

ICISIT 2022

International Conference on Information System
and Information Technology



UNIVERSITAS
MERCU BUANA
YOGYAKARTA



CONFERENCE BOOK

Artificial Intelligence Accelerated
Adoption for Society Empowerment

Indonesia, July 27, 2022



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Preface

Let us expressed our gratitude toward Allah SWT, which allow us to organize the very first International Conference on Information System and Information Technology 2022 (1st ICISIT 2022) 27th July 2022. This conference is our first international conference jointly organized by Faculty of Information Technology, Universitas Mercu Buana Yogyakarta which technically co-sponsored by IEEE Indonesia Section and supported by Universiti Kuala Lumpur.

Conferences Committee would like to express our gratitude to honorable keynote speakers for sharing their knowledge in the plenary session of this conference. We are also grateful to all of the participants of this conference which coming from various institutions and countries. Beside Indonesia, the paper also came from Malaysia, India, Turkey, Germany, and USA. High appreciation also addressed to all of the committee members who have worked hard for this conference's success.

We congratulate all of the presenters who have successfully accepted and enrolled to this event after being reviewed by at least reviewers using a blind review system. The acceptance rate of this conference is 47.6%.

This conference program designed to help participants to find relevant information related to the event such as schedule and paper abstract of the papers to be presented int this conference. However, should there be any confusion associated with this conference, please feel free to approach out committee members.

Last but not least, we offer our apologies for any mistakes in managing and organizing this conference, from the paper submission process until the post-conference activity.

Yogyakarta, July 2022
The 1st ICISIT 2022 Committee

Welcome Speech from The General Chair of ICISIT 2022

Welcome to the first International Conference on Information System and Information Technology (ICISIT) 2022.

I am glad to welcome the honorable speakers and excellent participants from all around the world at this conference. This conference has a single primary goal, that is to enable a meeting point between academia, industry, and government to share their research achievement in information technology for a better human life.

Although this year we are already overcome one of the biggest pandemic situations we ever had. We are choosing to go the safest way possible to held this event, which is in a virtual format. However, it will hopefully not reduce the meaning of this conference. We still can share and support each other to produce something useful for the community.

In this so called “post-pandemic” situation when everything starts to get moving on again, researchers from various fields also digging into the potential of the situation to help this transition. Various studies were conducted to help with the transition, to encourage the economy, educational, or any industrial fields on adaptation toward the current condition. Toward the concept of Society 5.0, Artificial intelligence starts to be used in various fields in the human life. It helps in any ways possible for the society empowerment. Therefore, we bring forward the topic of the conference “Artificial Intelligence Accelerated Adoption for Society Empowerment”.

Today, scientist have to take their roles and responsibilities to share their expertise to solve the real-world problem in the new world order. Researchers have to take the chance to find out an explanation, methods, and tools to enable the society to adapt the new way of life.

Finally, I would like to extend our sincere gratitude and appreciation for all of the hard work and dedication provided by the technical program committee, reviewers, and keynote speakers.

I would like to express my gratitude to the steering committee members, the organizing committee, the IEEE Indonesia Section, Faculty of Information Technology’s Board of Directors, Universitas Mercu Buana Yogyakarta, and Universiti Kuala Lumpur for the support that conducted the success of the 1st ICISIT 2022.

**The General Chair of 1st ICISIT 2022
Irfan Pratama, S.Kom., M.Eng.**

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Conference Information

Dates	: July, 27 th 2022
Organizer	: Faculty of Information Technology, Universitas Mercu Buana Yogyakarta
Venue	: Zoom Virtual Meeting
Official Language	: English
Secretariat	: Kampus II : Jl. Jembatan Merah, No. 84.C. Gejayan, Yogyakarta, Indonesia.
Phone	: (0274) 584922
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Conference Website	: https://icisit.org/

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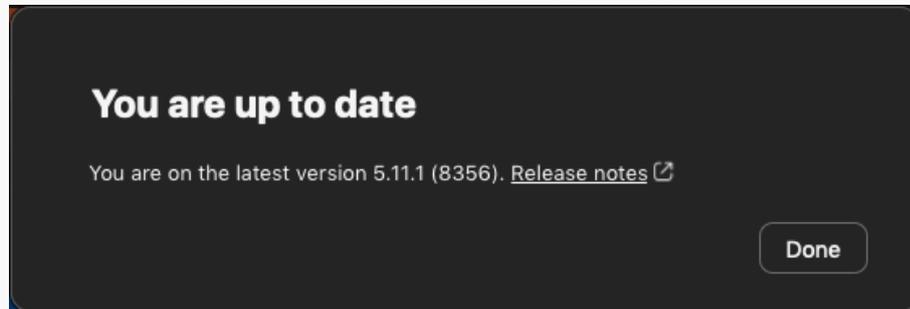
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Meeting Room

1st ICISIT 2022 will be held virtually using **Zoom** Meeting Platform

Please pay attention to these items below:

1. Use the latest version of Zoom: Update Version 5.11.1. (Required)

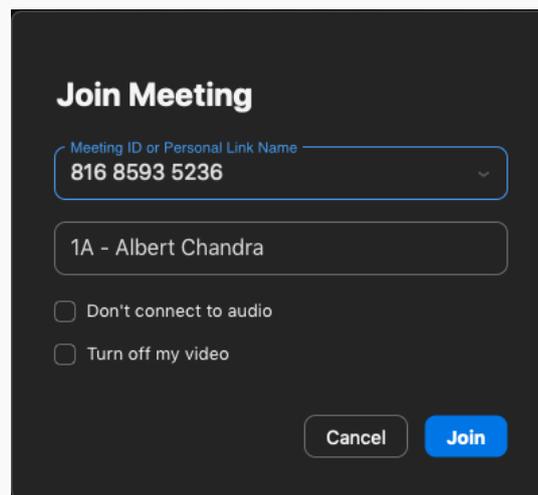


2. Set Zoom Username by the following format:

Session Code – Your Full Name

Example: **1A – Albert Chandra** (Required)

For session code details, please check the “Program Schedule” Page



Universitas Mercu Buana Yogyakarta is inviting you to scheduled Zoom meeting:

Topic : ICISIT - International Conference on Information System & Information Technology

Time : Wednesday, July 27 2022 06:00 Jakarta

Join Zoom Meeting

<https://us02web.zoom.us/j/81685935236?pwd=TEEwZXV0MSswSWlxcUhjaGRnRkJDZz09>

Meeting ID : 816 8593 5236

Passcode : 086799

**Only presented papers will be submitted subject to possible publication in IEEE
Explore digital library**

Program Schedule

Time		Room A	Room B	Room C	Room D	Room E
Wednesday, 27 July 2022						
07.30 am – 08.00 am	30	Log in: Log in to Zoom Meeting (id: 816 8593 5236 pass: 086799)				
08.00 am – 09.30 am	90	1A: Parallel Session 1-A	1B: Parallel Session 1-B	1C: Parallel Session 1-C	1D: Parallel Session 1-D	1E: Parallel Session 1-E
09.30 am – 12.15 pm	195	Opening Ceremony + Plenary Speakers				
09.30 am	10	Greeting from MC and National Anthem of Republic Indonesia: “Indonesia Raya”				
09.40 am	5	Speech from The Committee as General Chair: Irfan Pratama, S.Kom., M.Eng.				
09.45 am	5	Speech from Dean of Faculty of Information Technology of Universitas Mercu Buana Yogyakarta: Anief Fauzan Rozi, S.Kom., M.Eng.				
09.50 am	5	Speech from rector of Universitas Mercu Buana Yogyakarta: Dr. Agus Slamet				
09.55 am	5	Plenary Session Moderated by: Albert Yakobus Chandra, S.Kom., M.Eng.				
10.00 am	50	Plenary Speaker 1: Ir. Lukito Edi Nugroho, Ph.D				
10.50 am	15	Discussion: Q & A of 1 st Speaker				
11.05 am	50	Plenary Speaker 2: Dr. Mohd Nizam Husen				
11.55 am	15	Discussion: Q & A of 2 nd Speaker				
12.10 am	5	Closing and Photo Session				
12.15 am – 13.00 pm	45	Break: Break Time				
13.00 pm – 15.30 pm	150	2A: Parallel Session 2-A	2B: Parallel Session 2-B	2C: Parallel Session 2-C	2D: Parallel Session 2-D	2E: Parallel Session 2-E
15.30 pm	15	Closing, Awarding, Announcement & Photo Session				

Note:

The time shown refers to the **Jakarta Indonesia Time Zone (GMT+7)**

Two characters in bold is the **session code (1A, 1B, 1C, 1D, 1E, 2A, 2B, 2C, 2D, 2E)** that should be used as the prefix for the zoom presenter’s username

Plenary Speaker Profile



Dr. Mohd Nizam Husen
(mnizam@unikl.edu.my)

Dr. Mohd Nizam Husen is currently a Deputy Dean (Academic & Technology) and an Associate Professor at the Universiti Kuala Lumpur Malaysian Institute of Information Technology (UniKL MIIT), Malaysia. He received his B.Sc. in Computing from the University of Portsmouth, U.K., in 1997, followed by a Master degree in Information Technology from Universiti Utara Malaysia, Malaysia, in 2007. He received his Ph.D. degree in Computer Engineering from Sungkyunkwan University, Suwon, South Korea, in 2017. He is the author of more than 40 research articles. His research interests include artificial intelligence, intelligent systems, pattern recognition, visual attention, and indoor localization. He is also a Reviewer of various well-known journals, among others are the IEEE Communications Letters, IEEE Transactions on Industrial Electronics, Journal of Pattern Recognition Research, Springer Mobile Networks and Applications, and Journal of Location Based Services. Dr. Nizam is also a certified Professional Technologist from the Malaysia Board of Technologist (MBOT) where he is actively involving as Evaluation Panel for Technology and Technical Academic Programmes Accreditation. He is also appointed by the government as an Expert Panel for Ministry of Science, Technology and Innovation (MOSTI) Research & Development Fund (2021-2023). Other than that, he is also a Certified iOS Application Developer, Certified Android Application Developer, and Certified Cyber Security Specialist.

Plenary Speaker Profile



Ir. Lukito Edi Nugroho, Ph.D.
(lukito@ugm.ac.id)

Ir. Lukito Edi Nugroho, Ph.D. is currently a lecturer at Electrical Engineering & Information Technology Department Universitas Gadjah Mada, Indonesia. He received his Ir. In Electrical Engineering from the Universitas Gadjah Mada, Indonesia in 1989, followed by a Master Degree in Computer Science from James Cook University, Australia, in 1994. He received his Ph.D. degree in Computer Science and Software Engineering from Monash University, Australia, in 2001. He is the author of more than more than 140 research articles along with 3 book and 3 book chapters. He is principal researcher on several project such as Molina (Mobil Listrik Nasional) and smart farming on palm plantations. His research interests including pervasive computing, context-aware computing, e-government and smart city, and educational technology transformation. He is also having outstanding achievement as a practitioner as he was a Director of PT Gamatechno Indonesia from 2004 – 2008. Assisting the government institution as a technical expert on composing strategic planning of e-government and smart city. Team leader of Jogja Smart Province master plan's composing activity. He is also an assessor of universities national accreditation board.

