



The 8th International Conference on Computer Science and Computational Intelligence 2023

“Empowering Smart Technology in Digital Era
for Industry and Society”

School of Computer Science

Bina Nusantara University

2023

Publisher of the proceeding



Indexed by:



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Preface

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Wina Permana Sari^a, Milkhatussyafa'ah Taufiq^a, Santy^a, Margaretha Ohyver^a,
Kenny Jingga^a, Anderies^a

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The 8th International Conference on Computer Science and Computational Intelligence (ICCSCI 2023) is annual forum for researchers, engineers, and scientist to disseminate their knowledge and research on Computer Science, Computational Intelligence, and Information Technology. We are pleased to announce the theme of the ICCSCI 2023 is: 'Empowering Smart Technology in Digital Era for Industry and Society'. The conference warmly welcomes prospected authors to submit their research and idea to ICCSCI 2023 and share their valuable experiences with scientists and scholars around the world.

ICCSCI 2023 received 137 manuscripts from 5 countries, namely Indonesia, United Kingdom, Philipinne, Japan, and Malaysia. After a careful review process of 242 manuscripts, 130 manuscripts were accepted or approximately 53.72% rate of acceptance. These manuscripts are divided into seven tracks:

1. Intelligent System and Machine Vision
2. Software Engineering, Information Security and Networks
3. Big Data and Information Technology
4. Internet of Things and Robotics
5. Multimedia, Game Development, and Mixed Reality
6. Computational Linguistic and Audio Processing
7. Computing and Theoretical Computer Science

We would like to appreciate all participants, keynote speakers, reviewers, and committee for the contributions to the conference program and proceeding. We would like to express our gratitude to the reviewers for the valuable review and suggestion, so that we can maintain the quality of this proceeding very well. This conference is held in a successful collaboration between program committee and technical committee. We would like to thank Elsevier for supporting the publication of this conference proceeding.

We are looking forward for the next event in computer science and computational intelligence in the future.

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Keynote Speaker I

Development of Information and Communication Technology (ICT) in the Digital Era

Prof. Madya DR Mohamed Imran Mohamed Ariff

Universiti Teknologi MARA Perak Branch, Malaysia

Abstract

The digital era has witnessed an incredible evolution in Information and Communication Technology (ICT), transforming the way we communicate, work, and live. ICT encompasses a wide range of technologies such as computers, the internet, mobile devices, and more, enabling us to access information, connect with others, and conduct business with unprecedented ease and efficiency. In this talk, I will explore the development of ICT in the digital era, its impact on various sectors, and the exciting future trends that lie ahead.

Keynote Speaker II

Enabling Autonomic Internet of Things: Recent Advances, Evaluation Criteria and Future Research Directions

Tahir Mohammad, PhD, MSc, B.Tech

University of Turku, Finland

Abstract

The rise of the Internet of Things (IoT) has led to the deployment of small computing and data-transmitting devices across various technological domains. However, manually setting up and managing these devices on a large scale is impractical and inefficient. To address this issue, it is necessary to establish intelligent procedures that enable autonomy, allowing devices and networks to operate efficiently with minimal human intervention. While autonomic computing has proven effective in reducing user intervention in managing computer systems in the traditional client-server paradigm, implementing autonomic principles in IoT networks requires new approaches due to their diverse, distributed, and resource-limited nature.

This keynote presentation will delve into the fundamental principles of autonomic computing and their significance in the context of IoT. It will explore the self-* paradigm and the MAPE (Monitor-Analyze-PlanExecute) loop from an IoT perspective. Additionally, a set of qualitative characteristics will be discussed to evaluate the autonomic behaviour of an IoT system. Lastly, the challenges associated with achieving autonomic IoT and potential directions for future research will also be discussed.

Keynote Speaker III

Demystifying Interpretable Machine Learning: the Why and How

Dr. Ir. Yaya Heryadi, M.Sc., CDS., CDRAI.

Bina Nusantara University, Indonesia

Abstract

In this keynote speech, we will go into the field of interpretable machine learning to investigate the transformative potential of interpretable machine learning in the development of trustworthy and open artificial intelligence systems. Beginning with the difficulties black-box models face, we also emphasize the importance of openness and trust in the present AI ecosystem.

We emphasize the necessity of interpretable machine learning not only for improving accountability but also for assuring fairness, reducing biases, and ensuring moral decision-making. Applications in the real world, such as in healthcare, finance, self-driving cars, and criminal justice, underscore the necessity for interpretable models in drawing reliable results and building credibility across a range of disciplines.

We examine interpretable machine learning's how rather than just the why. We explore popular post-hoc interpretation techniques, including rule extraction, partial dependence plots, local interpretability tools, and feature importance, to elucidate the insights and justifications they offer. We highlight the importance of domain knowledge by illustrating how these techniques let us comprehend the inner workings of complex models without compromising accuracy.

In addition to introducing interpretable machine learning, we also discuss the drawbacks and restrictions of these techniques, such as the trade-off between complexity and interpretability. We do draw attention to ongoing research and potential strategies aimed at overcoming these constraints, opening the door for more reliable and scalable interpretable models.

Throughout the speech, we emphasize interpretable machine learning's critical role in fostering trust, fostering human-AI cooperation, and ensuring responsible AI deployment. An atmosphere where judgments are made ethically, fairly, and with the interests of society in mind is encouraged by increased transparency, which offers stakeholders the ability to validate, develop, and grasp AI systems.

Finally, the purpose of this presentation is to encourage and inspire specialists from other fields to use interpretable machine learning. By demystifying AI's ideas, uses, and methods, we may achieve the technology's full promise and build a future in which transparency, trust, and moral judgment are at the center of our intelligent systems.

Keynote Speaker IV

Toyota Global Cyber Security Best Practice

Abidin Riyadi Abie.

CIO – Toyota Astra Finance

Abstract

Cybersecurity attacks are becoming more common and sophisticated. Some examples of these attacks include phishing scams, ransomware attacks, and distributed denial-of-service (DDoS) attacks.

To combat these threats, a layered approach to cybersecurity is recommended. The peopleprocess technology approach is a layered approach to cybersecurity that involves people, processes, and technology working together to protect against cyber threats. The people component of this approach involves educating employees about cybersecurity risks, best practices for protecting against those risks, and who are the key persons responsible for cybersecurity. The process component involves developing policies and procedures for managing cybersecurity risks. The technology component involves implementing security technologies such as firewalls, intrusion detection systems, EDR, vulnerability management tools, patch management tools, etc, to protect against cyber threats. By combining people, processes, and technology into a single framework, organizations can create a layered defence that is more effective than any one component alone.

Toyota Astra Finance (TAF) as part of Toyota Group has implemented a cybersecurity framework based on The National Institute of Standards and Technology (NIST). The framework is based on four core functions: Identify, Protect, Detect, Respond and Recover.

The Identify function involves understanding the organization's cybersecurity risks and developing a plan to manage those risks. The Protect function involves implementing safeguards to protect against cyber threats. The Detect function involves monitoring the organization's systems for signs of a cyber-attack. The Respond function involves taking action to contain the attack and minimize the damage. Finally, the Recover function involves restoring normal operations after an attack.

Implementation example 1: Incident response is an important part of any cybersecurity program. It involves having a plan in place to respond to a cyber-attack quickly and effectively. This plan should include procedures for identifying and containing the attack, as well as steps for containing an attack and recovering from the attack.

Implementation example 2: Endpoint Detection and Response (EDR) and Security Operations Center (SOC) are two important components of a cybersecurity program. EDR involves protecting and

monitoring endpoints such as laptops and servers for signs of a cyber-attack. SOC involves monitoring an organization's network for signs of a cyber-attack using tools such as EDR, SIEM, etc.

Implementation example 3: Many researchers believe that people are the weakest link in cybersecurity. Securing people is a very important part of any cybersecurity program. This involves educating employees about cybersecurity risks and best practices for protecting against those risks.

GENERAL SCHEDULE

Day 1 – Wednesday, 2 August 2023

Onsite location: Aula Universitas BINUS Malang
 Jl. Araya Mansion No.8 - 22, Genitri, Tirtomoyo, Kec. Pakis,
 Kabupaten Malang, Jawa Timur 65154

Link Zoom: <https://binus.zoom.us/j/93838018205?pwd=VHBsNElsblc1MkdGSWp6YjNpdzA5Zz09>
 Meeting ID: 938 3801 8205
 Passcode: 010319

Time	Program Detail
08.15 – 08.45	Registration
08.45 – 09.00	Opening by Master of Ceremony (MC)
09.00 – 09.45	Opening Remark, Signing MoU, and Welcoming Speech 1. Opening remark by Dr. Robertus Tang Herman, S.E., M.M., Prof. Tirta Nugraha Mursitama, and Dr. Fredy Purnomo, S.Kom., M.Kom. 2. Signing Memorandum of Understanding (MoU) with academic partner: (1) UMM dan (2) PUP 3. Welcoming speech by Dr. Anita Rahayu, S.Si., M.Si
09.45 – 10.15	Opening performance and ceremony Photo Session
10.15 – 11.00	Keynote Speaker 1: Prof. Madya DR Mohamed Imran Mohamed Ariff – Universiti Teknologi MARA Perak Branch, Malaysia Moderator: Santy
11.00 – 11.15	Coffee break 1
11.15 – 12.00	Keynote Speaker 2: Dr. Ir. Yaya Heryadi, M.Sc., CDS., CDRAI. – Bina Nusantara University, Indonesia Moderator: Gusti Pangestu
12.00 – 13.00	Lunch break
13.00 – 15.00	Parallel Session 1
15.00 – 15.15	Coffee break 2
15.15 – 17.00	Parallel Session 2

Day 2 – Thursday, 3 August 2023

Onsite location: Aula Universitas BINUS Malang
 Jl. Araya Mansion No.8 - 22, Genitri, Tirtomoyo, Kec. Pakis,
 Kabupaten Malang, Jawa Timur 65154

Link Zoom: <https://binus.zoom.us/j/93838018205?pwd=VHBsNElsblc1MkdGSWp6YjNpdzA5Zz09>
 Meeting ID: 938 3801 8205
 Passcode: 010319

Time	Program Detail
08.30 – 09.00	Registration
09.00 – 09.15	Opening by Master of Ceremony (MC)
09.15 – 10.00	Keynote Speaker 3: Prof. Agus Harjoko, Drs., M.Sc., PhD. – Gadjah Mada University, Indonesia Moderator: Elizabeth Paskahlia Gunawan
10.00 – 10.45	Keynote Speaker 4: Tahir Mohammad, PhD, MSc, B.Tech – University of Turku, Finland Moderator: Abdul Haris Rangkuti
10.45 – 11.00	Coffee break 1
11.00 – 12.00	Keynote Speaker 5: Abidin Riyadi Abie. - CIO – Toyota Astra Finance Moderator: Dany Eka Saputra
12.00 – 13.30	Lunch break and networking
13.30 – 15.30	Parallel session 3
15.30 – 15.45	Coffee break 2
15.45 – 16.15	Closing Remark and Awarding Session 1. Closing remark by Choirul Huda, S.Kom., M.M. 2. Closing remark by Prof. Dr. Ir. Widodo Budiharto, S.Si., M.Kom., IPM., SMIEEE 3. Awarding session by Dr. Abdul Haris Rangkuti, S.Kom., M.M., M.Si.

PARALLEL SESSION SCHEDULE

Parallel Session I (Room 201)

Date/Time	Wednesday, 2 August 2023/ 13.00-15.00 WIB	
Onsite Location	Room 201	
Link Zoom	https://binus.zoom.us/j/99186973545?pwd=M1ZvdkttRXNHZit4dDBlUXQxK3k2dz09 Meeting ID: 991 8697 3545 Passcode: 977547	
Track	Intelligent System and Machine Vision (ISMV)	
Moderator	Dany Eka Saputra	
Paper ID	Author	Title
7225	Ida Bagus Kerthyayana Manuaba	A Comparative Analysis of Computer Vision Libraries in the Context of a Jakarta Traffic Simulator
	Thomas Dwi Dinata	
8386	Raphael William Theodore Tumewu	Using Machine Learning for the Prediction of Diabetes with Emphasis on Blood Content
	Matthew Maximillian Tane	
	Averina Nurdin	
	Kristen Margi Suryaningrum	
	Hanis Amalia Saputri	
7533	Mahmud Isnan	Indonesian Agricultural-crops Classification Using Transfer Learning Model
	Alam Ahmad Hidayat	
	Bens Pardamean	
7858	Yudy Purnama	Comparative Analysis of ARIMA and Prophet Algorithms in Bitcoin Price Forecasting
	Michael David Angelo	
	Ilhas Fadhiilrahman	
8327	Andrew Giovanni Gozal	SENTIMENT ANALYSIS OF THE INDONESIAN COMMUNITY TOWARD FACE- TO-FACE LEARNING DURING THE COVID-19 PANDEMIC
	Hady Pranoto	
	Muhammad Fikri Hasani	
8250	Nanda Pratama	Attention is Everything You Need: Case on Face Mask Classification
	Dody Harianto	
	Stefan Filbert	
	Harco Leslie Hendric Spits Warnars	
	Maybin K. Muyeba	
8251	Bayu Kanigoro	Drowsy Detection System by Facial Landmark and Light Gradient Boosting Machine Method
	Rojali	

Parallel Session I (Room 205)

Date/Time	Wednesday, 2 August 2023/ 13.00-15.00 WIB	
Onsite Location	Room 205	
Link Zoom	https://binus.zoom.us/j/91095628767?pwd=a00vUm1sVHpsVzZmb1pnYjFvTE9yUT09 Meeting ID: 910 9562 8767 Passcode: 738646	
Track	Intelligent System and Machine Vision (ISMV)	
Moderator	Alexander Agung Santoso Gunawan	
Paper ID	Author	Title
7712	Christiella Abinosy Setiawan	Gestive : Evaluation of Multi-Class Classification Methods for Gesture Recognition to Improve Presentation Experience
	Galang Nurbudi Utomo	
	Vianny Pangesa	
	Vierdaria Wijayanti	
	Vieri Ferdian Putra Basuki	
	Yuliani Hermanto	
	Silviya Hasana	
	Ivan Halim Permonangan	
8259	Angelina Patience Mulia	Usability Analysis of Text Generation by ChatGPT OpenAI
8261	Beatrice Josephine Filia	Improving Batik Pattern Classification using CNN with Advanced Augmentation and Oversampling on Imbalanced Dataset
	Filbert Fernandes Lienardy	
	I Kadek Perry Bagus Laksana	
	Jayasidhi Ariyo Jordan	
	Joyceline Graciella Siento	
	Shilvia Meidhi Honova	
	Silviya Hasana	
	Ivan Halim Permonangan	
8566	Putri Sari Asih	Interpretable Machine Learning Model For Heart Disease Prediction
	Yufis Azhar	
	Galih Wasis Wicaksono	
7713	Brigita Vanessa Salim	Face Shape Classification Using Swin Transformer Model
	Chyntia Chyntia	
	Jason Orlando Indrawan	
	Jessica Hidayat	
	Steven Matthew	
	Tesalonika Abigail Eikwine Mangkang	
	Silviya Hasana	
	Ivan Halim Permonangan	
8344	Rizaldi Ardika Mahendra P	Technique of Mental Health Issues Classification based on Machine Learning: Systematic Literature Review
	Kevin Irzam Rachmadiansyah	
	Sidharta	
8407	Ridan Lukita	DEVELOPMENT OF 3D SCANNER APPLICATION

	Faisal	WITH STEREO CAMERA FOR 3D OBJECT RECONSTRUCTION
	Hady Pranoto	

Parallel Session I (Room 310)

Date/Time	Wednesday, 2 August 2023/ 13.00-15.00 WIB	
Onsite Location	Room 310	
Link Zoom	https://binus.zoom.us/j/98680290349?pwd=TTNsaW5obXUrQmkvZTIWK0dOQTlsdz09 Meeting ID: 986 8029 0349 Passcode: 441181	
Track	Intelligent System and Machine Vision (ISMV)	
Moderator	Albert Verasius Dian Sano	
Paper ID	Author	Title
8368	Christian Carlos Tertius	Comparing Artificial Neural Network and Decision Tree Algorithm to Predict Tides at Tanjung Priok Port
	Jonas Steven	
	Hanis Amalia Saputri	
	Kristien Margi Suryaningrum	
8405	Marco Vito Christopher	Comparing Age Estimation with CNN and EfficientNetV2B1
	Abdul Wahid	
	Ghinaa Zain Nabiilah	
	Rojali	
8410	Meiliana	Systematic Literature Review on Implementation of Chatbots for Commerce Use
8318	Marcelino Hans Budi	Detection Sleep Stages Using Deep Learning for Better Sleep Management: Systematic Literature Review
	Bayu Ferdiman	
	Sidharta	
7516	Felix Indra Kurniadi	Comparing Local Binary Pattern and Gray Level Co-occurrence Matrix for Feature Extraction in Diabetic Retinopathy Classification
7480	David Liemanto Gunawan	A Novel Approach to Flexible Multi-Resolution Image Compression using Deep Learning Based Autoencoders on Overlapping Image Patch

Parallel Session I (Room 311)

Date/Time	Wednesday, 2 August 2023/ 13.00-15.00 WIB	
Onsite Location	Room 311	
Link Zoom	https://binus.zoom.us/j/91420970657?pwd=ZE1FNDRIMUVJVmlsdW85TE1CMENaUT09 Meeting ID: 914 2097 0657 Passcode: 844763	
Track	Internet of Things and Robotics (IOTR)	
Moderator	M. Aldiki Febriantono	
Paper ID	Author	Title
7743	Andi Pramono	Integrating IoT-Based Devices for Monitoring The Humidity and Temperature In the Boarding House Space
	Wenseslaus Daniel	
	Jordan Firman Wijaya	
	Natasha Putri Wijaya	
8255	Nurudin	Monitoring Applications for Vehicle based on Internet of Things (IoT) using the MQTT Protocol
	Arief Agus Sukmandhani	
	Muhammad Zarlis	
8265	Hadad Al Akbar	Guidance in Designing A Smart Campus : A Systematic Literature Review
	Muhammad Reza Faturrahman	
	Sidharta	
8281	Andi Sama	Acquiring Automation and Control Data in The Manufacturing Industry: A Systematic Review
	Harco Leslie Hendric Spits Warnars	
	Harjanto Prabowo	
	Meyliana	
	Achmad Nizar Hidayanto	
8328	Gunawan Wang	Designing Personalized Integrated Healthcare Monitoring System through Blockchain and IoT
	Aldian Nurcahyo	

Parallel Session I (Room 313)

Date/Time	Wednesday, 2 August 2023/ 13.00-15.00 WIB	
Onsite Location	Room 313	
Link Zoom	https://binus.zoom.us/j/99122135559?pwd=WkxvQUtIZkpmUjRybC9oTzVsdjVjUT09 Meeting ID: 991 2213 5559 Passcode: 375734	
Track	Big Data and Information Technology (BDIT)	
Moderator	Edy Irwansyah	
Paper ID	Author	Title
7290	James Lewi Duykers	Analyzing Factors for Supporting Early Warning Flood Using Clustering Approach
7497	Davin Pratama Chandra	Prediction of Stock Value Web-Scraped Google Trends and Twitter data-driven model
	Ida Bagus Kerthyayana Manuaba	
8322	Michael Libnao	Traffic Incident Prediction and Classification System Using Naïve Bayes Algorithm
	Marwin Misula	
	Christopher Andres	
	Jester Mariñas	
	Aleta Fabregas	
7747	Pristian Budi Dharmawan	Big Data Capabilities for Hospital: A Systematic Literature Review
	I Gusti Ayu Ngurah Stita Maharani	
	Cuk Tho	
7752	Nikodemus Thomas Martoredjo	Challenges of using internet-based social media as a learning tool in the digital age
8340	Calista Kalleya	Smart City Applications: A Patent Landscape Exploration
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	Evaristus Didik Madyatmadja	
	Meiryani	
	Mulyani Karmagatri	

Parallel Session I (Room 314)

