development facilitates the dissemination of information and news from various media, especially on social media. The news spread on social media is not necessarily the truth, and it could cause many fake news or hoaxes to spread and mislead the public. The number of hoaxes circulating on social media confuses readers in understanding the truth of information. Several models for detecting hoaxes have been built using a Deep Learning approach to process unstructured data such as text and images. In this study, three models were created using a deep learning approach to detect hoaxes on social media Twitter. The three deep learning methods used are Bidirectional Long Short-Term Memory (BiLSTM), 1 Dimensional-Convolutional Neural Network (1DCNN), and Hybrid Bi-LSTM-1DCNN. Term Frequency - Inverse Document Frequency (TF-IDF) is used as feature extraction and Global Vectors (GloVe) as feature expansion. Several scenarios were applied to compare the methods to achieve the best model with the best accuracy results. 1D-CNN method gets the highest accuracy of 96.51%, followed by BiLSTM with an accuracy of 96.09%, and Hybrid Bi-LSTM-1DCNN with an accuracy of 95.94%.

# Hoax Detection on Social Media with Convolutional Neural Network (CNN) and Support Vector Machine (SVM)

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## Abstract

Hoax news has long been a problem for society that is quite worrying because receiving hoax news can change a person's point of view to something that is not good, the impact of which is detrimental to many individuals and groups of people. Machine learning and deep learning can be implemented to detect hoax news. Examples of methods used in previous studies are SVM (Support Vector Machine) and CNN (Convolutional Neural Network). This research proposes the application of the CNN and SVM methods. In addition, this research develops a CNN-SVM hybrid model, which is the uniqueness of this research. The dataset is sourced from Twitter which focuses on the Ferdy Sambo Case and the Kanjuruhan Tragedy that will occur in 2022. The dataset amounts to 25,325 and is divided into two with a splitting ratio of 90:10. After three algorithms was trained, they achieved excellent performance. This matter can be seen from the accuracy scores for the two methods, which managed to improve their performance after feature extraction and expansion were applied with TF-IDF (Term Frequency Inverse Document Frequency) feature extraction, unigram + bigram weighting, and feature expansion with GloVe (Global Vector for Word Representation). The highest performance model is the SVM model with the similarity top 1 and Tweet corpus (95.95% accuracy), followed by the hybrid CNN-SVM model with the similarity top 10 and Tweet + News corpus (95.79% accuracy) and CNN model with the similarity top 15 with Tweet + News corpus (95.11% accuracy).

# Interactive Simulation Tool for Spatiotemporal Data of Climate-related Fires over Borneo

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## Abstract

Hazardous forest fires over Borneo in 2019 should be a concern that natural climate-related disasters have been increasing; they can be more frequent and extreme. Research about forest fire prediction and its impact has been abundant. However, there still needs to be more people's awareness of the hazard and risks. This study introduces an interactive simulation tool to help society and scientists from other fields understand better the risk of climate-related fire in Borneo. The interactive simulator of forest fire prediction is created as a web-based application using the Flask framework and Bokeh library in Python. As the first development, it visualizes the historical spatial and temporal forest and land fire data over Borneo, computed by machine learning methods, namely Random Forest, Decision Trees, and Support Vector Machine. The prediction results show that the three models similarly predict burned areas. Meanwhile, Random Forest predicts the carbon emission slightly better than other models, with 4.751 and 0.008 for MAE and NRMSE, respectively. It also gives interactive features that the user can play to estimate the fires, given climate and environmental conditions.

**ABSTRACTS: PARALLEL SESSION 4A**  
**DIGITAL COMMUNITY AND SOCIETY**

# Distance Learning Interaction Design Recommendations for Blind Students to Achieve Learnability

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## Abstract

The COVID-19 pandemic requires school learning activities to be carried out online or through distance learning methods. This situation has a significant impact on blind students due to their visual limitations. Previous research has successfully designed interactive interfaces with good usability values. However, the learnability aspect was still relatively low, as it primarily focused on students with complete visual blindness. In this study, it was discovered that blind students with low vision can perceive writing with certain font sizes and colors. Therefore, due to these distinct characteristics, the existing design is not suitable for students with low vision impairments. Consequently, this study aims to design a distance learning interaction that specifically caters to low vision blind students, utilizing a user-centered design (UCD) approach.



# Comparative Analysis of the Quality of Tiket.com and Traveloka Applications Using the E-Servqual Method on User Satisfaction

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## Abstract

Currently, with the development of online ticket booking technology, there is a higher demand for it among the Indonesian people. Therefore, the authors are interested in examining the quality comparison of two online ticket sales applications, namely Tiket.com and Traveloka, using the E-Servqual method with eight dimensions of research variables Efficiency, Fulfillment, Reliability, Privacy, Responsiveness, Compensation, Contact, and Security. The research was conducted for one month with a total of 400 respondents. The results obtained from the respondents indicate that the Tiket.com application better meets user expectations compared to the Traveloka application. However, the perceived value of service quality for both applications, Tiket.com and Traveloka, yielded similar results. Moreover, the Tiket.com application demonstrated superior service quality with a score of 0.931, while the Traveloka Application scored 0.927. Therefore, it can be concluded that the Tiket.com application is closer to meeting user expectations compared to the Traveloka application. The resulting data is based on a questionnaire distributed to users of both applications. The Statistical Package for the Social Sciences (SPSS) and Microsoft Excel were used for data processing. These results highlight the importance of considering the value aspects to improve the quality of services for both applications.

# E-commerce Factors that Motivate Consumers' Purchasing Decisions: A Cross-Regional Study and Local Attractors and Sustainers for Personalization

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## Abstract

Online shopping is no longer a luxury, but a lifestyle. Based on Venkatesh, Speier-Pero and Schuetz's (2022) findings on antecedents to online shopping, this study first investigates the degree of convergence and key success factors across sampled geographical regions by identifying similarities and differences in strategies, which encourage purchasing and satisfaction, with perceived usefulness, perceived ease of use, perceived trust and perceived enjoyment as relative advantage across all models; second, based on the identified key opportunities, propose value-added functions; third, sample 183 survey respondents' perceptions towards these functions; and infer feasibility/viability of the design in enhancing online shopping UX. Contributions are identification of progression within/across the regions, mapped to the Capability Maturity Model. Findings from perceptions towards the proposed functions, indicate new business models, and collaborative value chains should build on individual/social psychological factors especially congruence, value consciousness, trust and enjoyment. Differences in the ranking of attracting and sustaining factors, further enable more specific design of personalization channels and types, based on gender and age.

