ABSTRACT BOOK

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IEEE

IEEE INDONESIA SECTION

Paper Id	**1A-1570755850**	*Session* **1A**

Title **Firebase Authentication Cloud Service for RESTful API Security on Employee Presence System**

Authors *Luthfan Hadi Pramono and Yohanes Krisna Yana Javista (Universitas Teknologi Digital Indonesia, Indonesia)*

Abstract Authentication is essential in identifying users to access or use the system. One application of the Authentication process is the Presence System. The old Presence System at Amigo Company is prone to misuse and data manipulation, so it is necessary to develop a new Presence System based on Smartphones. Data communication between Backend and Frontend architecture in Presence System using RESTful API. This study aims to implement security on the RESTful API by using JSON Web Token generated by Firebase Authentication Cloud Service. The results of the study indicate that the user cannot manipulate data or use the identity of another user because of Firebase Authentication security and the strict data verification process.

Paper Id	**1A-1570759334**	*Session* **1A**

Title **Capacity Analysis of Non-Orthogonal Multiple Access (NOMA) Network over Rayleigh Fading Channel with Dynamic Power Allocation and Imperfect SIC**

Authors *Rummi Sirait (Universitas Indonesia)*

Abstract Non-Orthogonal Multiple Access (NOMA) is a multiple access scheme that can increase channel capacity and spectral efficiency by utilizing superposition coding (SC) on the transmitter and successive interference cancellation (SIC) to detect multiuser on the receiver. This paper investigates the effect of imperfect SIC and dynamic power allocation on NOMA channel capacity. Based on the simulation results, it is shown that the sum capacity of NOMA schemes in the imperfect SIC with dynamic power allocation is better than the sum capacity of orthogonal multiple access (OMA) schemes. The sum capacity of NOMA users with dynamic power allocation is better than fixed power allocation. In imperfect SIC, with a transmit power value of 30 dBm and the value of the residual interference level is 0.005, the channel capacity is 9.04 bps/Hz. While the residual interference level is 0.02, the channel capacity is 7.07 bps/Hz.

Paper Id	**1A-1570759539**	*Session* **1A**

Title **Performance Evaluation of Visible Light Communication System Deployment using Multipower Multiple LED Scenario**

Authors *Berlian Nurfadhilah, Muhammad Imam Nashiruddin and Brian Pamukti (Telkom University, Indonesia); Muhammad Adam Nugraha (Peruri Research Institute for Authenticity (PRIfA), Indonesia)*

Abstract 5G networks technology has to offer exceptionally high capacity. One of the most promising approaches is optical wireless communication technology. Alternatively, optical wireless communication technologies can be adopted as technology to provide higher data rates. Visible Light Communication (VLC) is a communication technology for future high capacity with a range of the electromagnetic spectrum (370-780 nm) utilizing light-emitting diodes (LED). This research investigates performance in implementing multiple LEDs in a Visible Light Communication system in a closed indoor room. The simulation computer results indicate that the VLC system's performance improves when using higher power transmit for multiple LEDs. The highest received power is about -16 dBm for reaching BER ≤ 10-3 and distance propagation transmitter to receiver at 6.23 meters.

Paper Id	**1A-1570766575**	*Session* **1A**

Title **A New Approach for ARP Poisoning Attack Detection Based on Network Traffic Analysis**

Authors *Yohanes Priyo Atmojo, I Made Darma Susila, Ida Bagus Suradarma, Lilis Yuningsih, Erma Sulistyo Rini and Dandy Pramana Hostiadi (Institut Teknologi dan Bisnis STIKOM Bali, Indonesia)*

Abstract Address Resolution Protocol (ARP) is a communication protocol to map the computer's addresses to the Media Access Control (MAC) address. In its implementation, ARP can be abused, or known as ARP poisoning attack. The impact of ARP poisoning attacks is a deadlock to communicate on the network, identity fraud from addressing a computer through illegal access to steal important and confidential information. Several ARP poisoning attack detection models have been introduced. Still, they depend on application tools requiring complex configuration and mostly state ARP poisoning attacks as normal activity. In this paper, a model for detecting ARP poisoning attacks is proposed using the K-NN classification. The proposed model has a contribution to the feature extraction process based on network traffic flows analysis. The results show that the proposed model can detect ARP poisoning attacks more accurately than some classification algorithms with a TPR value of 97.67% and a detection accuracy of 98.7%.

Paper Id	**1B-1570754047**	*Session* **1B**

Title **Sentiment Analysis in Indonesian on Jakarta Culinary as A Recommender System**

Authors *Boby Siswanto (Bina Nusantara University, Indonesia)*

Abstract Sentiment analysis is a technique used to determine whether the opinion statement is positive or negative. A positive opinion means that it tends to be liked and recommended, whereas a negative opinion means that it tends to be disliked and not recommended. According to a survey conducted by YouGov of the diet habit which correlates with culinary, Jakarta is one of the healthiest cities in the world according to a survey conducted by YouGov of diet habit. Diet has a strong correlation with culinary. Culinary is related to basic human needs, namely eating. This study implements sentiment analysis from a culinary dataset in Jakarta whose source is Twitter which is processed using the Sastrawi library with the aim of comparing Twitter's sentiments towards Jakarta's culinary with the results of a YouGov survey. The results obtained are that Jakarta culinary's recommendations are worth looking for and visit based on 53% positive sentiment in this study. This result is in accordance with the results of a YouGov survey on the Jakarta city's dietary habits, which proves that Jakarta is one of the healthiest cities in the world.

Paper Id	**1B-1570757692**	*Session* **1B**

Title **Recommendation System for Elective Courses using Content-based Filtering and Weighted Cosine Similarity**

Authors *Aina Musdholifah (Universitas Gadjah Mada, Indonesia)*

Abstract Each study program requires students to take several elective courses. The appropriateness of the elective courses taken with the student's abilities can be one of the factors for the success of student studies. This research focuses on building a content-based filtering recommendation system that provides several elective courses recommendation according to the student's academic history. The proposed recommendation systems' results are based on preprocessed word items from courses taken by the user. The weighted cosine similarity between the elective courses syllabus and the user profiles is calculated. Moreover, the experiment employed a dataset of the CSUGM course syllabus. The proposed recommendation system is evaluated in two ways, i.e., questionnaire method and validation method. The questionnaire method obtains an assessment of system performance, hence the validation method to get the average accuracy. The questionnaire was conducted by involving thirty students of the CSUGM undergraduate program. The experimental results show that the proposed recommendation system has a good performance proven by the percentage of recommendation diversity 81.67%. Furthermore, the accuracy of the proposed recommendation system has an average of 64%.

Paper Id	**1B-1570758711**	*Session* **1B**

Title **Solving the Capacitated Vehicle Routing Problem (CVRP) with Guided Local Search and Simulated Annealing for Optimizing the Distribution of Fishing Vessels**

Authors *Hozairi MT (Islamic University of Madura, Indonesia)*

Abstract This paper discusses the completion of the distribution route of fishing vessels in twenty-six Fish Landing Bases (FLB) to the National Fisheries Port (NFP), this research includes the Capacitated Vehicle Routing Problem (CVRP) model with several constraints, namely, distance, number of ships, ship capacity, fish catches, travel time and ship operating costs, thus requiring optimization of the route of fishing vessels to each FLB. The method used to solve the problem is Guided Local Search (GLS) and Simulated Annealing (SA) using Google OR-Tools which are proven to be efficient in solving heuristic problems. The results showed that the application of the GLS and SA methods showed different results, for the simulation of two and three fishing vessels the same distance optimization results were obtained, namely 290 miles and 355 miles, but for four fishing vessels the GLS method resulted in 464 miles while the SA method yields 439 miles, meaning that the more fishing vessels, the SA method has a better performance than the GLS method, for a case study of the distribution of fishing vessels in Maluku, the SA method is capable of 6% efficiency in distance while being able to save time and ship operational costs. The results of this study contribute to saving the company's operational costs and improving the quality of fish exports abroad.

Paper Id	**1B-1570765622**	*Session* **1B**

Title **Sentiment Analysis on Social Media (Twitter) about Vaccine-19 Using Support Vector Machine Algorithm**

Authors *Emny Yossy (Universitas Bina Nusantara, Indonesia)*

Abstract Currently the world is experiencing a Corona Virus Disease (Covid-19) pandemic which attacks the respiratory tract and spreads very quickly to various countries including Indonesia, so the World Health Organization (WHO) has declared Covid-19 as a pandemic. To overcome this pandemic, experts in the medical field also intervened by making vaccinations to strengthen human immunity against the Covid virus. This sentiment analysis was carried out to see opinions on the object, namely the existence of a Covid-19 vaccine. Data collection by crawling data with the keyword 'Covid Vaccine'. The method that will be used is the Support Vector Machine (SVM). The analysis was carried out by comparing the classification accuracy values of the two SVM kernel functions, namely linear and Radial Basic Function (RBF). The results of the study obtained positive sentiment of 43.5%, negative of 19.1%, and neutral of 37.4%. Then the evaluation of the system using the confusion matrix obtained an accuracy value for the linear kernel of 79.15%, a precision value of 77.31%, and a recall value of 78.09%. While the RBF kernel has an accuracy of 84.25%, a precision value of 83.67%, and a recall value of 81.99%. While the cross validation obtained the optimum value at k = 1 with an accuracy value of 80.18% for the linear kernel and 85.88% for the RBF kernel. So the RBF kernel has a higher accuracy than the linear kernel.

Paper Id	**1B-1570768125**	*Session* **1B**

Title **Similarity Normalized Euclidean Distance on KNN Method to Classify Image of Skin Cancer**

Authors *Arif Ridho Lubis and Santi Prayudani (Politeknik Negeri Medan, Indonesia); Al-Khowarizmi Al-Khowarizmi (Universitas Muhammadiyah Sumatera Utara, Indonesia); Yuyun Lase (Polytechnic State Of Medan & Education, Indonesia); Yulia Fatmi (Politeknik Negeri Med*

Abstract The method which is used to classify various types of data such as numbers, images, text is the K-Nearest Neighbor (KNN) method. Basically KNN, however, accepts numeric data so that data other than numeric extract them into numeric. As in this paper, the classifying images of Skin Cancer sufferers consisting of malignant and benign images is performed by extracting data with a Gray-Level Co-occurrence matrix (GLCM) to obtain numerical data from skin cancer images. The GLCM process in this paper makes the matrix be divided into contrast, dissimilarity, homogeneity, energy, correlation and ASM. Then the process is classified where the process with KNN performs the same which usually uses the Euclidean distance compared to the normalized Euclidean distance. The classification process also produces validation applying the accuracy technique calculated by MAPE. The results in this paper testing with Euclidean distance achieved MAPE of 0.71043036% by testing with Normalized Euclidean distance achieving MAPE of 0.3151053%. This showed the similarity in image classification using KNN is more optimal by using the normalized Euclidean distance approach

Paper Id	**1B-1570769391**	*Session* **1B**

Title **Region Proposal Convolutional Neural Network with augmentation to identifying Cassava leaf disease**

Authors *Budi Dwi Satoto (University of Trunojoyo Madura, Indonesia & Trunojoyo University of Madura, Indonesia); Bain Khusnul Khotimah (Trunojoyo of University, Indonesia); Mohammad Syarief (University of Trunojoyo Madura, Indonesia)*

Abstract The article describes a new idea in recognizing cassava plant disease patterns based on the damage that occurs to the leaves. There are four classes of observed disease and one class of Normal. Classification using an image processing approach is needed to be able to solve these problems. What might be done is to improve the classification method that has been done by previous researchers. In the image processing method, the cassava leaf image resource file has a background color that is almost the same or close to the color of the object being sought, so an appropriate contour method is needed. The results of the research showed that a better accuracy value was obtained using the Convolutional Neural Network. The addition of the purpose region clarifies the area observed in cassava leaves. As an illustration, the proposed Convolutional neural network method can recognize patterns well in previous architecture and also Custom Layer. The addition of the region proposal method increases the classification accuracy indicator by around an average of 99.01 %. Evaluation of the effectiveness of this method was confirmed by calculating an average MSE 0.0080, RMSE 0.0935, and MAE 0.0063 with an average training computation time of around 7 minutes 50 seconds. The results of the newly developed research show that there is an average improvement of 0.04% from the previous classification research, and the proposed method can be used as a reference for further research

Paper Id	**1B-1570770923**	*Session* **1B**

Title **Filter Selection And Feature Extraction To Distinguish Types Of CT Scan Images**

Authors *Oky Nurhayati (Diponegoro University, Indonesia); Bayu Surarso (Universitas Diponegoro, Indonesia)*

Abstract The aim of the study has of selecting the most significant filtering method as input for feature extraction to distinguish the types of Head CT Scan images. Visually distinguishing the scanned medical image (head CT Scan) has difficulty because it has similar results. So that research is needed that aims to distinguish the types of digital images scanned by using image processing methods, filtering, and feature extraction. We used a medical image taken from the head CT-Scan of the patient. To be processed using a computer, the data is scanned to obtain digital image data. Furthermore, various filtering methods were selected, such as median, bandpass filter, XYZ color transformer filter, enhanced local contrast filter, and histogram equalization. The most significant filtered image results are then extracted using the statistical feature extraction method. The results showed that histogram equalization and enhanced local contrast filter methods were the most significant filtering methods. While the mean and standard deviation are the two most significant characteristics that can distinguish the three classes of head CT Scan.