Parallel Session

1-A

Chair: Dr. Dahlan Abdul Ghani

Authors: Muhammad Akmal Juniawan; Novialdi Ashari; Rizdiani Prastiti; Suci inayah; Fandi Gunawan; Panca O. Hadi Putra

Exploring Critical Success Factors for Enterprise Resource Planning Implementation: A Telecommunication Company Viewpoint

The telecommunication companies have become more important and competitive. The rapid development and changes in the telecommunications industry, requiring high demand for the excellent quality of communication services for transferring information so the companies are searching and improving the internal resources to achieve a competitive advantage. Enterprise Resource Planning (ERP) system is an Information Technology (IT) solution that enables and improves the efficiency of management decisions and innovative business operations of telecommunication companies. This paper has the main objective to identify the critical success factors and quantify their impact on ERP implementation in the telecommunication industry, especially in ABC Telco Company. The data were collected through a semi-structured interview and a questionnaire survey using Pareto Analysis. Based on the results, The one CSFs from the interview result is included as the "vital few" CSFs that occupy a substantial amount (80 percent) of the cumulative percentage of occurrences based on survey result which is Effectiveness of Project Leader that mean this CSFs must be attentive and focused by ERP practitioners in the Telecommunication industry along with the others most influence and "vital few" CSFs and they must ensure the remaining CSFs should not be ignored. Furthermore, it is recommended to assign the capable project leader to make a strategy for implementation of the ERP and determine what approach the team should take to achieve that success of implementation. Once these objectives are put in place and enriched, the other CSFs should be incorporated.

Parallel Session

1-A

Chair: Dahlan Abdul Ghani

**Authors: Swardiantara Silalahi; Royyana Ijtihadie; Tohari Ahmad;
Hudan Studiawan**

A Survey on Logging in Distributed System

Systems' performance evaluation and improvement are endless as long as a system runs. This requires several records of data containing the chronological order of executed process. In this case, logging comes into action. Logging is a mechanism of recording the empirical running process in software or system. Expected benefits from this practice include assisting the developer in debugging under the development phase. For a running system, it is not only for debugging but also for compliance check and anomaly detection. The logging mechanism might vary from one system to another, especially if a stand-alone system is compared to a distributed system. Thus, this survey aims to identify the existing recent works on logging state-of-the-art along with the research objectives. The underlying architecture and considerations are summarized. A logging taxonomy becomes one of the main contributions of this study. Current research limitations and challenges are discussed, followed by several possible areas of future research directions.

Parallel Session

1-A

Chair: Dahlan Abdul Ghani

Authors: Muharman Lubis; Mutmainnah lanure; Furqan Maulana

***Assessment of IT Maturity Level and Roadmap Preparation for
Improving Governance Based on COBIT 5 (Case Study: XYZ Company)***

Based on the results of the assessment conducted at PT XYZ, PT XYZ has implemented information technology to help run its business processes. However, the use of this technology has not yet identified the maturity level. For this reason, it is necessary to conduct an assessment and then design recommendations and a roadmap for improvement based on ideal information governance based on the COBIT Framework. The formulation of recommendations considers the results of the assessment at the assessment stage which consists of 3 main steps, namely Analysis of Organizational Context and IT Governance Needs, Assessment of Existing Conditions, and Preparation of Recommendations for strengthening existing governance.

Parallel Session

1-A

Chair: Dahlan Abdul Ghani

Authors: Fatma Kurnia febrianti; Muhardi Saputra; Warih Puspitasari

COGS Report Customization Design for Profitability Analysis with ABAP List Viewer: Case Study of a Telecommunication Enterprise

Along with revenue, one of the necessary metrics in calculating gross profit for profitability analysis is Cost of Goods Sold (COGS). The objective of measuring profitability with gross profit is to reckon how efficient an enterprise manages the labors and supplies in carrying out the production process or services provision. PT XYZ is an Indonesian state-owned enterprise that operates in the service sector of information and communication technology and telecommunications networks. In supporting the cost allocation and profitability analysis process, PT XYZ has implemented SAP S/4HANA. However, the company still faces shortcomings in its daily business operation, particularly profitability analysis reporting. The current report of COGS for profitability analysis in the system does not provide information about the business process source of the cost allocation. This research studies the solution to answer the problem of PT XYZ by designing a custom report development with ABAP List Viewer (ALV) that can display the source details of COGS for a product. The solution is developed with the expectation that as a result of the information presented in the report, the finance unit can analyze the cost and budget allocation to determine the proper course of action regarding profitability and cost management.

Parallel Session

1-A

Chair: Dahlan Abdul Ghani

Authors: Yekti Wirani; Maurice Ibrahim

The Effect of Personal Innovativeness and Trust in Online Lending Platforms to Adoption of Indonesian Sharia FinTech Lending

As one of the nations with tremendous Muslim residents, Indonesia only has eight authorized Sharia FinTech Lending. In addition, based on a survey of the Sharia financial literacy and inclusion index conducted by the OJK, it is comprehended that the Sharia financial literacy index in Indonesia is still low compared to conventional finance. This study aims to identify the impact of Profit-sharing, Personal Innovativeness, Familiarity, Security, and Trust in Online Lending Platform on the Intention to Use of Sharia FinTech Lending in Indonesia. This study involved 104 respondents to fill out an online questionnaire and two respondents to validate the recommendations designed through interview techniques. The results of quantitative data processing were analyzed using SmartPLS. This study concludes that Personal Innovativeness and Trust in Online Lending Platforms affect Intention to Use in Sharia FinTech Lending. This study contributes several recommendations for Sharia FinTech Lending providers in Indonesia to improve their services to be accepted by the community and under sharia principles.

Parallel Session

1-A

Chair: Dahlan Abdul Ghani

**Authors: Wildan Razaq Ramadhan; Daffa Satrio Bako; Nico Winata;
Henkie Ongowarsito**

Perceived Value Model Analysis on Video Games Cosmetics Purchase and Continued Use Intention

This paper studies the effect of the perceived value of paid in-game items related to its continued use intention and the user purchase intention along with the relation between the two. Enjoyment, quality, social, and economic value are the perceived value that was used to test the hypothesis. The results suggest that the perceived economic and social values to either the purchase intention or continued use intention have low significance, this led to the writer assumption of pandemic time of data was taken, this needs to be researched further. On the other side, we found perceived quality significantly affected the continued use intention and purchase intention. Furthermore, potentially increase customer retention also affected the purchase intention.

Parallel Session

1-B

Chair: Putri Taqwa P

Authors: Bahrul Ilmi Nasution; Sri Indriyani Siregar

Regional Economy Condition in Indonesia During COVID-19 Pandemic: An Analysis Using Teaching Learning-Based Fuzzy Geodemographic Clustering

COVID-19 has impacted Indonesia and caused an economic recession during 2020. The economic condition in Indonesia should be evaluated through the regional economic condition. One well-known approach to do a regional analysis is a geodemographic analysis using Fuzzy Geographically Weighted Clustering (FGWC). However, FGWC is still weak against the local optima, so it is necessary to use an optimisation algorithm to enhance it. This study proposes a new approach of FGWC enhancement using Elicit Teaching-Learning Based Optimisation (ETLBO) to analyse the regional economic condition in Indonesia. We compare ETLBO with previously implemented optimisation algorithms in FGWC, such as Particle Swarm Optimisation (PSO) and Intelligent Firefly Algorithm (IFA). This study found that ETLBO performs well in identifying Indonesia's regional economic condition. Moreover, the clustering results showed the difference of problematic sectors. We also found that the provinces in Java Island joined into a cluster and have problems in many sectors. This study can be used as the basis for the evaluation of regional economic conditions in Indonesia.

Parallel Session

1-B

Chair: Putri Taqwa P

Authors: Rizky Pratama Hibatulah; Dedy Rahman Wijaya; Wawa Wikusna

Prediction of Microbial Population in Meat Using Electronic Nose and Support Vector Regression Algorithm

Meat is one of several sources of protein needed by the human body. Until now, meat consumption has continued to increase yearly for various reasons, including its high nutritional value as a source of protein and its wide availability. The public must know the excellent quality of meat not consume rotten meat when choosing meat. Meanwhile, people still use the sense of smell to determine the quality of meat based on personal views. To overcome these obstacles, it is necessary to develop a method to predict the microbial population in meat to determine whether the meat is safe for consumption. Prediction requires the use of an acceptable approach. Using an electronic nose (e-nose) in conjunction with the Support Vector Machine Regression (SVR) technique allows a structured approach to predict the microbial population in meat concerning the Meat Quality Standard. The prediction results indicate that the system is accurate, as shown by R-squared 0.977 and an RMSE 0.026.

Parallel Session

1-B

Chair: Putri Taqwa P

Authors: Salamun Rohman Nudin; Budi Warsito; Adi Wibowo

Impact of Soft Skills Competencies to Predict Graduates Getting Jobs Using Random Forest Algorithm

Soft skills competencies is a special skill by a person in the field of self-management. This competency is very much needed by higher education in getting a job in the era of industry 4.0 and society 5.0. Analysis of the impact of soft skills competencies is currently not widely carried out, even though the tracer study instrument for higher education already exists. Prediction of alumni readiness to enter the work world is very important for higher education. It is necessary to carry out further analysis in this regard. The focus of this research is to analyze the relationship between soft skills competencies and the absorption of graduates in getting a job before six months using the random forest algorithm. The results of the testing using confusion matrix in the development of this prediction model resulted an accuracy of 64%.

Parallel Session

1-B

Chair: Putri Taqwa P

Authors: Adhi Dharma Wibawa

Iris Grid Image Classification Using Naïve Bayes for Human Biometric System

Biometrics is a measurement of a person's physical and behavioural characteristics. Iris image is one of many biometrics data such as fingerprint, voice, face, and gait that can be used as an identifier. Iris is the coloured part of the eye that helps the pupil see clearly and regulates light entry. Iris recognition is one of the important topics in biometric systems because of its unique pattern. Several related studies have been carried out to automatically obtain the most efficient method to understand and recognize the iris for human verification. This study proposes an analysis of iris images for biometrics systems with effective image processing techniques for system recognition. CVBL Iris image dataset was used in this study with 4320 iris images. After converting the iris image into a rectangle form, the Grid iris image experiment was implemented to find the highest accuracy. Several iris image grid-size were simulated to find the best accuracy. Multinomial Naive Bayes is used as a classifier. The Naive Bayes method is a machine learning method that uses probability calculations (rules-based). This algorithm uses probability and statistical methods, which predict future probabilities based on the previous data. The study results indicate that the proposed method can recognize the iris by identifying its fibres and encoding the fibre data using a grid image approach, with a classification accuracy of 92.37%, using an iris grid size of 70x50 pixels. This research can be useful for developing human biometric systems based on iris with a simple preprocessing approach.

Parallel Session

1-B

Chair: Putri Taqwa P

Authors: Christopher Harris

Detecting Fake Yelp Reviews Using a Positional LSTM / K-L Divergence Ensemble Approach

Online reviews of products and services often have a significant impact on future purchases. Unfortunately, this invites opportunities for fraud -to provide fake reviews to improve a company's reputation in the eyes of consumers or to disparage the reputation of a competitor. We combine two methods to detect fraud in Yelp restaurant reviews. First, we develop and apply a bi-directional Long-Short Term Memory Recurrent Neural Network (LSTM) to take advantage of the positional relevancy of comments within reviews. LSTMs are well-suited to examine linguistic features in text and evaluating different regions of text within the review enhances our model's accuracy. To this component, we apply a Kullback-Leibler (K-L) divergence technique to examine the discrepancy in the term rankings between real and fake Yelp reviews. This ensemble is used to discriminate fake reviews from real ones, achieving an average precision of 0.5402 and an AUC of 0.866. which is an improvement over other state-of-the-art techniques on the same YelpNYC dataset.

Parallel Session

1-B

Chair: Putri Taqwa P

**Authors: Fairuz Iqbal Maulana; Gusti Pangestu; M.Febriantoro;
Rahman Arifuddin; Vandha Widartha**

Visualization Analysis and Trends in Indonesian Internet of Things Research Using Bibliometrics

The Internet of Things (IoT) has emerged as a critical issue and area of research for a variety of communities, academics, and industries worldwide. Due to the lack of research in IoT and understanding the direction of IoT development in the future. This research presents bibliometric analysis and analysis of science mapping on IoT. Data was taken from the Scopus database based on Indonesian state affiliation from 2012 - 2020. A total of 1415 documents (Conference proceedings, journals, book series, and books) were retrieved, which were then processed online via Scopus Web and by VOSviewer software to perform advanced bibliometric analysis and science mapping analysis. The method is divided into five stages: keyword selection, initial search results, search result refinement, initial compilation, and data analysis. Scopus's list of the most frequently published and indexed articles, the most published papers are in the subject area of Computer Science (29.0%) with 938 documents, Engineering (20.7%) with 668 documents, Physics and Astronomy (9.5%) with 308 documents. The data processed and visualized on this topic offer exploratory information about the current status and trends in the IoT scientific literature and provide insight for established and novice researchers in understanding this research topic.