## Credit Card Fraud Detection using TabNet

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### Abstract

The adopting of cashless payment methods, such as credit card payments and online transactions, has significantly enhanced the payment experience and added convenience to our daily lives. However, with the increase in cashless payment usage, financial fraud has become more sophisticated, posing a significant challenge to the security of these payment systems. In response, machine learning-based approaches have gained popularity in fraud detection. In this research paper, we propose the application of a deep tabular learning model, TabNet, for classifying transactions into fraudulent or non-fraudulent categories. TabNet utilizes a sequential attention mechanism to learn from tabular data. It comprises a series of decision steps where each step selects relevant features and updates the internal representation of the data. This mechanism enables the model to effectively capture complex, non-linear relationships between features, making it highly effective for fraud detection. The utilization of TabNet in fraud detection can contribute to strengthening the security of the payment system and reduce the chance of financial fraud. To evaluate the efficacy of our proposed approach, we conducted experiments on three widely used credit card fraud datasets, including the MLG-ULB dataset, the IEEE-CIS Fraud dataset, and the 10M dataset. Our experiments revealed that TabNet outperforms the state-of-the-art approaches across all three datasets, demonstrating its robustness and effectiveness in detecting fraudulent transactions.

# Blockchain-based Mutual Authentication Model for Customer Services

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## Abstract

The Identity Management (IDM) system faces a challenge in its current state due to the Public Key Infrastructure (PKI) based identity verification process that involves stakeholders sharing excessive information with a trusted central party. This centralization of IDM is problematic, intricate, and increases the risk of identity theft and privacy infringement. Thus, it is imperative to prioritize the privacy of stakeholders to foster trust and establish a positive reputation with service providers. To address this issue, this study recommends a decentralized approach by implementing a blockchain-based mutual authentication model. This model integrates QR codes to conceal Personally Identifiable Information (PII) and facilitate mutual authentication. Additionally, the blockchain serves as an immutable reference point for validation which helps proposed model to achieve 100% accuracy in average 11s of authentication time taken, stable and reliable.

**ABSTRACTS: PARALLEL SESSION 4B**  
**DIGITAL HEALTHCARE**

# A Composite Sentiment Summarizer Score for Patient Reviews: Extending RoBERTa

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## Abstract

Recently, sentiment analysis is applied in the healthcare domain to improve patient's experiences through collecting and analyzing patient reviews. With the ascent of artificial intelligence, the Robustly Optimised Bidirectional Encoder Representations from Transformer Pretraining Approach (RoBERTa) has shown exceptional performance in the task of Natural Language Processing, including sentiment analysis. The result of sentiment analysis using RoBERTa generates three sentiment scores, representing the degree of negative, neutral, and positive sentiment in the analyzed text. Nevertheless, these sentiment scores are presented separately, making it difficult to gain a comprehensive understanding of the mixed sentiments expressed in the review text. In this paper, the concept of composite sentiment summarizer is introduced by combining the positive, negative, and neutral scores into an overall sentiment score, a more complete analysis of the mixed sentiments can be obtained from the unstructured reviews. This composite sentiment summarizer score provides a more balanced and precise representation of the sentiment expressed in the text. This paper investigated four proposed approaches by extending capabilities of RoBERTa with the composite sentiment summarizer score. The results demonstrated the potential of using the ranking approach to calculate a composite sentiment summarizer score for sentiment analysis and highlighted the importance of considering a more nuanced approach to sentiment analysis with a wider range of sentiment intensities.



# Medical Image-based Prediction of Brain Tumor by Using Convolutional Neural Network Optimized by Cuckoo Search Algorithm

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## Abstract

Brain tumor is one of the most aggressive forms of cancer. In 2015, approximately 23,000 people were diagnosed with brain tumors according to cancer statistics in the United States. Radiologists utilize medical imaging techniques to manually detect tumors. However, the process of tumor classification takes a very long time and is based on the expertise and capability of radiologists. As the number of patients increases, the volume of data requiring daily analysis also grows significantly, causing visually interpreted readings expensive and prone to inaccuracies. Convolutional Neural Network (CNN) is the most popular method as a CAD system based on medical images. This research focuses on utilizing the CNN method, optimized by the cuckoo search algorithm, to predict brain tumors based on a dataset of 1050 T1-weighted contrast enhanced MRI images in MATLAB data format. This research achieved the best results with an average accuracy of 0.926 for the test data.

# On Improving Malaria Parasite Detection from Microscopic Images: A Comparative Analytics of Hybrid Deep Learning Models

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## Abstract

Malaria, a life-threatening mosquito-borne disease, contributes to a significantly high number of fatalities in tropical/sub-tropical regions due to inadequate detection technology, lack of laboratory experience, and other barriers. From the design perspective of a general-purpose point-of care solution for detecting malaria along with other tropical diseases, malaria parasite detection from blood work needs to integrate accurate and fast detection capabilities. In this vein, in this paper, we develop three hybrid data-driven models in this paper that combine a convolutional neural network (CNN) with long short-term memory (LSTM), bi-directional LSTM (BiLSTM), and gated recurrent unit (GRU), respectively. CNN is employed in all three proposed models to extract the relevant features that are passed to two cascaded layers of Recurrent Neural Networks (RNNs) in each model that acts as a classifier. Based on the experiments conducted with a public dataset, we demonstrate that our designed CNN-GRU-GRU hybrid model outperformed the other models in terms of accuracy (96.01%), less type-I error rate (1.81%), and type-II error rate (2.18%). On the other hand, the CNN-LSTM-LSTM model was attributed to a low computing (training) time of just 4 minutes and 46 seconds. Our findings clearly elucidate the potential of combining classifiers in biomedical analytics research and pave the way for portable point-of-care devices with reasonable accuracy and fast computation times, enabling them to be used for collaborative learning for large-scale, real-time disease modeling.