Paper Id	**1B-1570774198**	*Session* **1B**

Title **Mining User Reviews for Software Requirements of A New Mobile Banking Application**

Authors *Andika Elok Amalia (Bina Nusantara University, Indonesia); Muhammad Zidny Naf'an (Universitas Gadjah Mada & Institut Teknologi Telkom Purwokerto, Indonesia)*

Abstract Migration to the new system or application is very challenging, especially if the users have to adapt to a new application that is implemented with direct conversion technique. It triggers many user reactions, one of them is their opinions and rate about the application in play store (Google Play Store for example). Application reviews can be used to elicit user requirements or to verify requirements. This paper demonstrated the result of mining application reviews to support software requirements elicitation. It motivated by research area natural language processing (NLP) for requirement engineering (RE). Training and testing conducted to a dataset contains about 1200 application reviews of a new mobile banking application by classifying them into two classes (req and other) using Multinomial Naïve Bayes algorithm. The classification performance measured are accuracy score 0,8220 and one of class that has higher classifier performance is "other" class with value precision 0,83, recall 0,94 and F1 0,99. Even though, the result is not optimal yet, especially for "req" class, this research already implemented all categories of NLP technologies such as NLP techniques, NLP tools, and NLP resources.

Paper Id	**1C-1570758717**	*Session* **1C**

Title **Vessel Detection Based on Deep Learning Approach**

Authors *Irwan Priyanto (LAPAN, Indonesia); Aniati M. Arymurthy (University of Indonesia, Indonesia)*

Abstract Effective monitoring of Indonesia's marine waters is one of the essential necessities to ensure national sovereignty.
Vessels monitoring can be carried out by implement object detection methods to find all objects of interest in an image. In this study, we present a deep learning approach in high resolution optical satellite images for detecting & counting the number of vessels. Our method has adopted a deep learning approach with a Faster R-CNN network backbone and inception-v2 feature extractors. Our experiments revealed that our methods produced promising results within reasonable accuracy in vessel image detection and identification. It achieves an accuracy of 94.4% and 0.971 for F1Score.

Paper Id	**1C-1570759335**	*Session* **1C**

Title **Odor Source Localization in Low Computational Controller Micro Quadrotor**

Authors *Nurrizal Alqindi, Muhamad Rausyan Fikri and Djati Wibowo Djamari (Sampoerna University, Indonesia)*

Abstract This paper proposes a new approach for odor source localization using a low computational controller in the micro quadcopter. Searching for an odor source is an engineering problem, it can be a simple task if a high-computational controller is implemented. However, in reality, a micro quadcopter has a major constraint: the payload limitation where the high-computational controller can be out of the option. In this case, a low computational controller is employed to complement the searching requirement. In this research, the searching algorithm based on bio-inspired behavior of the silkmoth and noise reduction based on the Savitzky-Golay filter is employed. The odor source localization in the micro quadcopter shows a satisfactory result where the test is validated through experimental validation.

Paper Id	**1C-1570759425**	*Session* **1C**

Title **Analysis of Color and Texture Features for Samarinda Sarong Classification**

Authors *Anindita Septiarini (Universitas Mulawarman, Indonesia); Rizqi Saputra, Andi Tejawati and Masna Wati (Mulawarman University, Indonesia); Hamdani Hamdani and Novianti Puspitasari (Universitas Mulawarman, Indonesia)*

Abstract Samarinda sarong or Tajong Samarinda is a traditional woven fabric originating from Samarinda, East Borneo, Indonesia. It is made through a weaving process using a loom called a Gedokan (a traditional machine). Unfortunately, many Samarinda people still lack knowledge regarding the type of Samarinda sarong; hence they cannot recognize it. Therefore, an automatic method of image processing-based needed to recognizing and classifying the motif of Samarinda sarong. This method requires appropriate and discriminatory features to obtain the optimal classification results. This work aims to analyze color and texture features to produce discriminative features. The color features used are color moments applied on RGB and HSV color spaces, while texture features were extracted using Gray Level Co-occurrence Matrix (GLCM). Subsequently, those features were reduced using correlation-based feature selection (CFS) followed by applying the Support Vector Machine (SVM) classifier. The dataset used consists of 150 sarong images (50 Belang Hata, 50 Belang Negara, and 50 Kuningsau). The method performance successfully achieved the accuracy of 100% using only 10 color features from a total of 34 features.

Paper Id	**1C-1570759471**	*Session* **1C**

Title **Unmanned Surface Vehicle Autopilot and Guidance System Design with Disturbance Using Fuzzy Logic Sliding Curve**

Authors *Mochammad Sahal, Briliant Haqiqi and Rusdhianto Effendi Abdul Kadir (Institut Teknologi Sepuluh Nopember, Indonesia)*

Abstract One technology that is developing rapidly at this time is unmanned vehicles. An unmanned surface vehicle (USV) or an unmanned ship can go without a captain. USV has a variety of functions such as a vehicle and a combat tool to a means of transportation. The development of the USV into an autonomous vehicle requires a variety of configurations both in determining speed, trajectory, and avoiding obstacles. The designed system certainly has external disturbances which can affect the stability of the system. The existence of environmental changes that can occur with various conditions results in the USV system that needs to be able to adapt. To overcome these problems, a stable intelligent controller can be designed. In this study, the USV autopilot and guidance system was designed using a Fuzzy Logic Sliding Curve. In testing the results of system design, simulations will be carried out using MATLAB software. This study carried out various variations to obtain an autopilot and guidance unmanned surface vehicle (USV) system method that was able to reach the waypoint in the fastest time and the shortest distance.

Paper Id	**1C-1570766534**	*Session* **1C**

Title **An Enhanced Classification of Bacteria Pathogen on Microscopy Images Using Deep Learning**

Authors *Son Ali Akbar (Universitas Ahmad Dahlan, Indonesia); Kamarul Hawari Ghazali (Universiti Malaysia Pahang & Vision and Intelligent System Research Group, Malaysia); Habsah Hasan (Universiti Sains Malaysia, Indonesia); Zeehaida Mohamed (Universiti Sains Mala*

Abstract Classification of bacteria pathogens has significant importance issues in the clinical microbiology field. The taxonomy identification of bacteria is usually recognized through microscopy imaging. The classical procedure has the lacks detection and a high misclassification rate. Recently, computer-aided detection is an applied deep learning approach that has been growing to improve classification quality. This study proposed an enhanced classification technique to recognize the bacterial pathogen images. The DensNet201 pre-trained CNN architecture has been used for deep feature extraction and classification. In addition, the transfer learning with the freeze layer technique applied can enhance the accuracy performance and reduce the false-positive rate. The experimental result can improve state-of-the-art decision-making.

Paper Id	**1C-1570766734**	*Session* **1C**

Title **Comparison of Case-Based Reasoning and Certainty Factor Methods for Dengue Diagnosis**

Authors *Hamdani Hamdani and Anindita Septiarini (Universitas Mulawarman, Indonesia)*

Abstract Dengue is a disease caused by a dengue virus infection that is transmitted through the bite of Aedes Aegypti and Aedes Albopictus mosquitoes. People with dengue fever who are diagnosed based on symptoms that appear without any medical considerations can lead to mishandling. Therefore, a computer-based system is needed to overcome these problems. This study aims to compare two methods: Case-Based Reasoning (CBR) and Certainty Factor (CF) for diagnosing dengue. The CBR method computed the similarity value of the new case disease with the previous case to justify the disease. Meanwhile, the CF method used the certainty value of the disease. The dataset consists of 110 patient data divided into three categories of dengue fever, namely, dengue fever, dengue hemorrhagic fever, and dengue shock syndrome. There are 19 symptoms of the patient recorded. The expert system presents the result of dengue diagnosis, the appropriate treatment solutions, and the comparison results of the diagnosis from the CBR and CF methods. Based on the evaluation result, it shows that the CBR method achieves the value of accuracy, precision, and recall is 84.455%, 84.455%, and 100%, while the CF method obtain 80.909%, 80.909%, and 100%, respectively. Based on the test results, it shows that there are differences in values, so that the conclusion is that the CBR method is more accurate in diagnosing dengue.

Paper Id	**1C-1570769722**	*Session* **1C**

Title **The handwriting of Image Segmentation Using the K-Means Clustering Algorithm with Contrast Stretching and Histogram Equalization**

Authors *Muhammad Munsarif (Dian Nuswantoro University, Indonesia); Moch Arief Soeleman (Sepuluh Nopember Institute of Technology & Dian Nuswantoro University, Indonesia); Pulung Nurtantio Andono (Dian Nuswantoro, Indonesia); Muljono Muljono (Dian Nuswantoro Unive*

Abstract An analysis of handwritten documents is a scientific technique to understand a writer's personality using handwriting scratches and patterns. Graphologists have identified human characters using visual observations. The identification process requires a long time because the observations are conducted comprehensively and examining one by one of the letters or words of the overall handwriting. Therefore, we need a system that automatically identifies the characters of human personalities based on handwriting, requires a shorter period, and provides objectivity. Handwriting image processing to identify human characters has been developed in various fields, such as education, medicine, psychology, and criminology. In image processing, segmentation is an important stage to separate an object from its background. On the other hand, the k-means clustering algorithm is an algorithm to classify some cluster regions based on certain characteristics. Therefore, it can be implemented at the segmentation stage of handwriting images. This research started with data acquisition. The data employed constituted scans of handwriting obtained from graphologists. Then, the image quality improvement employed contrast stretching and histogram equalization. The next step was image segmentation using the k-means clustering algorithm. Segmentation was conducted by varying k values to gain the best segmentation results. The evaluation was conducted by comparing the results of segmentation images with the results of reference images. The reference images were obtained from segmentation images using Otsu's thresholding method. Otsu's method (1979) has been widely applied in various research on segmentation and produced good accuracy. Therefore, this study applied the image segmentation results with Otsu's method as a reference. The results showed that (1) the

highest evaluation indicator was in the segmentation results without pre-processing, and (2) the k value was = 2 with the average accuracy of 100%, the average sensitivity of 100%, and the average specificity of 100%.

Paper Id	**1D-1570758909**	*Session* **1D**

Title **Detection pests system for Local Mayas Rice Plants East Kalimantan using Dempster Shafer**

Authors *Novianti Puspitasari and Hamdani Hamdani (Universitas Mulawarman, Indonesia); Heliza Rahmania Hatta (Mulawarman University, Indonesia); Anindita Septiarini and Masna Wati (Universitas Mulawarman, Indonesia)*

Abstract People need a source of carbohydrates that come from staple foods such as rice to maintain their immune system in the current pandemic era. Mayas rice is a variety that contributes to the fulfillment of carbohydrate sources because it has specific physiological function components beneficial to health. However, the production of Mayas rice plant is lower than other types of rice due to pest attacks. In addition, the community still has minimal knowledge to identify the types of pests that attack Mayas rice, so people have difficulty determining the proper pest control method. Applying the Dempster-Shafer method into an expert system can be a solution for the community to find out the types of pests found in Mayas rice plant. The data used in this study came from experts with 32 symptoms and 10 types of pests. This study shows the percentage level of possible types of pests found in Mayas rice based on the calculation results of the Dempster-Shafer method. The test results on the expert system are 80%, indicating that the expert system is accurate to use.

Paper Id	**1D-1570759408**	*Session* **1D**

Title **Object Detection for Autonomous Vehicle using Single Camera with YOLOv4 and Mapping Algorithm**

Authors *Mochammad Sahal, Ade Oktavianus Kurniawan and Rusdhianto Effendi Abdul Kadir (Institut Teknologi Sepuluh Nopember, Indonesia)*

Abstract At this time, the development of artificial intelligence technology is growing rapidly. This situation is also supported because the existing hardware is capable of performing heavier and more complex computations when compared to hardware from 10 to 20 years ago. The autonomous car itself is an example of the development of this artificial intelligence technology. In autonomous cars, many algorithms are needed to create autonomous cars that are feasible to drive, so it is not to endanger other road users, for example, object recognition. The performance of object recognition itself is very dependent on the hardware that the system used, so the algorithm that system used needs to be fast, efficient, and accurate. So the method used is YOLOv4 to detect objects while adding a mapping algorithm to know the location of every object that is detected relative to the sensor. The model used has a precision value of 0.5723 or 57.23 percent and recall is at a value of 0.4587 or 45.87 percent, as well as the addition of a mapping algorithm to determine the position of objects relative to the camera, and the addition does not affect the processing speed of the detection algorithm. object used. This method can be used for real-time because the detection speed is quite fast, where the average detection speed is 0.03860 seconds or 25.87 FPS.