Parallel Session

1-C

Chair: Anggit Ferdita Nugraha

Authors: Arsy Yudha Prinanto; Muhammad Rivai; Rachmad Setiawan

Diagnostics of Magnetron Transmitter System Using Thermal Camera and Neural Network

The magnetron transmitter system is one of the most important components of weather radar. When it is faulty, the weather radar can down. Monitoring the condition of the magnetron transmitter system is crucial to ensure the weather radar is operating normally. In this study, the temperature monitoring of the magnetron transmitter system was carried out. An MLX90640 thermal camera that produces a temperature matrix output is required to represent the overall temperature of the magnetron transmitter system. The thermal camera output is used as the basis for the identification of magnetron transmitter system conditions by neural networks. Identifying the condition of the magnetron transmitter system will be early detection if an anomaly occurs in the magnetron transmitter system. The results of this study showed that the thermal camera can measure the temperature of the magnetron transmitter system. The neural network-based diagnosis system can identify several magnetron transmitter system conditions, such as magnetron on, magnetron off, radar off, modulator power supply overheat, switch array unit overheat, and signal processing faulty. This innovation is expected to be early detection of an anomaly that occurs in the magnetron transmitter system so that it can minimize downtime to make repairs due to the unpreparedness of spare parts.

Parallel Session

1-C

Chair: Anggit Ferdita Nugraha

Authors: Mohammad Farizshah Ismail Kamil; Jamaludin Nor Azliana Akmal; Mohd Rizal Mohd Isa; Shokri Jusoh

Prediction of Breed Lineage for Small Ruminant Production Using Deep Learning Technique

According to UN Committee on World Food Security, people must always have access to sufficient food supplies such as meat, chicken, and sheep. Although important to Malaysian Muslims which account for about 60% of the population, sheep are in short supply locally due to the high mortality rate caused by fatal diseases such as Foot and Mouth Disease (FMD), Tetanus, etc. Because of inbreeding, qualities such as disease resistance, fertility, prolificacy, vigor, and survivability are reduced in animals, often referred to as inbreeding depression. It is important to note that infected sheep may cause contaminated sheep meat produce, transmitting foodborne bacteria such as E.coli and Salmonella to humans during different stages of food preparation. Previously, other papers compared hundreds of images of sheep to deep learning models to learn of its breed. Although successful, both methods took a long period to complete. This paper proposes a framework based on deep learning techniques that will identify and predict breed lineage and inherited disease in sheep. The adopted deep learning algorithm will improve time efficiency in retrieving immediate information while still maintaining a high accuracy rate. From a wider perspective, the proposed framework has the potential to be used across domains as it can be trained with any other dataset.

Parallel Session

1-C

Chair: Anggit Ferdita Nugraha

Authors: Arif Ridho Lubis; Santi Prayudani; Yulia Fatmi; Yuyun Iase; A-Khowarizmi

In Image Classification of Skin Cancer Sufferers: Modification of K-Nearest Neighbor with Histogram of Oriented Gradients Approach

Classification in data mining is one technique in recognizing all types of data. Where data can be in the form of text, numeric, images and others. One of the superior classification techniques is the KNN algorithm. The KNN algorithm is a distance search using Euclidean distance. image data classification using the HOG process is needed to modify the KNN. The purpose of this paper is to classify patients with classifying skin cancer patients using the KNN method where the Histogram of Oriented Gradients (HOG) process is used to assist in extracting data for skin cancer patients, which consists of benign and malignant cancers. However, in this paper, the images included in this article are pictures of skin cancer sufferers, which consist of malignant and benign. The data obtained were 660 datasets of which 630 were used as training data and 30 were used as test data. The training and testing went well, this was shown by getting a MAPE of 1.06705477%. So that the classification process can be accepted because it shows a small validity.

Parallel Session

1-C

Chair: Anggit Ferdita Nugraha

Authors: Muchamad Taufiq Anwar

Optimizing LSTM Model for Low-Cost Green Car Demand Forecasting

Demand forecasting is an important task in every business including car manufacturing. The high initial production cost of cars places even more importance on demand forecasting especially for a specific type of car such as the Low-Cost Green Car (LCGC). Within its current 8 years journey, the number of demands for LCGC cars has experienced some fluctuation which makes the need for accurate demand forecasting even more important. This research aims to accurately predict the demand for LCGC cars in Indonesia using the Long Short-Term Memory (LSTM) method. However, it is difficult to find the best parameter settings for a neural network-based model such as LSTM. Therefore, this research will explore the effect of different parameter settings on the model accuracy. The data used in this research is the number of monthly domestic LCGC car sales from September 2013 to December 2021 obtained from the Association of Indonesian Automotive Industries (GAIKINDO). The experiments were conducted using the Tensorflow package in Python and were evaluated for their performance using MAE and MAPE. The experimental results showed that the LSTM model can accurately predict car sales/demands with an MAE of up to 977.6 and MAPE of 6.8% (accuracy 93.2%).

Parallel Session

1-C

Chair: Anggit Ferdita Nugraha

**Author: Muhamad Fulki Firdaus; Hilman Fauzi; Yunendah Fuadah;
Anggit Adji Hapsari; Ibrahim Shapiai**

Spatial Selection Configuration on EEG Stroke Signal

Stroke is one of the cerebrovascular health disorders caused by a blockage of blood flow to the brain. Data from South East Asian Medical Information Center (SEAMIC) explain that the most significant stroke mortality occurred in Indonesia, Philippines, Singapore, Brunei, Malaysia, and Thailand. There are several methods for diagnosing stroke, one of which is an electroencephalograph (EEG). EEG is one of the more widely used BCI methods due to its lower price, portability, ease of use, and high temporal resolution than other methods. To achieve good performance, most EEG require signals from various places on the scalp. However, using a large number of channels can degrade signal performance in the EEG. Therefore, this study will select the optimized channel using the spatial selection method to see which channels are relevant to the EEG stroke signal. Also, using the Power Spectral Density extraction feature and Extreme Learning Machine classification. The L2-norm energy calculation method gets better results than other methods. This method can also select the active channel that is relevant to the stroke EEG signal. The results show that the spatial selection method can increase accuracy by 15 percent and optimize the system with 37.5 percent channel reductions.

Parallel Session

1-C

Chair: Anggit Ferdita Nugraha

Authors: Jans Hendry

Piezoelectric-Based Battery Charging on Multirotor Drone: A Concept Model

The multirotor drones have been used extensively in modern farming. This device can help to tackle many tasks that is limited to human such as planting, watering, monitoring, spraying disinfectant, and so on. This device can be so much useful in wide area of farms. Hence, it can save farmer's time and energy. Drones mostly use battery or supercapacitor as their power supply. It means that they cannot fly forever without charged. Battery recharging takes time. Hence some researches have already conducted to make the battery charging easy to do the drone can continue to do the tasks without the need to stop the operation. In this research, we propose a concept model for battery recharge without stopping the drone from operation. It converts sounds from multirotor drone's motor into current by using piezoelectric sensor. Based on calculation and analysis on frequency spectrum, ideal fundamental frequency is 120 Hz that yields length of piezoelectric sensor's resonator 11 cm.

Parallel Session

1-D

Chair: Aznida Abu Bakar Sajak

Authors: Arif Ridho Lubis; Santi Prayudani; Muharman Lubis; Okvi Nugroho

Sentiment Analysis on Online Learning During the Covid-19 Pandemic Based on Opinions on Twitter Using KNN Method

Coronavirus Disease of 2019 began in Wuhan in December 2019 and it was declared as a global pandemic by WHO. Until January 2021, it affected all of human activities on earth i.e., experiencing many obstacles from restrictions on activities, closure of tourist attractions to restrictions on face-to-face learning activities in schools or universities. Due to the policy of providing a broad influence on the community with various comments through social media, many twitter users make tweets containing positive and negative comments leading to statements about online learning or daring. The problem is that they contain so many different words, abbreviations, informal language, and symbols, creating difficulties to choose which words or groups of words that can produce positive or negative statements. K-Nearest Neighbors algorithm is used to classify positive and negative tweet data, the results were AUC for class 0: 0.754, 1: 0.635, 2: 0.721 and with a precision classification score of 0.86, recall is 0.85 so that the results of the classification of negative and positive sentences on the online learning tweet data were ROC-AUC of 0.853 and the accuracy value of 0.885.

Parallel Session

1-D

Chair: Aznida Abu Bakar Sajak

Authors: Reza Amelia; Azizah Endrastaty; Dana Indra Sensusue

Critical Success Factors of Knowledge Management Implementation in BPKP

As the auditor for the President of the Republic of Indonesia, the Financial and Development Supervisory Agency or abbreviated as BPKP, was charged to give a fast strategic recommendation to the President. Knowledge management (KM) became one of the vital strategies in organizations to improve the quality of recommendations and achieve organizational goals. A survey method was conducted to identify critical success factors (CSF) of KM implementation at BPKP. The structural equation modeling partial least square (SEM-PLS) method was used in this study to implement knowledge management as the latent variable. After that, the research model was described, and all critical success factors were explained clearly because of this research. The study results indicated that the critical success factors of the application of knowledge management are leadership, information technology, and rewards/motivation.

Parallel Session

1-D

Chair: Aznida Abu Bakar Sajak

**Authors: Christianto Wibisono; Muharman Lubis; Rohman Fauzi; Arif
Ridho Lubis**

The Establishment of Organizational Culture in Multinational Cellular Telecommunication Companies

This study aims to determine whether there is a dominant organizational culture in cellular telecommunications companies in the Indonesian capital city using survey methods and class actions. In brief, the results of the study show that the dominant organizational culture with Company A is a rule oriented, Company B is organizational ties or glue, Company C is an innovation oriented while Company D is a result-oriented. In the context of audit and control techniques in the information systems department, students who are prepared as the best graduates placed in the company tend to think creatively when the approaches like jigsaw seem to increase focus and capability accordingly. Therefore, organizational culture might hinder this kind of improvement which most the graduates are trapped in the aspects procedural and clerical activities of audit and control of information systems, conflicted with the undergoing education on campus who preferably use certain type of approaches in learning techniques.

Parallel Session

1-D

Chair: Aznida Abu Bakar Sajak

Authors: Sekar W Prasetyaningtyas

Digital Transformation in Vocational High School: A Soft System Approach

The Digital Transformation process, especially in vocational high school, is highly complex and should be understood by scholars. We use seven stages of soft systems methodology to contribute to a deeper understanding of The Digital Transformation process, especially in vocational high school as a policy issue. The methodology used was an exploratory study, in-depth interviews to gather data. All stakeholders related to the process were the main interviewees. The outcomes showed the actors involved and the obstacles experienced by the actors in transforming the existing condition to the digital one. The paper proposed a digital transformation model in vocational high school due to this soft system approach.