Date/Time	Wednesday, 2 August 2023/ 13.00-15.00 WIB	
Onsite Location	Room 314	
Link Zoom	https://binus.zoom.us/j/96862837916?pwd=QmRmZnN4WGJZZUFKR2NXZkFIaXovUT09 Meeting ID: 968 6283 7916 Passcode: 524981	
Track	Computing and Theoretical Computer Science (CTC)	
Moderator	Anita Rahayu	
Paper ID	Author	Title
7517	Ali Gunawan	The Effect of Using Cashless (QRIS) on Daily Payment Transactions Using The Technology Acceptance Model
	Alifia Farrah Fatikasari	
	Selva Aisah Putri	
8311	Joko Pebrianto Trinugroho	Machine Learning Approach for Single Nucleotide Polymorphysm Selection in Genetic Testing Results
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	Mahmud Isnan	
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8246	Dedy Syamsuar	Path Planning Using the Bee Colony Algorithm to Find Routes for a Coffee Plantation Using Drones
	Deden Witorsyah	
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	Hanif Fakhurroja	
	Ahmad Luthfi	
	Muhammad Izman Herdiansyah	
8381	Juan Fabio Amos Kristensen Lumbantoruan	Developing a Poverty Model in Papua Using Geographically Weighted Regression
	Margaretha Ohyver	
	Jurike V Moniaga	
8282	Alam Ahmad Hidayat	Utilizing Semi-supervised Method in Predicting BRCA1 Pathogenicity Variants
	Joko Pebrianto Trinugroho	
	Rudi Nirwantono	
	Digdo Sudigyo	
	Bens Pardamean	

Parallel Session II (Room 201)

Date/Time	Wednesday, 2 August 2023/ 15.15-17.00 WIB	
Onsite Location	Room 201	
Link Zoom	https://binus.zoom.us/j/99186973545?pwd=M1ZvdkttRXNHZit4dDBlUXQxK3k2dz09 Meeting ID: 991 8697 3545 Passcode: 977547	
Track	Computational Linguistic and Audio Processing (CLAP)	
Moderator	Elizabeth Paskahlia Gunawan	
Paper ID	Author	Title
7276	Mahmud Isnain	Sentiment Analysis for TikTok Review Using VADER Sentiment and SVM Model
	Gregorius Natanael Elwirehardja	
	Bens Pardamean	
8273	Tora Sangputra Yopie Winarto	Tackling Clickbait with Machine Learning: A Comparative Study of Binary Classification Models on YouTube
	Kevin Wijaya	
	Muhammad Abdullah Faqih	
	Simeon Yuda Prasetyo	
	Yohan Muliono	
7463	Ilvico Sonata	Topic Segmentation Using Transformer Model for Indonesian Text
	Yaya Heryadi	
	Cuk Tho	
8302	Renante Galdo Bahala	Spider Plus: A Text Classifier for Research Article Components
	Ria Sagum	
8283	Felicia Angelica	DeepLyric: Predicting Music Emotions through LSTM-GRU Hybrid Models with Regularization Techniques
	Zefanya Delvin Sulistiya	
	Romington Hydro	
	Yuda Simeon Prasetyo	
	Yohan Muliono	

Parallel Session II (Room 205)

Date/Time	Wednesday, 2 August 2023/ 15.15-17.00 WIB	
Onsite Location	Room 205	
Link Zoom	https://binus.zoom.us/j/91095628767?pwd=a00vUm1sVHpsVzZmb1pnYjFvTE9yUT09 Meeting ID: 910 9562 8767 Passcode: 738646	
Track	Computational Linguistic and Audio Processing (CLAP)	
Moderator	Gusti Pangestu	
Paper ID	Author	Title
8304	Ria Ambrocio Sagum	Philippine Supreme Court Case Summarizer using Latent Semantic Analysis
	Rey Edison R. Cayetano	
	Airis Dale F. Lobrio	
8335	Albert Verasius Dian Sano	Proposing a Visualized Comparative Review Analysis Model on Tourism Domain Using Naïve Bayes Classifier
	Evaristus Didik Madyatmadja	
	Corinthias P. M. Sianipar	
	Hendro Nindito	
	Agung Purnomo	
	Adriel Anderson Stefanus	
8366	Kenneth Filbert	Emotion Detection in Textual Data using Deep Learning
	Daniel Yohanes	
	Jessen Surya Putra	
	Hanis Amalia Saputri	
	Kristien Margi Suryaningrum	
8402	Mario Sebastian Santoso	A Comparative Analysis of Decision Tree and Support Vector Machine on Suicide Ideation Detection
	Jovan Jonathan Suryadi	
	Kevin Marchellino	
	Ghinaa Zain Nabiilah	
	Rojali	
8565	Merinda Lestandy	Exploring the Impact of Word Embedding Dimensions on Depression Data Classification Using BiLSTM Model

Parallel Session II (Room 313)

Date/Time	Wednesday, 2 August 2023/ 15.15-17.00 WIB	
Onsite Location	Room 313	
Link Zoom	https://binus.zoom.us/j/99122135559?pwd=WkxvQUtIZkpmUjRybC9oTzVsdjVjUT09 Meeting ID: 991 2213 5559 Passcode: 375734	
Track	Big Data and Information Technology (BDIT)	
Moderator	Wina Permana Sari	
Paper ID	Author	Title
8244	Riyan Leandros	Minor Program Mapping based on Multiple Intelligences with Cluster Analysis Approach
	Bambang Dwi Wijanarko	
	Dina Fitria Murad	
	Rosilah Hassan	
	Sunardi	
8316	Muhammad Asrol	Improving Supplier Evaluation Model using Ensemble Method-Machine Learning for Food Industry
	Sofyan Wahyudi	
	Suharjito	
	Christian Harito	
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7730	Gregorius Natanael Elwirehardja	Determining Variables Associated with Annual Oil Palm Yield: An Explainable Gradient Boosting Approach
	Teddy Suparyanto	
	Miftakhurrokhmat	
	Bens Pardamean	
8329	Nurrahmi Mauliddiah	Implementation Graph Database Framework for Credit Card Fraud Detection
	Suharjito	
7545	Dedy Ariansyah	Digital Twin (DT) Smart City for Air Quality Management
	Mahmud Isnani	
	Reza Rahutomo	
	Bens Pardamean	

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Date/Time	Wednesday, 2 August 2023/ 15.15-17.00 WIB	
Onsite Location	Room 314	
Link Zoom	https://binus.zoom.us/j/96862837916?pwd=QmRmZnN4WGJZZUFKR2NXZkFIaXovUT09 Meeting ID: 968 6283 7916 Passcode: 524981	
Track	Computing and Theoretical Computer Science (CTC)	
Moderator	Rojali	
Paper ID	Author	Title
7678	Muhammad Fajar	The Adjusted SNR and It's Application for Selection Lorenz Function of Income Inequality Analysis
	Setiawan	
	Nur Iriawan	
8257	I G.A. Anom Yudistira	R PACKAGE DEVELOPMENT TO SUPPORT DISCRETE EVENTS SIMULATION LEARNING
	Rinda Nariswari	
	Sevien	
8563	Ilyas Masudin	Analysis of Financial Technology User Acceptance Using the Unified Theory of Acceptance And Use Of Technology Method (Case Study: Tokocrypto)
	Dian Palupi Restuputri	
	Darry Billy Syahputra	
8564	Dana Marsetiya Utama	A modified beluga whale optimization for optimizing energy-efficient no-idle permutation flow shop scheduling problem
8567	Thomy Eko Saputro	Determining the Objective Importance Weight of Green Manufacturing Indicators: A Case Study of the Indonesian Manufacturing Company

Parallel Session III (Room 201)

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Track	Software Engineering, Information Security, and Networks (SEIN)	
Moderator	Nyoman Wira Prasetya	
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7205	Crisdeo Nuel Siahaan	Study of Cross Site Request Forgery on Web Based Application: Exploitations and Preventions
	Mario Rufisanto	
	Raymond Nolasco	
	Said Achmad	
	Chrisando Ryan Pardomuan Siahaan	
7220	Adora Vania Permana	The Utilization of Mobile Communication on Marketing: A Systematic Review
	Agung Purnomo	
	Haryadi Sarjono	
	Fairuz Iqbal Maulana	
	Etsa Setiyati	
7221	Muhammad Alfarizi	Adoption Of Cash on Delivery (COD) Payment System in Shopee Marketplace Transaction
	Rini Kurnia Sari	
7674	Cornelius Mellino Sarungu	Android Based Job Search Application Megawe for The Segment of Workers with Education Level Below a University Degree
	Jingga Saka Asa	
	Daisy Tamara	
	Odiab Bumma	
8409	Meiliana	Agile Software Development Effort Estimation based on Product Backlog Items
7835	Bayu Kanigoro	A Review of Security in Financial Technology
8331	Kevin Wijaya	Steganography Image with Dynamic Encryption Key Generation
	Bryan Lansky	
	Cecilia Ariani Dewi	
	Rojali	
	Ghinaa Zain Nabiilah Time-Based	
8337	Oey, Kevin Andrian Santoso	Rust's Memory Safety Model: An Evaluation of Its Effectiveness in Preventing Common Vulnerabilitie
	Catherine Kwee	
	William Chua	
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	Rojali	

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Date/Time	Thursday, 3 August 2023/ 13.30-15.30 WIB	
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Track	Multimedia, Game Development, and Virtual Reality (MGDV)	
Moderator	Dany Eka Saputra	
Paper ID	Author	Title
7236	Elisha Gracia Huang	Deafvoir : Recognizing Sign Language Through Game
	Yudhistya Ayu Kusumawati	
	Elizabeth Paskahlia Gunawan	
8241	Jonathan Apriliano Saputra Boediono	Markerless augmented reality application for Indonesian traditional house education
	Muhammad Rizqi Aulia	
	Fairuz Iqbal Maulana	
8310	Muhammad Akbar Rahman	The Effectiveness of Augmented Reality Using Flash Card in Education to Learn Simple English Words as a Secondary Language
	Rosyidan Rouf Faisal	
	Cuk Tho	
7218	Ronald Sumichael Sunan	Feasible Technology for Augmented Reality in Fashion Retail by Implementing a Virtual Fitting Room
	Samuel Christopher	
	Novandy Salim	
	Anderies	
8274	Adam Fawazzaky Fardy Andreean	Exploring of Emotional Character in Online Games Toward Player
8247	Jazlyn Jan Keyla Latif	Design and Development a Virtual Planetarium Learning Media using Augmented Reality
	Michael Awarsa Kesuma	
	Augustinus Adrian Triputra	
	Fairuz Iqbal Maulana	
8387	Aldo Arista Wijaya P	Implementing Augmented Reality to Address Cultural Appropriation Issue
	Daniel Hendra Susanto	
	Felix Juwono Purwoko	
	Kanz Abdillah Hamada	
	Frihandika Permana	

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Link Zoom	https://binus.zoom.us/j/98680290349?pwd=TTNsaW5obXUrQmkvZTIWK0dOQTlsdz09 Meeting ID: 986 8029 0349 Passcode: 441181	
Track	Multimedia, Game Development, and Virtual Reality (MGDV)	
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Paper ID	Author	Title
7266	Daniella Oktalina Manalu	Developing Nusantara Mobile Application to Support Local Tourism in Indonesia
	Yudhistya Ayu Kusumawati	
	Cuk Tho	
7562	Ali Gunawan	Application of Virtual Reality in Diverse Fields of Study in Education Sector: A Systematic Literature Review
	Nivendy Wiranito	
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8268	Muhammad Naufal Sinai Harjana	A review of the potential use of mixed reality learning methods in comparison to traditional methods
	Hanley Yunanda Saputra	
	Cuk Tho	
8025	Riyan Leandros	User Experience Satisfaction Analysis of Customers on the BRI Mobile Application (BRImo)
	Nurul Sinta Elysa	
	Lintang Arini	
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8237	Daniel Kevin Kurniawan	Augmented Reality of Historical Relics in the British Museum
	Steven Sademi	
	Fairuz Iqbal Maulana	
8239	Bayu Ferdiman	Development of Augmented Reality Application in Physics through Newton's Laws and Object Interaction
	Hadad Al Akbar	
	Muhammad Reza Faturrahman	
	Fairuz Iqbal Maulana	
8240	Kharisma Indiarito Putra	Implementation of Augmented Reality in Study for Human Anatomy
	Patrick Jeremiah Lere Dawa	
	Yoss Dewangga Burgos	
	Fairuz Iqbal Maulana	

Parallel Session III (Room 311)

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Onsite Location	Room 311	
Link Zoom	https://binus.zoom.us/j/96935141282?pwd=SDVYMDdIcWhlWlVnK2pRblc3ajlZdz09 Meeting ID: 969 3514 1282 Passcode: 868149	
Track	Multimedia, Game Development, and Virtual Reality (MGDV)	
Moderator	Milkhatussyafa'ah Taufiq	
Paper ID	Author	Title
7214	Maevy Marvella	Implementation of Augmented Reality in Indonesian Tourism for Android Based Application
	Nissa Adila Hakim	
	Priskilla Adriani Seciawanto	
	Anderies	
	Andry Chowanda	
7240	Edi Sugianto	3D Modelling Building of District Johar Baru Using Arcgis Pro and CityEngine
	Johan Fernando Hosea	
	Bakti Amirul Jabar	
	Edy Irwansyah	
	Devi Fitriana	
7571	Nikolaus Hasudungan Tamba	The Effect of Educational Platformer Game "Loving Ma" on Adolescent Gadget Addiction
	Billy Andrian	
	Vincenzo	
	Yanfi	
	Pualam Dipa Nusantara	
7259	Muhammad Farrel Revikasha	Building 3D Object Model for Tourism in Monas using CityEngine
	Thoriq Wima Adiputra	
	M. Ilham Hudaya	
	Heri Ngarianto	
	Edy Irwansyah	
7216	Rendy Adidarma	The Application of Augmented Reality to Generate Realistic Interaction in The Property Sector
	Maximillian Lemuel Chanyassen	
	Alexander Imanuel	
	Anderies	
	Andry Chowanda	
7222	Christoper Lim	Online Learning Platform Analysis During COVID- 19 Pandemic in Indonesia
	Martin	
	Made Adi Adnyana	
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	Rhio Sutoyo	

ABSTRACT LIST

The Adjusted SNR and It's Application for Selection Lorenz Function of Income Inequality Analysis

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The formulation of signal-to-noise ratio (SNR) does not take into account the number of parameters used in the model, which can result in capturing intense noise when the number of predictor variables increases. Additionally, there is currently no probabilistic mechanism for comparing the model goodness measure values (in this case, adjusted SNR) of two candidate models used to select the best model. The research objective is to construct an adjusted SNR that accounts for the effect of the number of parameters used in the functional form of a model and establish a Lorenz function selection procedure using the adjusted SNR. The adjusted SNR is constructed by combining SNR and adjusted R^2 (R_{adj}^2), while the Lorenz function selection procedure is formed through a bootstrap mechanism. The proposed methods are applied to household consumption expenditure in Banten Province in 2020, the total income of employment per household in Ghana in 1998, and household income in South Africa in 2015, sourced from BPS-Statistics Banten Province of Indonesia, the Ghana Statistical Service, and Statistics South Africa, respectively. The adjusted SNR developed in this research can be used in empirical practice and addresses the weakness of SNR in not accounting for the number of parameters in the model. Selecting the Lorenz function through bootstrap using the adjusted SNR to measure model goodness-of-fit is a fundamentally new way of analyzing income inequality.

Keywords: measure; signal-to-noise ratio; model selection; bootstrap; Lorenz curve; income; inequality.

Path Planning Using the Bee Colony Algorithm to Find Routes for a Coffee Plantation Using Drones

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Hanif Fakhurroja^a, Muhammad Izman Herdiansyah^d

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The selling value of coffee depends on the level of maturity of the beans. The coffee plantation in Alam Indah village, Bandung district covers an area of 84 hectares or approximately 840,000 square meters, making it difficult for farmers to monitor the condition of each coffee plant individually. The objective of this paper is to provide a path planning using the bee colony algorithm to find the best routes for a coffee plantation. There are several monitoring techniques for coffee, one of which is using a drone equipped with image processing. In this research, path planning was carried out to determine the fastest route that a drone can take using the bee colony algorithm. The path planning was divided into two areas that have been adjusted to the operational capabilities of the DJI Phantom 4 drone type. The determination of the best route was carried out based on the neighborhood principle using the calculation of the highest fitness value. Each iteration entered the employed bee phase, onlooker bee phase, and scout bee phase. The result shows that there are 24 blocks that need to be passed through. Area 1 can be covered in 18.4 minutes and area 2 in 13.4 minutes at a speed of 30 km/h and a drone altitude of 10 meters. The fastest route in area 1 passes through blocks A-B-C-D-E-F-M-N-O-P-Q-L-K-G, while in area 2, the fastest route passes through blocks I-J-R-T-U-X-W-V-S-H.

Keywords: Path planning; Bee Colony; Plantation; Coffee; Optimization; Drone

R Package Development to Support Discrete Events Simulation Learning

I Gusti Agung Anom Yudistira^a, Rinda Nariswari^a, Sevien^a

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This study aims to describe the various capabilities of the simmer package for R, particularly when running a discrete event simulation model. It then develops a technique for building effective DES simulation models that accurately represent real systems and examines the simulation output on this simmer, both in statistical summary form and parameter estimation. The literature review method with descriptive and exploratory methodologies was employed in this study. When starting with simple models and progressing to more complicated forms step by step while explaining the system with a flow chart, model development is more successful. It is simple to replicate simulations in order to obtain standard error values for model parameter estimators. Creating a discrete event simulation in stages.

Keywords: simulation, discrete, R-package, event.

Utilizing Semi-supervised Method in Predicting BRCA1 Pathogenicity Variants

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Quantifying the effect of mutations in the BRCA1 gene is useful for understanding their clinical consequences on breast cancer. Machine learning models can be applied to predict the landscape of protein variant effects that might not be always accessible by experiments. In this work, we propose a simple semi-supervised learning method using a Gaussian mixture model to predict ~90% of the unlabeled missense variants of the BRCA1 gene collected from the ClinVar database. High-quality embeddings are used as a feature of the protein sequences, extracted using the latest pre-trained transformer-based language protein model. A statistical test show that the protein embeddings are effective and robust for predicting pathogenicity. Further, the lower representations of the features are then fed into the semi-supervised model. The prediction performance of the model only for the labeled testing data achieves an AUC score and an accuracy of 79.27% and 71.58%, respectively. Using our defined pathogenic probability score, we find that ~94% of variants in our unlabeled dataset are well-separated into either benign or pathogenic classes according to that scoring. Our scores obtain a moderate Spearman rank correlation with the results of established unsupervised variant effect models. Finally, our approach can potentially be developed for more accurate and biologically reliable predictions of the variant effects.

Keywords: embeddings; mutation effect; language model; protein sequence; semi-supervised learning

Machine Learning Approach for Single Nucleotide Polymorphism Selection in Genetic Testing Results

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^cComputer Science Department, BINUS Graduate Program, Bina Nusantara University, Jakarta 11480, Indonesia

Lactose intolerance is a type of digestive problem that may threaten the population because milk and dairy products compose of nutrients that are essential for human body. Genetic tests possess a great potential to detect lactose intolerance as it can be used in children and even infants. However, a new approach to analyze the genetic test results is needed to elucidate the Single Nucleotide Polymorphisms

(SNPs) that are related to lactose intolerance. In this work, we utilized the machine learning based feature selection to select the SNPs associated with lactose tolerance trait from genotyping samples of direct-to-customer (DTCG genetic tests, obtained from the public database. Recursive Feature Elimination (RFE) with XGBoost model was used to perform feature selection. We also compared three different models, such as XGBoost, support vector machine (SVM), and random forest (RF) for training the selected features. Our findings revealed that 20 SNPs (out of 3501) were chosen, with rs4394668 as the most important variables (F-score 0.009). Furthermore, when compared to the RF and SVM models, the XGBoost model had the highest accuracy (0.87). Further studies should be undertaken to elucidate how the selected SNPs may lead to the lactose intolerance trait.

Keywords: lactose intolerance, SNP, genetic test, feature selection,

A modified beluga whale optimization for optimizing energy-efficient no-idle permutation flow shop scheduling problem

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Attention to energy-efficient permutation flow shop scheduling problems is increasing in the context of globalization and environmental awareness. However, the energy-efficient no-idle permutation flow shop scheduling problem (NIPFSP) has rarely been studied. This study proposes a procedure using Beluga Whale Optimization (BWO) to solve the energy-efficient NIPFSP issue to reduce total energy consumption (TEC). The offered procedure is tested using four job and machine variations and compared with the PSO algorithm. An independent sample t-test was performed to test the optimization results of the BWO and PSO in 4 cases. The results indicate that the offered procedure produces lower total energy consumption than the PSO algorithm. In addition, the algorithm also provides more competitive results when solving the energy-efficient NIPFSP problem with a larger number of jobs. The implications of this academic research show that the proposed procedure can be applied to solve the problem of energy-efficient NIPFSP, which is indicated by low energy consumption.