Paper Id	**1D-1570769766**	*Session* **1D**

Title **East Nusa Tenggara Weaving Image Retrieval Using Convolutional Neural Network**

Authors *Silvester Tena (Universitas Gadjah Mada, Indonesia); Rudy Hartanto (Gadjah Mada University & Electrical Engineering and Information Technology Departmen, Faculty of Engineering Gadjah Mada University, Indonesia)*

Abstract The popularity of East Nusa Tenggara (ENT) province is attributed to a variety of traditional woven fabrics with local cultural attributes. Each tribe in the province has its design and colors that differentiate the fabrics leading to diverse decorative motifs. Due to different varieties, it is challenging for users to know both the type of motif and its origins. In this research, several Convolutional neural network (CNN) architecture benchmarks were carried out for ENT weaving images retrieval. The image retrieval method was chosen for the study since it has feature extraction and similarity measurement, which make searching and selection relatively easier. Furthermore, the CNN method is often used for feature extraction due to its ability to recognize objects while hashing and hamming distance algorithms help reduce the computation time for similarity testing. This study was conducted by comparing several pre-trained CNN architectures, including VGG16, ResNet101, InceptionV3, and Discrete Wavelet Transform. The results showed that the highest accuracy is ResNet101 architecture with 100%, 88.50%, and 55% at top=1, top=5, and top=10, respectively. The pre-trained CNN model and Discrete Wavelet Transform combination provided better results in case the feature dimensions were above 16-bit. The feature dimensions are generally based on the best 6-bit hashing code, though they are computationally time-consuming.

Paper Id	**1D-1570770435**	*Session* **1D**

Title **Detection of Covid-19 Based on Lung Ultrasound Image Using Convolutional Neural Network Architectures**

Authors *Chastine Fatichah, Muhammad Fadhlan Min Robby, Shintami Chusnul Hidayati and Tanzilal Mustaqim (Institut Teknologi Sepuluh Nopember, Indonesia)*

Abstract With the rapid spread of Covid-19 which is set to become a global pandemic, a fast, cheap, and guaranteed Covid-19 detection system is needed. Medical images such as CT scans and X-rays generally become a key diagnostic tool for Covid-19 detection. In this study, ultrasound images as an alternative medical image can be used for the diagnosis of Covid-19. The development of Covid-19 detection based on Lung Ultrasound images was carried out using a deep learning approach. We compare the performance of several the Convolutional Neural Network (CNN) architectures. The results of this study indicate that the accuracy of ultrasound images for infection detection is the best using the VGG16 architecture. The results of the evaluation of the built model produce precision of 89%, recall of 86%, F1-score of 85%.

Paper Id	**1D-1570773027**	*Session* **1D**

Title **An Improved Algorithm for Chest X-Ray Image Classification**

Authors *Bayu Adhi Nugroho (Universitas Islam Negeri (UIN) Sunan Ampel Surabaya, Indonesia)*

Abstract The application of Deep Neural Network for medical image classification has been known widely as an effort to help the tasks of a real doctor assessment. One of the applications is the classification of diseases from Chest X-Ray images. The NIH Chest X-Ray dataset is the most popular and the largest medical images database in the field. Several approaches have been done to improve classification of the 14 classes from the dataset, including: modifying network layers, handcrafting the dataset, and conducting smart-augmentation. We propose a weight modification algorithm for training to overcome the class imbalance problem and achieve further improvement for classification. Experimental results are provided to show the improved classification performance.

Paper Id	**1E-1570757893**	*Session* **1E**

Title **Sentiments Analysis of Indonesian Tweet About Covid-19 Vaccine Using Support Vector Machine and Fasttext Embedding**

Authors *Dikih Arif Wibowo (University of Gadjah Mada & Qiscus, Indonesia); Aina Musdholifah (Universitas Gadjah Mada, Indonesia)*

Abstract Vaccination is one of the efforts to overcome the COVID-19 pandemic in many countries, including Indonesia. Various responses through social media have also come from diverse levels of Indonesian society regarding the COVID-19 vaccine. Sentiment analysis about vaccines on social media is one way to investigates public responses to these efforts. This study proposes to develop a model that can analyze these sentiments by classifying the public responses on Twitter into positive, negative, and neutral sentiment classes.

One of the success factors in sentiment analysis is the selection of the appropriate feature extraction. In general, tweets contain a lot of non-standard words. Fasttext is a feature extraction that can handle non-standard word representations so that vectors can be presented as other standard words. Therefore, the proposed tweet sentiment analysis model consists of Fasttext as a feature extractor and SVM as a classifier. This study utilizes 1000 Indonesian tweets for experiment purposes. Furthermore, another feature extractor, WORD2VEC, and another classifier, MNB, are also used for comparison. The experimental results show that the Fastext-SVM model is outperformed others in terms of accuracy, i.e., 88.10%.

Paper Id	**1E-1570759483**	*Session* **1E**

Title **Stock Price Prediction During the Pandemic Period with the SVM, BPNN and LSTM Algorithm**

Authors *Icha Mailinda (University of Indonesia, Indonesia)*

Abstract The volatility of the stock market during the pandemic was a challenge that affects investors' decision in doing their investment. Machine learning was one of the options to cope with the issue, for it helped in developing predicted algorithm which analyzes time series data as part of the investors' investment consideration. The algorithm in machine learning can be the answer to the issue. The three comparable algorithm included SVM, BPNN, and LSTM within the case study of BBRI stock report on the period of 14th November 2019 to 23rd December 2020. The study compared those three algorithm to figure out which is the best one. This research emphasizes CRISP-DM methodology, which are business understanding, data comprehension, data preparation, algorithm development, evaluation and deployment. The result of this research concluded SVM has the best prediction accuracy with 0.003 MSE and 0.058 RMSE, followed by LSTM with 0.008 MSE and 0.087 RMSE, and lastly BPNN with 0.017 MSE and 0.132 RMSE. Reviewing this trend, SVM had the closest forecast to the exact result. BPPN had the highest RMSE, nevertheless it showed closer forecast to the exact result, comparing to LSTM. This research provides beneficial impact toward investors in delivering more accurate prediction so that they can also execute accurate decision regarding to stock forecast and investment.

Paper Id	**1E-1570765293**	*Session* **1E**

Title **A Customized DeepICF+a with BiLSTM for Better Recommendation**

Authors *Maria Anastasia Manullang and Mario E. S. Simaremare (Institut Teknologi Del, Indonesia); Teamsar Panggabean (Del Institute of Technology, Indonesia); Christina Clara and Reza Oktovian Siregar (Institut Teknologi Del, Indonesia)*

Abstract Recommendations are expected to help users make decisions when users are faced with a large amount of information. One technique for developing a recommendation system is item-based collaborative filtering (ICF), where this approach recommends items based on their similarity to the items with which users already interacted and comparable decisions made by other users. In recent years, many ICF approaches have made significant progress by using deep neural networks to learn similarities from data. Developing a recommender system based on ICF+attention approach has shown a significant output. In this research, we conducted experiments on MovieLens 1M dataset to build movie recommendation. A recent study demonstrates a good result by HR= 0.7084 and NDCG = 0.4380 of its performance. Previous work implemented MLP to predict the next watched movies. MLP performs poorly for prediction compared to BiLSTM performs better for prediction if the data in a historical model. In this work, we modify the architecture of the previous study (DeepICF+a with MLP) by replacing MLP model with BiLSTM Our work shows that the performance have a better result by 0.7121 and 0.4399 for HR and NDCG, respectively with configuration embedding size = 32, layers BiLSTM [64,32,16] and number negative = 8. The DeepICF+a with BiLSTM recommendation model provides a better optimization model for Train Loss with a score of 0.2064 and a Test Loss with a score of 0.1263 compared to MLP for train loss with a score of 0.2127 and a Test Loss with a score of 0.3167

Paper Id	**1E-1570765466**	*Session* **1E**

Title **Text Classification and Similarity Algorithms in Essay Grading**

Authors *Husni Thamrin (Universitas Muhammadiyah Surakarta, Indonesia); Naufal Azmi Verdikha (Universitas Muhammadiyah Kalimantan Timur, Indonesia); Agus Triyono (Universitas Muhammadiyah Surakarta, Indonesia)*

Abstract Open and closed questions are both important in an examination to evaluate the teaching and learning process. Both types of questions have their own advantage and disadvantage. Open-ended questions in the form of essays require manual grading that is harder and time-consuming. This paper presents an effort to grade essay answers based on classification techniques and similarity algorithms. We examine 1648 essay answers from an examination of Bahasa Indonesia. Teachers use integer values in the range of 0 - 12 to score the answer. Both classification techniques and similarity algorithms result in about the same grading as shown by the RMSE values in the range of 2.7 - 3.0

Paper Id	**1E-1570766181**	*Session* **1E**

Title **Improving Clustering Method Performance Using K-Means, Mini batch K-Means, BIRCH and Spectral**

Authors *Tenia Wahyuningrum and Siti Khomsah (Institut Teknologi Telkom Purwokerto, Indonesia); Suyanto Suyanto, Prasti Eko Yunanto and Wikky Fawwaz Al Maki (Telkom University, Indonesia)*

Abstract The most pressing problem of the KNN classification method is voting technology, which will lead to poor accuracy of some randomly distributed complex data sets. To overcome the weaknesses of artificial neural networks, we developed a new scheme in data set clustering, making the number of clusters greater than the number of data classes. In addition, the committee selects each cluster so that it does not use voting techniques such as standard KNN methods. This study uses two sequential methods, namely the clustering method and the artificial neural network method. Clustering methods can be used to group records into multiple clusters to select commissions from these clusters. Five clustering methods were tested: K-Means, K-Means with Principal Component Analysis (PCA), Mini Batch K-Means, Spectral and Balanced Iterative Reduction, and Clustering using Hierarchies (Birch). All tested clustering methods are based on the cluster type of the center of gravity. According to the result, the Birch method has the lowest failure rate among the five clustering methods (2.13), and K-Means has the largest clusters (156.63).

Paper Id	**1E-1570766830**	*Session* **1E**

Title **Design and Implementation of Post-Detection of Denial of Service (DoS) as a Mitigation System (PDDMS) Based on Dynamic Access Control List Algorithm**

Authors *Adian Fatchur Rochim, Fahmi Maghrizal Mochtar and Adnan Fauzi (Diponegoro University, Indonesia)*

Abstract Computer networking maintenance and monitoring have been essential things. A human administrator could not monitor the whole resources for 24 hours and take action directly in inactive hours when an incident occurs. Automating the network appliance with the integration of an attack detection system could help solve the problem. This study mainly focuses on mitigating network attacks using the Dynamic Thresholding algorithm as a detection and mitigation system based on network automation using the Dynamic Access Control List algorithm. The data used for this research is self-generated in a virtual environment, and a mitigation system written in Python to automate the router configuration through REST API. Prototype of the mitigation system, namely post-detection of DoS as a Mitigation System (PDDMS). The system testing phase results show that the mitigation system has an average of 1.57 seconds response time to configure ACL for one router. The implementation evaluated using Confusion Matrix shows 0% results of True-Positive Rate in the generated dataset, with 23.01% of accuracy and no positive results detected, which resulted in no response taken by mitigation system.

Paper Id	**1E-1570770959**	*Session* **1E**

Title **Sensor Placement Strategy to Detect Corrosion in Water Distribution Networks**

Authors *Ary Mazharuddin Shiddiqi (Sepuluh Nopember Institute of Technology, Indonesia); Deddy Aditya Pramana (Indonesia); Royyana Ijtihadie (Institut Teknologi Sepuluh Nopember, Indonesia); Tohari Ahmad (Institut Teknologi Sepuluh Nopember (ITS), Indonesia); Huda*

Abstract Water is distributed from sources to meet demands through pipe networks. Pipes are commonly made of metal and buried underground. These pipes can be corroded over time due to the environmental factors. A high level of corrosion on pipes indicates that the pipes in a network should immediately be replaced because they are very susceptible to cause leaks.

One way to detect the presence of corrosion in pipes is to observe flows in pipes by installing flow sensors in a pipeline network. Installing flow sensors in a pipeline network can be a complex problem for a very large network such as in urban areas. Ideally, we will need many sensors to detect changes in flow for such a pipeline network. However, it is very inefficient to do so due to provision and maintenance costs.

We developed a modeling based on pipeline network simulations to find a strategic location to install flow sensors to detect pipe corrosion. We used a directed acyclic graph (DAG) to model flow changes due to the presence of corrosion in certain areas. We apply the procedure to produce DAGs for locations that are susceptible to corrosion. Sensors are placed at locations with the highest intersection of the DAGs. Experimental results indicate that the trends between the increase in corrosion rates in pipes and changes in flow values in pipes can be mapped accurately.