# Optimizing MEG-EEG Mapping in Resource-Constrained Non-Intrusive Bio-Magnetic Sensing Systems: A Data-Driven Approach

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## Abstract

While Magnetoencephalography (MEG) and electroencephalography (EEG) are well-known neuroimaging techniques to capture a myriad of brain activities and stimulations, accessing conventional M/EEG devices is challenging. This is because of the bulky nature of the MEG machines, the need for magnetic shielding and cooling system, intrusive EEG electrodes, and various other complications involving preparing these devices to guarantee a clinical-grade signal acquisition. To address these issues, in this paper, we consider bio-magnetic sensing with emerging Magnetic Tunnel Junction (MTJ) sensors operating at room temperature that can map the sensed MEG to EEG signals, which can be helpful in this domain. However, such ultra-sensitive sensors are resource-constrained, and incorporating such MEG EEG mapping needs to be optimized to balance the accuracy and computational/energy trade-off. Therefore, we adopt a data-centric approach to address this optimization problem. Furthermore, we conduct rigorous comparative analytics on prominent machine/deep learning models on a publicly available dataset to establish a baseline proof-of-concept that can be seamlessly integrated with the considered bio-magnetic sensing systems. Our research unlocks the possibility for real-time monitoring of brain activities and abnormality detection away from the clinical environment and complex hospital settings. Moreover, the compact size and low-power requirements for the considered MTJ sensor make it compatible with IoT and wearable devices.

# Diagnosis of Lung Diseases from Chest X-Ray Images Using Different Fusion Techniques

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## Abstract

Lung diseases refer to a group of disorders that affect the lungs and respiratory system. Several factors, such as genetics, environmental pollution, infections, and smoking can cause these. Lung diseases include coronavirus (COVID-19), pneumonia, chronic obstructive pulmonary disease (COPD), and asthma. Lung diseases cause significant damage to lung function and lead to respiratory failure or even death. The symptoms of lung diseases can range from mild difficulty breathing to severe ones, including chest pain, bloody coughing, and shortness of breath. Early detection can increase the chances of successful treatment and improve the overall outcome for affected individuals. Artificial intelligence (AI) has demonstrated considerable potential for detecting and diagnosing lung diseases through machine learning algorithms and deep learning models. The detection of lung diseases using chest X-rays (CXRs) is demonstrated in this paper by applying feature-level fusion (FLF) and decision-level fusion (DLF) techniques. FLF involves concatenating the features from two models before the classification process. In comparison, DLF is executed after training the two models and then concatenating the results to make a single decision. The two models are DenseNet-169 and Vision Transformer (ViT-L32). On the COVID-19 Radiography database, the proposed models have been tested and trained. The data has been preprocessed using data augmentation and a blurring method. An 'Adam' optimizer is used while compiling the model. The accuracy of the DLF is 93.3%, while the FLF achieved an accuracy of 94.54%, which is better than the accuracy of the models without fusion.

# Face Mask Wearing Detection: A Comparative Analysis

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## Abstract

The COVID-19 pandemic has had a tremendous influence around the globe, impacting nearly every element of daily life. It has resulted in widespread illness and death, economic disruption, and changes in societal norms. Governments and organizations have applied various measures to slow the spread of the virus and mitigate its impacts. Among the most important mechanisms is the use of face masks to prevent the transmission and infection of COVID-19. This paper investigates and analyzes different machine learning (ML) methods to execute the classification task of categorizing faces into three classes: wearing masks, not wearing masks, or wearing masks improperly. The preprocessed and augmented dataset used in the study contains 4801 images with the dimension (50, 50, 3) and there are approximately 1500 faces for each class. According to the experimental results, convolutional neural networks (CNNs) can achieve 87% accuracy in classifying faces. These results indicate that CNNs outperform other ML methods, such as random forest, Naïve Bayes, and support vector machine.

## **ABSTRACTS: PARALLEL SESSION 4C**

### **MACHINE INTELLIGENCE**

# Scam Calls Detection Using Machine Learning Approaches

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## Abstract

In recent years, scam calls have become increasingly prevalent resulting in financial loss, identity theft, and other fraudulent activities. This research proposes a machine learning-based approach for scam call classification and detection using natural language processing (NLP) along with deep learning techniques. The model uses the dataset of scam and non-scam calls to train and understand the context of the caller and determine if the conversation is a scam or not. NLP techniques are leveraged, such as preprocessing text, converting audio samples to texts with Google API, and word embeddings, to build an accurate and reliable classifier. The highest results obtained is Long Short-Term Memory (LSTM) algorithm with an accuracy of 85.61% in detecting scam calls.



# Hoax Identification On Social Media Using Recurrent Neural Network (RNN) And Long Short term Memory (LSTM) Methods

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## Abstract

Technological developments support the rapid spread of hoaxes on social media. Information dissemination needs to be identified as hoaxes to prove that not all information can be received immediately. The speed at which news spreads through social media can be used as an obstacle to the identification of hoaxes. This can be overcome by taking direct data and then identifying it using the Recurrent Neural Network (RNN) method and Long Short-Term Memory (LSTM). The identification results show that the RNN classification method is a classification method with a greater increase in accuracy than the LSTM method, which is equal to 98.32% and for the LSTM the final accuracy value obtained is 95.63%.

# ARES: An Automated Rotten Egg Sorter Utilizing the Egg's Physical Properties and Artificial Neural Network

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## Abstract

Currently, the market provides egg-quality sorters that make use of spectroscopy, a technique typically employed in industrial settings. There is limited research specifically addressing the identification of rotten eggs based on weight; the researchers proposed a solution, an automated egg sorter utilizing the egg's physical properties and artificial intelligence. In order to develop a technology that caters to the needs for food sustainability, the researchers formulated a system involving two (2) subsystems that work dependently and applied together, which created a device capable of classifying and automating the sorting process of market eggs depending on its quality (good or bad). In order to develop the system, 2 subsystems were made. The first subsystem is responsible for collecting the dataset involving the egg's weight and dimensions using a load cell, raspberry pi camera, and raspberry pi 4. The second subsystem involves integrating the developed model into the raspberry pi with a gripper as an actuator. Using 3 ML algorithms, the best result, using ANN yielded an accuracy of 93.75%.

# Finger Vein Presentation Attack Detection using Block-wise Variance-based Image Quality Assessment

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## Abstract

Biometrics refer to the physiological and behavioural characteristics uniquely possessed by individuals. Physiological biometrics are characteristics that can be measured from the human body such as palm print, fingerprint, iris, and finger vein. Meanwhile behavioural biometrics are measurement of patterns of humans such as gait, signature, and gesture. Among the different biometrics in use today, finger vein biometrics have been gaining popularity and are widely used for user authentication especially in the financial and access control application. Unfortunately, there are attack attempts known as presentation attack to bypass the system by presenting fake finger vein images with the aim to spoof the finger vein sensor or reader. This research aims to introduce an image quality assessment approach namely Block-wise Variance-based Image Quality Assessment (BV-IQA) that evaluates the discrimination of noisiness and blurriness information in the finger vein images for presentation attack detection. Experiments on two benchmark datasets, SCUT and VERA validated the proposed method's effectiveness, yielding a promising result of 0.14% ACER.