Keywords: beluga whale optimization, flow shop, energy-efficient, scheduling

Determining the objective weight of green manufacturing indicators: a case study of the Indonesian manufacturing company

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With the growing of environmental issues, manufacturing companies are compelled to improve their performance to reduce resource consumption and environmental pollution. Accordingly, company's performance should be measured according to the green manufacturing indicators. The importance of the indicators must be determined properly aligned with the company's goals and profiles. This study aims to determine the weight of green manufacturing indicators which becomes the critical input for green performance evaluation. Different weighting methods including entropy and CRiteria Importance Through Inter-criteria Correlation (CRITIC), are integrated using Decision-Making Trial and Evaluation Laboratory (DEA) to determine the final weight. A case study of the Indonesian manufacturing company is presented to illustrate the application of the proposed method. The result indicates that process technology, compliance of environmental quality standards, and operational standards are considered critical in green manufacturing.

Keywords: Green manufacturing; green performance indicators; entropy weight; CRITIC; DEA

Monitoring Applications for Vehicle based on Internet of Things (IoT) using the MQTT Protocol

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^bInformation Systems Management Department, BINUS Graduate Program - Master of Information Systems Management, Bina Nusantara University, Jakarta, Indonesia 11480

Monitoring of vehicle conditions is needed as one of the securities in driving because one of the accident rates is negligence in checking the condition of the vehicle. This study aims to help reduce the level of accidents and increase human awareness for vehicle conditions, especially minibus type vehicles. The system works to provide information on the condition of vehicles sourced from the Engine Control Unit (ECU). ECU data cars are obtained by SNIP traffic broadcast message and ask for data directly at the ECU. The car can provide vehicle information using a Canbus communication protocol through the OBD-II socket. Vehicle information can be seen by users through the website in real time. Based on the evaluation from the user side, this system provides ease of monitoring vehicle conditions because it can be accessed via the internet using various kinds of devices.

Keywords: OBD-II, Blackbox, Sstem Logging, ECU ;

Guidance in Designing A Smart Campus : A Systematic Literature Review

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With the latest development in information technology, smart campuses have become a topic that attracts attention in the world of education, especially in higher education. The smart campus has the potential to change the way of managing, accessing facilities, and teaching and learning process. The smart campus can collaborate various latest technologies such as edge computing, blockchain, deep learning, virtual reality, and other trend recent technologies. Therefore, this research is a guideline for developing an effective and efficient smart campus system with the latest information and communication technology. This paper explains smart campus technology, features, architecture that have been implemented in real life. Thirty-two papers will be analyzed using the Systematic Literature Review (SLR) method. Hopefully, this guideline can be a valuable reference for smart campus designers, researchers, and practitioners interested in developing innovative and efficient smart campus systems.

Keywords: Smart Campus; Guideline; Architecture; IoT Technology; Systematic Literature Review.

Study of Cross-Site Request Forgery on Web-Based Application: Exploitations and Preventions

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Cross-Site Request Forgery (CSRF) is a prominent web exploit that continues to pose significant security risks, even on highly ranked websites. This research focuses on identifying the underlying vulnerability, understanding the techniques employed, and proposing effective preventive measures. The hybrid method which is systematic report review method and lab-based scenarios method is conducted to identify CSRF exploitation and prevention mechanisms. Using a scenario-based testing approach, this study investigated the cause and effect of CSRF attacks, uncovering numerous techniques for exploiting this vulnerability. Based on the report review, 35 CSRF vulnerability reports from the Hacker one Bug Bounty Platform are analyzed. The result shows there is a lack of awareness and implementation of primary defenses, resulting in a high violation of end-user data integrity. The result also extensively describes some of the profound causes and effects of CSRF attacks and uncovers a broad range of techniques for exploiting this vulnerability. Furthermore, this study provides actionable recommendations to enhance system security and raise awareness among developers and users. The findings from this research serve as a valuable resource for improving security practices and mitigating CSRF attacks.

Keywords: cross-site request forgery, web exploitation, vulnerability

The Utilization of Mobile Communication on Marketing: A Systematic Review

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The advancement of mobile communication technology with entrepreneurial minds is advancing, and its use is increasingly playing an important role in business, marketing, and life. However, there are not many studies that focus on the role of mobile communication in the business world, especially those that focus on marketing. The purpose of writing this paper is to determine the status of research and the relationship between mobile communication in the field of marketing. The method used in this research is systematic literature review using the PRISMA protocol, involving 29 articles. Through quantitative analysis, we found that many years of article publication occurred mostly in 2020 due to the development of 5G technology. Australia is the largest article producing country in the world because many researchers are trying to examine public acceptance of mobile communication technology. The use of mobile communication is also mostly used in the marketing and segmentation processes in multilevel firm level marketing with multipoint mobile communication. On the other hand, articles with a marketing perspective that discuss price issues have never been discussed.

Keywords: Entrepreneurship; marketing; systematic review.

Adoption Of Cash on Delivery (COD) Payment System in Shopee Marketplace Transaction

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Everyone is connected to the internet, everyone now believes in buying and selling activities on the internet, and at this time the internet world has a fairly well-maintained security. The growth of marketplace platforms such as Shopee makes it easier for people to make purchases only from home. The Cash on Delivery (COD) payment system is an option for people who want easy direct payments. The COD payment method has many benefits, especially in avoiding fraud. Consumers, upon seeing the advantages, have found that this method also has drawbacks, one of which involves the phenomenon of not wanting to pay for the delivered product and blaming the courier. SEM-based quantitative studies were applied in analytic exploration of the factors that influence the acceptance of Cash on Delivery Payment Methods on Shopee Marketplace customers with an online survey by obtaining 368 respondents.

This study uses the theory development of UTAUT and Privacy Security System. This research resulted in a statement influence of social, hedonic motivation, price value, habits, information quality and privacy security systems on behavioral intentions will encourage the sustainable use of the COD system.

Keywords: Marketplace; Cash on Delivery; Payment; Privacy Security

Rust's Memory Safety Model: An Evaluation of Its Effectiveness in Preventing Common Vulnerabilities

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Ensuring safe program operation is crucial for systems programming, and memory safety is a significant aspect of this. This paper assesses the memory safety strategies used in Rust and C++ programming languages. Rust is a modern language that has become popular due to its focus on safety, performance, and concurrency, whereas C++ is known for its efficiency and low-level programming capabilities. The analysis compares and contrasts the memory safety features of both languages, including Rust's ownership and borrowing model and C++'s manual memory management techniques. Additionally, the study examines the development tools available for both languages and compares ease of use and productivity. The analysis shows that Rust has several memory safety advantages over C++. Rust's ownership and borrowing model enables safe memory management without requiring manual intervention. By enforcing strict rules for memory usage, the compiler in Rust prevents typical memory-related errors like null and dangling pointers. However, in contrast to Rust, C++ provides more low-level hardware control but needs manual memory management, exposing it to memory errors such as buffer overflows and memory leaks. Moreover, Rust's memory safety features simplify the development of secure and dependable code, especially for applications with crucial security requirements. In contrast, C++ demands significant memory management expertise to avoid memory-related errors. In conclusion, Rust offers several memory safety benefits over C++, making it a superior choice for applications with critical safety needs. However, the selection of language ultimately depends on the specific project requirements and the development team's experience and preferences.

Keywords: Rust programming Language; Memory Safety; C++ Programming Language; Software; Security; Systems Programming

Indonesian Agricultural-crops Classification Using Transfer Learning Model

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Classification of Indonesian crops is a critical task in developing farming and getting more understanding of agriculture. However, there is no clear task in classifying types of crops in Indonesia. Transfer learning has been used successfully in a variety of image classification applications. Thus, in this paper, we collected images of Indonesian crops from the internet randomly and proposed a classification by using transfer learning of deep learning with four pre-trained models: EfficientNet-B0, ResNet18, VGG19, and AlexNet. In the experiment, augmentation techniques such as random horizontal flip, random vertical flip, and random affine were utilized to prevent the network from overfitting. The result found that EfficientNet-B0 outperformed other models with an accuracy of 82.55. Then, the model struggled to distinguish between crops in the same family. According to the results, although transfer learning can work well to classify images of Indonesian agricultural crops, some improvements are still required to address existing issues.

Keywords: Agriculture, Classification, Crop, Deep Learning, Transfer learning

Technique of Mental Health Issues Classification based on Machine Learning: Systematic Literature Review

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Mental health issues are focused on extensively and are an immense part of human life. As a result, formulating effective approaches for early detection and intervention is critical. Machine Learning algorithms have demonstrated promising results in clustering and categorizing mental health disorders in recent years. This research is using a clustering approach to categorize and detect diverse patterns of mental health disorders among teenagers. To develop guidelines and selection of relevant articles for our paper, we follow PRISMA literature review guidelines. We also evaluated each Machine Learning model, including SVM, NGBoost, KNN, RNN, SGD, DT, RF, XGBoost, and logistic regression. The result is that XGBoost delivers very satisfying build results. However, there is another algorithm, namely LGBM, which is no less satisfying than XGBoost.

Keywords: Machine Learning; Mental Health; Systematic literature review;

Item Verification on the Smart Trolley System using Object Recognition based on the Structural Similarity Index

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Supermarket customers often encounter significant delays during checkout due to manual verification processes, wherein items are removed from the cart, handed over to the cashier, and individually scanned. To address this inefficiency, this paper introduces the design and development of an automatic payment system as part of a smart trolley solution aimed at expediting the verification process. Our goal is to develop an automatic moving trolley with smart payment devices to solve the problem. This system features a web-based payment application, which allows customers to scan their items using a barcode reader while shopping. After shopping, customers can review and confirm their items in the trolley and proceed to an exit room. Here, each item is individually verified using a camera and purchase finalization occurs. Our item verification method leverages object recognition using deep learning and similarity measurement with the structural similarity index (SSIM), which compares detected items to images stored in the supermarket's database. Our findings suggest the successful implementation of the proposed method and demonstrate that verification using the SSIM is a better alternative to traditional procedures.

Keywords: item verification; smart trolley; supermarket; object recognition; structural similarity index; payment system

Topic Segmentation using Transformer Model for Indonesian Text

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The increasing number of articles available in the digital library will require quite a long time and accuracy in sorting articles according to needs. The use of artificial neural networks in finding the right articles as needed through topic segmentation applications will help this process in terms of speed and accuracy. Several neural network models used in segmentation topic applications include Recurrent Neural Networks (RNN), Convolutional Neural Networks (CNN) and Long Short-Term Memory (LSTM). The Transformer model since its introduction in 2017 for Natural Language Processing (NLP) has a better level of accuracy compared to the RNN, CNN and LSTM models. Transformer model research for segmentation topic applications, especially articles in Indonesian language, is still very

limited. This paper will discuss the use of the Transformer model in segmentation topic applications for Indonesian-language articles. The experimental results found that the accuracy produced by the Transformer model was higher than previous LSTM model with the WindowDiff value generated by the model proposed using Transformer is 0.249 and the LSTM baseline model is 0.363, while the P_k value generated by the proposed model is 0.279 and the LSTM baseline model is 0.394.

Keywords: CNN; LSTM; RNN; Topic segmentation; Transformer

Sentiment Analysis for TikTok Review Using VADER Sentiment and SVM Model

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TikTok, a social networking site for uploading short videos, has become one of the most popular. Despite this, not all users are happy with the app; there are criticisms and suggestions, one of which is reviewed via the TikTok app on the Google Play Store. The reviews were extracted and then used for training a sentiment analysis model. The VADER sentiment method was utilized to offer the review's initial labeling (positive, neutral, and negative). The result revealed that most reviews were classified as positive, meaning that the data were imbalanced and challenging to handle in further analysis. Therefore, Random Under-sampling (RUS) and Random Over-sampling (ROS) methods were deployed to deal with that condition. The labeled reviews were subsequently pre-processed using tools such as case folding, noise removal, normalization, and stopwords before being used for training a Support Vector Machine (SVM) model for sentiment classification. The SVM trained without resampling produced the most favorable results, with an F1-score of 0.80.

Keywords: Sentiment Analysis; TikTok; SVM; VADER Sentiment; Google Play Store

Spider Plus: A Text Classifier for Research Article Components

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Uploading research articles to a database can be a complex process with multiple HTML fields. The complexity of this process makes users less efficient and productive. This study explored the use of the Multilayer Perceptron (MLP) algorithm using language-independent features (count and Boolean features) to create a multi-class text classifier that can classify 10 research article components (e.g., title,

authors, abstract, etc.). The text classifier was developed to pave the way for a streamlined manual data entry process for uploading research articles to a database by implementing a single textarea in favor of using multiple HTML fields. The text samples were obtained from multiple sources using web scraping technology, consolidated, cleaned, and standardized. The 12 language-independent features were generated based on the textual formats of sample texts (e.g., count of capitalized letters, digits, punctuation, checking the existence of a URL pattern, etc.). Recursive feature elimination with cross validation (RFECV) was used to determine the optimal number of input features. The hyperparameter values of the model were determined through the grid search technique. A trial-and-error process was conducted to determine the number of hidden layers. The model achieved 95%, 94%, and 95% scores for micro, macro, and weighted average f1-scores, respectively. The model performed well in classifying research article components. However, it is sensitive to textual format (e.g., lower or upper case, punctuation used, etc.). For subsequent research in this area, this study recommends investigating the use of both language-dependent and language-independent features to address the limitations of the current model.

Keywords: research article components; multilayer perceptron; artificial neural network, multiclass text classification, language-independent features

Agile Software Development Effort Estimation based on Product Backlog Items

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In all methods of Agile Software Development methods, an estimation process which determines the size of all Product Backlog Items (PBI) is essentially important. One of those methods is Planning Poker. This method is familiar among developers in the globe and one of the famous analogy-based estimation techniques known. In Planning Poker, the goal is to have a consensus vote on how big a product backlog should be. This consensus is reached via open discussion. As discussion is involved, many aspects of human errors could cause problems such as: anchoring effect and overconfidence which often leads to underestimation. To comprehend this, we offer an AI method that can be applied alongside the discussion to minimize this human error factors. We will be using NLP and ANN to classify a Product Backlog Item based on previous projects. The aim is individual estimate given by the AI that is free from influence from human to give better estimation. The result is expected at above 90% accuracy to give the best performance.

Keywords: agile; ANN; effort estimation; neural network; NLP; planning poker

Android Based Job Search Application “Megawe” for The Segment of Workers with an Education Level Below a University Degree

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Indonesia is a vast market for talents recruiting, with around 203 million people that count into work age definition (above 15 years) and around 138 million of them are workforce, while 7 percent of the workforce are open for hire. There are several players of job-seeking apps in Indonesia. But most of them are targeting talents with undergraduate degrees and above. Mid to high-level jobs have become such an attractive market for these players. We can see it on several job seeker hub websites, where job seekers proudly post their personal profiles to attract recruiters from top employers. It is not possible for lower-level job seekers to post their profiles on these websites. They will just be under the recruiter's radar. Whereas from the report data released by the Indonesian statistical center bureau regarding the percentage of open unemployment based on education level, the total unemployment rate from diploma education and below is very large compared to the unemployment rate with university education (undergraduate and above). The Covid-19 pandemic also gave a negative impact on the lower job segment, with a decrease in demand and sales resulting in a higher layoff rate which also means an increased percentage of the open unemployment rate. We need a solution to this problem. A solution that can erode a large chunk hidden under an iceberg. This paper offers “Megawe”, a mobile application-based solution to assist both job seekers and low-level job recruiters. This segment may have a smaller contract value than upper segments but has a much larger quantity of labor force. Because we are focusing on development speed and accuracy of requirements, we used the prototyping methodology in the implementation of the solution. Moreover, before it is launched publicly, we conducted usability testing to gain a deeper understanding of the user experience directly from users of the targeted segment.

Keywords: mobile app; job search; usability testing

Integrating IoT-Based Devices for Monitoring The Humidity and Temperature In the Boarding House Space

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Boarding houses provide the service of renting out living quarters. A good boarding house maintains a pleasant temperature and humidity level. High humidity may damage the interior and the people who live in it; therefore, it must be monitored more closely. Simpang Kost is the boarding house the author used as an object of research on monitoring temperature and humidity using an application called Smart Life. The goal of this study is to use IoT-based sensors to monitor and automatically solve temperature and humidity concerns in various rooms. Smart temperature and humidity sensors are IoT-based. This device

measures the temperature and humidity in the room. According to the collected data, three categories of rooms have issues with high humidity presentation levels, so the authors offer several solutions to address these issues. The dehumidifier functions as an actuator, starting when the humidity in the room rises and stopping when the humidity in the room reaches the standards. An exhaust fan is also linked to an IoT-based smart breaker and serves as an actuator. When the room temperature rises above a certain threshold, this tool will activate and turn off automatically.

Keywords: Temperature, Humidity, IoT, Boarding House

Acquiring Automation and Control Data in The Manufacturing Industry: A Systematic Review

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Industry 4.0 has driven the need for Information Technology (IT) & Operational Technology (OT) convergence to modernize OT by leveraging IT. The challenges for manufacturing operations are utilizing and converting years of scattered data into valuable information integrated into the company's digital transformation strategy. This paper aims to provide a systematic literature review of current evidence in digital transformation for acquiring automation & control technologies data in manufacturing operations, such as Programmable Logic Controller (PLC), Supervisory Control and Data Acquisition (SCADA), Distributed Control System (DCS), and Manufacturing Execution System (MES), for analytics purposes and identify the current trends and best practices in this area. The findings cover current information on influential researchers, published journals, research trends, industries, industry types, types of analytics applications, methods, and frameworks for acquiring automation & control technologies data from the legacy OT infrastructure.

Keywords: Industry 4.0; Operational Technology; PLC; SCADA; MES; Data Acquisition; IT/OT convergence; Manufacturing.

Designing Personalized Integrated Healthcare Monitoring System through Blockchain and IoT

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Personalised Integrated Healthcare Monitoring System (PIHMS) has received major attention from the healthcare industry. With large population and strong growth of Indonesian middle class, PIHMS is certainly a big market for major healthcare providers. Although Indonesia has strong growth of middle-class, ironically, it is not supported with adequate physician ratio. Indonesian Ministry of Health (MoH) reported in 2020 the ratio of physicians per 1.000 patients is 0,62, far below WHO standard. As consequence, many Indonesian patients prefer to go abroad to have better healthcare services. The article supports the government's initiative to develop PIHM design by implementing IoT devices and blockchain networks. The use of PIHMS is essential to reach large patients that spread in remote areas, that suits to Indonesian condition. The article proposes PIHM based on blockchain solution (MedDApp) that enables to utilise IoT devices to carry out remote monitoring and medical consultation. The article examines the use of blockchain architecture to support developing data interchange between patients, healthcare providers and third parties such insurances and ministry of health (MoH). Data gatherings from respective stakeholders from Data and Information Centre division (*Pusdatin*), MoH and state-own hospitals to support developing smart health care architecture (MedDApp). The MedDApp design is expected to provide secure access between patients with healthcare professionals and third parties (national insurance companies and researchers in MoH). The outcome of the article is expected to be used as a reference for major healthcare providers to provide better services for their large patients.

Keywords: Personalised Integrated Healthcare Monitoring (PIHMS); IoT devices; blockchain networks;

Time-Based Steganography Image with Dynamic Encryption Key Generation

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The rapid advancement of technology has necessitated stronger protection measures for data exchange. Encryption, coupled with robust keys, is an effective method to safeguard sensitive information. This study aims to improve the security of key levels by implementing a combination of steganography and encryption. The approach involves using two keys, one in the form of a normal string and the other based on the insertion time. These keys are combined to create a new, stronger encryption key. The secret messages are then encrypted using this new key and inserted using the Least Significant Bit method in steganography. This integrated approach aims to provide a higher level of protection for data during transmission and storage.

Keywords: Type your keywords here, separated by semicolons ;

Developing a Poverty Model in Papua using Geographically Weighted Regression

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Poverty is one of the world's main problems, which has been very difficult to overcome. The poverty rate has influences on economic growth in an area. The greater the poverty rate in an area, the more difficult it is for an area to grow economically. Many factors affect the level of poverty. Geographical location, level of education, population growth in each region, significantly affect the poverty level. The many factors that affect the poverty level make it difficult for us to predict which factors will influence the level of poverty in an area, making it difficult for us to solve the problem. This research was made to predict what factors influence the level of poverty in Papua, Indonesia. This study uses a Geographically Weighted Regression (GWR) method due to the existence of spatial heterogeneity. It produces model estimates that are local for each location and different from other locations to get a model with the most influential factors in each region. The results of this study are as follows. First, agricultural employees affected the poverty rate in each location in Papua. Second, house area and households with access to safe water are significant variables in Yapen, Biak Numfor, and Supiori.