Paper Id	**1E-1570772073**	*Session* **1E**

Title **Forensic Event Reconstruction for Drones**

Authors *Hudan Studiawan (Institut Teknologi Sepuluh Nopember, Indonesia); Tohari Ahmad (Institut Teknologi Sepuluh Nopember (ITS), Indonesia); Ary Mazharuddin Shiddiqi (Sepuluh Nopember Institute of Technology, Indonesia); Bagus Santoso and Baskoro Adi Pratomo (I*

Abstract Event reconstruction is one of the forensic processes to determine and reconstruct event sequences of cyber security attacks or incidents. In drone forensics, existing research focuses on artifact extraction and analyses. Therefore in this paper, we propose an event reconstruction for drones using directed graph representation. The sentiment analysis technique is used to investigate any events of interest that have been represented as graph vertices. Experimental results on drone public datasets indicate that the proposed method can reconstruct events and show suspicious activities of a drone to assist the investigation.

Paper Id	**1F-1570766454**	*Session* **1F**

Title **Data Mining Using Apriori Algorithm and Linear Regression in Product Recommendations**

Authors *Laurentinus Laurentinus (ISB Atma Luhur, Indonesia); Okkita Rizan and Hamidah Hamidah (STMIK Atma Luhur, Indonesia); Sarwindah Sarwindah, Rahmat Sulaiman and Hengki Hengki (ISB Atma Luhur, Indonesia)*

Abstract The utilization of data mining technology has now been widely applied in large companies in various aspects. But unfortunately, there are still many businesses in Indonesia that have not used data mining technology in improving future strategic business plans. The data that enters the company becomes historical data that goes into the company archives and is finally left stored. Companies are required to provide easy and fast services to customers and determine future business strategies, especially at the Bahari Bangka Belitung Restaurant in serving tourists. Tourists are very difficult to decide on the products they want to order and ask for recommendations from the waiter. Based on the problems encountered, the problem is solved by utilizing processed transaction data in providing product recommendations or related superior menus for marketing purposes. Data mining helps extract data that has been stored for a certain period to be used as a reference in providing recommendations. The algorithm in this study is an a priori algorithm based on a website and android using the prototype method. The results of this study are a priori recommendations for products in the form of associative rules or consumer transaction patterns by collecting transaction data and then by experimenting with a dataset of 274 transactions calculated using the Apriori algorithm with a minimum support value of 50 and a minimum confidence value of 75%. User Acceptance Testing of 6 variables with ten questions regarding effort expectancy, social influence, performance expectancy, use behavior, supporting facilitating, and behavioral intention produces an average index of 90.4%.

Paper Id	**1F-1570766875**	*Session* **1F**

Title **Comparison of Kernels Function between of Linear, Radial Base and Polynomial of Support Vector Machine Method Towards COVID-19 Sentiment Analysis**

Authors *Khoirunisa Widyaningrum, Adian Fatchur Rochim and Dania Eridani (Diponegoro University, Indonesia)*

Abstract Support Vector Machine (SVM) is a machine learning algorithm that is generally used to classify data by finding the best hyperplane that separates classes. In SVM algorithm use kernel function when dataset cannot be separated linearly. There are several types of kernel methods, including linear, Radial Basis Function (RBF), and polynomials of the SVM algorithm. In previous research, each kernel has been used. However, the comparison of the three kernel function methods has not been obtained because each kernel function method is used in different datasets. For this reason, this research is proposed to obtain comparative information of the three kernel functions. In this study, we will compare the linear kernel SVM algorithm, RBF, and polynomial using the parameters of accuracy, sensitivity, and specificity. The dataset used is data from Youtube media to analyze public sentiment on the increase in cases at the beginning of the entry of the COVID-19 pandemic in Indonesia. In this study, the accuracy values of the classification model were 0.86 for the linear kernel, 0.90 for the Radial Base Function (RBF) kernel, and 0.91 for the polynomial kernel. The sensitivity values obtained for each model are 0.64 for the linear kernel, 0.48 for the Radial Base Function (RBF) kernel, and 0.20 for the polynomial kernel. While the specificity values obtained for each model are 0.89 for the linear kernel, 0.95 for the Radial Base Function (RBF) kernel, and 0.99 for the polynomial kernel.

Paper Id	**1F-1570766877**	*Session* **1F**

Title **NFR Classification using Keyword Extraction and CNN on App Reviews**

Authors *Taufik Hidayat and Siti Rochimah (Institut Teknologi Sepuluh Nopember, Indonesia)*

Abstract Documentation and fulfillment of software requirement are important aspects in measuring the success of a team in developing software. In the field of requirement engineering, there are two types of requirements namely functional requirements (FR) and non-functional requirements (NFR). Nowadays, requirements may also be found in app reviews, so this study proposes a method for classifying non-functional requirements of software from app reviews. We extract several keywords automatically from app reviews and app description, and classify app reviews plus keyword extracted using convolutional neural network (CNN) and word2vec vectorization into several category of NFRs. The result show that our proposed method performed better than basic CNN and any neural network algorithm.

Paper Id	**1F-1570774046**	*Session* **1F**

Title **Input Feature Selection in ECG Signal Data Modelling using Long Short Term Memory**

Authors *Ahmad Saikhu and Cinthia Vairra Hudiyanti (Institut Teknologi Sepuluh Nopember, Indonesia); Arya Wijaya (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia)*

Abstract One of the diseases that are a significant burden worldwide is cardiovascular disorders, diseases related to the work of the heart have a high probability of causing death. So we need a tool or model to detect the patient's heart signal against the risk of cardiovascular disorders. Electrocardiogram (ECG) recordings are often used to capture the propagation or propagation of electrical signals in the heart from the patient's body surface. Reading the ECG signal data is very tiring because every second, there are around 180 points that are captured which consist of the patient's pulse, movement, and breath. In this research, input feature selection will be carried out using the Long Short Term Memory method for ECG signal data. Furthermore, the results of the model performance that the Long Short Term Memory model with one input, namely (t-1), is the best compared to using two or four input features.

Paper Id	**1G-1570752619**	*Session* **1G**

Title **Developing NEO Smart Contract for Weather-Based Insurance**

Authors *Mukuan Junior Salem, Fajar Eranmus Ndolu and Diar Eka Risqi Hidayatullah (Universitas Indonesia, Indonesia); Riri Fitri Sari (University of Indonesia, Indonesia)*

Abstract Weather-based insurance has been developed across emerging economies in many countries. In several Southeast Asia (SEA) countries, weather-based insurance has been released to protect fishermen from the natural events or extreme weather. The value of insurance coverage is obtained from an expensive and lengthy process, especially when facing an extreme weather condition such as sea storm. This adds a heavy toll on fisherman's shoulders when facing the natural conditions. To solve these problems, which is to reduce evaluation costs, blockchain-based smart contracts are used ensure easier asymmetric information. We proposed a blockchain-based smart contract framework that applies to weather-based index insurance. We chose Docker Container and Neo blockchain platform for our experiment due to its easy access tokens from neo-python with a private network. In this experiment we developed a smart contract implementation on Neo. We defined 6 (six) functions that can be triggered if certain conditions are met from an external data application program interface (API). In our experiment of blockchain implementation using Neo, we found that Neo is scalable and trusted and as well having a low memory consumption that could be running in a low specification machine. The deployment of a blockchain based system is feasible to be conducted using Neo platform.

Paper Id	**1G-1570765581**	*Session* **1G**

Title **A Conceptual Digital Library Model for Validated Content-based Preservation of Traditional Javanese Songs**

Authors *Khafiizh Hastuti and Arry Maulana Syarif (Universitas Dian Nuswantoro, Indonesia); Muslih Muslih (Dian Nuswantoro, Indonesia); Aton Rustandi Mulyana (Institut Seni Indonesia Surakarta, Indonesia)*

Abstract The development of a digital library for the preservation of traditional Javanese songs requires the validity of the content that is part of the collection. Meanwhile, collecting traditional Javanese song data is a challenge since there is still a lot of song data stored in hard copy and data spreads everywhere. Internet-based digital libraries can be a solution for easy user access both for uploading content or accessing song data. Easy access for users to upload related content can increase the number of collections. In order to maintain the validity of the collection, user leveling based on role-based access control is implemented by dividing users into Guest, Member, Contributor and Reviewer levels with Administrator level acting as librarians. Thus, the validated content-based preservation approach proposed in the development of a digital library of traditional Javanese songs is expected to be a solution to these problems. Song data uploaded by users can be displayed in a digital library as a candidate collection, but any content that is determined to be part of the library collection must pass the validation process. It is similar to the process in the Wikipedia or similar archive sites but the proposed validation stage adopts the process in peer review journals. Furthermore, the digital library technology instruments, digital library organization and digital library environment are selected as instruments to evaluate the proposed model.

Paper Id	**1G-1570766231**	*Session* **1G**

Title **Spectrum Sensing Using Adaptive Threshold Based Energy Detection in Cognitive Radio System**

Authors *Budi Bayu Murti (Gadjah Mada University, Indonesia)*

Abstract Wireless communication has experienced rapid development and has been widely used to meet the needs of society. However, in some real situations it shows that most of the allocated spectrum is underutilized. Cognitive radio (CR) is a smart technology that aims to improve the utilization of licensed spectrum frequencies by providing opportunistic access to Secondary Users (SU). Dynamic spectrum access techniques can be used without intervention to the Primary User (PU). An important problem in CR is the sensing of the spectrum which must be able to accurately detect the presence of a primary user in the licensed band. In this research, a framework was developed based on the modeling of spectrum energy detection using Matlab software. Modeling is done on the PU signal source, AWGN communication channel, as well as the SU receiver side. Evaluation is carried out to obtain adaptive threshold value settings that can be adjusted to obtain optimum detection accuracy. Results analysis was performed statistically based on ROC graphs to determine the performance of the detection system. The results of the simulation showed that at the adaptive threshold value that has been set, then the value of Probability of Detection (Pd) will increase along with the increase in the value of SNR. The value of Pd will also increase with the number of samples used.

Paper Id	**1G-1570766614**	*Session* **1G**

Title **Application of Clustering Method on Vehicular Ad-hoc Network (VANET) on Mobility of Medical Vehicles in Urban Environment**

Authors *Achmad Affandi, Devon Suardi and Eko Setijadi (Institut Teknologi Sepuluh Nopember, Indonesia); E Endroyono (ITS & Institut Teknologi Sepuluh Nopember, Indonesia); Gatot Kusrahardjo (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia)*

Abstract Vehicular Ad-hoc Network (VANET) is a data communication network technology between cars and road-side units (RSU) that enables telecommunications network infrastructure to improve road safety and traffic efficiency.

This technology can be applied to smart accident and emergency response management systems in urban environments. With the challenges of medical vehicles that require safety and punctuality in responding to natural disasters or serious accidents, VANET technology is needed that can regulate communication between vehicles.

In this study, modeling and application of the clustering method for the medical vehicle community in an urban environment was carried out using the SUMO and OMNet++ simulators which were adjusted to the parameter settings.

The routing algorithm modeling of the medical vehicle clustering method will be applied to the system simulation that produces map.sumo.cfg which contains a simulation of the urban environment and NED File which contains a simulation of delivery performance and routing of data packets. Furthermore, an analysis of vehicle communication performance will be carried out using .awk scripts in the form of Packet Delivery Ratio, End-to-End Delay, and Routing Overhead.

The simulation results show that the Packet Delivery Ratio value will increase as the number of vehicles increases. The End-to-End Delay and Routing Overhead values also increase along with the increase in the number of vehicles.

Paper Id	**1G-1570771119**	*Session* **1G**

Title **Eye Tracking and Head Movement-Orientation Solution Design To Perceive People's Mind While Seeing COVID-19 Advertisements**

Authors *Maria Seraphina Astriani (Bina Nusantara University, Indonesia)*

Abstract Knowing what's on someone's mind might be challenging because only that person knows what's on their mind. COVID-19 advertisements are public service announcements, which raise public awareness of the issues occurred. A solution is needed to be able to find out what kind of advertisements attract someone to be memorized and to make COVID-19 advertisements even better. It is difficult to get the information in people's mind when they see the COVID-19 advertisement, a method and tools are needed to be able to mine the information which represent the human mind. We proposed the solution design based on Internet of Things (IoT) by using glasses to detect and record eye movements by using heat map. Accelerometer and gyroscope embedded in glasses are also needed to capture the head movement-orientation to perceive the gaze information to find out the pattern which COVID-19 advertisements can attract their attention to be memorized.

Paper Id	**2A-1570759477**	*Session* **2A**

Title **Performance Evaluation of Visible Light Communication System Design in Indoor Scenario**

Authors *Muhammad Imam Nashiruddin, Berlian Nurfadhilah and Brian Pamukti (Telkom University, Indonesia); Muhammad Adam Nugraha (Peruri Research Institute for Authenticity (PRIfA), Indonesia)*

Abstract Wireless network technology is proliferating. Therefore, optical wireless communication (OWC) technology is in great demand to support information and communication technology needs. Visible Light Communication (VLC) is a new technology in optical wireless communication and becomes the communication medium through visible light from LEDs that can be implemented for indoor and outdoor communication systems. For indoor VLC systems, Light Emitting Diode (LED) placement technique is very influential on the coverage of a room, and this research proposes designing VLC systems in closed indoor rooms measuring 5×5×3 m..3... The computer simulation obtained the highest received power at -18 dBm with the best coverage link communication 1.88 m..2.. and receiver propagation distance to the transmitter at 2.397 m.