# Day Driving and Night Driving Behavior Detection Using Deep Learning Models

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## Abstract

The detection of driving behavior is critical for road safety and driver assistance systems. Comparing the performance of driving behavior detection during day and night provides insight into the strengths and weaknesses of these systems under different lighting conditions. This comparison can encourage further work to improve the accuracy and reliability of the systems and ensure they always function optimally. This study aims to compare the performance of driving behavior detection using a digital video recorder (DVR) camera during day and night driving. The study uses a dataset of video footage recorded by a DVR camera on a driving simulator during both day and night driving. Several Convolutional Neural Network (CNN) models have been developed to detect instances of distracted driving behaviors. The study, conducted at VITAL Laboratories at UiTM Shah Alam, used MobileNetV2, GoogleNet, InceptionV3, and Resnet50 to model the data from 44 participants showing 7 different driving behaviors: normal driving, yawning, nodding off, texting, calling, talking to passengers, and using car features. Based on the experiments, the best CNN model for both sessions is InceptionV3 with the overall accuracy for driving behavior detection during day driving is 92.2% and during night-time is 76.9%. The results show that driving behavior detection performs better during the day driving session than at night driving session by a difference of 15.3%.

# Sentiment Analysis Using Learning-based Approaches: A Comparative Study

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## Abstract

Sentiment analysis, which involves analyzing text data and using language computation to extract valuable information, is a significant focus in Natural Language Processing (NLP). It is widely used in various applications such as product review analysis, customer feedback analysis, and social media monitoring. This research investigates the performance of different machine learning and deep learning models for sentiment analysis on a dataset of customer reviews from an e-commerce platform. A total of eight approaches have been presented in this study including LightGBM, SVM, KNN with bagging, MultinomialNB, DNN, LSTM, BERT, and RoBERTa. The performance for all the proposed models was compared using four evaluation metrics: accuracy, precision, recall and F1-score. The experimental results indicate that the SVM model has outperformed all the other methods with a testing accuracy of 73.98%. The F1-score, precision and recall are also the highest at 0.71, 0.72 and 0.70 respectively. This study contributes to the sentiment analysis literature by demonstrating the effectiveness of different models for sentiment analysis on customer reviews datasets.

**ABSTRACTS: PARALLEL SESSION 4D**  
**QUALITY OF LIFE AND SMART**

# Smart Camping Management Asset using Frequent Pattern-Growth Algorithm

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## Abstract

Managing camping tools is crucial to ensure the safety of campers and extend the life of the tools. Frequent Pattern-Growth (FP-Growth) Association Rule Algorithms have emerged as a powerful tool for managing assets effectively. This algorithm is used to identify frequent patterns in large datasets, making it an efficient method for discovering association rules to help organizations make informed decisions about their assets. In the context of asset management, FP-Growth Association Rule Algorithms can be used to identify patterns in asset usage, maintenance, and replacement. By analyzing historical data, the algorithm can identify which assets are most frequently used, which require the most maintenance, and which are most likely to fail. This paper proposes managing the assets of camping tools using FP-growth and radio frequency identification (RFID) cards for asset tags. The proposed management asset tools are built on an Android operating system smartphone. This research using 30%, 60%, and 80% minimum support. The experiment results show that the minimum support affects the time needed to build an association. A small minimum support requires a longer time, while a large minimum support requires a faster time. The confidence value is used to determine the relevance of the FP-Growth output results. The results of the tests show that the difference in minimum support affects the speed of building associations, and the confidence value is proportional to the minimum support used. This research can be used for other case studies, using equipment data other than equipment for outdoor activities.



## Intelligent-based SIEM Security Email Alert

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### Abstract

SIEM, or Security Information and Event Management, can be considered the latest cybersecurity technology in the security strategy that was taken and utilized mostly by professional cybersecurity teams. Whether it's from a large enterprise to a medium-small size company, it is used as a tool to monitor their IT environment to protect the company's digital assets, security incident prevention, and in addition, protect the company's reputation. Due to its reliability, it is fair to say that SIEM plays a vital role in the current cybersecurity trends since it can provide all these features through just a platform or web console compared to an antivirus. Even though SIEM includes many advanced security features. However, some pre-installed features contain limitations that may not suit a security team's needs when it comes to their operation manuals. For instance, the SOC (Security Operations Center) team is often required to review the reports generated by SIEM and send the info to their clients with the company's customized email templates. This feature is not provided by most of the SIEM software. Thus, this paper aims to develop a system that can overcome the lack of email customization and SOC team-to customers email sending-related issues in the SIEM that the SOC teams currently face in their daily operation.

# Optimising Video Transmission Performance in 5G New Radio Technology for Vehicle-to-Network (V2N) Application: A Comprehensive Analysis

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## Abstract

With the increasing demand for efficient and reliable communication in the transportation industry, the Vehicle-to-Network (V2N) application leveraging 5G New Radio (NR) technology has gained significant attention. Video transmission plays a critical role in V2N communication, enabling real-time information exchange between vehicles and the network infrastructure. However, the performance of video transmission in this context is influenced by various factors such as latency, bandwidth, reliability, and scalability. This paper presents a comprehensive performance analysis of video transmission on 5G NR technology for V2N application. The analysis focuses on addressing key issues, in particular the latency, and throughput of uplink data transmission. A set of experiments were conducted in a simulated urban environment on OMNET++ simulator using Simu5G framework. The results reveal that while all algorithms show similar trends in average MAC throughput, the MAX C/I algorithm outperforms the others at higher loads, achieving up to 14.5% higher throughput. In terms of delay, the PF algorithm exhibits the lowest average MAC delay, reducing delay time by up to 17.5%. Conversely, the DRR algorithm shows the highest delay, with a cumulative delay reaching 25.7% higher than the other algorithms. These findings offer valuable insights for optimizing resource allocation and improving network efficiency in 5G deployments. Future research can focus on enhancing delay performance, exploring fairness-delay trade-offs, and assessing scalability in larger networks.

# Robot and Human Interaction using Natural Language Understanding in Indonesian based on Mental Image Based Understanding

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## Abstract

Robots, in order to understand human commands, could be possible if there is an interaction between them. Possible interaction including the Natural Language, that humans have used to communicate with each other. The method used in this research for robots to understand Natural Language is Mental Image Directed Semantic Theory (MIDST) which uses unique Lmd formula as a basis for computing the Natural Language Understanding (NLU) processes. Equipped with support modules such as Speech to Text, Text to Speech, and Synonym Search Algorithm the robot successfully to receive, understand, and issue responses according to the Natural Language expressions given in Indonesian Language. The movement of the robot is also simulated in a two-dimensional plane to demonstrate its ability to serve humans.