Parallel Session

1-D

Chair: Aznida Abu Bakar Sajak

**Authors: Fifeka Onanda Wahid; Agustinus Putra; Heri Heryadi;
Anggraini Parahita; Mohammad Hilmy Zhafrani; Muhammad Rifki
Shihab**

Implementation of Virtual Organization in a Global Distributed Company: A Case Study

XYZ company is a multinational company owning 40 worldwide offices. Since the business is geographically distributed with a vast number of employees, tight, strong, and efficient coordination is a must. This paper observes how is virtual organization implemented in the XYZ company as a global distributed company. This research was conducted with a qualitative method. Primary data is obtained with interviews and secondary data collected from some relevant studies and literature documents from some trusted sources. The result review organization structure, communication and collaboration, and diversity and inclusion in XYZ company. This company uses a distributed communication model. Every branch can collaborate with any branch. They use several tools for collaboration and communication such as Microsoft Teams, WebEx, Jira, Confluence, and Internal Global Website System. To handle challenge in time zone differences, XYZ company have two methods of communication which are synchronous and asynchronous communication. XYZ company encourage a diverse and inclusive workspace because they have branch all over the world. It shows that virtual organization is becoming an increasingly important mode of work with the widespread use of information technologies. With the help of a virtual organization, A global distributed company can connect each of their branches even though they are geographically apart from each other.

Parallel Session

1-E

Chair: Mutaqin Akbar

Authors: Ilham Ramli; Lim Sanny

The Effect of Addiction, Perceived Values and Mobile Game Loyalty on Purchase Intention in Mobile Legends in Indonesia

The games industry is rapidly developing both globally and in Indonesia which results in big revenue, in which one of the most popular is Mobile Legends. There are various sources of income for a game, one of them is through selling in-app features that are also being done by Mobile Legends. The purpose of this research is to know the influence of addiction, perceived value, which consists of perceived playfulness, perceived flexibility, perceived connectedness, perceived reward, loyalty to Mobile Legends, and purchase intention in Mobile Legends. This research is analyzed using PLS-SEM with SmartPLS, based on respondent data collected through questionnaires. This was done through a method of purposive sampling towards Mobile Legends players, who actively play Mobile Legends almost every day (every day or every two days), have never bought items in the game, and have the intention to buy items in the game. There is a significant influence of addiction towards loyalty, but not towards purchase intention. Almost all factors in perceived value besides perceived flexibility have a significant influence on mobile game loyalty. Only perceived playfulness and mobile game loyalty have a significant influence on purchase intention.

Parallel Session

1-E

Chair: Mutaqin Akbar

**Authors: Tri Ika Jaya Kusumawati; Anwar Rifai; Mauridhi Hery
Purnomo**

Mobile Augmented Reality Serious Game Design Based on Bloom's Taxonomy

The limitations of real learning resources, the less attractive presentation of learning, and the mismatch of material delivery with the level of students' thinking abilities were challenges in implementing learning that needed to be addressed immediately. This study aimed to develop learning applications using the principle of augmented reality serious games based on taxonomy bloom as an alternative solution to this problem. The method used was the ADDIE development cycle. This cycle consists of five stages, namely Analysis, Design, Development, Implementation, and Evaluation. The product produced in this study was a serious game application with the concept of augmented reality based on bloom's taxonomy on computer network material. This application was tested on five teachers and thirty students. Next, an evaluation of the application was evaluated in terms of four aspects, namely functionality, reliability, usability, and efficiency. The evaluation results show that the application developed meets the criteria well in the four aspects, with details of 58% of users giving good ratings on the function aspect, 55% on the reliability aspect, 50% on the usability aspect, and 47% on the efficiency aspect.

Parallel Session

1-E

Chair: Mutaqin Akbar

**Authors: Muh Syaiful Romadhon; Dana Indra Sensuse; Nadya Safitri;
Deden Sumirat Hidayat**

A Systematic Literature Review of Knowledge Management Models for E-Learning

E-learning refers to a technology-based learning system that allows it to be accessed anytime and anywhere. The application of e-learning in the world of education today is very much needed. The Covid-19 pandemic has encouraged to be used as a backup and solution in the learning system. Currently, knowledge management has been widely applied to digital-based learning. In its application, it is necessary to know what methods and models are applied to support the successful implementation of e-learning. It is hoped that this research will find out the knowledge management model for e-learning suitable for educational institutions. This study aims to find out the models and impact that arise in applying knowledge management in e-learning. This research was conducted using a systematic literature review method that took references from ACM, IEEE, ProQuest, ScienceDirect, and Scopus from 2017-2021 with the final paper extracted as many as 16 articles. In using KM to e-learning, using quantitative methods is more widely used. The SECI model can be a solution as a material for analyzing existing KM processes. Several other models can be applied according to the needs and objectives of KM implementation on e-learning. The application results show positive impacts, including improving better perception, user satisfaction, and improving existing knowledge processing. The implementation of KM in e-learning is also one of the success factors needed.

Parallel Session

1-E

Chair: Mutaqin Akbar

Authors: Elena Oddey Goretti; Yudhistya Ayu Kusumawati; Anindya Widita

Kampusku: Information Portal Mobile Application Design of Private Universities in Indonesia

Education is learning that humans take throughout their lives to gain experience and knowledge. College is the highest level that can be reached in attaining education and degrees. After students graduate from Senior High School, students can continue their studies towards higher education. High school students have a high interest in private universities. However, private universities are likely unable to facilitate information to students practically. The purpose of making this application is to facilitate students who wished to continue their studies at higher education institutions with information from various private universities in Indonesia. The stages of this research method used the Design Thinking process. Therefore, to help students who have difficulty choosing private universities, the author wishes to create information portal application of private universities in Indonesia.

Parallel Session

1-E

Chair: Mutaqin Akbar

**Authors: Gregorius Kevin Satrya Ananta; Yudhistya Ayu Kusumawati;
Andi Pramono**

Artlution: Architecture Design of Mobile Apps for Artblock Problems

Art Block problems occur until today in the design world, where designer struggle finding ideas. Sometimes, designers open social media to solve art block problems. But the solution they have are not effective enough to increase their creativity and start their work, because the search engine could not help them enough and the lack of others opinion about each other's work. Researcher came out with the idea to create an application that can solve art block problems by increasing the work of the search engine, widen the category, and adding the Art Helper feature where designers can discuss about their work and can help others who needed help. By using design thinking methods this research proposed Artlution mobile apps design concept, meaning a solution for your art problems. Hopefully this research can be used as recommendation to further development in order to make the designer relatively more creative.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Nur Nafi'iyah; Nophaz Hanggara Saputra

Identification of Human Stress Based on EEG Signals Using Machine Learning

Mental health greatly affects human physical health. Mental health can be a source of thinking as well as the response center of all activities. The pressures faced, the burden of thoughts, and food patterns can be a source of human psychological conditions. If the human psychological condition is under stress, it can cause disease. The development of intelligent system technology can take advantage of electroencephalogram (EEG) signals to recognize human mental conditions (stressed and normal). The purpose of this research was to determine the most appropriate method in identifying human psychology (stress and normal) from EEG. Based on the EEG signal taken through the recording of the response signal of the human brain, feature extraction is performed. The features taken are the mean, standard deviation, and MAV of each sub band, and channel. The total data of respondents studied were 20 people, with 10 normal criteria, and 10 stress. Each of the mean, standard deviation, and MAV features was modeled using the Naive Bayes, SVM, KNN, Backpropagation, Regression Logistics, Deep Learning, ID3 methods. The best method for detecting stress and normal is KNN with 97% accuracy.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Nophaz Hanggara Saputra; Adhi Dharma Wibawa; Yuri Pamungkas

EEG - Based Statistical Analysis on Determining the Stress Mental State on Police Personnel

Suicide is a global phenomenon that occurs worldwide, including in Indonesia. This is due to complications from high and severe stress because of economic factors, family and environmental problems. High and severe stresses are not only experienced by the individual in a society, but also by government staff such as members of the police. The heavy workload, such as handling demonstrations with high escalation, is one of the factors that cause police members to experience high stress. The use of an Electroencephalogram (EEG) is one of the physiological signals that can be used to measure and recognize stress based on data on human brain activity. This research is exploring stress state by using eeg signal analysis in time domain. The analysis is done based on EEG time-domain features in the theta (4-8Hz), alpha (8-13Hz), and beta (13-30Hz) frequency bands from two different channels, namely F3 and F4 in the 10/20 EEG system. Twenty members of the state police (10 under stress conditions and 10 in normal conditions) are involved in this study. Statistical features such as Mean, Standard Deviation, and Zero Crossing are used to distinguish between stress and normal conditions. The experimental results showed that the Standard Deviation feature on the Alpha subband provided the highest difference in comparing between normal and stress conditions. In the classification of stress and normal conditions using several algorithms, SVM indicates the highest classification accuracy (88.90%), compared to other algorithms such as Random Forest (86.10%), K-NN (77.80%) and Decision Tree (77,80%).

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Gozde Karatas Baydogmus

Probability Selection for Solving Sudoku with Ant Colony Optimization Algorithm

Bringing together popular and loved games with artificial learning methods are the most effective way to increase both motivations to work and skills in understanding and solving problems. In this context, especially Japanese puzzles have been tried to be solved with metaheuristic algorithms by researchers in recent years. Among the Japanese puzzles, one of the most popular games all over the world is Sudoku. Since the traditional methods used to solve the problem in the Sudoku puzzle are quite complex, a different method was sought and this study focused on the solving Sudoku puzzle with Ant Colony Optimization. In addition, since probability selection is very important in the ant colony algorithm, the effect of Roulette Wheel and Rank Based probability selection methods and the number of colonies on the solution of the Sudoku puzzle was also compared. For the results with the number of colonies, operations were carried out according to 9, 36 and 81 ants. For the study, 15 Sudoku puzzles, easy, medium and difficult, were solved with an ant colony and the time complexity of their solution was evaluated separately for each probability selection. In the results, it was seen that the Rank Based probability selection increased the time complexity of the algorithm by approximately, and it was observed that the increase in the number of ants decreased the working speed but did not affect the result.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Gozde Karatas Baydogmus

A Parallelization Based Ant Colony Optimization for Travelling Problem

Many problems investigated in computer science are also related to problems in daily life. The most famous of these is the Traveling Salesman Problem. This problem is a routing problem and is related to problems such as transportation, networking, vehicle routing. Among the many approaches proposed for TSP so far, the most popular are convolutional algorithms. In this study, a Parallelized Ant Colony Optimization Algorithm is proposed to solve the Traveling Salesman Problem. Thanks to parallelization, the growing time complexity due to the increasing number of cities has been solved. In addition, the effect of the number of colonies on the result was also examined in the study. Experimental results were performed on 5 different problems taken from TSPLIB to validate the developed parallel algorithm. As a result of the study, it has been seen that the increase in the number of colonies increases the time complexity of the algorithm, but thanks to parallelization, it works 50% faster than normal operation.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Kadek Ari Sudama; Muhammad Rivai; Totok Mujiono; Dava Aulia

Electronic Nose Based on Gas Sensor Array and Neural Network for Indoor Hydrogen Gas Control System

Hydrogen gas leaks in a closed room can pose a fire hazard and poor air quality. The concentration of hydrogen gas of 4-75% in the air is highly flammable and can cause explosions. An electronic nose system consisting of gas sensors array and a neural network has been built to detect hydrogen gas leaks in a room. Data from each sensor is used as input for the classification of gases on the neural network. Proportional-integral-derivative (PID) method is applied to control the exhaust fan to eliminate hydrogen gas leaks in the room. The electronic nose and PID control are implemented on the Arduino Nano microcontroller. The experiment results showed that this system could classify several gases such as hydrogen gas, vehicle smoke, and perfume with success rate of 86.67%. The PID control becomes active when hydrogen gas with concentrations above 100 ppm has been classified. These results can minimize and prevent hazards from hydrogen gas leaks and maintain good indoor air quality.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Muhammad Adnan Pramudito; Yunendah Fuadah; Rita Magdalena; Achmad Rizal; Fauzi Frahma Taliningsih

ECG Signal Processing Using 1-D Convolutional Neural Network for Congestive Heart Failure Identification