Paper Id	**2A-1570764429**	*Session* **2A**

Title **Discrete Cosine Transform-Based Key Generation Scheme for Indoor Environment**

Authors *Suwadi Suwadi (ITS, Indonesia); Mike Yuliana (Politeknik Elektronika Negeri Surabaya, Indonesia); Iwan Wirawan (ITS, Indonesia)*

Abstract One of the widely used techniques to ensure confidentiality in Internet of Things (IoT) communications is cryptography. The technique works by establishing a secure path for communication between IoT devices. However, the obstacle that occurs is that the IoT device is a device with computational limitations so that it is unable to implement the secret key distribution mechanism in the cryptographic technique. To overcome this problem, some researchers focus on efforts to generate a random secret key on each device by utilizing the randomness of the communication channel. This paper proposes a key generation scheme intended for IoT devices using IEEE 802.11. This scheme utilizes the Discrete Cosine Transform (DCT) method to increase the correlation coefficient of the observed communication channel and reduce the resulting secret key bit mismatch. Performance validation of the key generation scheme carried out in an indoor environment shows that the resulting scheme is able to increase the correlation coefficient up to 20% and achieve BGR of up to 8.52488 bps.

Paper Id	**2A-1570765839**	*Session* **2A**

Title **Flexible Failover Using Routing Policies Different Administrative Distance and Internal BGP**

Authors *Hillman Akhyar Damanik (Budi Luhur University, Indonesia)*

Abstract Heterogeneity of Service Provider network connectivity on increasingly complex transmission networks and multilink transmission networks, so a link recovery system is needed that can minimize link and circuit link failures. Management of large distributed link connectivity and transmission line infrastructure with various business services that require link recovery systems when primary links fail or interrupt their paths. Increased internet and network coverage in terms of speed and cost efficiency of services to end-to-end latency, for customer service quality of service. The research objective was to implement and model Flexible Failover Using Routing Policies Different Levels of the BGP Hierarchy, for a Multipath environment for failure recovery processes with routing between BGP Autonomous System Internal and Policies Terms. Fast link failure and recovery mechanism in dealing with link failures and link congestion in service provider backhaul networks, at layer 3 and layer 2 by implementing BGP peering sessions with Routing Policies Different Levels of the BGP Hierarchy. The results obtained from the modeling that will be carried out in a multipath link environment, show and periodically generate the intervals obtained in the graph and test with the MRTG monitoring tool, have a direct average correlation with link failures. Failed link or node on primary link fails, secondary link is active and ready to perform recovery, then on tertiary link by selecting round-robin method to perform recovery. The process of removing the recovery link fromthe obtained results is 0-5.0-10 m/s.

Paper Id	**2A-1570766603**	*Session* **2A**

Title **Improved HEVC Video Encoding Quality With Multi Scalability Techniques**

Authors *Agus Purwadi (Politeknik Negeri Jember, Indonesia & Institut Teknologi Sepuluh Nopember (ITS) Surabaya, Indonesia); Wirawan Wirawan (Institut Teknologi Sepuluh Nopember, Indonesia); Suwadi Suwadi (ITS, Indonesia)*

Abstract Video content becomes very popular today and dominates internet traffic, and various efforts to design and implement QOS (Quality of Service) services are being carried out. During its transmission through network, there are lost packets and significant variations in the load on the bandwidth. Moreover, network congestion degrades the video data transmission rate. This study offers a new video encoding, namely HEVC (High-Efficiency Video Coding), with multi-scalability in its output, including SNR (Signal to Noise Ratio), spatial and temporal scalability. The results showed that the use of multi scalability techniques resulted in better performance than the single scalability indicated by the increase in the average PSNR (Peak Signal to Noise Ratio) in video quality.

Paper Id	**2B-1570770851**	*Session* **2B**

Title **ENT Randomness Test on DM-PRESENT-80 and DM-PRESENT-128-based Pseudorandom Number Generator**

Authors *Bety Hayat Susanti (Politeknik Siber dan Sandi Negara, Indonesia); Jimmy Jimmy (Badan Siber dan Sandi Negara, Indonesia); Mareta Wahyu Ardyani (Politeknik Siber dan Sandi Negara, Indonesia)*

Abstract In cryptography, random numbers hold a special importance in which they can be utilized as keys, to generate challenges, or merely as a value. The Pseudorandom Number Generator, as the name suggests, makes the generation of random numbers possible. It is widely accepted that there are two different categories of PRNG algorithms, namely the specifically built and those based on existing cryptography algorithms. The block cipher-based hash function scheme is one of the mostly used algorithms to generate outputs of a PRNG.

In this study, we performed the ENT randomness test on PRNG which is based on hash function based on block cipher. Since the hash function produces a fixed output, the data set will be used to match the required sample. The hash function scheme used is Davies-Meyer with block cipher construction, namely the PRESENT-80 and PRESENT-128 algorithms. The results showed that the output sequences produced by one iteration and two iterations of DM-PRESENT-80 and DM-PRESENT-128 as a whole passed the ENT test, which means that the PRNG has a random output.

Paper Id	**2B-1570774218**	*Session* **2B**

Title **Implementation of the Bresenham's Algorithm on a Four-Legged Robot to Create a KRPAI Arena Map**

Authors *Adytia Darmawan and Andre Faqih Ilham Suparman (Politeknik Elektronika Negeri Surabaya, Indonesia); Ali Husein Alasiry (Politeknik Elektronika Negeri Surabaya & Electronics Engineering Polytechnic Institute of Surabaya, Indonesia); Eko Henfri Binugroho an*

Abstract Kontes Robot Pemadam Api Indonesia (KRPAI) is a division of the Robot Competition in Indonesia whose mission is to extinguish fires according to the rules of the Trinity College International Fire Fighting Robot Contest (TCIFFRC) in Hartford, United States. The robot is placed in one of the 4 rooms randomly and is required to find a fire then extinguish it and return to the room where the robot is placed. The ability of robots to be able to carry out missions perfectly often fails because of the disturbance of obstacles in the room, do not know the pose of the robot when outside the room. A map is very important so that the robot knows its position in space and the distance of the robot from obstacles. Therefore, the focus of this research is not only on simulations but also on direct map-making to dynamically moving four-legged robots. The odometry method on the four-legged robot is used for routing and localization algorithms in making maps. Bresenham's algorithm is implemented in the map creation process. The results of testing and analysis, the value of the results of the 1 mm grid map up to the 5 mm grid map can form the obstacle object into a parabolic cell, and the average value of error cells from corridors, door widths, and walls is 0.92 cells.

Paper Id	**2B-1570774372**	*Session* **2B**

Title **Integration CLAHE and Seeded Region Growing for Segmentation Of Rubber Tree in HSI Color Space**

Authors *Wanvy Arifha Saputra, Rahimi Fitri, Agus Setiyo Budi Nugroho and Siti Kustini (Politeknik Negeri Banjarmasin, Indonesia)*

Abstract Rubber tree growth is excellent when in the tropics. Rubber trees that mature can be processed to extract the sap. The image segmentation process can be carried out first as the initial process of the maturity level classification. An accurate segmentation method and fast processing time are needed to support that process. We propose integrating CLAHE and Seeded Region Growing to segment rubber trees in HSI color space. This method uses a hue image as input, then enhancement of the sharpness image uses CLAHE. From this process, a seeded region growing segmentation method is used to separate the rubber tree object from the background. The result in this method shows that the average RAE is 31.02%, ME 21.61%, MHD 15.04%, and the processing time is 5.18 seconds. Based on these results, this can prove that the method is good enough to be applied on rubber tree images taken directly from a forest where the image has complexity texture, risk of multi-object, and complexity color.

Paper Id	**2B-1570775153**	*Session* **2B**

Title **Design of Transformer Oil Purification Equipment**

Authors *Yulianta Siregar (University Sumatera Utara, Indonesia)*

Abstract Insulating oil is often used as a material for insulation in transformers rather than gas insulation. Oil insulation is more practical because there is no gas leakage problem, and it is easier to conduct heat. Still, oil is more easily contaminated because oil has particles and water vapor. Transformer oil that has been used for a long time will experience a decrease in its insulation. Condition of oil insulation is necessary to purify the oil. Purification must be expensive because if the location of the transformer is far from the purification site, transportation costs are expensive, and it also takes a long time to complete the purification. In this study, a simple purification equipment design was carried out at a low cost. The prototype design has been tested and functions well to produce a large breakdown voltage. The result has a standard of 59.24 kV with a test temperature of 80°C and a circulation duration of 15 minutes

Paper Id	**2B-1570775460**	*Session* **2B**

Title **EEG Data Analytics to Distinguish Happy and Sad Emotions Based on Statistical Features**

Authors *Y Pamungkas (ITS Surabaya, Indonesia); Adhi Dharma Wibawa (Institut Teknologi Sepuluh Nopember, Indonesia)*

Abstract Affective computing is part of the important study of Human-Computer Interaction. Currently, EEG-based affective computing (emotion recognition) has become an interesting issue to be studied further. Emotions are not only closely related to aspects of HCI but also affect human health. Meanwhile, EEG is also considered a transparent tool in objectively revealing human emotions because the brain naturally produces EEG signals. This study focuses on comparing and classifying human emotions (happy and sad) based on EEG data. The channels used for recording EEG data are F7, F8, FP1, and FP2. Data preprocessing such as signal filtering, Independent Component Analysis, and Band Decomposition aims to clean the raw signal from artifacts and separate the signals according to specific frequency bands (Alpha, Beta, and Gamma). Then, statistical feature extraction is performed in the time domain to obtain the Mean values, Mean Absolute Value (MAV), and Standard Deviation values for further data analysis. The results show that emotion of happy has a higher feature value compared to emotion of sad. In the classification of happy and sad emotions using several algorithms, Random Forest signifies the highest classification accuracy (88.90%), compared to other algorithms such as SVM (86.70%), K-NN (88.87%), and Naive Bayes (86.63%).

Paper Id	**2B-1570775727**	*Session* **2B**

Title **Intelligent Diabetic Retinopathy Detection using Deep Learning**

Authors *Hanung Adi Nugroho and Eka Legya Frannita (Universitas Gadjah Mada, Indonesia)*

Abstract Diabetic retinopathy (DR) is the most common illness related to diabetes caused by the increasing of glucose in human blood and has been dramatically increased in the last decade. Practically, DR is examined by conducting manual analysis on retina images resulted from fundus camera modality in which can lead to some problems such as time-consuming, need more thoroughness and properly skill and experience. Due to the insufficient number of ophthalmologists, especially in rural areas, an alternative solution in supporting diagnosis properly is needed. Regarding to those issues, some research communities have proposed intelligent system for detecting DR. Despite some previous intelligent DR detection have been developed, there still remained problem that quality of image was extremely affect the performance. Hence, in this study we proposed an intelligent DR detection completed with image enhancement process for maintaining the model performance. Our proposed solution was performed in 200 retina images consisting of two classes (normal and abnormal or DR). Our proposed solution successfully increased the performance with the highest accuracy, sensitivity, specificity, positive predictive value, and negative predictive value of 0.92, 0.95, 0.81, 0.95, 0.81, respectively. This result has increased by around of 40% in most of evaluation metrics of the model's performance without an image enhancement process. It indicates that conducting image enhancement process before training the model was important to increase the model performance and to prevent the miss-detection.

Paper Id	**2B-1570776221**	*Session* **2B**

Title **Utilizing Chest X-rays for Age Prediction and Gender Classification**

Authors *Chris Solomou and Dimitar Kazakov (University of York, United Kingdom (Great Britain))*

Abstract In this paper we present a framework for automatically predicting the gender and age of a patient using chest c-rays (CXRs). The work of this paper derives from common situations in medical imaging where the gender/age of a patient might be missing or in situations where the x-ray is of poor quality, thus leaving the medical practitioner unable to treat the patient appropriately. The proposed framework comprises of training a large CNN which jointly outputs the gender/age of a CXR. For feature extraction, transfer learning was employed using the EfficientNetB0 architecture, with a custom trainable top layer for both classification and prediction. This framework was applied to a combination of publicly available data, which collectively represent a heterogeneous dataset showing a variation in terms of race, location, patient's health, and quality of image. Our results are robust with respect to these factors, as none of them was used as input to improve the results. In conclusion, Deep Learning can be implemented in the medical imaging domain for automatically predicting characteristics of a patient.

Paper Id	**2B-1570778276**	*Session* **2B**

Title **A Multi-channel Adaptive Equalization Method**

Authors *Shanghui Xiao (University of Electronic Science and Technology of China & Chengdu Technological University, China); Mengyao Zhang, Jian Liu, Qiang Xu, Wensheng Pan, Wanzhi Ma, Ying Liu and Shihai Shao (University of Electronic Science and Technology of Ch*

Abstract In recent years, multiple-input multiple-output (MIMO) technology is widely used in wireless communication to make full use of space resources and improve the efficiency and quality of communication. However, due to the coupling effect of capacitance and inductance, the multi-channel transmission system often has the problem of crosstalk, which makes the communication quality degraded or even unable to communicate. Aiming to solve the problem of crosstalk, we proposes a multichannel adaptive equalization method in this article. Based on solving the problems of channel multipath fading and intersymbol crosstalk, this method further suppresses the coupling crosstalk between multiple channels. This article demonstrates the rationality of the method through modeling of the transceiver system and formula derivation, we also verified the effectiveness of the method by the simulation processing of the measured data of the dual-polarized antenna.