# Performance Comparison Analysis of Virtual Router Redundancy Protocol (VRRP) with Gateway Load Balancing Protocol (GLBP) on a DMVPN Network

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## Abstract

Dynamic Multipoint Virtual Private Network (DMVPN) is a combination of mGRE, NHRP and IPsec Encryption technologies that can maintain network security in companies, especially aspects of confidentiality, data integrity and authentication. However, companies also require a consistently available network to ensure uninterrupted business processes, so First Hop Redundancy Protocol (FHRP) can be used as a solution for the availability aspect of the network. In previous research, the implementation of the DMVPN network used one of the FHRP protocols, namely HSRP, so this research was conducted to test the DMVPN network using other FHRP protocols, namely VRRP and GLBP using a star topology with a variation of Dual HUB to test network redundancy using evaluation metrics of network convergence time and Quality of Service (QoS) in the form of throughput, delay and packet loss. The results of QoS testing on sending TCP packets using GLBP on the DMVPN network are better based on throughput, delay, and packet loss. This is due to the load-balancing feature in GLBP. However, in UDP packet transmission, it was found that the use of VRRP on the DMVPN network was better than using GLBP based on the results of throughput, delay, packet loss and network convergence time. This happens because the load balancing feature on GLBP does not work on UDP packet transmission and network convergence time when the primary router has a problem, VRRP is faster with 3.58 seconds compared to GLBP which takes 9.56 seconds.

# Smart Waste Monitoring System Using Machine Learning for IoT-enabled Smart Green Campus

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## Abstract

The growing population worldwide has created a huge increase in the generation of waste. Due to the critical problems rising over the globe, it is a must to go towards a sustainable world. Building a green campus would help towards achieving sustainability goals. To enable a green campus to handle waste, an efficient waste monitoring system is required. The integration of Internet of Things (IoT) and Machine Learning (ML) can improve existing systems and contribute to a greener environment. This paper proposes a Smart Waste Management system, which makes use of IoT sensors such as Ultrasonic, PIR, RFID in order to track the level of waste generated by bins in the campus environment. The data captured using these sensors are analyzed using ML techniques in order to predict waste generation for the university. The predictions will eventually allow the university to allocate task to the cleaners in advance, better manage the waste and also make recycling easier. A map displaying the shortest path to follow to empty the bins is implemented to help the cleaners in their daily tasks. A prototype of this system is proposed in this paper.

**ABSTRACTS: PARALLEL SESSION 5A**  
**BIG DATA AND ANALYTICS**

# Fake News (Hoax) Detection on Social Media Using Convolutional Neural Network (CNN) and Recurrent Neural Network (RNN) Methods

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## Abstract

Information can be found and shared through social media effectively and quickly. One of the most widely used social media is Twitter. Any information shared on social media is not always true. With millions of social media users, the platform cannot be separated from disseminating information whose truth is uncertain. This has a negative impact on society because it can increase people's distrust of information circulating on social media. To overcome this problem, This research propose system that can detect hoax information on social media using deep learning. This research focuses on detecting hoaxes using the Convolutional Neural Network (CNN) and Recurrent Neural Network (RNN) methods using a dataset from Twitter of 25.325 data. To obtain optimum results, this study utilizes Feature Expansion in the form of GloVe (Global Vector) and Feature Extraction with TF-IDF (Term Frequency-Inverse Document Frequency). The uniqueness of this research lies in the combined application of TF-IDF feature extraction with GloVe feature expansion using CNN and RNN deep learning methods. The results of this study prove that the hoax detection system, by applying a combination of extraction feature with expansion features, can increase the accuracy value up to 95.09% in the CNN classification method, and in the RNN classification method, it has an accuracy of 95.12%.



# Experimental Study using Unsupervised Anomaly Detection on Server Resources Monitoring

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## Abstract

Monitoring resources in a server environment is an essential and indispensable process that ensures a decent resource allocation to show better performance. Existing resource monitoring solutions or tools can be used but require additional staff to monitor resource usage. It is a high workload task when there are thousands of servers and each server with thousands of application instances. When the consumption surpasses an unusual limit, it is considered an anomaly record. Unsupervised machine learning algorithms can detect anomalies through clustering. This study developed an experimental analysis using three clustering techniques to assess the performance of clustering for discovering the anomalies pattern in a multivariate time series dataset with 25,918 data points. The procedure to get the optimal numbers of clusters is performed before the experiment, which can be considered between 3 and 4 numbers of clusters. Cluster pattern analysis has been done for selecting the best optimal number of clusters among both selections. The experiment has included two dimensionality reduction techniques for dataset compression to investigate their influences towards clustering performance. Finally, three performance metrics are used for evaluating the cluster quality. This study concluded that the combination of K-Means with Principal Component Analysis produced the best cluster quality among 9 combinations of clustering techniques. Finally, the anomalies behaviors are identified in the distinguishable cluster from all the monitoring items. Nonetheless, it is worth noting that the output of the anomaly detection is different when clustering is performed using different numbers of clusters.

# Road Density Prediction Based on City Transport GPS Time Series Data using a Support Vector Machine

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## Abstract

Along with the development of the current era, urban transportation in Indonesia is very interesting, especially in the city of Bandung. City transportation is used by people who do not have private vehicles to carry out daily activities such as going to work, going to school, and travelling to a desired place. Generally, city transportation is also used because the fares given are quite affordable. To find out the coordinates of the location of city transportation, we can use the Global Positioning System (GPS). This study uses the Support Vector Machine (SVM) method. This method is used because of previous research; SVM produces a fairly high level of accuracy compared to other methods. SVM can also help improve system performance and find a relationship between urban transportation and congestion. The amount of data used in this research is 35320 data. From the results of the tests that have been carried out, the SVM classification method produces an accuracy rate of 98%.

# A Comparative Study for Language Recognition using Learning-based Approaches

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## Abstract

Language recognition is helpful for determining the natural language in a given document or part of text. Language recognition has attracted more attention in recent times due to its wide-ranging applications, including speech translation, multilingual speech recognition and more. Indeed, language recognition should be effective to ensure practical implementation. Therefore, learning-based approaches are introduced to enhance the effectiveness of language recognition. In this paper, a total of six learning-based approaches have been implemented for solving the language recognition problem. Experiments and evaluations are conducted to study the effectiveness of these learning-based approaches on identifying 5 different languages which are English, German, Czech, French, and Swedish. The experimental results show that the 1D-CNN model achieves the highest accuracy score of 65.99%.