Heart disease is one of the world's major causes of death. Congestive Heart Failure is one type of heart disease to consider (CHF). CHF is a condition in which the heart cannot adequately pump blood throughout the body. An ECG can be used to diagnose this condition. As a result, using the convolutional neural network (CNN) 1D technique, which combines three hidden layers and 16 output channels, a fully connected layer, and softmax activation, this study offers a system that can automatically recognize CHF illness. The information for this study came from MIT-BIH and BIDMC. This study obtained a 100 percent accuracy rating from the experiment. Automatically detecting CHF illness can aid medical workers in identifying the condition and providing appropriate therapy to patients.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Ibnu Da'wan Salim Ubaidah; Yunendah Fuadah; Sofia Sa'idah; Rita Magdalena; Abel Bima Wiratama; Richard Bina Jadi Simanjuntak

Classification of Glaucoma in Fundus Images Using Convolutional Neural Network with MobileNet Architecture

Glaucoma is a condition in which the optic nerve is damaged due to increasing pressure in the eyeball. The cause is a mismatch between the amount of ocular fluid (aqueous humor) generated and the amount of eyeball fluid discharged. Manual CDR calculations are commonly used to classify glaucoma. Therefore, this study proposes a system that can classify glaucoma automatically with the Convolutional Neural Network (CNN) method using the MobileNet architecture. The data utilized in this investigation came from rim-one-r1. This research received a 99% accuracy rate from the experiment. The automatic classification of glaucoma can aid medical workers in identifying the best course of treatment for their patients.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Fauzi Frahma Taliningsih; Yunendah Fuadah; Syamsul Rizal; Achmad Rizal; Muhammad Adnan Pramudito; Giyan Sukma Pratama; Andi Fany

Biometric Verification Based on ECG Signal Using 1 Dimensional Convolutional Neural Network

Biometric is an analysis of individual characteristics. For instance, fingerprint, voice, iris, and face are biometrics. Nowadays, those methods are often used; it still has the disadvantage of being easy to manipulate. Identification using Electrocardiogram (ECG) signal is one of the biometric methods developed to prevent individual manipulation since ECG signals are unique for each individual. In this study, a system was designed using ECG signals for biometric verification. The ECG signals are unique since each individual has different physiological, geometric, and characteristics. The ECG-ID dataset used for evaluation contains 90 subjects. The results show an accuracy of 91.9%. This proposed study is feasible enough to be used as verification biometrics.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Fauzi Frahma Taliningsih; Yunendah Fuadah; Syamsul Rizal; Achmad Rizal; Muhammad Adnan Pramudito; Giyan Sukma Pratama; Andi Fany

Biometric Verification Based on ECG Signal Using 1 Dimensional Convolutional Neural Network

Biometric is an analysis of individual characteristics. For instance, fingerprint, voice, iris, and face are biometrics. Nowadays, those methods are often used; it still has the disadvantage of being easy to manipulate. Identification using Electrocardiogram (ECG) signal is one of the biometric methods developed to prevent individual manipulation since ECG signals are unique for each individual. In this study, a system was designed using ECG signals for biometric verification. The ECG signals are unique since each individual has different physiological, geometric, and characteristics. The ECG-ID dataset used for evaluation contains 90 subjects. The results show an accuracy of 91.9%. This proposed study is feasible enough to be used as verification biometrics.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Tri Ayuningsih; Agung Suhendar; Suyanto

Feasibility Study of Artificial Intelligence Technology for Home Video Surveillance

Currently, the concept of video surveillance at home can already be supported by a CCTV system or IP camera installed at home connected to an internet connection. However, the CCTV or IP Camera device is only equipped with minimal features, generally only a motion detection feature that will provide notifications or alerts if motion or motion objects are detected in the observed area. It causes inconvenience to the user because too many alerts appear if the area being observed is often accompanied by the movement of people or objects, which is a natural thing and does not need to be suspected. The application of artificial intelligence systems in the home area is expected to increase the capability of home video surveillance to be smarter in giving notifications/alerts. In this research, smart video surveillance is developed using two schemes of video stream processing: full local processing and semi-cloud processing. Two edge computing devices connected locally to the internet are installed in the home area. Both devices consist of Jetson Nano and PC GPU (Intel Core i7 7th Gen 7700HQ, 8GB RAM, Nvidia GeForce GTX 1060). The IP cameras used are 2 Ezviz brand IP cameras installed in two different locations and connected to one home internet network. Experiments show that the local processing scheme is much more recommended for a residential environment since it provides a much shorter response time than the semi-cloud one.

Parallel Session

2-A

Chair: Mutaqin Akbar

Authors: Ita Sulistiani; Widodo Widodo

Breast Cancer Prediction Using Random Forest and Gaussian Naive Bayes Algorithms

Breast cancer is the second deadliest cancer after lung cancer. In 2021, ASCO-American Society of Clinical Oncology states that female invasive breast cancer increased by half a percent from 2008 to 2017. Breast cancer is induced by a misspelling of a cell, which causes the cell to become uncontrollable. If the problem is not treated soon within a few months, a large number of cells containing the wrong instructions can be detected as cancer. Machine learning has been widely used for developing breast cancer prediction models. Unfortunately, the problem of imbalanced datasets tends to have little to no attention in previous research using machine learning. This research aimed to develop breast cancer prediction models using Random Forest and Gaussian Naïve Bayes Classifier. Borderline Synthetic Minority Oversampling Technique (BSM) is applied to handle the imbalanced dataset problem; meanwhile, machine learning algorithms such as Random Forest and Gaussian Naïve Bayes algorithms were used to build the prediction models. Using UCI Machine Learning Wisconsin Breast Cancer Dataset (WBCD), the combination of BSM and Random Forest algorithm showed the highest recall score, approximately around 99.8%. Meanwhile, the BSM and Gaussian Naïve Bayes Classifier combination provided the lowest recall score among generated models, 78.2%.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

Authors: Anastassya Gustirani; Muhardi Saputra; Warih Puspitasari

Cost Driver Mapping for Budget Allocation Reporting in SAP FI-CO

Activity-based costing is the best method of cost allocation that allocates the cost based on the activity. PT. XYZ is a state-owned fast-growing enterprise that runs in the telecommunication and technology industry that use activity-based costing as their cost allocation method. To support their day-to-day business operation PT. XYZ use SAP S/4 HANA, but some flaws still perform throughout their day-to-day business operation of the cost driver mapping process. The current SAP system does not provide the user with the accessible information of the cost driver that haven't been posted, statistical key figure in the SAP system, to help the user to determine which statistical key figure has to be uploaded each month and the information of the posted statistical key figure in a format that can be reuse as a template to help the process of posting statistical key figure to the SAP system. ALV report is implemented to provide the desire information for the user to answer the current problem of PT. XYZ.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

Authors: Devina Arnyndiasari; Ridi Ferdiana; Paulus Insap Santosa

Software Practice for Agile Developers: A Systematic Literature Review

Software development is one of the work practices in a company's startup, academics, and industries. Agile is a software development methodology that is currently quite popular. Agile development practices Existing methodologies include Test-Driven Development (TDD), Behavior-Driven Development (BDD), Domain-Driven Design (DDD), and Model-Driven Development (MDD). Each software development practice is unique. Agile is a consideration for developers when selecting appropriate development practices due to the breadth of available practices. Thus, this study identifies the characteristics and effectiveness of Agile methods such as TDD, BDD, DDD, and MDD.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

Authors: Mirzha Ramadhani; Sidharta Sidharta; Nadya Budhianto

User Experience Evaluation of Surabaya's Freeletics Community Information System Using UEQ

The Freeletics Surabaya Sports Community Information System (FLSUB) aims to provide information about community activities, health, sports events and 12 weeks programs. In the 12 weeks program, each member is given a menu to work out and members are required to report progress by inputting data in the form of time and body photos during the 12 weeks program. In the development of FLSUB, measurement of User Experience (UX) is an important stage that must be passed. To ensure that FLSUB can be used properly by users, it is important to first measure whether FLSUB has met all dimensions of user experience (UX). The User Experience Questionnaire is a fast and efficient technique for measuring the dimensions of User Experience (UX) in FLSUB. The results of this study indicate which UX dimensions in FLSUB need to be improved before it can be fully used by users.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

**Authors: Roziyani Rawi; Mohd Rizal Mohd Isa; Mohd Nazri Ismail;
Aznida Abu Bakar Sajak; Mohd Azmi Mustafa**

A Survey: Readiness of Malaysian Higher Education Institutes Towards the Adaptions of Industry Revolution 4.0

Industry 4.0 has been a great topic discussed recently as it is known to be the latest revolution in the industrial field. Moreover, the implementation of IR 4.0 has given big impact to many sectors including education which called Education 4.0. This paper aims to study on the readiness of Malaysian Higher Education Institutes towards the adaptation of IR 4.0 in their education system from the perspective of network infrastructure. Survey method has been deployed to study the current network infrastructure and services supported in Malaysian Higher Education Institutes. Based on the survey, it shows that the readiness among Malaysian Higher Education Institutes is currently at medium level which require network infrastructure upgrade to support the IR 4.0 implementation.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

Authors: Okky Pramudita; Adhi Murti Citra Amalia H, Galuh Ayu Savitri

SMEs' Adoption of Social Media Consulting During COVID-19 Pandemic

This study aims to find SMEs adopting social media marketing consultations during COVID-19 pandemic. The rapidly spreading COVID-19 pandemic forced humans to limit their activities to decline the economic sector. MSME actors are a big enough party to the COVID-19 pandemic, so many have switched from offline to online businesses to survive. Unfortunately, not all MSME actors can use technology well, making it challenging to market their products online. The presence of a consultant in social media marketing is expected to help the problems of these SME's. The previous study on COVID-19 and social media adoption focuses on consumer behavior during the pandemic. This research is expected to complement how the COVID-19 pandemic has dramatically affected our daily lives. The method used is descriptive quantitative by distributing surveys to 50 SME's in Indonesia. The findings show that the acceptance of SMEs in Indonesia to social media is included in the high category, 80% of the total respondents.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

Authors: Fairuz Iqbal Maulana; M. Febriantoro; Miftahul Hamim; Bayu Ramadhani Fajri; Rahman Arifuddin

Scientometric Analysis in the Field of Big Data and Artificial Intelligence in Industry

Big Data and Artificial Intelligence (BD&AI) on Industry have grown so prevalent, and the potential they provide is so revolutionary that they are seen as critical for competitive growth. Because the number of organizations BD&AI on Industry technology is increasing exponentially, so is the need for BD&AI on Industry practitioners. Until we conducted this research, only 1399 academic documents on BD&AI in Industry found from 2002 to 2020 were obtained by searching on the Scopus database. BD&AI in the industrial sector are examined in depth in this paper. This study uses bibliometric analysis and indexed digital methods to map scientific publications worldwide. This study uses the Scopus database to collect information, as well as online analysis via the Scopus website and Vosviewer to demonstrate bibliometric network mapping. We use the article selection process, starting with the keywords to be searched for, the year limitation, then the database is exported into RIS and CSV format files. From the database, we also perform network mapping using VOSviewer. Researchers in China have the most articles published and indexed by Scopus among the most prolific authors (373), followed by the United States (239), and India with 125 academic publications. Data analysis reveals an upward trend in the number of worldwide publications in BD&AI in Industry, as measured by the Scopus index.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

Authors: Putri Taqwa Prasetyaningrum; Purwanto; Adian Fatchur Rochim

Gamification on Mobile Banking Application: A Literature Review

Gamification is a design strategy for applying game elements in a non-game context for the purpose of changing individual behavior. Gamification and its motivational potential are seen as a trend for enhance and promote user engagement in various contexts. Many application companies have adopted gamification, which aims to make consumers more attractive and loyal. Given the ambivalent evidence on the effectiveness of gamification Gamification's popularity has grown dramatically over the years, as seen by an increase in the number of gamification apps and more studies. Gamification might be personalized to people with various demographic and psychological characteristics, particularly in the banking industry. While the use of gamification in many underserved areas, such as banking, will provide amazing outcomes, most research investigating the role of gamification in banking have found that it has a significant influence on increasing consumer engagement and enhancing system performance. This research did a detailed review of the gamification literature and assessed the research methods and findings in gamification research in mobile banking in this study, which provides a more comprehensive overview of the topic. The goal of this research is to categorize and classify gamification in mobile banking, as well as to analyze the current state of the art to aid future research. For managerial and academic consequences, further research directions are also recommended.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