Paper Id	**2C-1570773822**	*Session* **2C**

Title **Cheat Detection on Online Chess Games using Convolutional and Dense Neural Network**

Authors *Reyhan Patria, Sean Favian, Anggoro Caturdewa and Derwin Suhartono (Bina Nusantara University, Indonesia)*

Abstract With the widespread use of chess engines cheating in chess has become easier than ever, especially in online chess. Cheating obviously brings a negative impact
to the sport. However, research on the topic on cheat detection in chess is still scarcely found. Thus, this paper will discuss data and algorithms that can be used to develop cheat detection tools to analyze games. For data, there are analyzed data and unanalyzed data from online chess games whereas for the algorithm that will be explored there are convolutional neural network (CNN) and densely connected neural network. The results from the experiment using the CNN algorithm are better than the densely connected neural network for detecting if the player is cheating or not. Meanwhile for the data, using either unanalyzed and analyzed data doesn't change the best performing neural network, but it was found using the analyzed data still boosts the accuracy of both neural networks.

Paper Id	**2C-1570773825**	*Session* **2C**

Title **Supervised Machine Learning Algorithms to Detect Instagram Fake Accounts**

Authors *Angela Susanto, Michael Jonathan Ekosputra, Ferdiana Haryanto and Derwin Suhartono (Bina Nusantara University, Indonesia)*

Abstract Instagram is extremely popular because many celebrities and their fan pages use Instagram as the platform for them to communicate. Instagram offers many media sharing features and has proven to be the most popular social media platform for promoting many brands. As the most popular platform, Instagram also has fake users. Regrettably, some people do malicious activities using fake accounts such as impersonating artists or influencers, hate comments and spread rumours to become viral. Hence, this research aims to detect Instagram fake users based on the user's profile. There are several stages before account authenticity detection is successful, starting from data pre-processing, selecting a classification model, and classification evaluation. The algorithms that are used to create the supervised machine learning model are Logistic Regression, Bernoulli Naive Bayes, Random Forest, Support Vector Machine, and Artificial Neural Network (ANN). This paper tried two experiments. The first is that the default state of the model has no parameters, and no features are added. Second, to improve the accuracy, new
features and tuning parameters were added in the experiment. Models that perform better than other models based on the second experiment with new features and parameters are Logistic Regression and Random Forest, with an accuracy of 0.93.

Paper Id	**2C-1570773835**	*Session* **2C**

Title **COVID-19 Detection Model on Chest CT Scan and X-ray Images Using VGG16 Convolutional Neural Network**

Authors *Shannen Latisha, Albert Halim, Regan Ricardo and Derwin Suhartono (Bina Nusantara University, Indonesia)*

Abstract In this pandemic of COVID-19, many people's lives are highly affected in various kinds of aspects. Tests are conducted due to the rising number of infected people, with the PCR test as the current gold standard for many. However, many experts consider the PCR test inaccurate due to the resulting false negative and false positive test results. In order to solve the problem, through this paper, the use of a deep learning model is proposed based on a customized VGG16 CNN as a way to identify the presence COVID-19 virus. The biomarkers used in this paper are X-ray and CT scan images of the lungs. At the end of the research, it can be concluded that both CT scan and X-ray images can be used to detect COVID-19 by using VGG16. However, by comparing the performance of the proposed X-ray and CT scan biomarker-based models, it can be inferred that the X-ray biomarker-based model obtained a higher accuracy score of 97% compared to the CT scan-based model with 93% accuracy. This research proved that the X-ray model got a better score and is a better alternative than CT scan, although both have potential and can be considered accurate alternatives to the PCR tests.

Paper Id	**2C-1570775185**	*Session* **2C**

Title **Peatland Data Fusion for Forest Fire Susceptibility Prediction Using Machine Learning**

Authors *Nurdeka Hidayanto (University of Indonesia, Indonesia); Adhi Harmoko Saputro (Universitas Indonesia, Indonesia); Danang Eko Nuryanto (BMKG, Indonesia)*

Abstract Forest fires have been a severe hydrometeorological hazard during the dry season in Indonesia. Pulang Pisau Regency in Central Kalimantan has become one of the most forest fires affected areas during the 2015 El Nino event. Based on MODIS data, more than 120.000 hotspots have been recorded between 2014 and 2019. Previous studies concluded that peatlands act as contributing factor to forest fires in the country. This study proposed the peat-effect on the development of machine learning models for forest fire susceptibility (FFS), which can support forest fire disaster management. In addition to the peat effect, such as elevation, slope, Normalized Difference Vegetation Index (NDVI), rainfall, distance from the road network, and distance from the residents. Random Forest (RF), Support Vector Classifications (SVC), and Gradient Boosting Classification (GBC) models were used to build the FFS map. The spatial data were then divided into training (2014 - 2018) and validation (2019) data. The experiment results showed an increase in Area Under Curve (AUC) from 0.84 - 0.87 to 0.87 - 0.88 due to the addition of the peat variable. The complete test resulted in the highest accuracy of 0.80 in the RF and SVC.

Paper Id	**2D-1570766981**	*Session* **2D**

Title **Tableware Ceramics Defect Detection Using Morphological Operation Approach**

Authors *Novita Rahmayuna and Kusworo Adi (Diponegoro University, Indonesia); Retno Kusumaningrum (Universitas Diponegoro, Indonesia)*

Abstract Inspections on product quality need to be carried out by manufacturing companies to ensure and maintain customer satisfaction. Quality control of physical products can be done using a digital image processing approach. Previous research conducted product defect detection using filtering and edge detection techniques based on image acquisition on flat objects. In some cases, image acquisition is taken on non-flat objects and has a background. The object's region of interest (ROI) needs to be analyzed to get the required object area. This paper aims to detect the location of the defect in the product using a morphological approach. The object of this research is a plain ceramic tableware plate consisting of a plate that has defect and has no defect. A morphological approach is used to segment the image to get the ROI and detect the location of the defect on the plate. Dilation, erosion, opening, and closing operators are utilized to obtain the expected results. The results in this study showed an accuracy of 85.76%.

Paper Id	**2D-1570768466**	*Session* **2D**

Title **Interline Feeder of Shunt Passive Harmonic Filter and Detuned Reactor to Reduce Harmonic Distortion**

Authors *Langlang Gumilar (Universitas Negeri Malang, Indonesia)*

Abstract Power electronics devices are increasingly needed today. Every human activity always uses power electronic equipment such as motor drive power supply, charger, inverter, control system, etc. The principle of switching work on these equipment can cause harmonics so that they are considered as nonlinear loads. The large number of power electronic devices in the electric power system causes high harmonic distortion. Total Harmonic Distortion (THD) and Individual Harmonic Distortion (IHD) are the measuring parameters for harmonics. High THD cannot be reduced by a shunt harmonic passive filter alone. Therefore, it is necessary to add additional devices such as a detuned reactor to improve the performance of the harmonic filter. The combination of a shunt harmonic passive filter and a detuned reactor are placed on the interline feeder bus. This interline method is done to save on adding harmonic filters to each feeder. Generally, each feeder is connected to a nonlinear load, so a harmonic filter is needed on each feeder. Several scenarios were made to compare the performance of the shunt harmonic passive filter when without a detuned reactor and when combined with a detuned reactor. All of these scenarios were carried out in the condition of the interline feeder of the electric power system. The results of each scenario show an increase in the performance of the shunt harmonic passive filter after being combined with a detuned reactor. In the first scenario, the THD-I value is 18.16% in feeder 1 and 15.86% in feeder 2. While the THD-V value is 26.9% in feeder 1 and 23.58% in feeder 2. In the second scenario, the THD-I value is 9.57% in feeder 1 and 10.96% in feeder 2. While the THD-V value is 8.87% in feeder 1 and 8.87% in feeder 2. In the third scenario, the THD-I value is 3.95% in feeder 1 and 4.53% in feeder 2. THD-V value is 2.17% in feeder 1 and 2.17% in feeder 2.

Paper Id	**2D-1570768486**	*Session* **2D**

Title **Fuzzy Based Wide Range Voltage Control Of DC Step-Up Zeta Converter For Energy Management System**

Authors *Jumiyatun Jumiyatun (Universitas Tadulako, Indonesia); Mochamad Ashari (Sepuluh November Institute of Technology, Indonesia); Soedibyo Soedibyo (Institute Teknologi Sepuluh Nopember & Indonesia, Indonesia); Ontoseno Penangsang (Institut Teknologi Sepuluh*

Abstract This paper presents a step-up zeta converter with wide-range control of input variation voltage using fuzzy logic. A wide range of converter control is commonly applied as part of the Energy Management System (EMS) to provide a constant output voltage. In this paper, a Photovoltaic (PV) represents a high variation of the voltage source. To overcome the fluctuating PV output voltage, a zeta-type DC-DC converter is used to keep it constant at a value of 24V DC. Zeta converters have lower output voltage ripple and relatively higher efficiency than other types of DC-DC converters. The results show that Zeta Converter can increase the output voltage to 24V with a minimum input voltage of 17V, with an average efficiency of 85.83% in simulation and 71.9% during implementation. The fuzzy algorithm can keep the output voltage constant at 24V with various input voltages.

Paper Id	**2D-1570770012**	*Session* **2D**

Title **Analysis of Short Circuit Current Fault Components on Centralized and Distributed Renewable Energy**

Authors *Langlang Gumilar (Universitas Negeri Malang, Indonesia); Stieven Netanel Rumokoy (Manado State Polytechnic, Indonesia); Dezetty Monika (State Polytechnic of Jakarta, Indonesia)*

Abstract One of the assessments for the reliability of the electric power system is the ability to serve the load needs continuously. There are no blackouts because there is an imbalance between the supply of electric power and the needs of the consumer load. The additional loads on the consumer side must be followed by the addition of power plants. Renewable energy is an alternative to increase the supply of electrical energy and does not damage the environment. However, the addition of new power plants can cause an increase in the contribution of short-circuit fault currents. The purpose of this paper is to compare the topology for the addition of renewable energy. The topology used is centralized and distributed generation. The renewable energy used consists of solar farm and wind farm. The best topology is a topology that produces lower short-circuit currents. Short circuit analysis methods used include the analysis of AC transient components, DC components, and AC rms components. Steady state short circuit simulation results show that distributed renewable energy contributes higher fault current than centralized renewable energy. Likewise, in the analysis of fault currents using the transient AC component, DC component, and AC component in rms value method, distributed renewable energy contributes higher fault current peak value than centralized renewable energy.

Paper Id	**2D-1570771565**	*Session* **2D**

Title **Influence of Wind Turbine Pitch Angle on DFIG Output Stability under Load Changes**

Authors *Langlang Gumilar (Universitas Negeri Malang, Indonesia); Dezetty Monika (State Polytechnic of Jakarta, Indonesia); Achmad Fahrul Aji (Universitas Indonesia, Indonesia); Stieven Netanel Rumokoy (Manado State Polytechnic, Indonesia)*

Abstract Wind power plants have several advantages compared to other types of renewable energy generation, such as wind energy sources that can be available during the day and night, the power that can be produced by wind power plants is greater. These advantages make many countries prefer to use wind power plants as the main electricity generation compared to other renewable energies. However, it is also necessary to know how the wind power plant can respond to changes in load. The load always changes every hour according to the consumption of electricity by consumers. Therefore, this paper aims to analyze the stability of the wind power plant against changes in load. The type of wind power plant used in this paper is the Double Fed Induction Generator (DFIG). The parameter that is used as input to maintain the stability of the wind power plant is the pitch angle of the wind turbine. The pitch angles used are 0, 10, 20, and 30 degrees. Furthermore, to determine the stability response of the wind power plant parameter output, it is necessary to test it with changes in load. The change in load in question is the addition of a load when the wind power plant is operating. The wind power plant output parameters analyzed include current, active power, induction generator rotation speed, and voltage. The simulation results on the output voltage side, the greater the pitch angle, the greater the peak voltage increase, and vice versa. On the side of current, active power and rotor rotation speed, the smaller the pitch angle, the less wave disturbance fluctuations and the faster the DFIG reach its stable condition for the output parameters, and vice versa. From these relationships, it can be concluded that a pitch angle of 0 degrees has a more stable output and can make DFIG more responsive to reach its normal condition when there is a disturbance that enters the electric power system.