Keywords: Geographically Weighted Regression; Poverty; Papua; Spatial Heterogeneity

Prediction of Stock Value Web-scraped Google Trends and Twitter data-driven model

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The World Bank and many financial analysts predicted that a global recession could occur in 2023. The unpredictability of the global economy, including stock prices, can have a negative impact on people's financial situation. Nonetheless, some investors may view this as an opportunity to purchase stocks at reduced prices with increased risk. Before investing, technology can help people conduct research and formulate strategies. This study aims to develop a predictive model to forecast the current stock price based on historical stock data, web-scraped Google Trends, and the number of daily tweets data. In addition, the objective of this study is to identify the optimal algorithm among Linear Regression, Decision Tree Regressor, and Random Forest. Thus, it has been demonstrated that historical stock data, Google Trends, and the number of daily tweets can be correlated with the current stock price. In addition, the Linear Regression algorithm-trained predictive model has the highest R2 score and the lowest Mean Absolute Error, Mean Squared Error, and Root Mean Squared Error.

Keywords: invest; stock price; stock prediction; predictive model; regression; web scraping; Twitter; Google Trends

Determining Variables Associated with Annual Oil Palm Yield: An Explainable Gradient Boosting Approach

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With the growing demands for Precision Agriculture (PA) in Indonesia, researchers have evaluated the utilization of Machine Learning for predicting oil palm yields and determining variables affecting them. Previous studies showed that meteorological variables, including rainfalls and wind speed, are associated with oil palm yields. In this research, the Extreme Gradient Boosting (XGBoost) model and the Shapley Additive exPlanations (SHAP) were deployed for analyzing the importance of 15 agrometeorological variables in predicting oil palm yield. The best model attained 1.911 RMSE and 0.855 R^2 . By analyzing the weights and gains of the XGBoost model along with the SHAP values, it was found that the yield in the previous year, the age and number of plants, the area of peat lands, and meteorological parameters such as rainfall rates and the number of rainy days in the previous three years were considered important. The previous year's yield in particular possesses the greatest weight and gain values according to the model, and the highest SHAP value among all input variables. However, the meteorological data used in this research are only limited to rainfall rates and the number of rainy days. In the future, more diverse variables can be analyzed.

Keywords: Oil Palm Yield; Machine Learning; XGBoost; XAI; SHAP

Big Data Capabilities for Hospital: A Systematic Literature Review

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The use of Big Data (BD) is considered to have the potential to provide significant benefits for hospitals because it can improve hospital services and can save treatment costs. This study aims to identify the effects of using BD Analytics (BDA) in improving hospital performance, including the key factors to determine the effectiveness of BD in improving the effectiveness of hospital performance, the data

sources needed, the utilization of BD in improving patient satisfaction, and the challenges that can hinder the use of BD as the factors to determine the capabilities of BD. Implementing the PRISMA concept to conduct a Systematic Literature Review (SLR) of relevant literature by identifying the selection of relevant data sources, determining inclusion and exclusion indicators, extracting data from selected papers, evaluating the quality of the papers, and analyzing data using the meta-analysis method. Through this process, the authors examined 111 papers from various database sources and found 24 papers for further research. The results of this study indicate that from 24 papers, the data source to conduct data analysis is the main key factor to determine the capabilities of BD for hospitals which affect the further analysis of BDA. It was also found that several challenges hindering the use of BD need to be overcome to maximize the use of BD. However, there were limitations in the data sources used in the study. Therefore, it is necessary to review policies and infrastructure and utilize more varied data sources to maximize the use of BD and decision support systems in hospitals.

Keywords: Big Data; Big Data Analytics; Hospital; Healthcare

Tackling Clickbait with Machine Learning: A Comparative Study of Binary Classification Models for YouTube Title

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Clickbait is a form of internet content whose function is to attract attention and entice users to click on a link. Its main goal generally is to generate more advertisement revenue for the creator. Clickbait is featured heavily on all kinds of social media, especially YouTube where there is a strong financial incentive to do so. Clickbait content constitutes 47.56% of content from mainstream broadcast media and US companies spent an average of 9.8% of their advertising budget on clickbait contents. Clickbait classification is the first and most important step in resolving the proliferation of clickbait content. Contributing to this, we aim to detect YouTube clickbait videos by building several binary classification machine learning models trained on an open-sourced dataset of 31.987 English YouTube video titles from GitHubGist to differentiate between clickbait or non-clickbait YouTube titles. The machine learning models are based on Naïve-Bayes, Support Vector Machine (SVM), and Long Short-Term Memory (LSTM) Network, with the final objective to compare each model's resulting effectiveness. The best-performing resulting model from this study is a kernel TF-IDF SVM model scoring 98.53% on accuracy, precision, recall, and f1-score which outperforms the past experiments that is using the same models.

Keywords: clickbait; machine learning; Naïve-Bayes; SVM; LSTM;

Improving Supplier Evaluation Model using Ensemble Method- Machine Learning for Food Industry

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Supplier evaluation plays a crucial role in maintaining the performance of the food industry supply chain. Machine learning approaches can be employed to formulate models aimed at analyzing and evaluating supplier performance. Previous research has successfully designed artificial neural network and decision tree models for supplier evaluation in the food industry with accuracies of 92.8% and 84.2% separately. Recognizing the opportunity to improve the model's performance, this study aims to enhance the performance of machine learning models for the analysis and evaluation of suppliers in the food industry. Two main models are proposed to improve the performance of the model: ensemble methods and support vector machine. This research has successfully designed a supplier evaluation model and demonstrated that the ensemble method - gradient boosting model outperforms other ensemble methods and support vector machine. It achieved a gradient of 93.6% on a 10-fold cross-validation dataset. For further research, the development of a dashboard is required to implement the supplier evaluation model using machine learning, facilitating decision-makers in evaluating and controlling supplier performance.

Keywords: Ensemble Method; Food industry; Machine Learning Supply chain Supplier evaluation.

Exploring the Impact of Word Embedding Dimensions on Depression Data Classification Using BiLSTM Model

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Depression is a mental health issue that impacts over 300 million individuals worldwide. Daily anxiety impacts the relationships of depressed individuals with their family and friends, affects their health, and, in the worst-case scenario, leads to suicide. Due to the an increase of social networks, a vast majority of people now express their thoughts, feelings, and emotions via social media. The researchers mainly focused on features and building predictions, making it difficult for them to detect depression via social

media. Word embedding offers a potential solution for processing and transforming unstructured data into meaningful representations. Embedded words represent textual data as numeric numerals with equivalent meaning. Using the Bidirectional Long Short-Term Memory (Bi-LSTM) paradigm, this investigation attempts to experiment with various weighting dimensions using the Word2Vec and GloVe methods. The data used is Depression: Reddit Dataset labelled: depressed and non-depressed. The experimental results of word weight dimensions using Word2Vec with a dimension of 500 are better than Glove. The results of accuracy, precision, recall and f1-score for the Word2Vec method were 96.22%, 97.02%, 95.30% and 96.15%, while the Glove method was 95.91%, 96.40%, 95.30% and 95.85% with a dimension of 200. Overall, Word Embedding Dimensions influences the results of this study. Based on these findings, it is concluded that the proposed Word2Vec method is a significant approach.

Keywords: Social Media ; Depression ; Word Embedding ; BiLSTM

Improving Supplier Evaluation Model using Ensemble Method- Machine Learning for Food Industry

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Supplier evaluation has a crucial role in maintaining efficiency in the food industry supply chain. Machine learning approaches can be employed to formulate models aimed at analyzing and evaluating supplier performance. Previous research has successfully designed decision tree and neural network models for assessing suppliers in the food industry with accuracies of 84.2% and 92.8% separately. Recognizing the opportunity to improve the model's performance, this study aims to advancing the machine learning models accuracy for analyzing and evaluating suppliers in the food industry. Two main models are proposed to enhance model accuracy: ensemble methods and support vector machine. This research has successfully designed a supplier evaluation model and demonstrated that the ensemble method - gradient boosting model outperforms other ensemble methods and support vector machine which is achieved a accuracy of 93.6% on a cross-validation dataset. The development of a dashboard is required to implement the supplier evaluation model using machine learning, facilitating decision-makers in evaluating and controlling supplier performance.

Keywords: Ensemble Method; Food; Machine Learning Supply chain Supplier evaluation.

Traffic incident prediction and classification system using naïve bayes algorithm

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The research paper proposes a Traffic Incident Prediction and Classification System using Naïve Bayes Algorithm (TIPCS) to proactively predict and classify traffic incidents, which can lead to improved incident management and traffic flow. The system utilizes real-time traffic data, including location, date and time, and Traffic incident prediction is the task of using historical and real-time data to forecast the occurrence of traffic incidents, such as accidents, congestion, or road closures, in the future. The system aims to determine whether an incident is likely to occur or not and to classify it accordingly. The system is trained on historical incident data and is continuously updated with new data to improve its accuracy over time. The Naïve Bayes Algorithm is used for incident prediction and forecast, by utilizing this algorithm, TIPCS can accurately predict and classify incidents at 70.03% accuracy. The proposed study has the potential to significantly improve incident management and traffic flow, ultimately benefiting both transportation officials and road users.

Keywords: Naïve Bayes Algorithm; Incident Prediction; Traffic Incidents in Metro Manila; Classification and Prediction System

Implementation Graph Database Framework for Credit Card Fraud Detection

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Credit card use is becoming more and more commonplace every day. Financial organizations and credit card customers lose a lot of money because of complicated illegal transactions. Fraudsters constantly stay on top of new technology to quickly perpetrate fraud against customer transaction patterns. We analyze credit card transaction networks and identify suspicious patterns, such as transactions connected to multiple accounts or unusual transaction patterns, transactions made at unusual times, and to monitor credit card transactions in real-time and quickly identify suspicious transactions. TigerGraph is used to analyze data, display results on a dashboard, and send notifications via email. One meth`\'

Ve 1`\'3-od commonly used in anomaly detection is to compare data values against the standard deviation. In this research, we explain the use of TigerGraph as a platform for anomaly detection above the standard deviation, as well as the use of the Louvain algorithm in finding merchant communities used

by fraudsters. The data used in this study comes from Sparkov simulation data obtained from Kaggle. Our results show that by using TigerGraph, we managed to achieve a very high accuracy rate of 99.77%, precision 82.84%, recall 72.38%, and f1-score 77,26% in predicting transaction fraud on Sparkov simulation data. This is much better than the results reported in a paper that uses the supervised machine learning method with the AdaBoost algorithm which achieves the highest accuracy of 77%.

Keywords: Credit card fraud detection, TigerGraph, Dashboard, Alert

A Comparative Analysis of Computer Vision Libraries in the Context of a Jakarta Traffic Simulator

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Traffic management is essential for preventing traffic congestion and regulating traffic flow. Jakarta has implemented several methods to reduce traffic congestion in response to the growing number of vehicles on the road. This study proposes integrating computer vision and fuzzy logic into traffic lights for use in traffic management. The study focuses on comparing and implementing three computer vision libraries: ImageAI, Cloud Vision, and OpenCV Libraries. This comparison is based on Jakarta traffic data captured by closed-circuit television (CCTV). After evaluating the libraries, the result indicates the ImageAI achieves better performance than the other libraries across testing measurements and it was used to develop a module simulator. This simulator was used to compare the amber time produced by each lane at a simple intersection under fixed time versus proposed-actuated traffic lights. The simulation of the proposed actuated traffic light scenario demonstrates that the use of computer vision and fuzzy logic in the decision-making process can marginally improve traffic simulation compared to the fixed-time traffic light scenario. This study illustrates the application of computer vision and fuzzy logic to traffic management. The application of these technologies to traffic lights has the potential to increase traffic flow and decrease congestion.

Keywords: Traffic management, Traffic congestion, Computer vision, Fuzzy logic, Traffic lights

A Novel Approach to Flexible Multi-Resolution Image Compression using Deep Learning Based Autoencoders on Overlapping Image Patch

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Compressing images using a deep-learning-based autoencoder usually can only work for images of a fixed size. This causes problems since the images might be in various sizes. This paper proposes a novel

approach that can be applied in real-life based on a patching algorithm for a given image. This algorithm aims to crop the image into smaller ones that can fit into our autoencoder model so that a single autoencoder model can be used for images with diverse sizes. The proposed approach was tested on a few autoencoder types (Vanilla, Deep Convolutional, and Variational Autoencoder), and it was found that different types of autoencoder impact the quality of the recreated images based on PSNR (Peak signal-to-noise ratio), MSE (Mean squared error), and SSIM (Structural Similarities). In our research we found that for PSNR and MSE, Variational Autoencoder got highest score among other design, with average of 21 PSNR and 1300 MSE Score and Deep Convolutional Autoencoder gives the best results in SSIM score among all other types of autoencoders with SSIM Score rate average at 0.5, when implemented in our system.

Keywords: Autoencoder image compression; deep learning-based autoencoder; image patching; image compressions methods.

Comparing Local Binary Pattern and Gray Level Co-occurrence Matrix for Feature Extraction in Diabetic Retinopathy Classification

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Diabetic retinopathy, a condition characterized by retinal damage and vision loss, is a prevalent complication of diabetes arising from elevated blood sugar levels. With a growing number of individuals affected, efficient and accurate diagnosis is crucial. This study aims to implement and compare the Local Binary Pattern (LBP) and Gray Level Co-occurrence Matrix (GLCM) feature extraction techniques, which have demonstrated success in prior research. The comparison will provide a comprehensive understanding of the image features, extract relevant data, and improve the performance of the image analysis pipeline for diabetic retinopathy classification. The result showed that from three scenarios the best accuracy provided by Support Vector Machine with the accuracy score between 73% until 74%, however, other algorithm have little difference which the result on 73%.

Keywords: Diabetic Retinopathy; GLCM; LBP; Computer Vision

Gestive : Evaluation of Multi-Class Classification Methods for Gesture Recognition to Improve Presentation Experience

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Gesture recognition is able to transform how we interact with technology, including during presentations. We aim to classify slide-control gestures and create a model that allows users to add their personalized gestures to to control presentation commands. To avoid wasting time on capturing and training the model, we aim to construct a model with a short training time and high accuracy. We assessed the efficiency of various multi-class classification methods for gesture recognition in presentation settings. We compared K-Nearest Neighbor (KNN), Support Vector Machine (SVM), Decision Tree, Linear Discriminant Analysis (LDA), and Random Forest. The results demonstrated that KNN offers the shortest training time while maintaining high accuracy. The findings of this study provide a basis for future research on gesture recognition technology and its implementation to improve presentation experience.

Keywords: gesture recognition; multi-class classification; training time; k-nearest neighbor, support vector machine; decision tree; linear discriminant analysis; random forest

Attention is Everything You Need: Case on Face Mask Classification

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Automated face mask classification has surfaced recently following the COVID-19 mask wearing regulations. The current State-of-The-Art of this problem uses CNN-based methods such as ResNet. However, attention-based models such as Transformers emerged as one of the alternatives to the status quo. We explored the Transformer-based model on the face mask classification task using three models: Vision Transformer (ViT), Swin Transformer, and MobileViT. Each model is evaluated with a top-1 accuracy score of 0.9996, 0.9983, and 0.9969, respectively. We concluded that the Transformer-based model has the potential to be explored further. We recommended that the research community and industry explore its integration implementation with CCTV.

Keywords: Face Mask Classification; Convolutional Neural Network; Attention; Transformer; Deep Learning

Usability Analysis of Text Generation by ChatGPT OpenAI Using System Usability Scale Method

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The development of artificial intelligence systems has resulted in various AI products including ChatGPT, which is a new product classified as a chatbot. This research aims to ensure that text generation systems such as ChatGPT open AI have the best level of quality and usability and are able to provide a satisfying experience for users. To measure and evaluate the effectiveness, efficiency and user satisfaction of the ChatGPT platform, researchers used the System Usability Scale (SUS) method. This data collection was carried out using an online questionnaire. After the collected data has been tested for validity and reliability, the researchers then analyzed the data results. From the results of the research conducted, the SUS value of the ChatGPT platform is 67.44. This score is included in the marginal high category of class D, with a reasonable or sufficient interpretation. With the results of the analysis per question item, it shows that users tend to agree that the system runs quite effectively, efficiently, well and is easy to understand. Although ChatGPT is able to perform tasks or commands well. However, it should be noted that not all information loaded by ChatGPT is presented in a complete, current and correct manner. This is because the information presented by ChatGPT is only limited to 2021. Because ChatGPT is a new technology and is still under development, further researchers are expected to test other features or ChatGPT to ensure the stability and reliability of the entire ChatGPT system using other research methods.

Keywords: Text Generation; Artificial Intelligence; ChatGPT; System Usability Scale; Questionnaire; SUS; Usability Analysis; OpenAI

Detection Sleep Stages Using Deep Learning for Better Sleep Management: Systematic Literature Review

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Sleep is a passive activity that has a major impact on our bodies. Sleep is also a fundamental necessity in life. Given that in this day and age many changes have occurred due to the impact of COVID-19. A study says a person's high level of stress can be bad for health because his sleep patterns become bad. The impact of poor sleep patterns can threaten a person's physical, mental and psychological health. So, a solution is needed to improve sleep patterns, namely by using a sleep tracker. This study used a Systematic Literacy Review based on a review proposed by Kitchenham. Adopting the Kitchenham method guidelines aims that the research carried out not only provides sufficient evidence but provides

the best and rigorous evidence of research results. To detect the stages of sleep which are divided into 5 stages, namely wake (Wake), N1, N2, N3 and N4 (REM) and diagnose sleep disorders can utilize various sensors such as electroencephalogram (EEG), Electrooculogram (EOG), Electrocardiogram (ECG), Electromiogram (EMG), and can be combined with various other signals such as breathing and using Polysomnography (PSG) signals to examine and diagnose sleep disorders. Researchers think that learning methods or analysis created by Deep Learning technology can provide good lead that can help track a person's sleep history into several sleep phases. Also, it can track sleep disorders experienced by users, however, the process towards improving the quality of sleep time of a user or patient remains their personal responsibility.

Keywords: Deep Learning; Sleep Tracker; Sleep Management; Systematic literature review;

Sentiment analysis of the Indonesian community toward face-to-face learning during the Covid-19 pandemic

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This research aims to analyze how the opinions of the Indonesian people in the learning system in the middle of the covid-19 pandemic. The research method is carried out by performing the K-NN method to determine the accuracy level of the data used. The research data method is taken through public comments on Twitter social media using scrapping techniques with appropriate keywords. The data will then be processed through training and testing and classified using the K-NN method. After the data is classified, the accuracy, F1-Score, Recall, and Precision level will be tested using Confusion Matrix. The result showed that KNN performed well, with above 70% of the F1-score for each class. According to the confusion matrix, accuracy also showed promising results with 82%. Future research may include oversampling the class with fewer numbers. K-Fold cross-validation can also be used to see the general performance of the model. The same method may be used to find sentiment towards a political policy that is taken; whether a policy gets a good or bad response, if the response is bad, you can see the causal factors that cause the negative sentiment. In this way, you can find out the will of the public.

Keywords: sentiment analysis; face to face learning; k-nn;

Comparing Artificial Neural Network and Decision Tree Algorithm to Predict Tides at Tanjung Priok Port

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Tanjung Priok Port is an international port in Indonesia located in Tanjung Priok, North Jakarta. For all activities carried out at Tanjung Priok Port to run smoothly, this research was made which aims to predict the height of tides using the Artificial Neural Network (ANN) and Decision Tree methods with a quantitative approach. Artificial Neural Network (ANN) is a technique inspired by the way the biological nervous system works, namely in brain cells in processing information received by humans. while Decision Tree is also known as a decision tree which is an algorithm for building a decision hierarchy structure. The process of making a Decision Tree starts from the Root Node to the Leaf Node which is done recursively. This research was conducted to predict the height of tides in January 2018 - June 2018. By using both methods that have been computed, the ANN method produces a smaller MSE value than the Decision Tree method. The ANN method produces an MSE value of 0.003727983. While the Decision Tree method produces an MSE value of 0.009870259. If the dataset used has larger amount of data and the architecture of each algorithm is more complex, then the calculation results obtained will be more accurate.

Keywords: Tidal prediction; Artificial Neural networks; Decision tree.

Comparing Age Estimation with CNN and EfficientNetV2B1

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Age estimation from facial images is a challenging topic in computer vision since it can automatically label the human face with an exact age according to various physical or biological characteristics, such as facial structure, spots, and wrinkles. Additionally, it has substantial applications in many fields, including healthcare, security, entertainment, and education. There are a lot of techniques to estimate age, but the most popular one is the convolutional neural network (CNN), which offers high accuracy but needs a lot of training time and much more labeled data to achieve it. Another popular technique is transfer learning with feature extraction, which can provide higher accuracy with faster training time because it uses a pre-trained model rather than building one from scratch but has limited flexibility and a substantial risk of overfitting. Due to the advantages and disadvantages of both methods, this study analyzes and compares the effectiveness of transfer learning and CNN methods for age estimation from facial images. Using R-squared and RMSE as test metrics, the results show that the CNN method offers a better process and accuracy than the transfer learning method, with a higher R-squared value and a lower RMSE value.