# Prediction of Road Density Based on Time Series of City Transportation GPS Data Using Method Artificial Neural Network

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## Abstract

Traffic congestion in big cities is a severe problem affecting transportation efficiency and residents' quality of life. To address this problem, predicting road congestion is essential to help better traffic planning. In this research, the authors provide a method using an Artificial Neural Network (ANN) algorithm to predict road congestion based on GPS time series data of urban transit. First, the authors collected a dataset including GPS time series data of city transit fleets. This data includes coordinates, time, speed, and traffic status. In this study, 35320 datasets have been prepared by dividing them into training data and test data. Next, the author implemented the ANN algorithm using an architecture appropriate to the time series prediction problem. The author trained the artificial neural network using the prepared training data and performed performance evaluation using the test data. The experimental results show that this research can provide a relatively accurate prediction of road density based on GPS time series data with an accuracy value of 98%.

# Gold Prices Forecasting Using Bidirectional LSTM Model Based on SPX500 Index, USD Index, Crude Oil Prices and CPI

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## Abstract

The objective of this research is to develop an accurate gold price forecasting model using Bidirectional LSTM model, taking into account significant factors such as the SPX500 Index, USD Index, Crude Oil Prices, and Consumer Price Index (CPI). Previous studies suggested the potential for improved performance when utilizing a Bidirectional LSTM model. To optimize the models, a random search tuner was employed to identify the best hyperparameters for Bidirectional LSTM model. The results demonstrate that the Bidirectional LSTM model exhibited a marked potential for enhancing the accuracy of gold price predictions. This advanced forecasting model can provide valuable insights for governments, policymakers, and investors, empowering them to make well-informed decisions in the gold market.

**ABSTRACTS: PARALLEL SESSION 5B**  
**DIGITAL COMMUNITY AND SOCIETY**

# Consumer Behavior in Using Instant Funds: Insights from a Triandis Model Analysis

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## Abstract

Financial technology (fintech) is experiencing rapid growth in Indonesia, providing easy access to financial products and services. Instant Funds, which functions like a credit card with fast disbursement, has gained popularity as a fintech product. Understanding the factors that influence individual online consumer credit when using Instant Funds is important. This study focuses on the specific factors that influence the use of Instant Funds to improve individual online consumer credit behavior in Indonesia and involves a population that is relevant to the characteristics of young consumers in Indonesia. The approach involved 251 respondents from Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek), a region that has significant relevance of instant fund users. Data was collected through questionnaires and analyzed using SmartPLS 4.0. The results show that influence, facilitating conditions, perceived consequences, and social factors significantly influence individual online consumer credit when using Instant Funds. Social factors, in particular, exert the most influence on users' credit decisions. The implication of this study is that it provides valuable insights for fintech platforms that offer Instant Funds, allowing them to improve their services. The implication of this study is that it provides deeper insights for them to improve consumer experience with innovation, improved service quality, fair credit evaluation, and effective promotion strategies. We hope this study can make an important contribution to the development of fintech in Indonesia and help provide recommendations to promote financial literacy and responsible use of online consumer credit among the public, education sector, regulatory agencies, and markets in Indonesia.



# The Influence of Users' Perception Of Security, Privacy, and Trust in Using Online Dating Applications

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## Abstract

Users of online dating applications have been widely used by the public, especially young people, to find relationships or partners online. The purpose of this study is to describe the perceptions of security, privacy, and user trust in using online dating applications. In order to maintain user satisfaction, the Online Dating App must ensure that the Dating App's services must have user perception. This study aims to see the effect of user perceptions on security, privacy, and user trust using the Technology Acceptance Model (TAM) method. There are seven variables used, namely Perceived Usefulness, Perceived Ease of Use, Perceived Security, Perceived Privacy, Trust, Behavioral Intention To Use, and Actual System Use. The data collected is data obtained from distributing questionnaires by collecting 400 respondents who have used online dating applications and have an age range of 17 years to 25 years. The applications used for data processing are Smart-PLS 3.2.9 and Microsoft Excel. The results showed significant results, significant results, namely Perceived Usefulness had a significant effect on Behavioral Intention, Perceived Ease of Use had a significant effect on Behavioral Intention to Use, Perceived Privacy had a significant effect on Trust, Perceived Security had a significant effect on Trust, Trust had a significant effect on Trust Behavioral, Behavioral Intention to Use has a significant effect on Actual System Use.

# Analysis of Clock Synchronization with Different Topology in Wireless Sensor Network (WSN)

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## Abstract

Sensor is a device which is used to detect some object to collect some data. Sensor will deliver the data consisting of id and data to the computer and from the computer to another sensor using a data cable which consumes a lot of time. Nowadays, sensors have WiFi relay or Bluetooth built-in. It will make the sensor deliver the data without data cable or wire(wireless). Sensors can connect to WiFi and send the data to server, database or other sensor. Sensors communicate with other sensors which make the sensor work automatically. The connection between sensors with other sensors is called Wireless Sensor Network (WSN). There can be some delay when the sensor communicates. The delay will affect message delivery. It can make the data will not be sent or maybe corrupted. So, clock synchronization is needed to remove the effects of random delays from the timing message transmissions sent across wireless channels. When communicating, the node will make some network called topology. The examples are star, mesh, etc. Different topologies may also affect the clock synchronization. This will also affect when delivering data. There are many types of protocols used in WSN such as the Average TimeSync Protocol. Average TimeSync Protocol is a protocol which synchronizes the clock speed and clock offset. It will be implemented using Matlab. The data which will be processed by Matlab are clock from each node and when synchronized. By doing the analysis, it is expected to know if topology affects clock synchronization.

# Sentiment Analysis of the Indonesia Presidential Election 2024 with Ensemble Learning for Reducing Disinformation on Social Media

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## Abstract

Disinformation on social media is a frequent problem, especially in the political context related to the 2024 Presidential Election. The purpose of this sentiment analysis research is to reduce disinformation through the application of the Ensemble Learning method using 4 classifiers namely SVM, Random Forest, Gradient Boosting, and Stacked Ensemble, by utilizing TF-IDF and Cross-Validation. Data used in modeling is 11,611 data. The results of the research show that SVM, Random Forest, Gradient Boosting Classifier, and Stacked Ensemble are able to classify disinformation with significant accuracy. SVM achieved 86.44% accuracy, Random Forest achieved 87.65% accuracy, and Gradient Boosting Classifier achieved 88.20% accuracy. Stacked Ensemble achieves the same accuracy as GBC. Ensemble Learning through Stacked Ensemble has proven to provide promising results in efforts to reduce disinformation on social media. The results of this research make an important contribution in developing the use of sentiment analysis to address the problem of disinformation in social media.