Paper Id	**2D-1570771597**	*Session* **2D**

Title **A slow Cooker Design based on Fuzzy Logic Control Temperature System**

Authors *Ratna Aisuwarya (Andalas University, Indonesia)*

Abstract Rice cooker and slow cooker have almost the same physical form and use a heating element. Rice cookers work by increasing the temperature until the boiling point, while the slow cooker works by increasing the temperature until it reaches the temperature point and maintains it for a predetermined time. In this research, we designed a system that can control the temperature of the rice cooker to function as a slow cooker. The temperature of the rice cooker can be controlled using a fuzzy logic-based system so that it functions as a slow cooker, with a solid-state relay as a voltage controller on the heating element. Temperature stability in each variation of slow cooker mode selection using fuzzy control occurs at ± 93°C for 2-hour mode, ± 83°C for 4-hour mode, and ± 73°C for 6-hour mode.

Paper Id	**2D-1570772274**	*Session* **2D**

Title **An XGBoost Model for Age Prediction from COVID-19 Blood Test**

Authors *Nunung Nurul Qomariyah (Bina Nusantara University Jakarta, Indonesia); Ardimas Andi Purwita and Maria Seraphina Astriani (Bina Nusantara University, Indonesia); Sri Dhuny Atas Asri (Pasar Minggu Hospital, Indonesia); Dimitar Kazakov (University of York, U*

Abstract COVID-19 has been declared as pandemic by the World Health Organization (WHO) in January 2020. Many studies found that some specific age groups of people are having higher risk of contracting the disease. This disease can be detected through a test, called Reverse-Transcriptase Polymerase Chain Reaction (RT-PCR). There are some studies which also found that the appearance of the disease can be detected from the patient's blood test pattern. Based on these previous studies, we conducted an analysis to close the research gap in both areas and find the connection between the patients' age and their blood test. Predicting a person's age from blood chemistry is not new in health science. Most of them is used to develop medication and detecting the sign of the disease associated with aging. Based on our experiment, we find an interesting fact that XGBoost algorithm can be used to predict the age of the patients from their blood test. The performance evaluation also shows a very satisfactory result with the R-squared score above 0.80 and Normalized RMSE under 0.1.

Paper Id	**2E-1570777953**	*Session* **2E**

Title **Multi Label Classification Of Retinal Disease On Fundus Images Using AlexNet And VGG16 Architectures**

Authors *Reyhansyah Prawira and Alhadi Bustamam (Universitas Indonesia, Indonesia); Prasnurzaki Anki (University of Indonesia, Indonesia)*

Abstract Diseases of the eye have the potential to cause blindness in sufferers. There have been many types of diseases that exist in the human eye. Some examples of diseases that exist in the eye include Diabetic Retinopathy (DR), Myopia (MA), Optic Disc Cupping (ODC). Fundus images help medical personnel to see what diseases are in the eyes of people with certain diseases. In one fundus image there may be more than one disease in the eye. The research that will be carried out is to find out what diseases are contained in the fundus image by using multi-label classification. The research will be conducted using a deep learning method using the AlexNet and VGG16 architectures which will then be compared between the two models. The data used are fundus images on DR, MA, and ODC diseases as many as 1133 data. The results obtained in this study indicate that the AlexNet model is better than the VGG16 model in performing multi-label classification on fundus images

Paper Id	**2E-1570778483**	*Session* **2E**

Title **Analysis of Resistivity, Dielectric Strength and Tensibility of Insulator Materials of A Mixture of Epoxy Resin, Silicone Rubber, and Coal Ash**

Authors *Yulianta Siregar (University Sumatera Utara, Indonesia)*

Abstract Coal ash is a coal combustion waste whose amount increases with the use of coal as fuel. The reuse of coal waste has been carried out in civil construction such as the cement industry. Coal ash is utilized in the manufacture of polymer insulating materials with the main ingredients of epoxy resin and silicone rubber. The feasibility of epoxy resin insulators, silicone rubber, and coal ash was tested by testing resistivity, dielectric strength, and tensile strength. The insulator material test was carried out according to ASTM standards and was carried out for 12 different types of samples. The addition of coal ash filler affects the dielectric strength of the test sample. The stability of the test value can be seen in sample S7, with the composition of the sample consisting of 30% resin A, 30% resin B, 20% silicone rubber, and 20% coal fly ash. The test results of the sample code S7 have a resistivity value of 42.793 MΩm, a dielectric strength value of 154.133 kV/cm, a tensile stress value of 7.53 MPa, and a strain percentage of 16.75%. Calculation of the stability of the research results is from the scoring of the overall composition.

Paper Id	**2E-1570778491**	*Session* **2E**

Title **Retinal Disease for Clasification Multilabel with Applying Convolutional Neural Networks Based Support Vector Machine and DenseNet**

Authors *Alicia A Lumbantoruan (University of Indonesia, Indonesia); Alhadi Bustamam (Universitas Indonesia, Indonesia); Prasnurzaki Anki (University of Indonesia, Indonesia)*

Abstract The retina is an essential part of the eye and works to transmit visual information to the brain. In maintaining the eye, an ophthalmologist needs regular examinations, but the price is expensive and takes time. Therefore, technological developments are expected to help the medical world to detect diseases. The technology is image processing. Convolutional Neural Network (CNN) is the most popular neural network model to handle image analysis and can recognize patterns from an image accurately. This study detected Drusens, Optic Disc Cupping, and Tessellation diseases using 534 fundus images. The architecture used Convolutional Neural Network-based Support Vector Machine (CNN based SVM) and DenseNet, which is a Convolutional Neural Network architecture development. In obtaining the best results, in this study, we use several variations of the optimizer, namely adam, nadam, and RMSprop, and the best results from this study can be seen from the accuracy value of 93,21% using the DenseNet architecture.

Paper Id	**2E-1570778689**	*Session* **2E**

Title **Virtual Inertia Enhancement using DC-Link Capacitors in Wind Integrated Power Plants**

Authors *Sidratul Montaha Silmee (Daffodil International University, Bangladesh); Md Sabbir Hosen (University of Science & Technology Beijing, China)*

Abstract Whenever a power plant reaches generation failure, inertia is the key aspect that maintains the frequency stability of the plant. The adaption of Renewable Energy Sources and their corresponding power generation methods have reduced the inertia feature of the present day power plants. As the trend of ameliorating to renewable energy sources is escalating gradually, it has become the need of hour to develop proficient techniques for enhancing inertia. This research emphasizes the efficacy of inertia enhancement techniques, like DC Link capacitors, which produce virtual inertia and operate as a storage system. Furthermore, Simulink models validate that the amalgamation of semiconductors, such as DC Link capacitors promises an ameliorated stability of power system by stabilizing the frequency response which marks this methodology as a reasonable and productive approach for future wind integrated power plants.

Paper Id	**2G-1570766633**	*Session* **2G**

Title **Quasi Linear Utility Function Based-Wireless Internet Incentive-Pricing Models**

Authors *Fitri Maya Puspita (University of Sriwijaya, Indonesia); Evi Yuliza (Universitas Sriwjaya, Indonesia)*

Abstract In the internet pricing scheme, internet incentive pricing is used to optimize the price of online services. The desire to pay is one of the prerequisites for customers to subscribe to the service in this study, hence diverse consumers are used. With the growing demand for internet services, service providers are competing to deliver the finest service possible in order to improve service quality and attract customers. Then, using a combination of bundling, a Quasi Linear utility function, high and low demand users, reverse charging, and a two-part tariff pricing system, this study aims to find the best model and solution for an enhanced internet incentive-pricing model. The computation used to test the model using real data reveals that in this scenario β as a parameter and γ as a parameter with two-part tariff-pricing scheme when 〖FG〗_xy increases and a increases, as numerical example from local data shows an incentive value of IDR 797.55 / kbps. This shows that an enhanced incentive-pricing strategy has benefited ISPs.

Paper Id	**2G-1570766725**	*Session* **2G**

Title **The Intention to Use Online Groceries Shopping during the COVID19 Pandemic**

Authors *Lianna Wijaya (Binus University, Indonesia); Helen Helen (BINUS Online Learning, Bina Nusantara University, Indonesia); Sakti Pramudya (Binus Online Learning, Bina Nusantara University, Indonesia); Andina Sulistiowati (BINUS Online Learning, Bina Nusantar*

Abstract The Coronavirus disease (COVID19) has brought many impacts to the activities including changed the habit for shopping the daily groceries. The purpose of this research is to examine the intention to use the Online Groceries Shopping (OGS) based on the framework of Technology Acceptance Model (TAM) with two primary factors that influence the intention to use technology OGS: perceived usefulness and perceived ease of use. This is a quantitative research with non-probability sampling techniques of 317 respondents measured by 5 Point Likert scale and using Structural Equation Model (SEM) Smart PLS version 3 to analyze the data. The results obtained show all variables have positive and significant relationship to the intention to use OGS during the Covid19 Pandemic.

Paper Id	**2G-1570769591**	*Session* **2G**

Title **Implementation of Chatbot on University Website Using RASA Framework**

Authors *Lia Fauzia and Raden Budiarto Hadiprakoso (Poltek Siber dan Sandi Negara, Indonesia); Giri Noto (Politeknik Siber dan Sandi Negara, Indonesia)*

Abstract Chatbots are increasingly being utilized to help human performance to boost communication ease and provide better and faster services. A chatbot was built to make it easier to give better and more conveniently available information services 24 hours a day, seven days a week. The suggested chatbot design is constructed using the Rasa framework and is based on the Dual Intent and Entity Transformer (DIET). DIET is a multi-tasking transformer architecture that is both advanced and lightweight. The chatbot will be implemented on the "Politeknik Siber dan Sandi Negara" website, focusing on addressing questions about new student admittance. The chatbot is built with Docker and put as a Chat Widget on the website. The dataset utilized to train the algorithm combines past chat data and data from university social media. The chatbot that has been constructed will be evaluated. Model evaluation metrics and functionality tests are used in the evaluation. Testing with evaluation results in a precision value of 0.99. a recall value of 1.0, and an F1 score of 0.99. While the functioning test percentage is 90.625 %.

Paper Id	**2G-1570769616**	*Session* **2G**

Title **Twitter Bot Account Detection Using Supervised Machine Learning**

Authors *Febriora Nevia (Poltek Siber Dan Sandi Negara, Indonesia); Raden Budiarto Hadiprakoso (Poltek Siber dan Sandi Negara, Indonesia); Giri Noto (Politeknik Siber dan Sandi Negara, Indonesia); Nurul Qomariasih (Poltek Siber Dan Sandi Negara, Indonesia)*

Abstract Twitter is a central social media platform that is fast growing in popularity among social networking sites. Twitter's popularity and extremely open nature make it a prime target for automated programs known as bots. Bots can be used for various purposes, including spamming, influencing conversations, altering user popularity, polluting material, disseminating disinformation, and conducting propaganda. The purpose of this research was to give a new viewpoint on determining the likelihood of an account being recognized as a bot applying Machine Learning methods. Random Forest and XGBoost are the algorithms utilized. The investigation began with exploratory data analysis to ascertain the dataset's state. Model engineering is the next stage, which entails the processes of feature engineering, feature selection, hyperparameter tweaking, and algorithm benchmarking. The findings of this investigation suggest that the XGBoost algorithm outperforms Random Forest, with an accuracy of 0.8908 for XGBoost and 0.8762 for Random Forest.

Paper Id	**2G-1570772565**	*Session* **2G**

Title **Non-Hermitian Symmetry(NHS)-OFDM Application in MIMO-NOMA-VLC System**

Authors *Assaidah Assaidah (University of Sriwijaya, Indonesia)*

Abstract We discussed the BER performances versus SNR variation for every level of interference of LED neighbours in MIMO VLC network serving 6 user equipment (UE). The MIMO configuration is 2x3 or 3x2, based on NHS-OFDM and NOMA schemes. The required power ratio of MIMO-2x3 is 1:2:4 while MIMO-3x2 configuration needs 1:2 of power ratio. To obtain BER below FEC limit, the minimum SNR should be above 20 dB for each MIMO configuration with the maximum interference level allowed is 3% for MIMO-3x2 and 1 % for MIMO-2x3. In case where the SNR = 30 dB, the maximum interference level allowed are 13% and 10% for MIMO-3x2 and MIMO-2x3, respectively, to maintain the BER below FEC limit.

Paper Id	**2G-1570774019**	*Session* **2G**

Title **Analysis of Fuzzy Logic Algorithm for Load Balancing in SDN**

Authors *Ian Agung Prakoso, Sofia Hertiana and Favian Dewanta (Telkom University, Indonesia)*

Abstract

Server Resource limitations are generally an obstacle affecting the quality of service (QoS) due to increased traffic levels. Therefore, Load Balancing is needed to manage service requests to the optimal application server. Over time, technological developments in the field of telecommunications, especially in networks, gave rise to a new concept, Software Defined Network (SDN). SDN is a new network architecture that can separate control and data planes and provides standardized and programmable capabilities. SDN enables global network display and provides the ability to use network resources efficiently. SDN also reduces network management burden and increases network flexibility. The advantages of SDN in controlling the network can be exploited with various load balancing strategies that are used to distribute traffic loads to improve overall system performance.