Authors: Malini Sathyabalan; Maxwell Christian

A Study of Computer Aided Tools for Evaluation of Text in English as a Foreign Language

The Automated Essay Score System is a web-based system that uses cloud computing to score and evaluate essay entries. It sends real-time score feedback to encourage revision. These essay scoring have alleviated some of the burden on teachers to improve students' writings, but there are still some issues that are not yet addressed. This research looks at the benefits and drawbacks of automated evaluation systems, as well as whether they will continue to grow in the future. This study explains the existing issues based on feedback from teachers and students who use the online writing system in order to improve its effectiveness in writing. A few research questions are addressed in this study concerning the usefulness of an automated essay grading system. What are the most significant issues with computerized essay scoring systems? Will the automated essay scoring system see a good trend in the not-too-distant future? When assessing writing, what are the best ways to utilize online resources, such as automated essay scoring tools.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

Authors: Farrel Ruchiyat; Daffa Albaihaqi Santoso; Muhammad Alttha Ikhsan; Hengkie Ongowarsito

Information System Analysis and Design for Mobile-Based HoMain Applications

Builders are workers who have special expertise in the field of development. The community's need for a worker who has special abilities in repairing parts of the house is still difficult to find because of the limitations of area and distance. In the current era of the covid 19 pandemic, there are many people who want to find work such as builders, and there are also many people who need construction workers to repair parts of their homes but are unsure whether the performance of the builders they recruit will be good or not. In this study, the author makes an application to find out how one can find construction workers through an online application, and how potential customers can find the right and trusted builder. Only needing a smartphone and internet connection, smartphone users can access this HoMain application. The purpose of this research is to design an online application for a mobile-based construction service ordering system to support the needs of the community and building craftsmen in construction work. With this application, people can easily order construction services based on online locations. The HoMain application development method uses the Rapid Application method where application development becomes relatively fast and efficient.

Parallel Session

2-B

Chair: Jawahir Binti Che Mustapha

Authors: Novy Ariyanto

Analysis of Employee Attendance Mobile Application Problems Based on User Reviews: A Case Study

E-government is a government administration that utilizes information and communication technology to provide services to its users. Civil Servants (PNS) who are one of the E-government users, are obliged to be an example in the implementation and use of its. One application of E-government for civil servants is a mobile presence application or called Face Biometric Location Authentication (FABIOLA). FABIOLA is used by employees of National Research and Innovation Agency (BRIN). The application had been downloaded more than 5000 times with a 4-star rating on Google Playstore. Although it has received a fairly good rating, this cannot be used as a reference because there are still many negative reviews. To identify the problem, a text mining methodology and association rules are used. From the results of text mining analysis, several aspects of problems related to applications are obtained, namely "aplikasi", "foto", "gagal", "android", and "absen". From these 5 aspects, association rules were carried out to facilitate fishbone analysis. From the results of the fishbone analysis, several solutions to the problem are proposed, namely application reengineering, the use of a stable internet connection, and clear application operating instructions.

Parallel Session

2-C

Chair: Arita Witanti

Authors: Virdha Rahma Aulia; Apol Prribadi Subriadi; Reny Nadlifatin

Gamification: A Comprehensive Review of Literature

Gamification is described as implementing game elements into non-game environments to enable game-like experiences. Gamification's popularity has increased significantly over the years, as seen by an expanding number of gamified apps and a growing body of research. To present a more complete picture of the topic, we conduct a comprehensive analysis of the gamification literature and assess the research methodologies and findings in gamification research. While the majority of the outcomes are mixed with mostly positive in terms of gamification's efficacy, the number of positive results is astounding. Additionally, health and commerce, as well as points and badges, continue to be the most often used settings and methods for gamification implementation. As a concluding contribution to the study, we present a complete overview of the future directions for the expanding body of research on gamification.

Parallel Session

2-C

Chair: Arita Witanti

Authors: Vina Ardelia Effendy; Yova Ruldeviyani; Muhammad Muslim Rifa'i; Vien Rahmatika; Wiwin Nuraini; Yosua Sagala

Measurement of Employee Information Security Awareness on Data Security: A Case Study at XYZ Polytechnic

Information security is a critical national policy issue. Cyber-attacks and information security breaches are becoming more and more common. Fears of a growing attack could occur far outnumber the recorded cases. This is felt at the XYZ Polytechnic, there were 926 cases of Brute Password Attacks in the third quarter of 2021. Efforts for information security have not been fully carried out. Therefore, it is necessary to know the level of information security awareness, especially among XYZ Polytechnic employees, and develop strategies to improve information security. The measurement uses The Human Aspects of Information Security Questionnaire (HAIS-Q) with seven areas of information security. An information security assessment is calculated using the Analytic Hierarchy Process (AHP) method. The results showed that the value of the focus area was at the intermediate level of consciousness (66.5%). Based on the results obtained, several strategies in terms of technology and human resources are needed to monitor and increase the level of information security awareness at XYZ Polytechnic.

Parallel Session

2-C

Chair: Arita Witanti

**Authors: Widia Febriyani; Muhammad Ilham Alhari; Tien Fabrianti
Kusumasari**

Design of IT Governance Based on Cobit 2019: A Case Study of XYZ Education Foundation

Technology today is used in the corporate sector and the education sector, especially in educational institutions. IT Governance is the process of managing IT investment decisions within a company to achieve its goals and meet its needs. Determining the appropriate scope for IT governance is critical to know from the side of the initial implementation strategy. In addition, governance facilitates the monitoring of all activities and controls in the company. Use COBIT 2019 Analytics in IT Governance to help organizations get the most out of risk management, Governance, and IT. The results of this study came in the form of designing corporate IT governance and identifying the main process recommendations for managing education. Five significant practical recommendations include APO12, DSS05, and DSS03.

Parallel Session

2-C

Chair: Arita Witanti

Authors: Muhammad Badriansyah Putra; Ira Sulistyowati; Riko Wijayanto; Fahmi Alaydrus; Teguh Raharjo

Issue and Challenges of the Data Analytics Development Project in the Center of Information System and Financial Technology

The development of information technology encourages the government to digitize business processes. The digitization generates a large and varied volume from various data sources so that data analytics development projects are required to overcome this to support the organization's data-driven decision making. This study aims to identify problems and challenges in the data analytics development project at the Center for Information Systems and Financial Technology (Pusintek) then the data analytics can prepare a strategic plan to minimize the issues and challenges so that the data analytic is optimally successful. The identification of issues and challenges in the development of data analytics projects is carried out through interviews with employees who carry out data analytics development projects at Pusintek in 2021 and then analyzed using qualitative analysis methods. Result of this study, the most issues and challenges in the data analytics development project at Pusintek are the data & information management and data analytics teams, followed by management, project management, and process. These issues and challenges should get more attention from the organization to be followed up immediately so that data analytics projects can be successful.

Parallel Session

2-C

Chair: Arita Witanti

Authors: Ridwan Budiman; Dana Indra Sensuse; Nadya Safitri

Knowledge Management Strategy in Indonesia Startup Company: Case Study in PT XYZ

Innovation is one of the important things for organizations in increasing competitiveness and maintaining the company's existence in the current technological era. In order to continue to innovate, PT XYZ realized the importance of the role of employees, who are important asset of the company, and knowledge as the foundation for the creation of new innovations. However, it turned out there was a knowledge gap in PT XYZ. This was due to incomplete project documentation, knowledge related to features that was not evenly distributed and was only owned by a few people, tacit knowledge that had not become explicit knowledge, and the occurrence of key employee turnover in the company. To overcome and prevent knowledge gap in the future, research using qualitative method was conducted by using semi-structured and open interviews with three subject matter experts in PT XYZ. Then, gap analysis using the Zack Framework and SWOT analysis was carried out to obtain a knowledge management (KM) strategy. Based on the interview results, there were 5 strength factors and 5 weakness factors from the company's internal, as well as 4 opportunity factors and 4 threat factors from external companies. Based on gap analysis result, there were 8 recommended KM strategies. Then, the KM strategy recommendations were prioritized based on interview result. There were 4 KM strategies classified as primary priority, which were KM1, KM2, KM5, and KM6, while 4 KM strategies were considered as secondary category, which were KM3, KM4, KM7, and KM8.

Parallel Session

2-C

Chair: Arita Witanti

Authors: Sajidah Rachmawati; Rifqi Rosidin; Muharman Lubis

Information Technology Governance at Rachmi Dewi Gresik Hospital Using the Cobit 5 Framework

Health is a field of life that cannot be separated from the influence of IT developments. Almost all over the world information technology has been deployed as a form of global engagement to support health services. Therefore, good IT implementation must also be supported by good IT governance. So that the application of IT can create values that support the vision, mission and goals of the organization. Behind the benefits of IT governance, it turns out to be a problem faced by RS Rachmi Dewi Gresik. Until now, Rachmi Dewi Gresik Hospital has not been able to carry out IT governance optimally. Therefore, the vision, mission and goals of Rachmi Dewi Gresik Hospital cannot synergize with IT optimally. Therefore, this study aims to help Rachmi Dewi Gresik Hospital implement IT governance using the COBIT 5 framework so that the IT implemented by the organization can be aligned with the hospital's vision and mission.

Parallel Session

2-C

Chair: Arita Witanti

Authors: Hidayatul Zelfia; Tiarma Simanungkalit; Teguh Raharjo

Comparison of Scrum Maturity Between Internal and External Software Development: A Case Study at One of the State-Owned Banks in Indonesia

In assisting the digital transformation in one of the state-owned banks in Indonesia, the implementation of Scrum has been carried out for the last 1 year. However, the lack of Internal IT Division resources has caused business users to form special teams outside IT Division and implement Scrum to assist them in developing a mobile application through project X to compete with another bank. Simultaneously, Internal IT Division tries to implement Scrum in developing another mobile application through project Y. The purpose of this research is to compare the maturity level of the Scrum Team in the External IT Division and Internal IT Division. The method used in this research was a mixed-method by combining qualitative method and quantitative method. Scrum Maturity Method (SMM) is used to assess the Scrum maturity and the response is modified following the Agile Maturity Method (AMM) to assess the maturity of each process area. The result of the maturity level assessment in the External IT Division is higher reaching Level 3 compared to the Internal IT Division which only reaches Level 2. This maturity level assessment uses Scrum Maturity Model (SMM) and provides recommendations for improvement based on the Key Process Area (KPA) in each general goal at each level.

Parallel Session

2-C

Chair: Arita Witanti

**Authors: Albert Yakobus Chandra; Putri Taqwa Prasetyaningrum;
Ozzi Suria; Paulus Insap Santoso; Lukito Edi Nugroho; Irfan Pratama**

Evaluation User Acceptance of Mobile Virtual Reality Application for English Learning

This research develops virtual reality that integrates media elements such as sound, animation, and video with virtual world to create an immersive user experience. It is aimed to provide more interactivities and interesting features in supporting learning activities, such as using Cardboard to observe the virtual world and interact with virtual objects. Previously, a prototype was built to evaluate (high school) students' interests in using virtual reality technology as a supporting media to learn English language subject at high schools in Yogyakarta. The previous research shows that students agreed to use of virtual reality prototype had been useful to support their learning activities. In this present research, a mobile application prototype is developed and evaluated using TAM methodology in order to understand the user behavior towards the application. The application of TAM in the field of learning and teaching for various learning domains implemented to understand the acceptance from the users while using Virtual Reality-based learning media. The TAM model It is a model can explain that the user's point of view will determine their attitude in accepting Virtual Reality-based learning applications. The evaluation results from this study showed that respondent is enjoyable to use this application (4.37 mean point) and 3.98 (mean point) feels that Virtual reality application is useful for learning English.