# Gamification in Live Streaming Platform: A Systematic Literature Review

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## Abstract

Gamification uses game design techniques, game thinking, and game mechanics to enhance non-game context. Gamification usually refers to applications and processes outside of games that encourage people to adopt or influence how they use them. The Authors' goal in taking this topic is to tell some aspects of using the gamification system. Of the 210 journals the Authors found in making this article, there were 24 articles that the Authors made the primary reference in making this scientific article. The Authors use a Systematic literature Review with three research questions: What elements are used in Live Streaming gamification? What media is suitable for livestreaming Gamification? What are the impacts of using Gamification in live streaming? From the amount of data, the authors found in various references; the authors found a conclusion that readers can use; in fact, Author believes that this gamification system is more profitable for the marketing, entertainment, and live streaming sectors.

# A Novel Airfare Dataset To Predict Travel Agent Profits Based On Dynamic Pricing

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## Abstract

Profit prediction in the aviation industry is an important process to increase competitiveness in business. However, it is challenging because it relies heavily on good quality datasets. A good quality dataset can increase the linear correlation between features and can improve the coefficient of determination is the proportion of variation in the dependent variable that can be predicted from the independent variable. The purpose of this research is to create a novel flight ticket dataset where we add three new features to the general flight ticket dataset. We add NetPembayaran, SalesAgent and Profit features to our dataset. The approach used in making this dataset is to collect flight ticket sales transaction data, flight schedule lists, and flight ticket sales history data from various available sources, and integrate them into one comprehensive dataset. Our novel dataset successfully increases the linear correlation between features and can also increase the coefficient of determination. We also evaluated the model we used for profit prediction using RMSE.

## **ABSTRACTS: PARALLEL SESSION 5C**

### **MACHINE INTELLIGENCE**

# Face Recognition and Physiological Signal for Impaired Drivers: A Review

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## Abstract

The use of Facial Recognition (FR) technology has become increasingly prevalent in a wide range of applications, from security to social media. The ability to identify individuals based on their facial features has proven to be a valuable tool in many real-world scenarios. However, one area that has yet to be fully explored is the use of FR technology in detecting impaired drivers. Driving under the influence of alcohol is a significant public health issue, and the development of reliable and accurate methods for detecting impaired drivers is crucial. While various Physiological Signal (PS) based methods have been developed for this purpose, the use of FR technology in this context has been largely overlooked. This gap in research provides a motivation to look into potential approaches that not only apply FR but also focus on PS. This paper aims to highlight the significance of FR and PS for detecting impaired drivers. It provides an overview of the related works in this area. Additionally, it identifies potential research gaps and discussion for further investigation.



# Intrusion Detection System Using Incremental Learning Method

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## Abstract

Intrusion Detection System (IDS) is a security system that monitors computer networks or systems for unauthorized access or malicious activity. The main purpose of an IDS is to detect and alert suspicious activity, so that appropriate action can be taken to stop or mitigate attacks. Incremental Learning uses machine learning algorithms to continuously learn and adapt to new network activities. The Incremental Learning process enables IDS to adapt to changing network conditions and to identify new or previously unknown attacks. The results of the Incremental Learning experiment using Naive Bayes and SVM on different datasets show the superiority of the Naive Bayes algorithm with an average accuracy of 0.9840.

# Development of Stress Detection System Based on Heart Rate Using Artificial Neural Network

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## Abstract

One of the current advances in technology is in the field of sensing, which can be used gradually to monitor various matters related to health, one of which is heart rate. Most people deal with stress as a standard part of everyday life. High-intensity or long-term stress can impact our safety and disrupt our lives. This can be avoided by developing a stress detection system based on heart rate using the Neural Network method. The data from 7 research subjects from Telkom University students with dataset parameters including heart rate and footsteps using a Fitbit Charge 3 smartwatch produced total 58.351 data heart rate and 4.184 data step, this is used to get more information complete of the characteristics of time series data, then data collection by giving a stimulus to the subject to label stress and not stress in the data using two tests that are doing math problems and watching horror movies. In this study, the results of system testing were to measure the accuracy of the Neural Network Algorithm. in stress detection or not from the data that has been examined. The experiment results showed that the performance of the Neural Network algorithm in performing stress detection reached an accuracy of 93.93%.

# Fire Detection on Video Using Multi-Feature Fusion and Support Vector Machine

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## Abstract

In this paper, we developed a fire detection system based on video using multi-feature fusion and support vector machine (SVM). Our multi-feature fusion-based system used an improved frame difference method and combination of Lab, YCbCr, and RGB color models to eliminate nonmoving and nonfire pixels in video. The fire characteristics features are determined by calculating the boundary disorder of the fire with convex hull, calculating the fire pixels in each frame to obtain fire area variability, and calculate centroid stability. The final process of fire detection is conducted by using an SVM classifier. For our experiment, we used 142 videos for training set and 19 videos for testing set. Each video has a variety of scenarios such as various video resolutions and FPS, the number of moving objects other than fire, environmental lighting conditions, angles, and video capture times. Our experiment result showed the average accuracy of the proposed system reached 86.61%.

# A Correct Face Mask Usage Detection Using YOLOv4 Framework

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## Abstract

In this research, we built a system to detect the use of facial masks in images, especially in public places. Our system used YOLOv4 for detecting the facial masks usage. This research was conducted using dataset with outdoor and indoor test scenarios. In previous research that has been conducted in 2020, images of faces with masks and for the rest of the faces without masks, the resulting accuracy is 96% with more than 4000 training times. We used three labels for the dataset, namely correct mask use, incorrect mask use, and not using mask. We used 1984 images for training set and 992 images for testing set. From our experiment, the best results were obtained when making adjustments to the IoU value of 0.5 which has an F1-Score value of 0.9850 when testing for all classes.

# Driver Drowsiness Detection Using Deep Learning Models Based On Different Camera Positions

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## Abstract

Driver drowsiness is among the most critical causes of vehicular incidents. Consequently, a solution to mitigate this problem is exponentially increasing where an intelligent vehicle system is being implemented in vehicle development. In these studies, a solution is developed by implementing Convolutional Neural Network (CNN), which is tasked to identify the driver's drowsiness behaviour. For the datasets that are needed for training and testing of CNN models, datasets are collected at VITAL Laboratories located at UiTM Shah Alam that is recorded from 3 DVR Camera that is placed in the left (CL), middle (CM), and right (CR) positions. The models proposed in these studies are MobileNet-V2, ResNet50, and InceptionV3 architecture, where the performance of each model is evaluated by classifying the behaviour based on three different camera positions. The architecture that is being chosen is InceptionV3 from camera 5, which is placed in the middle positions that successfully achieved an overall accuracy of 85.5% in classifying drowsiness behaviour.