Keywords: age estimation; convolutional neural network; transfer learning; facial images;

Development of 3D Scanner Application with Stereo Camera for 3D Object Reconstruction

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Visual perception in RGBD (Red-Green-Blue and Depth) camera technology allows the camera to provide color image and depth structure information simultaneously from the surface of the scanned object. Based on this technology, data from an RGBD camera can be processed to reconstruct the scanned object in a three-dimensional (3D) model. However, devices that are prebuilt to perform this task with good accuracy are expensive and are only intended for 3D scanning tasks. On the other hand, some multi-purpose depth cameras can be used for 3D scanning but require some tweaks to ensure a good and accurate reconstructed model. A method has been proposed to optimize the camera and reconstruction system to compile RGBD information from recorded close-up objects and process them into a full-scale 3D digital model. This process involves developing the appropriate recording method along with settings and adjustments for scanning and model reconstruction of close-range objects. As a result, information from multi-purpose RGBD camera can be reconstructed in three-dimensional form that accurately represents real-life objects. The reconstructed model can be utilized for applications that rely on real-life objects as their main basis. The proposed method enables the use of inexpensive multi-purpose RGBD cameras for 3D scanning.

Keywords: RGBD; 3D scan, reconstruction

Systematic Literature Review on Implementation of Chatbots for Commerce Use

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The digitalization of businesses proves to create more opportunities for big and smaller businesses to expand their businesses through the internet. Customer engagement is more prevalent due to internet accessibility making businesses scramble for solutions to reach out to more customers and retain them. Chatbots have been the most popular solution chosen by businesses for e-commerce. The technological advancements in Chatbots itself have made chatbots more humanlike, accurate and easier to create. This paper presents the existing implementations of chatbots and the usages. Chatbot technology isn't good enough to allow even big businesses to develop a 100% accurate chatbot. However, chatbot technology has advanced enough in the form of chatbot platforms. Chatbot platforms provide smaller businesses an easy way to create and implement chatbots to their business without needing or with minimal knowledge

of coding. Which means everyone has an opportunity to create their own chatbot for their needs with condition that they are willing to put some time in it compared to before were businesses need experts to develop a chatbot from scratch.

Keywords: Chatbot; E-Commerce; Systematic Literature Review; Conversational Agents; Artificial Intelligence.

Interpretable Machine Learning Model For Heart Disease Prediction

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In the medical industry, accurately predicting a patient's likelihood of heart disease requires a high-performance model and explaining how the model arrived at its conclusion. To address this, a study has proposed a way to interpret machine learning models using SHAP and LIME. Four models have been created: Vector Machine, Random Forest, XGBoost, and k-Nearest Neighbor. The SVM and XGBoost models exhibit the highest f1-score performance, reaching up to 88%. These models can then be utilized during the interpretation stage with the aid of SHAP and LIME. Based on the SHAP visualization results, it is evident that the predictions made include various significant variables. Meanwhile, LIME explains the classification of each data point. Additionally, it confirms that SHAP and LIME are valuable tools for interpreting models.

Keywords: interpretable machine learning; SHAP; LIME

Unsteady State Temperature Distribution Inside House Based on Slope Roof

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The house is a building that serves as a place to gather with family and also to get comfort. The house is designed so the occupants can feel aesthetically and functionally comfortable. It will be interesting to discuss the temperature inside the house as one of the comfort factors. The study aims to analyze the temperature conditions inside the house, which are influenced by the slope of the roof. A two-dimensional unsteady state heat equation represents this temperature since the temperature distribution satisfies the heat transfer concept and changes over time. This governing equation will be approximated by the forward time center space scheme as one finite difference method and completed by the quadratic ghost point method since the house domain is an irregular shape. Van Neumann criteria are applied here to analyze the stability of the computational approach for this numerical scheme.

Furthermore, these schemes are implemented in MATLAB application to quantitatively and visually display temperature dynamics. Some simulations completed these approximations to see temperature variations over time. The results show that the bigger slope causes the average temperature to be cooler. In other words, the temperature in the house will be more comfortable when the roof slope gets bigger.

Keywords: unsteady state heat equation; ghost point; finite difference method; slope roof.

Artificial Intelligence Based Automatic Live Stream Chat Machine Translator

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In the world of live streaming, language barrier in the live chat remains an issue as people from any language can gather in one live stream, making it harder to understand what each other has said in the chat. The issue becomes more relevant as many major live streaming platforms still do not have automatic live stream chat translation as their feature. To tackle this issue, the author has built the deep learning models that can perform the automatic translation on the live stream chat's incoming English messages to Indonesian and outgoing Indonesian messages to English. These models follow the architecture of Seq2Seq model, an encoder for encoding the input and a decoder for predicting the translation. On both of the encoder and decoder, LSTM variant of the RNN is used to learn the important features of a sentence sequentially. Bidirectional language model allows the sentence to be processed in both directions. Global attention network helps the decoder in finding contextual information from the encoder for the prediction.

Keywords: Seq2Seq Model; LSTM-Variant RNN; Bidirectional Language Model; Attention Network; Machine Translation.

Emotion Detection in Textual Data using Deep Learning

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Technological advancement is something we can no longer ignore, deep learning being one of those advancements. With deep learning, emotions can be extracted and analyzed in textual data to be utilized in various sectors, involving human behavior analysis. The main objective of this paper is to investigate and discover basic emotional categories that are typically exhibited by humans, such as sadness, joy, anger, fear, and disgust. Sectors focused on business can utilize emotion detection for various

applications, such as to create personalized services, and in medical scenarios to help develop specialized mental treatments. This paper enables other researchers to enrich their knowledge and develop a more accurate and efficient deep learning model. To create an emotion detection model, analysis regarding the best performing model has to be done. This paper discusses the difference in performance across three different RNN models, namely LSTM, BiLSTM, and GRU. The RNN based models, in theory, share the same architecture and will be evaluated using the ISEAR dataset to create an emotion detection model. The result of this paper concluded that the simplest RNN model, GRU, achieved the highest score across four scoring metrics: accuracy, recall, precision, and F1 score. The GRU model achieved an accuracy of 60.26%, BiLSTM with 59.3%, and LSTM with 57.65%. Hence, based on the results, the GRU-based models are a strong choice for emotion detection when tested on the ISEAR dataset.

Keywords: Emotion Detection; Textual Data; Deep Learning; Natural Language Processing; Recurrent Neural Network

Philippine Court Case Summarizer using Latent Semantic Analysis

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Artificial Intelligence in the field of Law has introduced a lot of innovations to aid legal experts, and one of those are summarizing systems. Text summarization is the process of condensing text into a compact summary highlighting the important parts of the original text. As years pass by, numerous text summarization systems are being developed, and improvements keep getting made. These advancements have been helping humans in easing labor work with summarizing lengthy documents. With this, the researchers would like to propose a tool that will summarize legal documents, specifically cases obtained from the Philippine Supreme Court website. This includes extracting meanings and analyzation of words, and similarity of sentences from the original legal document obtained from the website of the Philippine Supreme Court. The tool will take the content of the original document, analyze the words, structure, and sentences according to context, and finally produce the summary. The proposed tool will be called SUMMIT, from the words “Summarize It”. The method to be used to summarize the documents using the tool is called Latent Semantic Analysis (LSA). The researchers will use Python as their programming language in developing the summarizer tool.

Keywords: Natural Language Processing; Latent Semantic Analysis; Extractive-based summarization

Proposing a visualized comparative review analysis model on tourism domain using Naïve Bayes classifier

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This study, using the Naïve Bayes classifier, proposes a new descriptive model for conducting a comparative review analysis on the tourism domain. The proposed model seeks to improve the understanding of tourists' experiences by visually representing their opinions between various tourist destinations. The model predicts the sentiment of tourist reviews using the Naive Bayes classifier, which is then used to generate visualizations that facilitate comparative analysis. The comparison takes two tourism sites as experimental examples. The results, in terms of accuracy, show 80% and 64% for the first and the second site respectively. The study discusses the model's implementation, effectiveness, and potential applications in the tourism industry. The findings of the study suggest that the proposed model can provide valuable insights into tourist experiences and help tourism stakeholders, such as the managements of tourism sites, the future or soon coming tourists to make informed decisions based on comparative analysis.

Keywords: Comparative review analysis; Naïve Bayes classifier; tourism

Comparative Analysis of ARIMA and Prophet Algorithms in Bitcoin Price Forecasting

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The purpose of this research is to compare ARIMA and Prophet algorithms and find the best algorithm for forecasting bitcoin prices. The dataset is two years historical bitcoin data between February 2019 and 2021. The data is segmented into daily, weekly, and monthly period category. Both algorithms are built into a univariate model that only receive 2 features for training the model. Several ARIMA models is developed for each dataset interval. After that, the parameter of each model will be cross-referenced to each other to obtain the best parameter combination. Meanwhile, Prophet model will be developed using automatic and manual tuning. Then again parameter value of each model will be cross-referenced to each other to obtain the best parameter combination. Evaluation of the training model is done by calculating the Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE), Mean Squared Error (MSE), and Rooted Mean Squared Error (RMSE). The results showed that the best model for the

daily and weekly data category was the Prophet algorithm, while for the monthly data category was the ARIMA algorithm.

Keywords: Time Series; Forecasting; Bitcoin; ARIMA; Prophet; Comparison

Drowsy Detection System by Facial Landmark and Light Gradient Boosting Machine Method

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The objective of this study was to develop a drowsiness detection system that can help to reduce traffic accidents caused by drivers who are feeling sleepy. The approach employed in this study involved the use of behavioral measures to monitor the driver's face. The study utilized a prototyping application development model, involving five cycles of testing and refinement. The results showed that the accuracy of the system prototype increased by 21.8% compared to previous research. The system prototype was integrated into a PC application that generates an alert sound for five seconds when a drowsy driver is detected. Testing of the application showed that the drowsiness detection system performed well.

Keywords: drowsiness detection, machine learning

Improving Batik Pattern Classification using CNN with Advanced Augmentation and Oversampling on Imbalanced Dataset

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In image classification task, imbalanced dataset is a problem that often occurs. Batik pattern data also suffers this problem, mainly because of the poor quality of available images and rarity of certain patterns. In this research, we employed a novel advanced augmentation and oversampling techniques on the imbalanced dataset to address this issue. This approach enhanced the diversity of the images, encompassing variations in color, contrast, wrinkles, and warps that may be present in batik garments. We employed two CNN models, DenseNet169 and VGG-16, along with three different training methods for our study. These methods included training without oversampling and advanced augmentation, training with oversampling, and training with both oversampling and

advanced augmentation. The results showed that the best accuracy was achieved with DenseNet169 with our oversampled and augmented dataset, with an accuracy of 84.62%. Additionally, VGG-16 also performed well on said dataset, achieving an accuracy of 82.56%. Our results suggested that by using our oversampling & advanced augmentation on the dataset, the model performance improved compared to plain data and oversampled data.

Keywords: batik pattern classification; imbalanced dataset; oversampling; advanced augmentation; convolutional neural network

A Comparative Analysis of Decision Tree and Support Vector Machine on Suicide Ideation Detection

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Suicide and self-harm are the most severe public health issues, especially in this modern era. On other side, the improvement of technology helps people can be easier to share their emotion in social media. This led us to think of making a Suicide Ideation Detection to prevent any potential suicide action being committed. Our aim for this research is to increase the capabilities of Decision Tree and Support Vector Machine algorithm, enhancing the performance of already existing research about suicide ideation detection with improved accuracy. By comparing DT and SVM, we hope we can develop a model that can effectively detect suicidal behavior, leading to a better prevention strategy, and minimizing the number of suicide attempts. The dataset used is from subreddit forums “SuicideWatch”, “depression”, and “teenagers”. We discovered that SVM performs better than Decision Tree with an overall score of 91,89% whereas Decision Tree with an overall score of 81,47%.

Keywords: Artificial Intelligence; Support Vector Machine; Decision Tree; Suicide Ideation Detection

Digital Twin (DT) Smart City for Air Quality Management

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Air pollution is a pressing issue in cities, and managing air quality poses a challenge for urban designers and decision-makers. This study proposes a Digital Twin (DT) Smart City integrated with Mixed Reality technology to enhance visualization and collaboration for addressing urban air pollution. The research adopts an applied research approach, with a focus on developing a DT framework. A use case of DT development for Jakarta, the capital of Indonesia, is presented. By integrating air quality data,

meteorological information, traffic patterns, and urban infrastructure data, the DT provides a comprehensive understanding of air pollution dynamics. The visualization capabilities of the DT, utilizing Mixed Reality technology, facilitate effective decision-making and the identification of strategies for managing air quality. However, further research is needed to address data management challenges to build a DT for Smart City at scale.

Keywords: Digital Twin, Smart City, Mixed Reality, Augmented Reality

Social media as a learning tool in the digital age : A review

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The development of information and communication technology has brought many changes to human life. Currently, everyone has easy and simple access to connect to the internet and interact through various social media. Social media with its many features can not only be used as a communication tool but also can be used in other functions. One is that it can be used as a tool in digital learning. The use of social media as a tool for presenting digital educational or learning content can help enrich more learning content, expand learning materials, and provide opportunities to share information easily and engagingly. The purpose of this study is to examine the use of internet-based social media in educational settings. The approach used is a systematic literature review by collecting literature from data sources Scopus and Google Scholar, sorting, and presenting them according to the topic of discussion. The results are that using social media tools in learning has a positive impact. There are challenges in using social media, namely aspects of personal data security and dependency problems. However, all of this can be anticipated if there is a collaboration between teachers and students in using social media effectively and responsibly.

Keywords: social media; internet; learning; digital age

Identifying Factors for Supporting Early Warning Flood using Clustering Approach And Geo-Spatial Analysis

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Floods in Jakarta are very frequent and caused by many factors, from very high rainfall to flash floods. This natural disaster has greatly impact the society, from economy to health problems. In this research, we used ArcGIS Pro with unsupervised clustering method HDBSCAN to create a prototype that would

make it easier for people to find out the area that is prone to floods. We received a lot of positive input from many respondents who had seen our prototype design and how it can assist people as the early warning to floods. We analyzed the factors lead the flood early warning system, those factors are high density population distance from river to the high-density population area, drainage system, rainfall intensity, and flood history. We will group flood point with the unsupervised clustering method.

Keywords: social media; internet; learning; digital age

The Effect of Using Cashless (QRIS) on Daily Payment Transactions Using the Technology Acceptance Model

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Bank Indonesia launched a digital payment system innovation to build a better Indonesian economic system. The payment system established is QRIS. QRIS payments can facilitate the settlement of transactions made by the people of Indonesia and can also be effective, efficient, and a guaranteed technology security system. The variables used in this study are Social Influence, Perceived Usefulness, Perceived Ease of Use, and Perceived Trust using the Technology Acceptance Model (TAM) research method. Research data is processed using the Smart-PLS application to obtain valid calculation results. This study aims to determine the effectiveness of QRIS users, user trust in the QRIS security system, and user satisfaction using QRIS. Based on the research results that have been carried out, implementing a cashless has made good progress in using transactions through QRIS. From the research survey results, 522 respondents used QRIS, and 54 respondents did not use QRIS. This can be seen from the respondents influence in every Indonesian region. It can be seen that the implementation of QRIS has made good progress in the use of transactions through QRIS users, which can be seen from the presence of respondents in every region of Indonesia. However, in some cases, there is a lack of facilities and infrastructure for transactions via QRIS because interest in using QRIS is still lacking in areas outside Jabodetabek. From the results of research conducted by the author, the hypothesis that the author obtained was 8, namely Social Influence (SI) has a positive effect on Perceived Usefulness (PU), Social Influence (SI) has a positive effect on Perceived Ease of Use (PEOU), Perceived Usefulness (PU) positively influenced by Perceived Ease of Use (PEOU), Perceived Trust (PT) is positively influenced by Perceived Usefulness (PU), Perceived Trust (PT) is positively influenced by Perceived Usefulness (PU), Behavior Intention of Use (BI) is influenced positively by Perceived Trust (PT), Behavior Intention of Use (BI) is positively influenced by Perceived Usefulness (PU), Use Behavior is positively influenced by Behavior Intention of Use (BI).

Keywords: Technology Acceptance Model (TAM), QRIS, Cashless, Indonesia.

Developing a Poverty Model in Papua using Geographically Weighted Regression

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Poverty is one of the world's main problems, which has been very difficult to overcome. The poverty rate has influences on economic growth in an area. The greater the poverty rate in an area, the more difficult it is for an area to grow economically. Many factors affect the level of poverty. Geographical location, level of education, population growth in each region, significantly affect the poverty level. The many factors that affect the poverty level make it difficult for us to predict which factors will influence the level of poverty in an area, making it difficult for us to solve the problem. This research was made to predict what factors influence the level of poverty in Papua, Indonesia. This study uses a Geographically Weighted Regression (GWR) method due to the existence of spatial heterogeneity. It produces model estimates that are local for each location and different from other locations to get a model with the most influential factors in each region. The results of this study are as follows. First, agricultural employees affected the poverty rate in each location in Papua. Second, house area and households with access to safe water are significant variables in Yapen, Biak Numfor, and Supiori.

Keywords: Geographically Weighted Regression; Poverty; Papua; Spatial Heterogeneity

Analysis of Financial Technology User Acceptance Using the Unified Theory of Acceptance and Use of Technology Method

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Behavioral Intention and Use Behavior can be interpreted as acceptance and utilization for users when using a system and how users can accept and use a system. The focus of Behavioral Intention and Use Behavior in this study is financial technology applications related to cryptocurrency transactions on the X application. This research was conducted to assess and analyze the acceptance of the use of the X application and to test the variable or indicator hypotheses on the UTAUT method. Three variables influence the evaluation of acceptance and use of the X application. Performance Expectancy has an influence and significant effect on Behavioral Intention. Social Influence has an influence and significant effect on Behavioral Intention. Facilitating Conditions have an influence and significant effect on Use Behavior.

Keywords: : Behavioral Intention, UTAUT, Performance Expectancy, Social Influence, Use Behavior

Implementation of Augmented Reality in Android-based Application to Promote Indonesian Tourism

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Indonesia is known for its iconic tourism industry. However, there is a significant popularity difference between each destination. This imbalance has been a problem that the Indonesian Ministry of Tourism has been trying to solve through the "Wonderful Indonesia" campaign. Unfortunately, some did not perceive it as a success. With the breakthrough of Augmented Reality (AR) that is seen as a great factor in enhancing user experience in the tourism sector, this research aims to design and develop an immersive android-based application that implements Augmented Reality and Audio Guidance to promote and create branding for Indonesian tourism spots. This research uses a methodology divided into 4 phases; Analysis Requirement, Research and Collect Data, System Design and Development, and Testing. A survey was conducted in the Analysis Requirement phase to find people's knowledge and preference for tourism spots in Indonesia. Another survey was conducted in the Testing phase to test the application's usability and whether the aim has been achieved. The main findings indicate that most local tourist respondents stated that the application developed is an effective way for them to explore and educate themselves about Indonesian tourism sites. Therefore, this application might be a sustainable answer and a new approach compared to what the Indonesian government has done in the past years.

Keywords: Augmented Reality; Indonesian Tourism; Android; Usability Testing

The Application of Augmented Reality to Generate Realistic Interaction in the Property Sector

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Augmented Reality is a technology that overlays computer-generated information and images in a natural environment to enhance or augment the contextual perception of the user's environment. The utilization of AR is currently one of the most important in developing several industrial sectors, such as architecture, engineering, and construction development. Nowadays, the property sector industry has always been an issue of sale for users that do not have direct access to the property. The pandemic and the economic problem in different countries have also reduced consumer interest in purchasing houses. Due to these issues, this paper aims to provide a platform for addressing these pain areas. The software can apply

Augmented Reality to real estate in real-time using a mobile device. Not only can they see the outside of the property, but they can also see the interior design, furniture design, and property mapping in 3D. Our test results show that an application is needed to provide the property sector with high demands. Over 80% of our respondents confirm that our application's presence will help ease the sales problem. Because it can save the customer time, viewing property frequency, and cost saving. These increased demands, we are developing an AR-based application for the market to use and gain more traction in the property sector.

Keywords: Augmented Reality; Property Industry; Vuforia Ground Plane; 3D Model; Android; Performance Testing

Feasible Technology for Augmented Reality in Fashion Retail by Implementing a Virtual Fitting Room

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Augmented Reality has become a bridge from the virtual to the real world. This technology has been an implementable choice for fashion companies to provide more information and customization for their user's shopping experience. From the COVID-19 pandemic alongside technological globalization, fashion industries have to find a new way for customers to purchase products. All things considered, AR helped fashion industries keep customers attracted and satisfied. This paper is conducted in a Systematic Literature Review manner to review and compare the AR technologies used by fashion industries. Furthermore, the result would be a proposition of which Augmented Reality technology or platform option is feasible and implementable for the fashion industry. After comparing the technologies used in past papers and their technical and economic feasibility, we propose a 3-term plan. The short-term plan with zero cost and mobile platform-focused application, the medium-term plan with an upgraded version of the garment object from 2D images to 3D objects, and the long-term plan changing the platform used from mobile to a new device. We also conclude that artificial intelligence can also support and improve the augmented reality experience for customers in the fashion retail industry by implementing an AI-powered virtual assistant.