Parallel Session

2-C

Chair: Arita Witanti

**Authors: Justin; Anderes Gui; Muhammad Shabir Shaharudin;
Muhamad Fairuz Ahmad Jasmi; Faizah Shahudin**

Factors Affecting the Success of Information Technology Projects

Because of the rising technical capabilities of software and hardware, the information system changes at a rapid pace. The integration of the information system is crucial to the success of the project in order to guarantee that it continues on track. This research aims to assess the link and effect of such elements on the success of an IT project. Top management support, communication, change management, organizational culture, training, transactional leadership, transformational leadership, and objective clarity are just a few factors to consider. The questionnaire used for data collection was delivered to respondents in a snowball fashion using the snowball approach. The respondents who took part in this study were those involved in an information technology project: firm managers, supervisors, directors, commissioners, project personnel, and interns. The data were processed and analyzed using SPSS version 26 and SmartPLS version 3.3.5. According to the findings of this study, the factors of communication, training, and organizational culture all contribute to project success favorably. The Top Management Support variable, on the other hand, has a negative impact on the project's overall performance.

Parallel Session

2-C

Chair: Arita Witanti

Authors: Rosihan; Achmad Hidayanto

Measurement of Employee Information Security Awareness: A Case Study at an Indonesian Correctional Institution

Information security is a critical aspect of the rapid development of information technology in government agencies. The Directorate General of Corrections is continuously improving information security since its system's data is highly confidential, including data of inmates and their relatives. This study aimed to measure the level of employee information security awareness of the Indonesian Correctional Institution. The importance of each focus area adopted from the KAMI Index and HAIS-Q was measured using Analytical Hierarchy Process (AHP). A Total of 87 valid questionnaire questions were distributed to 218 employees at the Directorate General of Corrections and the Correctional Unit. The questionnaire was processed using descriptive statistics. The results showed that employee awareness of information security was satisfactory, with a value of 85.81%. Some recommendations were given to maintain and improve information security awareness.

Parallel Session

2-D

Chair: Husna Sarirah Husin

**Authors: Henry Novianus Palit; Indar Sugiarto; Doddy Prayogo;
Alexander Pratomo**

Performance Analysis of a Parallel Genetic Algorithm: A Case Study of the Traveling Salesman Problem

Genetic Algorithm (GA) is one of the most popular optimization techniques. Inspired by the theory of evolution and natural selection, it is also famous for its simplicity and versatility. Hence, it has been applied in diverse fields and domains. However, since it involves iterative and evolutionary processes, it takes a long time to obtain optimal solutions. To improve its performance, in this research work, we had parallelized GA processes to enable searching through the solution space with concurrent efforts. We had experimented with both CPU and GPU architectures. Speed-ups of GA solutions on CPU architecture range from 7.2 to 22.2, depending on the number of processing cores in the CPU. By contrast, speed-ups of GA solutions on GPU architecture can reach up to 172.4.

Parallel Session

2-D

Chair: Husna Sarirah Husin

Authors: Rebecca La Volla Nyoto; Yova Ruldeviyani

Infiltration Wells Program in Jakarta: Twitter Sentiment Analysis

The infiltration wells program in Jakarta, Indonesia, is one of the issues that has become a hot topic on Twitter after a political figure's car fell into one of the infiltration wells in South Jakarta. As a result, a growing number of people have spoken out about the program's benefits and drawbacks, which later cause pros and cons. This study aims to determine public sentiment on Twitter about the Jakarta infiltration wells program and to determine the accuracy and performance of the Naïve Bayes, Support Vector Machine (SVM), and K-Nearest Neighbor (KNN) as the classification algorithms used in this research. With SMOTE, balanced data of 591 positive and 591 negative tweets was obtained, with testing data of 138 tweets. The result shows the highest accuracy of 93.32 percent was reached, as well as high performance with SVM, followed by Naïve Bayes in second place, and KNN in third place. Most tweets were discovered to have negative sentiments, based on the public comments on Twitter about the program inability to handle floods, the formation of puddles and damages on roads, high allocation program budgets, and protests of residents who had not been compensated for their assistance in building the infiltration wells.

Parallel Session

2-D

Chair: Husna Sarirah Husin

Authors: Basith Abdurrohman Asy'ari; Muhammad Rivai; Muhammad Attamimi; Djoko Purwanto

Design of 3D LiDAR Combined with Neural Network for Object Classification

LiDAR is one of the visual sensors which can measure a distance and form an environment description. This device is needed for many kinds of vehicle navigation especially for the autonomous system. Nowadays, the 3D LiDAR is still expensive in the market. This study has developed and constructed a 3D LiDAR consisting of a single point LiDAR as the main sensor and a Neural Network for classifying objects. Proportional-integral-derivative (PID) controller was involved to maintain the motor rotation in order to stabilize the scanning process. Arduino Mega microcontroller was used as the main processor to obtain the LiDAR data, to control the motor speed, and to communicate the data with computer. In this case, the 3D LiDAR was tested using five different objects. The experimental results show that the system can recognize all objects with a 100% success rate. This proposed system can be expected to support the road safety on an autonomous vehicle. In addition, the 3D LiDAR can be marketed in a low price.

Parallel Session

2-D

Chair: Husna Sarirah Husin

Authors: I Made Darma Susila; Yohanes Priyo Atmojo; Ni Luh Putri Srinadi; Ida Bagus Suradarma; Lilis Yuningsih; Erma Sulisty Rini

Performance Analysis of the Triple Exponential Smoothing Method During the Covid19 Pandemic on Tourist Visit Data

Data forecasting methods are essential in the business world to determine the company's future steps. However, the COVID-19 pandemic has hit the tourism economy hard, resulting in a slump in income. In this study, trials were conducted to analyze the reliability of forecasting methods on data affected by the COVID-19 pandemic. The method used is the Triple Exponential Smoothing method involving two models, namely Additive and Multiplicative. In this paper, the test is carried out using actual data derived from data from a service company engaged in tourist crossing transportation. Each method's alpha, beta, and gamma values are determined based on the parameters that produce the smallest error value. The experiment results show the predictability of the Triple Exponential Smoothing method by measuring the prediction error value based on the Mean Absolute Percentage Error (MAPE) value, which was 7.56% in the Additive model and 10.32% in the Multiplicative model before the pandemic happened. However, both methods' prediction measurements during a pandemic produce poor forecasts with an error percentage above 40%. Meanwhile, during the decline in pandemic cases, the value of the Triple Exponential Smoothing Multiplicative method was closer to the actual data with a prediction error value of 33.02%. Therefore, the Triple Exponential Smoothing Multiplicative method is more resistant and suitable for implementing into a forecasting system with actual data that influences pandemic events.

Parallel Session

2-D

Chair: Husna Sarirah Husin

Authors: Muhammad Fadhurrahman; Adhi Harmoko Saputro

Peat Depth Prediction System Using Long-Terms MODIS Data and Random Forest Algorithm: A Case Study in Pulau Pisau, Kalimantan

Peatlands have an important role as global climate regulators because they store global amounts of carbon which, if degraded, will result in increased concentrations of greenhouse gases in the atmosphere. Peatland mapping using satellite imagery is considered effective for classifying a land cover area. Previous studies concluded that satellite imagery can be used to classify a peat area and a non-peat area. In this study, we use satellite imagery with a mounted MODIS sensor from 2015-2019 and calculate the index from MODIS bands. The Machine Learning (ML) method was used for generating a peat depth in Pulau Pisau, Kalimantan. Random Forest (RF), Support Vector Machine (SVM), Support Vector Regressor (SVR), Gradient Boosting (GB), and Ada Boost (AB) models were used to generate a peat depth map. The best performance was achieved by RF Classifier with accuracy 0.99 and RF Regressor with $R^2 = 0.88$.

Parallel Session

2-D

Chair: Husna Sarirah Husin

**Authors: Muhammad Akbar Haikal Frasanta; Dedy Rahman Wijaya;
Heru Nugroho; Tora Fahrudin**

Heart Diagnose Application Using Bagging Algorithm

One of the many organs in the human body is the heart. The function of the heart is to pump blood all over the body. If the heart is suffering damage or interference, it could cause many harms to people starting from chest pain, fatigue, dizziness, and the worse is death. To prevent this is by doing a heart health check to get the treatment needed. However, the patients have to come to the hospital to do a heart health check, which costs a lot of money. Therefore, we propose another method of diagnosing heart disease. This study uses a machine learning bagging algorithm (random forest) to detect heart disease with two classes: no disease or disease. The evaluation results show that the bagging algorithm achieved 97.8% accuracy from the best optimal grid search parameters. It can be concluded that this proposed method can fairly discriminate heart disease.

Parallel Session

2-D

Chair: Husna Sarirah Husin

Authors: Riswanda Al Farisi; Ridi Ferdiana; Teguh Bharata Adji

The Effect of Anthropomorphic Design Cues on Increasing Chatbot Empathy

Empathy is the process of understanding and reacting to other people emotional expressions that involve cognitive and affective aspects. Empathy in education is very important, because service experiences in student academic services that are emotional and generate student affective responses have an influence on student motivation and academic achievement. Recent advances in artificial intelligence (AI) allow computers to gain the ability to express empathy by analyzing and reacting to user emotional expressions via chatbot conversational agents. Chatbots with human-like cues such as their language style can also affect user emotions. In order for chatbots to have human-like cues, it is necessary to apply the concepts in Human Computer Interaction (HCI) to chatbots. This research will apply one of the concepts in HCI, called Anthropomorphic Design Cues (ADC). Anthropomorphic is an attribution of human characteristics and behavior that is applied to non-human entities such as animals, plants, or technological devices like chatbot. This study will apply two designs from ADC on chatbots, verbal design and non-verbal design. This study will compare the level of empathy between two chatbots with ADC and without ADC. The results showed that based on the results of statistical tests using the Mann Whitney U Test ADC had a significant p-value of $0.000 < 0.05$ on chatbot empathy, so it can be concluded that ADC had a significantly positive effect on increasing chatbot empathy.

Parallel Session

2-D

Chair: Husna Sarirah Husin

**Authors: Husni Iskandar Pohan; Harco Leslie Hendric Spits Warnars;
Benfano Soewito; Ford Gaol**

Recommender System Using Transformer Model: A Systematic Literatur Review

Online transactions are significant in the pandemic era. Using online transactions can minimize the risk of physical contact with disease transmission between buyers and sellers. However, with so many choices of items, it becomes challenging for users to decide which item suits their needs. For this reason, the recommender system was created as a handy tool. Recommender systems can help provide ratings, compare with other user data, use personal transaction history, use current events, or combine the above methods. Currently, computer science experts are constantly trying to improve recommender systems. In 2017 a new method emerged that uses transformers as one of the deep learning models. The combination of recommender systems and transformers can process extensive data, create different weights for each input data, and process data without sequentially allowing parallel processing and reducing training time significantly. Many papers in various countries are continuously trying to improve this methodology. In this literature review, we try to analyze the technology used, the dataset used, and the area where the technology is implemented. In this case, we carry out collecting papers, then filtering, classifying and analyzing, and making conclusions.

Parallel Session

2-D

Chair: Husna Sarirah Husin

Authors: Eddy Nurraharjo; Mardi Utomo; Bagus Prakoso; Herny Februariyanti

A New Color-Based Instrument Model for Basic Music Learning

Online transactions are significant in the pandemic era. Using online transactions can minimize the risk of physical contact with disease transmission between buyers and sellers. However, with so many choices of items, it becomes challenging for users to decide which item suits their needs. For this reason, the recommender system was created as a handy tool. Recommender systems can help provide ratings, compare with other user data, use personal transaction history, use current events, or combine the above methods. Currently, computer science experts are constantly trying to improve recommender systems. In 2017 a new method emerged that uses transformers as one of the deep learning models. The combination of recommender systems and transformers can process extensive data, create different weights for each input data, and process data without sequentially allowing parallel processing and reducing training time significantly. Many papers in various countries are continuously trying to improve this methodology. In this literature review, we try to analyze the technology used, the dataset used, and the area where the technology is implemented. In this case, we carry out collecting papers, then filtering, classifying and analyzing, and making conclusions.