## **ABSTRACTS: PARALLEL SESSION 5D HYBRID 1**

# Comparative Analysis and Simulation of MPLS Ipv6 Network QOS Using OSPFv3, IS-IS, and EIGRP Routing Protocols for Triple Play Services

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## Abstract

IP is the addressing method used in the world of the internet. The increase in internet users also has an impact on increasing IP usage. IPv6 is a solution to answer this problem, where IPv6 has a very broad addressing capability when compared to its predecessor, namely IPv4. Fast packet delivery is also the dream of all internet users. MPLS is here to answer the wishes of users, where MPLS offers very high data transmission with its forwarding technology. The selection of the right routing protocol is also one of the factors that affect the speed of sending data packet. This routing protocol plays a role in finding the best path that can be passed by data packet. Combining the ability to send data that is owned by MPLS and the selection of the best path that is owned by the routing protocol will make data transmission faster. In this study, 3 routing protocols will be tested, namely OSPFv3, ISIS, and EIGRP, where the three routing protocols will run on MPLS based backbone networks, and the internet protocol (IP) used is IPv6. From the results of the tests carried out, EIGRP obtained the best results. In the EIGRP video test, the throughput is 1.39 MB, the delay is 7.9 ms, and the jitter is 7.95 ms. In testing the EIGRP file obtained 1.55 MB, 6.07 ms delay, and 5.61 ms jitter. In the EIGRP voice test, the delay was 24.35 ms and the jitter was 25.93 ms.



# Evaluation of the Hybrid Classification and Regression Tree (CART) - LDA (Linear Discriminant Analysis) Algorithm for Predicting DDoS Attacks

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## Abstract

Due to a recent rise in internet usage, it has evolved into a tool for cyber crime activity. DDoS attacks are one of the cyber crimes that continue to occur frequently. The purpose of this attack is to weaken the victim's server. If the victim's server has been successfully compromised, several further attacks will be easier to execute and undoubtedly harm the victim. A DDoS attack prediction system is therefore needed in order to address this situation, at the very least allowing the victim to take the initiative when a fresh attack is begun. The goal of the research is to develop a DDoS attack prediction using a hybrid of the LDA (Linear Discriminant Analysis) and CART (Classification and Regression Tree) machine learning algorithms. The "DDoS attack SDN Dataset" was the dataset utilized in this study. It contains 104,345 data points and 23 data attributes, including labels. From the experiment results, standard CART accuracy 98.64% and execution time 0.9s , and CART hybrid LDA accuracy 73.56% and execution time 0.3s.

# IoT-Based Smart Green Campus Leveraging Machine Learning

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## Abstract

For the well-being of all inhabitants of the planet and future generations, it is important to foster a green mindset. In order to increase the likelihood of a successful transition, the utilization of recent technological tools is fundamental. Green campus is about adopting practices that prioritize the protection and preservation of the ecosystems in universities. Smart green campus makes use of the recent technologies in an intelligent way in order to enhance effectiveness of the universities' sustainability initiatives. Smart involves the interconnection of technological devices, which is a feature of the Internet of Things (IoT) that allows real-time data acquisition via various sensors. This paper proposes a system that gathers data from the sensors via an IoT network in the university premises. These data can be used to assist the management of the university in the decision-making process. Prediction using Machine Learning (ML) is used for analyzing data and to gain further insights of the data. Thus, preventive actions can be formulated to, in turn, protect the environment based on the predictions. With the help of Streamlit, the real-time and prediction data are presented on a web application. This system aims to improve the usage of resources in an efficient and sustainable way for the day-to-day activities carried out in the campus.

# Intrusion Detection on Unmanned Aerial Vehicle (UAV) using Binary Decision Tree

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## Abstract

Intrusion Detection holds paramount significance in the realm of Unmanned Aerial Vehicle (UAV) operations, necessitating the deployment of robust and effective system methodologies. Among these methodologies, Binary Decision Tree stands out as a prominent technique within Intrusion Detection. With this context in mind, I aim to present the outcomes of my research pertaining to Intrusion Detection on UAVs, employing the Binary Decision Tree approach. The Binary Decision Tree method entails the integration of an algorithm into Machine Learning, which subsequently executes the algorithmic process. The findings derived from the UAV Intrusion Detection, employing the Decision Tree methodology, have demonstrated a remarkable level of accuracy, achieving a perfect score of 100% across all evaluated aspects within the datasets. In the testing phase, involving six distinct datasets, only two displayed aspect values slightly below 100%.

# A Study on the Implementation of YOLOv4 Algorithm with Hyperparameter Tuning for Car Detection in Unmanned Aerial Vehicle Images

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## Abstract

Unmanned Aerial Vehicles (UAVs) for surveillance and monitoring have become more prevalent due to their versatility and mobility. These vehicles capture high-resolution images that provide a broad field of view in real-time. Today, enhancing object detection accuracy on images captured by unmanned aerial vehicles (UAVs) has become a significant challenge. Through extensive research, it has been established that the correct setup of hyperparameters is imperative to achieving the highest accuracy in machine learning. Our study introduces a technique that utilizes hyperparameter tuning to implement the YOLOv4 algorithm, enabling the detection of cars in unmanned aerial vehicle images. In general, all scenarios of this study have different accuracy results, which have implications for their detectability. Thus, scenario 3 of YOLOv4 hyperparameter tuning is the best model accuracy. Our approach utilizes the PSU Aerial Car Images Dataset from previous studies. During this research, accuracy values were obtained through testing at the model validation stage rather than at the testing stage. In this study, we achieved a validation performance of the detection model by using a validation dataset proportion of 20%. Based on our research, it has been revealed that the YOLOv4 algorithm is a highly efficient car detection system when it comes to unmanned aerial vehicle images. Through rigorous testing of multiple hyperparameter tuning scenarios, we achieved an exceptional accuracy of 99.02% in the optimal model scenario, which utilized YOLOv4. Similarly, in replicating a research paper's hyperparameter tuning methods on YOLOv3, the highest accuracy of 98.40% was attained in scenario 2.

**THE END**

**Thank you for your participation and Support**