Keywords: Augmented Reality, Virtual Fitting Room, Kinect, Fashion Retail, Mobile Application

Predicting Cancer Death Rate and Determining the Major Cause of Cancer using Ridge Regression

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There are a few assumptions that must be fulfilled to obtain a good regression model. One of them is there is no multicollinearity in predictors. This one did not meet when Steven Burnett generated prediction model for Cancer Mortality Rates which have 31 predictors. This research has one objective, i.e., to handle multicollinearity in Burnett model using Ridge Regression. The result is there are 8 predictors as significant factors to mean per capita (100,000) of cancer mortalities from 2010 to 2016. The estimated model with these predictors has better accuracy than the Ordinary Least Square regression.

Keywords: Burnett; Multicollinearity; Ridge Regression

Online Learning Platform Analysis During COVID- 19 Pandemic in Indonesia

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Covid-19 forces Indonesia's education institutions to operate learning online. The continuity of online learning is influenced by several factors, such as personal space, environment, and learning system. Out of all categories, Learning Management System (LMS) has the most impact on online learning. LMS has a role in facilitating several activities, starting from scheduling classes to assignment collection. There are several choices when choosing LMS that are publicly available. The authors chose three LMSs that are the most popular: Google Classroom, Microsoft Teams, and Edmodo. This research aims to know the factors that *affected* the online learning process in Indonesia during the COVID-19 pandemic and what influenced the selection of LMS. This research uses a Systematic Literature Review and PRISMA to identify factors that *affect* the online learning process and learning management system selection. From this research, the authors have found that internet connection is the most discussed factor related to things that *affect* the online learning process. Next are Learners' and Instructors' Engagement and LMS. The authors have also found that easy use, class management, assignment, file sharing, and communication features are the main factors in LMS selection. From this result, the authors hope this research can increase the quality of online learning in Indonesia. This research can be further developed by discussing more LMS that covers several scopes.

Keywords: COVID-19, Google Classroom, Edmodo, Microsoft Teams, Online Learning, Indonesia, Learning Management System;

Deafvoir: Recognizing Sign Language Through Game

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People with hearing impairments exist in our society, whether we realize it or not. It is not easy for them to communicate with us, the ones without hearing disabilities, and they often receive a lot of mistreatment. Since we don't learn about sign language and don't know where to start, our knowledge about sign language is also limited. This paper explains the making of Deafvoir—a visual novel game about sign language—as well as why it is developed and how it can help the deaf and us learn sign language. By conducting a survey and asking how familiar sign language is to some people and their response about Deafvoir, we can move forward to realize this sign language learning visual novel video game and make it local-based before going international. With this video game, it is hoped to make Indonesia's younger generation, especially Gen Z, understand and be able to use sign language whenever they encounter the deaf in real life.

Keywords: Hearing disability; video game; sign language; visual novel

3D Modelling Building of District Johar Baru Using ArcGIS Pro and CityEngine

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Various image-based approaches are currently available for 3 Dimensional (3D) modelling. Among them, two main geomatics techniques are photogrammetry and laser scanning. Owing to the limited availability of photographs to the general populace, the employment of satellite and aerial photogrammetry is rather intricate. In light of Jakarta's absence of a comprehensive three-dimensional portrayal, there is an impetus to generate accurate, precise, and detailed tri-dimensional visualizations of a particular sector within Jakarta, specifically Johar Baru. This endeavor shall be undertaken through a technique termed LoD, with ArcGIS and CityEngine serving as the fundamental instruments for this initiative. To do this, we provided a framework that leverages existing technologies and data sources to reduce the time and work needed for prospective 3D indoor routing applications. Our indoor and building 3D models were created using the CityEngine procedural modelling approach from CAD files and building footprints. This work does not address data delivery or administration; it primarily focuses on 3D visualization. Cadastral, visualization, and non-functional requirements are the three main areas of 3D visualization requirements against which CityEngine was assessed. A case study corresponding to a real issue that has already been recognized in Portugal is used to evaluate the problem. The results are encouraging. The CityEngine won't be the best

choice for all users because of the steep learning curve. Using CityEngine, we can show and design a 3D reality in Johar Baru.

Keywords: 3D Modelling; Level of Detail; ArcGIS; CityEngine;

Building 3D Object Model for Tourism in Monas using CityEngine

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A prominent monument in DKI Jakarta is the Monument Nasional (abbreviated as Monas). This moniker serves as both a symbol for the city of Jakarta and a representation of the people of Jakarta and Indonesia. Apart from being a monument, Monas also has a history of the Indonesian nation. In this study, 3D models are designed to display visualizations of Monas and surroundings in 3D form with the aim of helping tourists who want to visit Monas in preparing and increasing their understanding of the tourism in Monas. This study was conducted with the help of CityEngine software that created the 3D models of Monas implemented and displayed on a website with a web scene format. Using image-based 3D modelling, the main geomatics techniques is photogrammetry, it allows for new methods to create virtual 3D. To do this, various components including route visualizations must collaborate. To do this work we have a framework that leverages the technology and data sources already available to reduce the time and work required for prospective 3D applications. With the existence of a Monas 3D visualization that can be accessed through web browser, it expected that it will make tourists not complicated to obtain various tourism information and increase the tourism in Jakarta.

Keywords: 3D Model; CityEngine; National Monument; Tourism; 3D Visualization

Developing Nusantara Mobile Application to Support Local Tourism in Indonesia

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Tourism is a very important sector and has a major influence on development and national income. Moreover, Indonesia has thousands of tourist destinations that are very beautiful and interesting to visit, both for Indonesians and foreigners. It's just that, there are still many local tours, such as tourist villages, which are still not well known by most people. In fact, there are many cultures, customs, places of recreation, or characteristics of an area that need to be seen and introduced to outsiders, even to Indonesians themselves. Therefore, this study aims to explain the problems that occur in the field of tourism, as well as provide solutions in the form of tourism applications that aim to help promote local

Indonesian tourism, as well as make it easy for travel enthusiasts to organize their travel plans. The process of making this travel application is also carried out through various research and interviews with potential users and IT people in order to produce an attractive and effective application. This study uses the design thinking method. Researchers collected data sources from literature studies and surveys through questionnaires, where the results of the data obtained from the questionnaires were numerical or quantitative. The aim is to determine the level of public interest in tourism, as well as determine the level of potential users of this tourism application. That way, the goals of this application will be achieved and effective in helping solve tourism problems.

Keywords: mobile application ; tourism ; local tourism

File Encryption Application using Menezes-Vanstone Elliptic Curve Cryptography Based on Python

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Humans have been affected by the advent of information technology in many different ways. Information can be sent freely as a result of the conveniences offered. However, unauthorized parties may take advantage of this to retrieve and utilize the information without the owner's consent. In this paper, the authors perform text, image, audio, and video data security using a modified version of the Menezes-Vanstone elliptic curve cryptography algorithm. The study implements Menezes-Vanstone Elliptic Curve Cryptography in a program for file text, image, audio, and video encryption and decryption, while also providing performance data for both our program and alternative approaches for comparison. The outcome demonstrates that the encrypted file size is smaller than alternative approaches. Nevertheless, our program might benefit from some enhancements in terms of encryption and decryption times.

Keywords: Elliptic curve cryptography(ECC); Menezes-Vanstone ECC; file encryption

Design of intelligent decision support system for supply chain sustainability assessment

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The objective of this research is to develop an intelligent decision support system (IDSS) that can aid decision-makers in enhancing the performance and sustainability of the sugarcane agroindustry's supply chain. A case study focusing on a sugarcane agroindustry supply chain was proposed. The IDSS was developed using the waterfall approach, which follows the system development life cycle (SDLC) and employed an object-oriented programming technique. The outcome of this study is a prototype of the IDSS, consisting of a database, model base, and knowledge-based management system configuration. To evaluate the sustainability of the supply chain, a fuzzy inference system and an adaptive fuzzy inference system algorithm were utilized. Through verification and validation, it was determined that the IDSS prototype has the potential to be implemented in real-world scenarios, as long as certain assumptions related to the model are taken into consideration.

Keywords: Intelligent Decision Support System; Fuzzy Inference System; Supply Chain: Sustainability.

The Effect of Educational Platformer Game "Loving Ma"

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This study aimed to create an educational game application based on the theme of motherly roles in the platformer genre. The game application is designed to feature three levels consisting of multiple-choice questions about the roles of a mother. The Extreme Programming (XP) method is utilized to create the game application. Extreme Programming (XP) is a branch of the Agile Development method used to develop systems with uncertain or rapid requirements changes. The steps of the XP method consist of planning, designing, coding, and testing. The game application is evaluated both internally and outside. Black-box testing and eight golden rules are used for internal review. The findings of black-box testing can be used to determine the viability of a game application. The evaluation findings of the eight golden rules are required to evaluate the game application's user interface. The Game Experience Questionnaire is used for external review (GEQ). The GEQ was distributed through Google Forms, and 67 respondents completed it. The result of the GEQ was then tested for validity and reliability, calculated to find the mean number and standard deviation, and analyzed. Therefore, it was concluded that the game application provides a good user experience.

Keywords: game application; platformer; Extreme Programming; Eight Golden Rules; Game Experience Questionnaire

User Experience Satisfaction Analysis of Customers on the BRI Mobile Application (BRImo)

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Bank Rakyat Indonesia, a government-owned bank, has launched BRImo (BRI mobile) as a digital mobile transaction service. A study was conducted to analyze customer satisfaction with the BRImo app in Lubuk Pakam, due to differences in the number of customers versus the number of BRI Mobile Banking users. A survey was conducted using a User Experience Questionnaire, with 400 respondents completing an online questionnaire via Google Forms. The evaluation results showed that the attractiveness aspect received an above-average evaluation value of 1,270, clarity received an above-average evaluation value of 1,552, efficiency was evaluated as good with a value of 1,509, accuracy received an above-average evaluation value of 1,229, and stimulation received an above-average evaluation value of 1,194. However, the novelty aspect received a below-average evaluation value of 0.320 and needs improvement. To improve this aspect, the application should be updated regularly to avoid monotony, with updates to the appearance or features of the application. Based on follow-up interviews, customers expect BRImo to add a live chat feature with customer service and a mutation download feature.

Keywords: BRImo, mobile banking, User Experience Questionnaire

Augmented Reality of Historical Relics in the British Museum

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Museums are one of the tourist attractions that are in great demand by the public. Museums can be used as a place to increase knowledge for many people; many people visit museums during the holiday season or on tourist tours, causing severe congestion when they want to visit the museum during that season. This hinders people from enjoying and learning about historical relics. Therefore, our group decided to help people to learn about the historical relics in the museum by using other media. Our group will create an Augmented Reality (AR) application in the form of historical relics in the British Museum. Augmented Reality (AR) will be created using the SDLC (Software Development Life Cycle) method to be able to produce maximum results so that users can use this Augmented Reality (AR) application more easily. The expected result of making this Augmented Reality (AR) application is to reduce the density in the museum, helping people to recognize and gain information about relics, paintings, sculptures, and others in the British Museum without having to visit the museum, as well as to assist students in learning about British historical heritage with a more fun method in a 3D View.

Keywords: Historical; Relics; Museum; Augmented Reality; Britannia.

Development of Augmented Reality Application in Physics through Newton's Laws and Object Interaction

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Physics learning is often challenging for students due to its abstract and complex concepts. This research is made to overcome the problem of lack of understanding related to physics learning due to abstract concepts. This research aims to develop and evaluate an Augmented Reality (AR) application that focuses on learning Newton's Law by interacting with 3D objects like balls, cars, and rockets. AR-based technology has been recommended for use in education due to its excellent potential in helping to improve the understanding of the concept of a material to be better. Therefore, this research will develop and evaluate the use of augmented reality in physics learning related to newton's law. This paper uses the ADDIE model method as the basis for developing Augmented Reality applications by involving the stages of analysis, design, development, implementation, and evaluation. The study results show that the developed AR application can help students understand the concept of Newton's Law and increase interest in learning. Student feedback obtained through questionnaires indicated that they rated this application positively regarding ease of use, engagement, and effectiveness in supporting the learning process. The AR application developed in this study improves the quality and effectiveness of physics learning through innovative and interactive technology. Further research could focus on developing additional content and features and exploring the impact of this application on a broader group of students and in different areas of education.

Keywords: Augmented Reality; Physics Education; Newton's Law; ARCore; Object Interaction; Interactive Learning.

Implementation of Augmented Reality in Study for Human Anatomy

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Biology learning is often challenging for students due to it needs a lot of memory ability and visual ability to memorize all the methods. This research aims to develop and evaluate an Augmented Reality that is based of biology human anatomy such as human body (human body, human muscle, and human

skeleton), lung, eye, ear, digestive system. AR-based technology has been recommended for use in education due to its excellent potential in helping to improve the understanding of the concept of a material to be better. Therefore, this research will develop and evaluate the use of augmented reality in biology learning about human anatomy. This research applies the ADDIE model by involving the stages of analysis, design, development, implementation, and evaluation. The study results show that the developed AR application can help students understand human anatomy and learn the description of human anatomy. Student feedback obtained through questionnaires indicated that they rated this application positively regarding ease of use, information conveyed properly, and effectiveness in supporting the learning process. The AR application developed in this study improves the quality and effectiveness of biology learning through innovative and interactive technology. Further research could focus on developing additional content and features and exploring the impact of this application on a broader group of students and in different areas of education.

Keywords: Historical; Relics; Museum; Augmented Reality; Britannia.

Markerless Augmented Reality Application for Indonesian Traditional House Education

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This paper proposes the development of a markerless augmented reality (AR) application for Indonesian traditional house education. The application aims to provide an immersive and interactive way of visualizing traditional houses from various regions of Indonesia, with the potential to raise public awareness about the importance of preserving traditional culture. The prototyping method was employed as the most appropriate approach to software development, and the ARFoundation platform was used to integrate plane detection into the AR application. The results showed that 80% of tested devices were compatible with ARCore, and the AR plane detection could detect up to 250cm from the device position. In addition, a feedback survey conducted on 17 testers showed that the application design and mechanism brought a good experience to users, with 53% stating that the app is easy to use. This research project contributes to the development of technology-based solutions to promote Indonesian culture and preserve traditional houses, especially for younger generations who may be less familiar with traditional culture.

Keywords: Augmented Reality; Traditional House; Rumah Adat; ARCore; Application.

Design and Development a Virtual Planetarium Learning Media Using Augmented Reality

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The solar system has always been a mystery to many. If not for the advanced technologies, most humans would not have the opportunity to gain knowledge about the planets. Although Earth is a part of the solar system, the solar system is simply too dangerous and expensive for humans to explore casually. Humans do not interact with the Sun or planets actively. This is especially concerning for children who often require visual aids in studying. An Augmented Reality (AR) based application can solve that problem. Through Virtual Planetarium, children may interact with the Sun or the planets and gain information. This will help aid children's guardians in studying the solar system. The application is made by Systems Development Life Cycle (SDLC) method. Through the making of this application, it is expected that children will have a better understanding of the solar system.

Keywords: Augmented Reality; Planetarium; Virtual; Virtual Planetarium; Application.

A Review of the Potential Use of Mixed Reality Learning Methods in Comparison to Traditional Learning Methods

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Education is one of the most important part in our life. But through the centuries, the learning methods used have remained the same. Until now, most learning in schools still use traditional learning media such as books, blackboards, or even just using the lecture method. This method has several drawbacks. In dealing with this problem, Mixed Reality can be an option. This technology offers more immersive and interactive learning for students. But based on previous research, the implementation of MR has various impacts, from positive to negative. This research examines the comparison between mixed reality learning method and traditional method in enhancing the effectiveness of learning. The potential effectiveness of Mixed Reality as a learning method will be compared to the effectiveness of traditional learning methods. The study was conducted by distributing questionnaires to 100 students. Based on the data, it can be concluded that more than 90% of students consider learning with mixed reality to be more effective than traditional methods. However, several challenges were identified, such as lack of funding, insufficient human resources with understanding of mixed reality technology, and slow adaptation of students and teachers to this technology. Therefore, this research suggests the need for efforts to improve access and utilization of mixed reality technology in education.

Keywords: Mixed Reality; Learning Method; Education.

Exploring of Emotional Character in Online Games Toward Player

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This study intends to investigate how players' emotional responses to characters in online games. 100 respondent who play online games participated in the research's online survey, which was used to collect data. Four open-ended survey questions focused on the impact of game characters on players' emotions, player interactions with game characters, how emotionally charged characters affect gameplay, and the variables that influence players' emotional attachment to game characters. The findings revealed that most respondents believed that game characters had a big influence on their feelings and mood. They also highlighted how many elements, such as aesthetic design, character strength, and plot, have an impact on players' emotional attachment to game characters. The study also found that emotional characters might have a major impact on players' gaming because they can foster sentiments of empathy and connection, which can boost motivation and engagement. The results imply that, in order to improve players' experiences, game designers should take into account the emotional influence of game characters while creating online games.

Keywords: Augmented Reality; Education; Flash Card; English; Effective; Technology.

The Effectiveness of Augmented Reality Using Flash Card in Education to Learn Simple English Words as a Secondary Language

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Considering the potential and benefits of augmented reality and the development of education efficiency is essential, it is necessary to utilize the benefits and potential suitable to be implemented in the education field. One of the benefits is the fun learning experience compared to the traditional method. Furthermore, this study aims to analyze the effectiveness of using augmented reality in learning simple English words. The technology method is marker-based tracking, where the marker is flashcards that will be uploaded into Vuforia SDK Kit. Also, this research method uses ADDIE because it is an instructional design that makes the researcher easily to keep track of the progress and result. Then, the method is tested and analyzed using paired t-tests to measure its effectiveness and the User Experience Questionnaire to measure the user experience. Based on the analysis, the result shows that the result is effective, and the

questionnaire has a good overall score. In conclusion, the result corresponds to the contribution of this research that enables the education learning experience to be effective, fun, and interactive.

Keywords: Augmented Reality; Education; Flash Card; English; Effective; Technology.

Preserving Indonesian Culture in the Digital Age: Implementing Augmented Reality to Address Cultural Appropriation Issue

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Cultural appropriation is a complex issue that can lead to the loss of a nation's cultural identity. With the widespread adoption of mobile phones in Indonesia, there is an opportunity to use technology, specifically augmented reality (AR). To address this issue, our user-friendly AR app allows users to interact with Indonesian culture in a virtual environment. Through AR technology, users can engage with Indonesian culture in an immersive and fun way. Our target market is the younger generation, and our app provides a user-friendly interface that allows users to scan AR markers to access different cultural settings. Users can choose from two cultural regions, Bali and Papua. Once a region is selected, a scene showcases the desired region's iconic places and objects accompanied by a traditional folk song. In developing the AR app, we used the agile software development method for approximately two months with four developers. At the end of the development phase, we conduct four testing aspects of the application—namely, angle testing, functionally testing, usability testing, and hardware testing. The testing revealed that the application could perform well under various testing conditions. Through our AR solution, we aim to raise awareness of the importance of Indonesian culture and provide an educational experience that can inspire users to take ownership of their cultural heritage.

Keywords: Cultural appropriation; identity; Augmented Reality (AR); markers; traditional

ChirpMap: Python based Discord Bot for Tweet Data Visualization using Geographical Information System

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Recently, there has been a rise in internet usage due to the Covid-19 pandemic. Twitter has become a subject of interest in various studies because it provides a vast and diverse collection of data that is constantly updated. This abundance of data has inspired the development of a python-based discord bot,

known as ChirpMap, which aims to visualize tweet data. By utilizing a python backend API, ChirpMap serves as the bot's brain and is integrated into the discord platform. This bot generates a heatmap based on user-provided keywords and the language of each tweet. The heatmap displays the distribution of tweets across different countries, as determined by the user's query within the discord bot. Despite successfully generating tweet counts and heatmaps based on user input, ChirpMap still requires further updates to improve its ability to understand natural language and accurately identify tweet locations.

Keywords: Type your keywords here, separated by semicolons ;

Implementation of Handwriting Recognition and Answer Evaluation with Recurrent Neural Network

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Many teachers still utilize exams to gauge their pupils' knowledge. However, as the teacher must comprehend each answer provided by each student individually, analyzing the exam response can take a long time. Additionally, different handwriting styles may lead to errors in scoring the response, resulting in an erroneous mark. This study suggests a web-based program that can read students' handwriting to assist teachers in assessing students' responses. The objective of this study was to develop a web-based application that can accept student responses as input and output correctness.