Parallel Session

2-D

Chair: Husna Sarirah Husin

**Authors: Nathaniel Syalomta; Muhammad Ikhwan Khalid Nasution;
Indah Utami; Deva Oktavia; Syamsul Rizal; Nur Ibrahim; Nor
Kumalasari Caecar Pratiwi**

Classification of Nutrition Deficiency in Rice Plant Using Convolutional Neural Network

Nutrient deficiency often occurs in rice plants, thus affecting the level of production and quality of rice. Nutrient deficiency, in general, can be seen from the color and shape of sick leaves; therefore, it can be detected early to reduce the symptoms of nutritional deficiency in rice plants. This study classifies the symptoms of nutritional deficiency in rice plants using the Convolutional Neural Network (CNN) with ResNet 50 and ResNet 152 architectures. There are 1156 images with datasets sourced from Kaggle, divided into nitrogen (N) deficiency and Phosphorus(P) deficiency. And Potassium (K) deficiency. The dataset augmentation process used oversampling techniques to balance the data. The best results were obtained from the ResNet 50 architecture with accuracy and validation values yielding 98% and testing values 97%.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Winda Ayu Safitri; Tohari Ahmad; Dandy Pramana Hostiadi

Analyzing Machine Learning-Based Feature Selection for Botnet Detection

In the cyber era, the increasing problem of cybercrime is growing significantly and impacts the security of communication on the network. Malware is a malicious code attack that is harmful and needs to be handled appropriately. The botnet is a data and information security threat that uses malware on computer networks. Several botnet activity detection models have been carried out using a classification approach in previous studies. However, it has not been analyzed about selecting features to be used in the learning process of the classification algorithm. In fact, the number and selection of features used can affect the detection accuracy of the classification algorithm. This paper proposes an analysis technique for determining the number and selection of features based on previous research. The aim is to obtain the analysis of using features. The experiment has been conducted using several classification algorithms, namely Decision tree, k-NN, Naïve Bayes, Random Forest, and Support Vector Machine (SVM). The results show that using a certain number of features decreases the detection accuracy. Compared with previous studies, the results obtained show that the average detection accuracy of 98.34% using four features has the highest value from the previous study, 97.46% using 11 features.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Baiq Yuniar Yustiarini; Favian Dewanta; Hilal H. Nuha

A Comparative Method for Securing Internet of Things (IoT) Devices: AES Vs SIMON-SPECK Encryptions

Delivering information from Internet of Things (IoT) devices to a cloud server possesses several security issues, e.g., information eavesdropping, modification, and theft. Therefore, communication between IoT devices and the cloud server should be protected by encryption methods. However, there is not much options of encryption techniques which is suitable for the need of lightweight communication as demanded by the IoT devices. Due to these circumstances, the NSA launched an encryption algorithm for IoT named SIMON and SPECK, which are maximally efficient, while still providing the advertised level of security, as determined by the key size. The aim of this study is to test and compare the Simon-Speck and AES encryption algorithms and their effect on networking performance on IoT devices. The parameters in this test are delay, throughput, the efficiency of memory usage from the encryption algorithm, and the value of the avalanche effect. Experimental result show that the SPECK algorithm outperforms the SIMON and the AES algorithms in terms of communication delay and memory usage. Regarding the avalanche effect values, the SIMON algorithm possesses the highest avalanche effect value in average against the SPECK and the AES algorithms.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Antonius Schmidt; Dominik Aufderheide

Applications of Inventive Design Methodology for a Sensor Fusion Approach in Structure-From-Motion (SfM) Applications

Generating three-dimensional models from real world objects based on a monocular image stream is a fundamental task in computer vision with a wide range of possible applications. For this Structure-from-Motion (SfM) algorithms provide an approach based on the successful tracking of 2D feature points throughout an image sequence and the subsequent camera egomotion estimation and a global 3D structure recovery. However, the performance of those approaches is still limited in terms of robustness, accuracy and density of the reconstructed scene model. This paper introduces an approach based on Inventive Design Methodology (IDM) for the systematic analysis of existing SfM approaches and a subsequent derivation of a novel sensor fusion approach in order to overcome current application related restrictions.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Mohamad Hafizat Zainal Abidin; Saravid Suchaad; Chia Yee Ooi; Nordinah Ismail; Mohd Azlan Abu

Scalable Off-Chain Blockchain for Vehicular Network

Autonomous vehicles are a rapidly developing technology that promises to be much safer and more efficient than the current human driven vehicles. These vehicles must be constantly communicating information such as current position, speed and direction to other vehicles, in real-time. Thus, it is of vital importance to ensure the network that managing communication between autonomous vehicles is secure from external tampering. One way of improving the security of a vehicular network is by incorporating blockchain technology into the network. However, under certain condition, blockchain-based networks do pose several challenges, such as processing latency and limited throughput. Scalability, that is, the ability of the network to perform as expected with increasing loads, is also a concern. The current work aims to show that the deficiencies of the blockchain-based vehicular network can be reduced by using an off-chain approach where the major computing overhead of the main blockchain is channeled off-chain to speed up and provide scalability. Simulations are carried out to measure the performance and scalability of the blockchain network in terms of processing latency and data throughput. The simulation results showed that the off-chain assisted blockchain network performs and scales better than the conventional blockchain network.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Rd. Yovi; Edi Sukamadirana; Nurma Siti Nurmanah

Comparative Analysis of Quality of Service and Performance of MPLS, EoIP and SD-WAN

Software Defined - Wide Area Network (SD-WAN) implementation is growing each year as one of the options for enterprise to have hybrid and redundant connection between traditional WAN and Internet. The cloud computing services, whether it is IaaS, PaaS, or SaaS has attracted most of enterprise to separate the corporate data connection from private WAN to public internet securely. This dual data traffic still can be managed by enterprise router, but it will require manual routing or at least delay with complicated rule to mitigate any link problem. SD-WAN as the development of SDN in wide area network, have the solution to solve the manual routing data, by putting the control plane in a software environment to manage the data traffic virtually. In Indonesia, the SD-WAN technology has been introduced by several vendors and operators, some enterprise still reluctance considering the security of enterprise data through public internet service, and some of them still questioning the Quality of Services compare to legacy or traditional WAN services. Therefore, this research will perform the Quality of Service and Performance of SD-WAN, compare to traditional Multiprotocol Label Switching (MPLS) link and Ethernet over Internet Protocol (EoIP) as one of the contenders. The object of the research is an active WAN of one of Indonesian company, that having those three connections between Jakarta and Surabaya. The QoS and performance are measured using ITU-T G.1010 standard as the reference.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Salsabila Shita Putri Nugroho; Yus Natali; Catur Apriono

Design of Millimeter-Wave Based Radio Over Fiber for 5G Application

As technology develops and data demands are getting higher, 5G technology increases capacity, improves connectivity, and be more flexible with user mobility. The Radio over Fiber (RoF) technique on millimeter-wave is an attractive solution to provide high data rates and network capacity. This study conducted a design and simulation of a millimeter wave-based RoF system with a radio frequency of 64 GHz. A phase modulator is an external modulation technique to generate millimeter-wave signals. The considered parameters are the Bit Error Rate (BER), Q Factor, and Eye Diagram parameters for system analysis by varying optical cable lengths of 1 km, 5 km, and 10 km. By varying the length of the optical fiber, the system performance does not meet the recommended parameters for optical fiber length variation of 10 km, where the resulting minimum value of BER is greater than 10^{-9} . This result shows that dispersion factors should be considered in long transmission for a millimeter wave-based RoF for 5G applications.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Mohd Nabil Iqbal Ahmad; Aznida Abu Bakar Sajak; Mohd Nazri Ismail; Noormadinah Alias

An Investigation on the Impact of Energy Harvesting in Green IoT with Netsims

Real world applications such as habitat monitoring, air quality, natural disaster prevention, smart agriculture, and smart building, all of it are possible due to the utilization of Wireless Sensor Networks (WSNs). In most cases, classic WSN nodes are fueled by non-rechargeable batteries with a limited capacity for energy storage. In this paper, we are proposing to implement the solar energy harvesting in wireless sensor network to increase the lifetime of each sensor node or may ideally achieve infinite lifetime. Nevertheless, there are many other obstacles to overcome and consider in solar energy harvesting, such as temperature fluctuations, solar panel conversion efficiency, solar energy forecasting difficulties, and power interruptions, as well as other environmental or natural phenomenon issues. The objective of this research is to review the recent literature on energy harvesting for wireless sensor network and focused on solar ambient light energy as well as to propose an efficient method and calculation for solar energy harvesting to achieve infinite lifetime of wireless sensor network.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Rahardian Luthfi Prasetyo; Sigit Basuki Wibowo; Dyonisius Dony

Study on Periodogram and Correlogram-Based Spectrum Sensing Implementation on GNU Radio

Spectrum sensing is part of cognitive radio to take advantage of the frequency spectrum used today. Over time, the existing and unused spectrum will be used for other purposes such as the use of IoT tools for daily needs. Testing of spectrum sensing is needed so that when other technologies take advantage of spectrum sensing, the process that occurs will not experience problems. In addition, there is one method used in spectrum sensing but there is no implementation technology yet. In this paper, a comparative test is conducted between the Periodogram and Correlogram methods. Furthermore, the results of the PSD will be entered into the detection spectrum using the existing threshold to determine the presence of PU. The detection results between the two PSDs will be compared and from the two results, it is found that the Correlogram has a lower noise value and has better Pd and Pfa calculation results than the Periodogram.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Muhammad Fadhil Lakarani; Aznida Abu Bakar Sajak; Mohd Nazri Ismail; Noormadinah Alias

Investigation of the Impact of Routing Protocol in Green IoT with Netsim

Technology evolution nowadays moving vigorously to improve human daily life but also directly affect the earth's resource consumption. Reducing energy consumption led to reduce of Carbon Dioxide (CO₂) emission to the surrounding which can cause environmental and health issue. The balance of fast data transmission with efficient energy consumption is important part to achieve green IoT. Wireless sensor which is one part of the IoT systems perform a duty to operate continuously without any data delay to be analyzed so that is why most wireless sensor only collecting raw data and do packet forwarding where later it will be analyzed by another physical device. Although the sensors still need to recognize the routing topology by themselves so that the energy consumed to forward the packet to its destination can be optimized. Researchers have used various way to control energy consumption using different hardware and power management so this research want to focus investigating on how using different routing protocols can impact the energy consumption.

Parallel Session

2-E

Chair: Dinda Eling Kartikaning Sasmito

Authors: Timothy Harlian; Muhammad Faris Ruriawan; Yudha Purwanto

Implementation of Blokchain for Digital Document Data Collection Website

The progress in technology and the digital paradigm forces a new standard, such as switching from physical to digital documents. Digital documents are implemented in various ways like certificates, certificates of merit, even diplomas. However, those things are vulnerable to counterfeit, and the integrity compromise of its content will be challenging to detect. One of the solutions is increasing transparency for the document data to ensure that no single point of failure exists. Blockchain has the potential to solve the problem. Blockchain has the transparency aspect to it. Therefore, it can be used to maintain the validity of document data. Because in blockchain, only read and write operations could be done, nothing could compromise the integrity of the data. This paper implemented a document validation system with Ethereum blockchain and Rinkeby Test Network as blockchain network. This blockchain application can do input, retrieve, update, and delete with 100% black-box testing and 100% white box testing. Performance testing for all transactions has the fastest time, 6.04 seconds, and slowest time, 93.32 seconds.