Keywords: Handwriting Recognition; Exam; Recurrent Neural Network

Initial Study of Batik Generation using Variational Autoencoder

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One of the most promising architectures for generative models is the variational autoencoder (VAE). To reconstruct Batik patterns for this work, we used a deep convolutional VAE architecture. Reconstruction outcomes from various batik motifs are mapped and contrasted using some criteria. As another crucial component of the convolutional network, batch normalization's impact on the model's performance was also examined. The dataset is used to study some learned latent space features. Through these findings, we laid the framework for next research on Batik generation utilizing VAE.

Keywords: variational autoencoder, Batik, convolutional neural network, generative model

Automatic Smart Crawling on Twitter for Weather Information in Indonesia

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Although Twitter is a popular platform for social interaction analysis and text data mining, it faces challenges with geolocation automation. To address this problem, the researchers propose the utilization of a Support Vector Machine (SVM) model to develop an automated Twitter crawling system. The system aims to collect data related to weather in Indonesia by employing Twin, a Python-based Twitter scraping software. To overcome null geolocations, the study incorporates aliases created based on the common practice of Indonesian users mentioning the country's location in tweets. The results demonstrate that the SVM model, combined with automated smart crawling, achieves an 85% accuracy rate.

Keywords: Social media; Twitter; SVM; smart crawling; weather.

Count-Data Mixed Models of Topical Tweets: A Case of Indonesia Flood Events

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Examining topic-level variability in modeling Twitter data can potentially yield more comprehensive insights into public perception during critical periods, thereby enhancing natural disaster mitigation and surveillance efforts. In this study, we utilized generalized linear mixed models (GLMMs) to illustrate the variability in tweet counts related to specific topics in Indonesia during the flood events that occurred in February 2021. The glmmTMB library in R was employed for this purpose. The data were assumed to follow two distinct exponential distributions: Poisson and Negative Binomial. To incorporate random effects, random intercepts and random slopes were introduced, allowing them to vary randomly across topics in the initial two models. Additionally, the final model addressed issues related to dispersion and zero-inflation. By evaluating the Akaike Information Criteria scores, we determined that a model based on the Negative Binomial distribution with random zero-inflation intercepts best fit the data. The chosen model formulation and the estimated parameters have the potential to forecast topic-specific trends in Indonesian flood-related Twitter data.

Keywords: count data; disaster surveillance; floods; mixed models; Twitter

Implementation of Computer Vision of Jakarta Weather Image Categorization Using ResNet

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At the moment, weather data is crucial for supporting neighborhood activities. The economy and trade are both centered in Jakarta, which is also Indonesia's capital. Therefore, it is crucial to have access to weather information so that these activities don't get disrupted, which would then hinder commercial and trade activity. Social media has been a very popular tool for spreading information recently. Particularly on Instagram, where users favor taking images and sharing the information they encounter. @jktinfo is the Instagram account that posts information about the situation in Jakarta and the area, including the current weather. The @jktinfo account is utilized in this project to gather data. Utilizing a variety of techniques, the collected photographs of sunny, cloudy, and wet situations were.

Keywords: computer vision; weather image categorization; data augmentation; deep transfer learning; residual network.

Machine learning models to predict the engagement level of Twitter posts: Indonesian e-commerce case study

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The growing utilization of social media platforms enables direct interaction between companies and consumers. However, the expanding range of interactions and real-world data complexities necessitate the development of more sophisticated decision models. To address this, the current research focuses on constructing machine learning models, namely multinomial logistic regression, decision tree, k-nearest neighbor, and random forest, to forecast the engagement level of Twitter posts from three prominent e-commerce platforms in Indonesia: Bukalapak, Blibli, and Tokopedia. The analysis comprises a dataset of 12,786 unique tweets, accumulating 11,870,254 favorites and 2,735,886 retweets over a seven-month period from February 1 to August 31, 2021. The prediction models are built upon three theoretical constructs with seven features, encompassing interactivity (e.g., links, hashtags), vividness (e.g., images, short videos, long videos), and temporal factors (e.g., day of post, last post time). Factors such as post frequency, interactive posting elements, and static visual elements emerge as significant features for

predicting the engagement level of Twitter posts. Results demonstrate that the random forest model outperforms singular classifier models, including multinomial logistic regression, decision tree, and k-nearest neighbor models, in terms of precision, recall, and F1 score.

Keywords: Twitter; social media; engagement; predictive analytics; machine learning.

Smart Plant Watering and Lighting System to Enhance Plant Growth Using Internet of Things

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Technology can have a positive impact on various fields, including agriculture. By integrating technology, agricultural practices can be automated, specifically in plant maintenance management systems, simplifying the process of growing and caring for plants. In the context of automated plant maintenance and growth, the Green House method incorporates factors such as humidity, temperature, and illumination. To facilitate faster and more effective plant cultivation and care, this study proposes an intelligent plant system that aims to promote plant growth. The data collected by connected sensors is gathered and interpreted using Arduino, enabling the generation of recommendations for greenhouse plant maintenance. The sensor's output properties demonstrate its capability in supporting the objectives.

Keywords: Agriculture; Technology; Greenhouse; Microcontroller; Plant Cultivation.

Signature Authentication Model using Adaptive Moment Estimation Optimization in Multilayer Backpropagated Artificial Neural Networks

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A signature serves as a unique symbol of consent used to authenticate and formally bind written materials. Due to its importance, a thorough verification process is required to establish the authenticity of a signature. In this research, we examined a dataset consisting of 2000 signatures, encompassing both genuine and custom-made signatures. By extracting their distinct digital characteristics, we conducted an analysis and developed an optimized model to assist in the manual and labor-intensive verification procedure. The outcome is a verification process that accurately determines the authenticity of a signature, differentiating between genuine and forged signatures. Our proposed method is based on nine

essential features, including ratio, x-axis centroid, y-axis centroid, eccentricity, solidity, x-axis skewness, y-axis skewness, and x-axis kurtosis. These features are incorporated into the Multilayer Backpropagated Artificial Neural Networks (BP-ANN) methodology, resulting in an efficient verification system.

Keywords: — Automatic signature authentication; signature feature extraction; Adaptive Moment Estimation Optimization; BP-ANN algorithm

Numerical Approximation to Porous Medium Equation Using a Quarter-Sweep Based Finite Difference and Explicit Four-Points Group

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In this study, numerical approximation is used to tackle the one-dimensional nonlinear porous media problem. The emphasis is on using a quarter-sweep finite difference technique to apply the approximation. The quarter-sweep computation approach is highly helpful in terms of reducing complexity while solving big and sparse linear equations. This is done in order to produce a finite difference scheme that works well for the porous medium equation. Internal calculations are carried out using an explicit four-points group methodology, and the resulting nonlinear system is solved using the Newton method. To demonstrate the efficiency of the suggested finite difference approximation and the explicit four-points group technique together, several examples involving the porous medium equation are described. Analyzing the maximum number enables an assessment of the computational time and iteration efficiency of the numerical approach. The method's accuracy is further evaluated by looking at the largest absolute errors the grid points can produce. The suggested method is compared with a half-sweep finite difference method that uses the Newton explicit group method and a conventional quarter-sweep finite difference approximation.

Keywords: finite difference method; quarter-sweep; Newton method; explicit group; porous medium equation

Mobile Based Brand and Car Type Detection Using Convolutional Neural Network

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Although the parking lot is equipped with CCTV surveillance, car theft incidents still occur occasionally. These thieves exploit a loophole in the system that prevents the identification of the car's brand and model upon entering and exiting the parking lot using the same ticket. Therefore, the aim of this research is to develop a system capable of detecting the brand and model of cars. The study utilizes convolutional neural network technology and specifically focuses on the EfficientNet, MobileNet, and MobileNetV2 architectures due to their low resource requirements. Training images for the study are sourced from an online marketplace for used cars, with each of the 20 car brand and model variations consisting of 100 photographs. creates a model after being processed. For the prototype, the approach is put into practice through a mobile application. This study compares EfficientNet, MobileNetV1, and MobileNetV2 as the end result. EfficientNet scored 74%, MobileNetV1 74%, and MobileNetV2 66% on the test of accuracy. The accuracy increases to 80% after the EfficientNet has been tuned.

Keywords: Parking system; Convolutional Neural Network; Transfer Learning; EfficientNet; MobileNetV1; MobileNet V2

Abnormal Data Classification Based on SSA-AELSTM

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Maintenance of production machinery and monitoring product quality through data analysis are the key problems with smart factories. There are far more normal values in the data collected for analysis during the production process than there are aberrant values. Data preparation uses a lot of energy before data analysis in order to make use of the data. In this research, we suggest a new hybrid technique that can perform anomaly detection more efficiently by merging two techniques, effective SSA techniques for reducing time series data and LSTM Autoencoder, which demonstrated great performance in time series outlier identification.

Keywords: Singular Spectrum Analysis; AELSTM; SSA-AELSTM; Smart Factory; Data Classification

Multimedia Application based on Virtual Reality to Introduce College Majors in Universities

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The goal of this project is to create virtual reality-based multimedia programs that can introduce users to fresh university experiences and information. Many prospective students are currently selecting the incorrect major, which could have negative effects on those prospective students. The Game Development Life Cycle, often known as the GDLC approach, is the development process method employed in this application. The GDLC process begins with initiation and progresses through pre-production, testing, beta, and release. Several respondents have tested the application. According to the survey's findings, 74.5% of respondents said that this application may encourage students to select the majors they are passionate about. According to the testimonial results, 77.1% of respondents thought this application was simple to understand.

Keywords: Virtual Reality, College Major, Universities

Support Vector Machine Method for Predicting Non-Linear Data

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The aim of this research is to evaluate the performance of a classification model on nonlinear data. The study utilizes accuracy, precision, sensitivity, and specificity metrics based on data from e-commerce X sellers. The classification model is developed using the Support Vector Machine (SVM) approach, employing different kernel functions such as linear, polynomial, and Radial Basis Function (RBF). By comparing the performance scores of each model, the best model is determined. The results indicate that the SVM model with a linear kernel outperforms the others, demonstrating the highest performance scores. This approach is applied to predict the status of sellers on e-commerce X.

Keywords: Support Vector Machine (SVM); kernel; functions; performance measures; e-commerce

Empowering Military in Tactical and Warfare Area with Virtual Reality Technology: A Systematic Literature Review

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The rapid advancement of virtual reality technology offers numerous real-world benefits across various sectors worldwide, including the military. As early adopters of this technology, the military has found multiple medical and practical applications. However, the research contributions of virtual reality technology, particularly in practical military applications, remain limited. This is primarily due to limited data availability and a lack of interest from researchers and military institutions. To investigate this issue, the authors are conducting a systematic literature study focused on practical military virtual reality, specifically tactical and combat operations. Following the PRISMA framework and employing searching

and inclusion-exclusion techniques, the authors identified twenty-five relevant research outputs that extensively discuss these topics, both qualitatively and quantitatively. Notably, fifteen of these studies focus on combat and weapon training simulators, and interestingly, researchers are beginning to integrate other technologies such as robotics, big data, haptics, body area networks, and signal processing. The majority of the quantitative research conducted in this area has demonstrated success, with eight out of ten papers showing positive outcomes. To improve research quality, the authors propose two main solutions: implementing combat and weapon training within the military system and encouraging innovative and in-depth research in this domain. In conclusion, the analyzed virtual reality products can serve as a platform for military forces to support personnel in enhancing and maintaining their personal development and skills.

Keywords: virtual reality; military; tactical; warfare; simulator software

Software Size Measurement of Smart Digital Tourism Project based on Use Case Point

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In recent years, the tourism sector has evolved into a key strategic business for boosting local economic output. This industry has been dealing with the COVID-19 pandemic impact since the end of 2019. The tourism sector was, however, expected to bounce back and carry on expanding as it had in the past. For the purpose of enhancing services for stakeholders, this sector must transition from the conventional approach to digitization. Regarding the ability to include stakeholders in offering smart services, a smart digital tourism should be prepared. The creation of this clever solution should follow a quantifiable software development approach, such as measurable software design. The purpose of this study is to provide a case point method for measuring software design in relation to project budget and schedule. The study's findings showed that the size of the project would be 112.27 Use Case Points, it would take 2,133.13 hours to complete, and it would cost 28,530,613.8 Indonesian Rupiah (IDR) to develop the software. The findings will aid in the management of software development at a later stage in terms of making decisions and planning additional quantifiable projects.

Keywords: Tourism; Project Management; Software, Use Case Point;

Flood-Prone Susceptibility Analysis In Garut Using Fuzzy Inference System Mamdani Method

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Floods frequently occur in The District of Garut, representing a natural disaster. Currently, the National Disaster Management Agency (BNPB) is actively engaged in monitoring the landscape conditions of the Watershed River (DAS) to mitigate the impact of floods. To better understand and map this specific natural disaster, a program has been developed for in-depth analysis. This program has successfully assessed the susceptibility level to floods and categorized various areas in Garut as safe, prone, or flood-prone. To elaborate further, this study utilizes the Fuzzy Inference System Mamdani as a calculation process. Several factors influence this calculation process, including rainfall intensity, watershed area, land slope, altitude, population density, and risk level. Overall, the research findings indicate a 92.30% level of accuracy compared to the flood-prone catalog released by the national government, demonstrating its applicability in real-world scenarios.

Keywords: Fuzzy Inference System Mamdani ; Flood ; Flood Vulnerability ;

Image Pre-Processing Effect on OCR's Performance for Image Conversion to Braille Unicode

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The number of cases of visual impairment has been rising, particularly in Indonesia. Additionally, most disabilities in Indonesia are visual impairments, according to data from the Population Census. Blindness is one aspect of this condition that accounts for a sizable percentage of it. Considering this, we are making an effort to assist them by translating literature, which entails converting text included in images into braille Unicode. A braille embosser, a device that can print braille sheets for the blind to read, will then be used to print this translation into braille. In this study, we discuss the consequences of pre-processing while converting a text-containing image to braille Unicode. Here, we employ the pre-processing techniques of binarization, denoising, and skew correction. These techniques are used before using the OCR, and the results are documented in this study. Additionally, the outcomes of pre-processed and raw photos are contrasted to determine the efficacy of applying pre-processing to an image.

Keywords: Visual Impairment; Optical Character Recognition (OCR); Binarization; Denoising; Skew Correction' Text to Braille conversion;

Extracting Information from Vehicle Registration Plate using OCR Tesseract

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The increase in population and vehicle ownership causes high levels of traffic density. The very high mobility of the population ultimately has an impact on routine congestion which is felt to be getting worse over time. There are several factors that cause traffic jams to get worse. One of them is due to the increasing number of motorized vehicles. The number of vehicles that continues to increase is not in accordance with the road capacity that can accommodate these cars. For this reason, a system is needed that can categorize cars that can run on certain days according to the number plate (eg odd or even) to reduce congestion. This built system can extract the license plates of vehicles passing on the highway using image processing and character recognition methods. This research paper proposed an Automatic Number Plate Recognition ANPR system is an image processing and character recognition system that is used to recognize a car's license plate using Optical Character Recognition (OCR). The inputted license plate is automatically localized, segmented, and recognized using the OCR algorithm provided in the Tesseract library. The experiment shows 83.3% accuracy due to the difference in license plate format, background, and fonts.

Keywords: Automatic Number Plate Recognition, License Plate, Localization, OCR – Optical Character Recognition, Segmentation, Tesseract, Vehicle Detection

Stock Price Prediction Model Using Deep Learning Optimization Based on Technical Analysis Indicators

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Stock price prediction is one of the processes of analyzing and determining stock prices in the future. With technical analysis, future stock price predictions can be predicted through the pattern of fluctuations in the stock price in the past. In this study, the researcher predicts the stock price for the next week using the Deep Learning method, namely the Multilayer Perceptron, and combined with the day-shifting method. To expect the results of this stock, the author also observes the model's usefulness and proposes a Mean Error to Mean Price Ratio (MEMPR) to increase the insights processed by the model. Then to find out the accuracy of stock price predictions for each algorithm, testing is carried out using stock data which consists of new data which is then carried out by a training process to get an absolute error value. The experimental results show that the model can predict stock prices with an R2 metric of 0.995.

Keywords: stock price, prediction, deep learning, multilayer perceptron, technical analysis, technical indicator

Application of virtual reality in diverse fields of study in education sector: a systematic literature review

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Technology is a form of non-living thing that supports and carries out the needs of human life. One type of technology is Virtual Reality (VR), which is already familiar to many people. According to Augmented and Virtual Reality Report conducted by Perkins Coie in 2020, education (28%) is the third sector that is expected to implement Virtual Reality (VR) the most, still behind gaming (47%) and health care devices (38%). The goal of this research is to generate insights about existing Virtual Reality (VR) implementations to encourage more implementation of Virtual Reality (VR) specifically in the education sector. We believe that Virtual Reality (VR) can be used to leverage learning in various fields of education. This research adopts Systematic Literature Review as a research method. Total of 200 published VR-related studies from 2019 to 2023 through Google Scholar, ScienceDirect, and ACM Digital Library, resulting from searches, then being reviewed, analyzed, and synthesized. The research concludes that there are ten fields (Arts, Engineering, History, Languages and Literatures, Life Sciences, Math and Computation, Medical, Physical Education, Physical Sciences, Qualitative Social Sciences) of study that apply Virtual Reality (VR) with Medical (77 study), Arts (24 study), and Math and Computation (18 study) hold the top three spots for the most number of studies done, the characteristic from field of study that suitable for Virtual Reality (VR) is the field of study that have practices which could be mirrored from real-life practice, three factors that influence the implementation of Virtual Reality in the education sector are engaging, imaginative, and precautionary while some of Virtual Reality (VR) benefits for learning are for attention training and to increase problem solving skills, and Virtual Reality (VR) learning is more effective compared to traditional learning based on empirical findings. Therefore, in this research, we discuss an overview towards the application of Virtual Reality (VR) in diverse fields of study in the education sector based on previous studies.

Keywords: Virtual Reality; Study Field, Education; Systematic Literature Review

A Review of Security in Financial Technology

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Financial Technology (FinTech) is a popular name for innovative technology utilized by financial organizations, with a focus on security and privacy concerns. These concerns include threats, attacks, hostile activity, and adversaries, as well as potential responses. The goal of this study is to undertake an assessment of current advances in financial industry security and privacy issues. FinTech is viewed as a gateway to increased business potential by financial sectors and entrepreneurs, but in order to explore such possibilities, mobile applications and other digital platforms must be established. However, security vulnerabilities to mobile applications have expanded dramatically, posing a dilemma for users and FinTech entrepreneurs. The findings of this study can be used to develop a theoretical framework for FinTech security and privacy, which will provide critical support for the establishment of a trustworthy security mechanism in FinTech.

Keywords: security, financial technology, machine learning

Identifying Factors for Supporting Early Warning Flood using Clustering Approach And Geo-Spatial Analysis

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Floods in Jakarta are very frequent and caused by many factors, from very high rainfall to flash floods. This natural disaster has greatly impact the society, from economy to health problems. In this research, we used ArcGIS Pro with unsupervised clustering method HDBSCAN to create a prototype that would make it easier for people to find out the area that is prone to floods. We received a lot of positive input from many respondents who had seen our prototype design and how it can assist people as the early warning to floods. We analyzed the factors lead the flood early warning system, those factors are high density population distance from river to the high-density population area, drainage system, rainfall intensity, and flood history. We will group flood point with the unsupervised clustering method.

Keywords: flood, unsupervised learning, clustering, HDBSCAN, Jakarta, early warning system.

Smart Plant Watering and Lighting System to Enhance Plant Growth Using Internet of Things

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Currently the technology has been applied to agriculture, both in software and hardware. The technology is applied as an automation management system for maintenance and maintenance of plant cultivation.

Greenhouse is the cultivation of plants that regulate various things such as humidity, room temperature, and the level of light intensity in the room with the aim of increasing the productivity of plant growth. This research proposes a smart plant control system by utilizing Internet of Things (IoT) technology. The reading of parameter values from the Greenhouse from the IoT sensor is recorded on electronic storage media which is then analyzed to make recommendations for farmers. The results of the analysis obtained in this study indicate that there is an increase in plant growth with the implementation of IoT tools.

Keywords: Agriculture; Technology; Greenhouse; IoT; Plant Cultivation.

Analysis of Financial Technology User Acceptance Using the Unified Theory of Acceptance and Use of Technology Method

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Behavioral Intention and Use Behavior can be interpreted as acceptance and utilization for users when using a system and how users can accept and use a system. The focus of Behavioral Intention and Use Behavior in this study is financial technology applications related to cryptocurrency transactions on the X application. This research was conducted to assess and analyze the acceptance of the use of the X application and to test the variable or indicator hypotheses on the UTAUT method. Three variables influence the evaluation of acceptance and use of the X application. Performance Expectancy has an influence and significant effect on Behavioral Intention. Social Influence has an influence and significant effect on Behavioral Intention. Facilitating Conditions have an influence and significant effect on Use Behavior.

Keywords: : Behavioral Intention, UTAUT, Performance Expectancy, Social Influence, Use Behavior

DeepLyric: Predicting Music Emotions through LSTM-GRU Hybrid Models with Regularization Techniques

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Music is a powerful medium that has the potential to evoke strong emotional responses in humans. Researchers have investigated the relationship between music and emotions and the growing interest in developing precise techniques for recognizing emotions in music. Growing interest among researchers in developing more precise techniques for recognizing emotions in music has evoked numerous studies to be conducted. The researchers trained LSTM and GRU (Gated Recurrent Unit) hybrid model on a dataset of

1,160 songs tagged with sadness, compassion, and tension. They were able to attain a test accuracy of 72.51%, although overfitting was discovered because of insufficient training data, a choice of dropout, and learning rate. The research proves the potential of machine learning methods for musical emotion recognition and recommends the use of regularization techniques to alleviate overfitting. It may be possible to create software that can recognize and respond to emotional states in musical contexts because of the research, which contributes to the growing body of knowledge on the connection between music and machine learning.

Keywords: Song Lyrics; Music Emotion Recognition; GRU; LSTM; Natural Language Processing; Hybrid Model

Smart City Applications: A Patent Landscape Exploration

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Smart cities thrive on supporting digital technology innovation of applications and patent protection in the entrepreneurial ecosystem. This research aimed to explore the significant trends in patents related to smart city applications worldwide. The researcher conducted a patent landscape analysis using 22,655 patent materials from the Lens.org database. The study's findings indicate that the number of patents for applications related to smart cities is rising annually. There is an opportunity to use innovations in smart city applications without having to pay royalties by using 1,443 patents that have been discontinued. With seven companies, American corporations have most of the patents for applications in smart cities. The most productive individual investor was Kim Soenghun from Korea, with 946 patents. The electricity (H), physics (G), and new technological developments (Y) patent sections dominate patents related to smart city applications. There were 11,903 simple family patents for smart city applications in seven country jurisdictions; the United States occupied the highest region.

Keywords: Application, Entrepreneurship, Smart City, Innovation, Patens.

Using Machine Learning for the Prediction of Diabetes with Emphasis on Blood Content

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Diabetes is a condition associated with high levels of blood glucose and insulin deficiency that is becoming more prevalent among children and adolescents. It is the ninth leading cause of mortality globally at over 1 million deaths per year. Misdiagnosis of type 1 diabetes with type 2 are frequent and causes diabetic ketoacidosis, a critical complication. This paper seeks for the most accurate model between frequently used machine learning algorithms - Multilayer Perceptron, Support Vector Machine and Random Forest

- in predicting diabetes among patients with focus on blood content analysis, specifically using the Laboratory of Medical City Hospital (LMCH) Diabetes Dataset, which was retrieved from Mendeley. Using hyperparameter optimization and ANOVA F- Value feature scaling, results show that Random Forest produced the highest accuracy at 1.00, followed by Multilayer Perceptron at 0.987 and Support Vector Machine at 0.96.

Keywords: Artificial Intelligence; Deep Learning; Diabetes; Machine Learning; Multi-layer Perceptron; Random Forest; Support Vector Machine

The Development of a Coliform Detection Game As A Part of Android – Based Virtual Food Safety Laboratory to Support Online Learning

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For educators in particular, the implementation of online learning during the epidemic both potential and challenges. In order to correctly attain learning outcomes, creativity is required to ensure that online learning is effective and efficient. In order to get through those problems, having the necessary learning resources is undoubtedly highly beneficial. However, there are still few learning resources accessible in several competency areas, such as practical work in food safety. Food safety is a topic that students studying food packaging technology, culinary arts, catering, public health, and food technology must master. The goal of this research is to create a virtual food safety laboratory application that includes a coliform detection game. This game app is meant to aid in the process of learning about This research focuses on food security and uses the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model approach to implement the steps of the game development life cycle. The coliform detection game app was validated by two material specialists and two design and media experts. Application tests were conducted in groups of five individuals, involving 25 students in the third semester of the culinary arts program at Creative Media State Polytechnic. The average pre-test score obtained from these trials was 2.88, while the average post-test score at the same time was 9.28. The data clearly

indicates that the coliform detection game application contributes to online learning as it significantly enhances student knowledge.

Keywords: Virtual laboratory; Game; Food safety; Online learning.

Prediction of Health Insurance Claims Using Logistic Regression and XGBoost Methods

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Fraud is one of the crimes in the financial industry. Health insurance claims are a kind of fraud in insurance. This research examines health insurance claims to predict fraud. The claims would be denied if there were any suspicions of fraud. Extreme Gradient Boosting (XGBoost) and Logistic Regression are the approaches employed in this research. The most recent method in machine learning, XGBoost, is an improvement over the classic statistical method, Logistic Regression, in terms of classification performance. There are nine independent variables that influence fraud in health insurance claims, according to the findings of the Logistic regression model. The comparison between Logistic regression and the XGBoost model showed that the XGBoost model is better than the Logistic model. Based on the result of accuracy, precision, and recall values on both models.

Keywords: Fraud detection; classification; health insurance claims; Logistic Regression; XGBoost

A MinMax Item-based Method for Multi-Criteria Recommendation Systems

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One of the common challenges in multi-criteria recommendation systems is dealing with data normalization. The challenge occurs since criteria can have diverse rating ranges and user rating behaviors are dissimilar. Previous studies on data normalization showed the supremacy of the Decoupling technique in the user-based multi-criteria recommendation system and the MinMax technique in the multi-criteria decision-making system as well as in data mining. A study also showed that the performance of Decoupling is improved in the item-based method than in the user-based. However, no study has been conducted to investigate the performance of MinMax compared to Decoupling in the item-based multi-criteria recommendation system. This study aims to combine the MinMax normalization technique and the item-based modeling approach in a multi-criteria recommendation system. The proposed method is named the MinMax Item-based method (MIB). We conducted a series of experiments using the Yelp Hotel multi-criteria rating dataset to perform a sensitivity analysis of MIB. The best settings are then used to benchmark MIB towards DCMItem, i.e., a method that combines the

Decoupling normalization technique and item-based multi-criteria modeling approach. The comparison results show the outperformance of MIB towards DCMItem by 2.30% in Precision and 2.00% in NDCG. Therefore, we can conclude that MixMax is able to improve the performance of the item-based multi-criteria recommendation system better than Decoupling.

Keywords: Decoupling; item-based; MinMax; multi-criteria recommendation system

Securing Text File Using Combination of Vigenere and One – Time Pad Cipher Algorithm

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Technological developments continue to increase, causing many crimes to occur on social media. There are various types of encryption that can be used. So we need a system to protect and prevent misuse of data by unauthorized parties. One of the techniques used in this study is the encryption method. Encryption is applied to user passwords on web login systems. Simulation results can be tested by measuring resistance to attacks or data theft. In this study, the Vigenere cipher was combined with the One-Time Pad cipher, which then produced encryption in the XOR results. Furthermore, the hash value that can be obtained by implementing the MD5 algorithm on encrypted files is used as a means of verifying encrypted files, further strengthening data security while confirming its integrity. Furthermore, the results show that the proper implementation of the algorithm affects data security positively. The test results were obtained with a value of 71%, which means that the encoding results are good enough for data security.

Keywords: Cryptography, Encryption, Decryption, Hashing, Polyalphabetic Cipher, One Time Pad Cipher, MD5.

Sentiment Analysis E-commerce Review

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Reviews give customers the opportunity to tell the rest of the world about how they love or hate a product. While there is a limit to the number of words, there is no limit to the words that reviewers can use to express their anger, frustration, excitement or joy in buying the product. Online reviews have become such a standard part of the buying process for many people these days that every online retailer needs to think about optimizing them in their business strategy. The sheer number of reviews requires a

special method or technique that can automatically categorize reviews, whether they are positive or negative. This research tries to classify e-commerce reviews with Naïve Bayes Classifier (NBC). The results of this research show that the accuracy with NBC is 72%, Recall 72% and Precision 78%.

Keywords: sentiment analysis; Naïve Bayes; classifier; review; e-commerce

Multivariate Time-Series Deep Learning for Joint Prediction of Temperature and Relative Humidity in a Closed Space

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An accurate predictive model of temperature and humidity plays a vital role in many industrial processes that utilize a closed space such as in agriculture and building management. With the exceptional performance of deep learning on time-series data, developing a predictive temperature and humidity model with deep learning is propitious. In this study, we demonstrated that deep learning models with multivariate time-series data produce remarkable performance for temperature and relative humidity prediction in a closed space. In detail, all deep learning models that we developed in this study achieve almost perfect performance with an R value over 0.99.

Keywords: closed space; deep learning; humidity prediction; indoor; temperature prediction

Systematic Literature Review on Statistics and Machine Learning Predictive Models for Rice Phenotypes

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Predicting the best-quality of rice phenotypes is the priority among agricultural researchers to fulfill worldwide food security. Trend development of predictive models from statistics to machine learning is

the subject of this review. Gathered from the Google Scholar database, 14 appropriate papers (2016-2020) related to the rice phenotypes prediction were selected through title and abstract content filtering. The outputs show that Support Vector Machine, Multi-layer Perceptron, and regression are the most used models, while yield is the priority prediction point besides tiller, panicle, and 1000-grain weight of rice. However, finding the accurate predictor is invariably challenging due to distinct rice varieties in the world and high confounding factors. Thus, developing an advanced deep learning model that accommodates these needs is worth considering further.

Keywords: rice phenotypes prediction; statistics; machine learning.

Long Short-Term Memory-based Models for Sleep Quality Prediction from Wearable Device Time Series Data

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Several studies suggest that sleep quality is associated with physical activities. Moreover, deep sleep time can be used to determine the sleep quality of an individual. In this work, we aim to find the association between physical activities and deep sleep time by modeling the time series data such as heart rate and a number of steps captured from a commercial wearable device. Our previous study demonstrates that deep learning-based time series modeling is well suited for our problem since the temporal patterns in the two physical parameters need to be captured to obtain more accurate results. We first preprocess our series data to have a time-step size of 10 minutes. To improve our previous effort in this modeling, we compare four different variants of Long Short-Term Memory (LSTM)-based models, ranging from single input to dual input models. Our result shows that the simple stacked LSTM model performs better for our data because the remaining models suffer from overfitting due to a larger number of the trained parameters.

Keywords: deep learning; forecasting; sleep quality; time series; wearable devices

Machine Learning Approaches in Detecting Autism Spectrum Disorder

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Early detection of Autism Spectrum Disorder (ASD) needs to be increased to prevent further adverse impacts. Thus, the classification between ASD and Typically Development (TD) individuals is an intriguing task. This review study has collected 26 related papers to answer four research questions, i.e., what are the most used data inputs, brain atlases, and machine learning models for ASD classification, as also to discover the significant parts of the brain correlated with the ASD. It was eventually found that functional connectivity matrix, Support Vector Machine, and CC200 are the most frequently used data input, model, and brain atlas, respectively. Researchers also concluded that the posterior temporal fusiform cortex, intracalcarine cortex, cuneal cortex, subcallosal cortex, occipital pole, and lateral occipital cortex are the brain regions highly correlated with ASD.

Keywords: autism spectrum disorder; brain atlas; brain region; machine learning.

Smart Home Monitoring to Improve Valuable Storage Security Using IoT-Bluetooth

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Every homeowner wants maximum security for their home from various disturbances and threats. Many homeowners have installed a surveillance camera (CCTV) as their home security system. Apart from its relatively high price, the security camera system has weaknesses, which are difficult to integrate with stable and secure user devices in real-time. This research proposes a security system that integrates the Internet of Things (IoT) with the Arduino Uno microcontroller, PIR, and Ultrasonic sensors. The two sensors are used as scouts connected to a servo motor, an automatic locking device. The proposed system can be utilized as a safe and relatively inexpensive preventive measure.

Keywords: smart security system, Internet of Things, PIR sensor, ultrasonic sensor, smart lock.

On the Measurement of the Inductive Bias Impact in Convolutional Neural Networks Training for Single Image Super-Resolution

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The performance of SISR models is currently growing at a rapid pace since the adoption of Convolutional Neural Networks (CNN) in the domain. Despite that, the understanding of the underlying factors of this rapid growth is still low. In this study, we proposed a study design to measure the impact of the inductive

bias in CNN on its training performance, which is one of the factors of the excellent performance of CNN in SISR. With this study design, we observed that not all CNN has a supportive inductive bias to the training performance. This result can provide guidance to future research in choosing a suitable CNN architecture for optimal SISR performance.

Keywords: Single-Image Super Resolution, Inductive Bias, Convolutional Neural Networks, Deep Learning

Performance Evaluation of Deep Transfer Learning Models in COVID-19 Chest X-Rays Diagnosis

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The devastation of the COVID-19 pandemic, or even similar worldwide disease catastrophes in the future, can undoubtedly be scaled down by the rapid testing of these infections. Even though RT-PCR has been the primary method of diagnosis in the current pandemic, many experts have also proven the credibility of chest radiography analysis and suggested the use of this testing method. In turn, a wide array of studies in 2020 attempted to create state-of-the-art models for COVID-19 diagnosis, utilizing established deep learning architectures like ResNeXt, Xception, etc. Of course, the studies used different pre-trained models, datasets, and had varying results. Therefore, we look to measure the performance of all the popular CNN architectures in classifying COVID-19 infected chest x-ray from healthy chest x-rays and using a single dataset as a benchmark to find the best performing pre-trained models in this task. In turn, future studies related to COVID-19 CXR detection can use the results of this study to select the best suited pre-trained models. The architectures we tested are all augmented with one Global Average Pooling layer (and the 2-unit output layer, of course) and are trained using an exponential learning rate scheduler. We also experimented with different hyperparameters in an attempt to fine-tune the model and get the best possible results. Our experiments show that most of the CNN models have a similar performance in this task, and even simpler architectures were able to achieve similar results as the more complex ones while having faster training time. However, ResNet models (particularly ResNet101) were able to consistently, though marginally, outperform all the other architectures we included in the study.

Keywords: measure; COVID-19, chest x-ray, convolutional neural network, transfer learning, performance comparison.

A Sentiment Analysis Model for the COVID-19 Vaccine in Indonesia Using Twitter API v2, *TextBlob*, and *Googletrans*

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COVID-19 was declared a world pandemic in early-mid 2020. After about a year, several vaccines for this virus have been found and become alternative solutions to reduce the spread of the COVID-19 pandemic and build up herd immunity in society. Since early 2021, Indonesia has been one of the countries that participate in using vaccines for the public to fight the COVID-19 pandemic. However, there are a lot of positive and negative responses from Indonesian society related to these COVID-19 vaccines. Implementing a sentiment analysis model for a specific topic like a “vaccine” from social media could help us to see and understand the responses from society in Indonesia towards the vaccine program that is being conducted by the Indonesian government. Understanding society’s response towards vaccines is expected to be able to support the Indonesian government, for example in formalizing the distribution strategy of vaccines in the future. This paper discusses how to develop a sentiment analysis model, by implementing several existing technologies such as *Twitter API*, *TextBlob*, and *Googletrans* Python libraries. The utilization of these existing technologies could show how a sentiment analysis model could be developed conveniently, for example in using cases to analyse Indonesian society’s responses towards the COVID-19 vaccine program. Besides the solution design, this paper also shows a sample of data visualization of the sentiment analysis model in a meaningful infographics format.

Keywords: Sentiment Analysis; NLP; Twitter API v2; TextBlob; Googletrans; COVID-19 Vaccine

Feasibility Study for Implementation Biometrics for Online Transaction

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It's a big challenge for businesses to increase security in the age of digital technologies, especially for online shops. In online shopping, hackers can penetrate networks and steal private information about customers. Biometrics are still not being used by online retailers in Indonesia as a form of payment security. In this essay, we'll talk about how biometrics might increase online transaction security and effectiveness.

Keywords: Biometrics, PIN, Online Retail, Security;

Data-Efficient Reinforcement Learning with Data Augmented Episodic Memory

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Reinforcement learning has been implemented to model a task by doing the task repeatedly to get the maximum results based on the reward and punishment policy. It has been implemented in the game and

agent-based modelling. In the game, the game agent or Non-Players character can be modelled using several techniques to achieve the goal (e.g. reinforcement learning, deep neural network and Monte Carlo Tree Search). Deep neural networks and Monte Carlo Tree Search, two more sophisticated techniques in reinforcement learning algorithms, assisted the present reinforcement learning in resolving more challenging issues. However, this area has two challenges: the minimum number of data to model and generalization to different environments. Determining a minimum number of data required by the architecture to train the model is quite a cumbersome task to be applied to real-world jobs and situations since it demands substantial data to be explicitly provided and trial-and-error re-configuration. This work proposes a Data-Efficient Reinforcement Learning model by augmenting the data and implementing episodic memory. To illustrate the effectiveness of the proposed model, this research compares it to several models, such as the Deep Q-Network (DQN) with episodic memory to the same model with data augmentation and episodic memory. The model adds to the observations before being stored in the agent's memory, causing the agent to use the same logic and take the same action in comparable situations. The outcome demonstrates that the augmented model can surpass the fundamental model in speed (with an improvement of 50% quicker).

Keywords: Deep Reinforcement Learning, Deep Learning, Reinforcement Learning, Data Efficient

Deep Feature-based RGB-D Odometry using SuperPoint and SuperGlue

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This paper presents a deep feature-based RGB-D odometry system using SuperPoint and SuperGlue. Geometry-based visual odometry systems face challenges, such as tracking failures in difficult scenes and scale ambiguity. As for the scale ambiguity problem, the map need not be initialized because 3D information can be obtained by using the depth cameras installed in smartphones in recent years. By contrast, learning-based visual odometry systems can estimate even particularly difficult scenes compared with ORB, SIFT, and LIFT features. We integrated this into our RGB-D odometry system. Compared with geometry-based and learning-based visual odometry systems, the proposed deep feature-based RGB-D odometry system achieved higher accuracy.

Keywords: Visual Odometry, SLAM, RGB-D Odometry, RGB-D SLAM, SuperPoint, SuperGlue.

AHMERS: Active Health Monitoring and Emergency Response System

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AHMERS, active health monitoring and emergency response system, is a mobile application-based system that wirelessly connects to a smartwatch to constantly monitor the human body and respond to sudden changes in vital data, in case of emergency. This app monitors heartbeat rate, blood oxygen saturation, body temperature, and compares them with pre-set normal values. If the data deviates or the user presses one of the emergency switches, the app immediately asks the person if he/she is ok. If the person fails to respond within a few seconds to the “Are you ok?” message, the app continues to send out distress signals to pre-set phone numbers and server along with the person’s altitude, latitude and longitude, and current location on the map so that help can be sent quickly. It can determine whether a person is suffering from a health-related problem such as heart failure, Corona virus infection, hypothermia, etc.

Keywords: Heart Rate, Blood Oxygen Saturation, Body Temperature, Health Monitoring

Face Mask Detection for COVID-19 Prevention using Computer Vision

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During the height of the Coronavirus Disease (COVID-19) pandemic, prevention by obeying health protocol is a key to fight this pandemic, one of the ways is by using a face mask. In this paper, we conduct a research to make a face mask detection using Computer Vision. This face mask detection will detect people who use mask or not using mask by using Convolutional Neural Network (CNN) Algorithm, using three models, namely MobileNetV2, ResNet50V2, and VGG16, which are trained as many as 20 epochs for each model. The result showed MobileNetV2 and Resnet50V2 have better performance in terms of accuracy and loss value than VGG16.

Keywords: Face Mask Detection, Computer Vision, COVID-19

Objective Sleep Quality Measurement based on Fuzzy Logic and Wearable Device

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Sleep is the natural state of relaxation for human being. Sleep quality is an essential yet frequently neglected aspect of sleep in general. Sleep quality is essential because it allows the body to restore itself and prepare for the next day. The standard method for evaluating sleep quality was subjective evaluation. Actigraphy devices, which can measure the sleep cycle, are now widely available. This study developed a method using Fuzzy Logic and an actigraphy device to measure and classify sleep quality. The fuzzy logic method was developed in several stages, which are determining the sleep quality measurement parameters, constructing the fuzzy set for each input variable, and developing the fuzzy rules. To evaluate the proposed fuzzy model, five individuals were invited to participate in the experiment and required to complete the PSQI subjective sleep questionnaire. The evaluation result shows that our proposed Fuzzy model achieves lower error compared to the existing method.

Keywords: sleep; sleep quality; actigraphy; artificial intelligences; fuzzy logic