Basic SDN features for flow control can be used for load balancing. It is an aware routing protocol that can maximizing the throughput and minimizing the interval of response time and reducing the jam. While the fuzzy method has the advantage that it is suitable to be applied to problems that contain an element of uncertainty.

The Performance for load balancing will be better because SDN can direct control the traffic flow to multiple servers. It can also be improved by selecting the server with minimum load using the Fuzzy Logic Algorithm. However, traditional server cluster load balancing schemes do not use device state data and cannot fully utilize the load balancing method. In this study, we propose an SDN-based Server Load Balancing method using fuzzy logic methods. The Fuzzy Logic Algorithm process requests with an increase in the quality of the Throughput, RTT, and lower CPU and Memory Utilization. Fuzzy Algorithm also illustrates the absence of overload on the servers which are under heavy load conditions.

Paper Id	**2G-1570774216**	*Session* **2G**

Title **Modeling of Multiple Cantilevers System for Broadband Vibration Energy Harvester**

Authors *Li Wah Thong (Multimedia University, Malaysia)*

Abstract Piezoelectric energy harvester has the capability in powering small scale semiconductor devices particularly in the low power sensors applications in Internet of Things (IoT) environment. It is known that the bandwidth and power of these energy harvesters can be improved by increasing the number of cantilevers in the system. This research presents the electromechanical model of multimode piezoelectric energy harvesters with different polarity connections between the cantilever beams to improve the broadband performance of frequency response in the system. The theoretical model and experimental results of the proposed multi-mode system exhibited a significant escalation of output voltage at the gap between two resonance frequencies when the polarity configuration in the cantilever connection is reversed accordingly. The outcomes designate that by interchanging the polarity of the electrical connection between the cantilever beams, the output voltage between the resonance frequency of the multi-mode system can be increase significantly in comparison with the conventional series interconnection.

Paper Id	**3A-1570766318**	*Session* **3A**

Title **Sentiment Analysis for Twitter Chatter During the Early Outbreak Period of COVID-19**

Authors *Fahed Jubair (University of Jordan, Jordan & Purdue University, USA); Nesreen A Salim, Omar Al-karadsheh, Yazan Hassona, Ramzi Saifan and Mohammad Abdel-Majeed (University of Jordan, Jordan)*

Abstract This study presents the findings of applying sentiment analysis on a corpus of seven million unique English tweets collected from March 26, 2020 to April 9, 2020 about the COVID-19 outbreak. First, an off-the-shelf lexicon-based sentiment analysis tool was used to determine sentiment polarity in each tweet. Then, an off-the-shelf text visualization tool was used to visualize the most frequent emotions and topics that showed positive and negative sentiments. The study revealed meaningful insights about which positive and negative emotion types were most prominent on Twitter chatter during the early period of the COVID-19 pandemic, and which topics garnered the most positive and negative emotional reactions. This work shows that analyzing social media chatter using sentiment analysis and text visualization tools is an effective approach for tracking people's concerns and mental health during pandemics and infectious diseases outbreaks.

Paper Id	**3A-1570772072**	*Session* **3A**

Title **Estimate the Survival and Hazard functions by using the Simulation Technique for Modified Weibull Extension Distribution**

Authors *Shaimaa B Yass and Iden Al Kanani (University of Baghdad, Iraq)*

Abstract In this paper, study the modified Weibull extension model, and derive the estimators of three parameters by using maximum likelihood estimator method, and rank set sampling estimator method. Then by utilizing Monte Carlo method in simulation procedure for generate various of samples sizes with various of replicate the sample size, and using the simulation for two estimation methods, noting that Mean Square Error for maximum likelihood estimator method is better than Mean Square Error for rank set sampling estimator method, and this give that Maximum likelihood estimator method is the best for estimating the parameters of modified Weibull extension distribution. Accordingly estimate the Survival and hazard functions for real data of patients who suffer of acute lymphocytic leukemia disease

Paper Id	**3A-1570772578**	*Session* **3A**

Title **Analysis of Factors on Continuance Intention in Mobile Payment DANA Using Structural Equation Modeling**

Authors *Sri Rahayu Natasia and Muhammad Gilvy Langgawan Putra (Institut Teknologi Kalimantan); Aidil Saputra Kirsan and Rizkya Salsabila (Institut Teknologi Kalimantan, Indonesia)*

Abstract The increasing use of mobile payments in Indonesia has attracted many financial companies to participate in making mobile payment services. This study uses the Structural Equation Modeling method to determine the relationship between variables of mobility, customization, security, reputation, trust in the platform, and perceived risk that can affect the continuance intention of using the DANA application. Data was collected through the distribution of questionnaires with the coverage of the city of Balikpapan and got 415 respondents. After the analysis, it was found that trust is a factor that influences continuance intention. Four factors significantly affect trust, namely mobility, customization, security, and reputation. Where mobility influences women's beliefs but does not have a significant effect on men. Customization has a greater influence on the beliefs of men than women. Security has a greater influence on women's trust than men. Reputation has a greater influence on men's trust than women. It can be concluded that trust has succeeded in being a mediator variable between mobility variables for women, customization, security, and reputation with continuance intention variables. Security has a greater influence on women's trust than men. Reputation has a greater influence on men's trust than women. It can be concluded that trust has succeeded in being a mediator variable between mobility variables for women, customization, security, and reputation with continuance intention variables. Security has a greater influence on women's trust than men. Reputation has a greater influence on men's trust than women. It can be concluded that trust has succeeded in being a mediator variable between mobility variables for women, customization, security, and reputation with continuance intention variables.

Paper Id	**3A-1570774096**	*Session* **3A**

Title **Prediction of Bontang City COVID-19 Data Time Series Using the Facebook Prophet Method**

Authors *Kurnia Kasturi, Ihsan Alfani Putera and Sri Rahayu Natasia (Institut Teknologi Kalimantan, Indonesia)*

Abstract The increasing trend of COVID-19 cases in the city of Bontang makes it the first order of the highest incident rate in East Kalimantan with a value of 1161.78 cases per 100 thousand inhabitants. The purpose of this study was to predict the increase in COVID-19 cases in Bontang City with a dataset of positive confirmed cases, recovered and died from COVID-19. The dataset used starts from March 24, 2020 - March 1, 2021 using the Facebook Prophet method, the Jupyter Notebook application, and the Python programming language. The research process consists of data collection stage, prediction implementation stage (data preprocessing, processing, performance evaluation, dashboard creation), and result analysis. Performance evaluation uses the Mean Absolute Error (MAE) and Mean Absolute Percentage Error (MAPE) methods. Visualization in the form of a dashboard using the Google Data Studio platform. The results of this study predict up to 92 days, namely May 5, 2021 and show a trend of increasing cases of covid to reach the highest positive value, highest recovery, and highest death, respectively, of 8695, 6099, and 156 people. To control COVID-19 in the city of Bontang, a minimum test, especially the PCR Test, is 870 tests and increases the need for hospitalization by 294. The average positive predictive error (MAE) is 0.17 and the average positive predictive accuracy value (MAPE) of 17.4%, which means that the positive prediction of contracting covid has good accuracy criteria. The average death prediction error (MAE) is 0.27 and the average death prediction accuracy (MAPE) value is 27%, which means that the predictions of patients dying due to Covid-19 have decent accuracy criteria. The average recovery prediction error (MAE) is 0.17 and the average recovery prediction accuracy (MAPE) is 17.4%, which means that the predictions of patients recovering from COVID-19 have good accuracy criteria.

Paper Id	**3B-1570778345**	*Session* **3B**

Title **Design of an IoT-based Body Mass Index (BMI) Prediction Model**

Authors *Glorious Musangi Mark and Pierre Bakunzibake (University of Rwanda, Rwanda); Chomora Mikeka (Directorate of Science, Technology & Innovation (DSTI), Malawi)*

Abstract Overweight and obesity have become a major health concern associated with diseases such as cardiac arrest, type 2 diabetes, stroke, high blood pressure, and other non-communicable diseases (NCD) and are the leading risks for deaths globally, killing more people than underweight. Body Mass Index (BMI) is a measure that uses weight and height to work out a person's nutrition status. Research throughout to calculate BMI is based on traditional manual methods which are time consuming, error prone and they are not cloud-based. Very few systems have incorporated machine learning yet with low accuracy. This research presents the design and development of a IoT based body mass index prediction model. This system consists of a NodeMCU microcontroller for computations with an inbuilt ESP8266 WiFi module, human load cell sensor for body weight measurement, a HX711 load cell amplifier module and HC-SR04 ultrasonic sensor for height measurement. Values are displayed on a 16x2 LCD and send to ThingSpeak for storage and analysis. ThingSpeak is integrated with MATLAB Machine Learning to make the prediction based on height and weight sensory data. This research uses Supervised Exponential Gaussian Process Regression algorithm to predict whether a person is underweight, normal weight, overweight or obese. The designed IoT Based BMI computation system achieves an accuracy of 99.18% with a time reduction of 1.1 % per person while the ML model achieves an accuracy of 98%.

Paper Id	**3C-1570748983**	*Session* **3C**

Title **Mechanical vibration control and second-order LTI system analysis of an SDOF with harmonic motion**

Authors *Ömer Ayvacı and Paweł Szulczyński (Poznan University of Technology, Poland)*

Abstract It is critical to analyze vibration because of the prevalence of vibration in engineering. Our primary objective is to find a new method to analyze mechanical system vibrations under different circumstances with a single degree of freedom (SDOF). The mass-spring-damping (MSD) system's mathematical structure will be used as a baseline for analyzing the SDOF system. The second-order homogeneous linear time-invariant (LTI) system (under damped, critical-damped, and overdamped) is analyzed and given in this conference paper. The findings include identified parameters such as dynamic magnetic variables, and step responses. Besides, a PID controller is optimized for vibration.

Paper Id	**3C-1570753312**	*Session* **3C**

Title **Operating Switched Reluctance Motor in Proper Excitation Angles**

Authors *Slamet Riyadi (Soegijapranata Catholic University, Indonesia)*

Abstract Switched reluctance motor has been an alternative solution for electric drives due to its advantages. Applications in hybrid and electric vehicles need high torque with low ripple. Operation in motoring mode requires phase current flows during positive slope of phase inductance, this can be implemented by current control or single pulse control. In certain range of its speed, single pulse control is more suitable. In this paper, excitation with different turn-on angles for single pulse control is analyzed. This is addressed to obtain higher torque. To verify the analysis, experimental works were done. To generate any excitation angles, digital signal controller was implemented as the core of the control strategy. By shifting the turn-on angle just before the point where the phase inductance starts to rise, higher torque can be produced.

Paper Id	**3C-1570758323**	*Session* **3C**

Title **High Detection of Hydroponic Plant Pak Choy Using Morphological Image Processing**

Authors *Casi Setianingsih (Telkom University, Indonesia)*

Abstract Hydroponics is a cultivation technique that uses water without using soil by emphasizing nutrients for plants. But in monitoring the height of the plant, people who want to plant hydroponics or who are doing it at home still estimate without knowing exactly, so there are plants whose height is not well monitored. These problems created an idea to create a detection system for plant growth and development to detect height more accurately.

Image Processing is a branch of knowledge about image processing that is processed digitally. The development of technology is speedy in computer vision that makes image processing not only to improve the image alone but also to detect or track an object, read barcodes, and others. The stages when doing image processing are acquiring images from images, preprocessing, and recognition. The method used in this system is the Morphological Image Processing method. The parameter used is to calculate the height of the Pak Choy hydroponic plant. Using this method, we obtained an accuracy of the system of 93.81% with a light intensity of 15.7 lux. During the 6 weeks of Pak Choy plant growth, the best accuracy was in the 3rd week with an accuracy of 97.24% with an average of 13.65 lux light intensity. The worst accuracy was found in the 2nd week, with an average accuracy of 86.25% at 15 lux light intensity.

Paper Id	**3C-1570764531**	*Session* **3C**

Title **Sentiment Analysis on Social Security Administrator for Health Using Recurrent Neural Network**

Authors *Casi Setianingsih (Telkom University, Indonesia)*

Abstract Twitter is a social media used to convey opinions, exchange information, upload videos and photos. On social media Twitter the exchange of information is fast becoming an advantage, so it is often used in delivering news and opinions in the form of criticism and suggestions such as to government agencies, for example, every time there is an issue of increasing dues to Social Security Administrator for Health, it is always a battle of opinion between the public. Social Security Administrator for Health is a government agency that guarantees the health of the Indonesian people, in this case civil servants and private workers are required to register for this insurance, as well as insurance for the poor. Opinion wars related to the issue of increasing insurance contributions between the public in the form of positive and negative opinions, a sentiment analysis system will be created using the Recurrent Neural Network classification method. With this system, it can help analyze opinions based on people's perspectives on Twitter social media, from the research results in the sentiment analysis of Twitter users, with an average accuracy is 86.67%.

Paper Id	**3D-1570778577**	*Session* **3D**

Title **Development of a Non-contact Two-Tier Biometric Security System for the DSWD 4Ps using Iris recognition and Speech Recognition**

Authors *Alfonso J Enriquez III, Gerard Edilbert Hayag Tuazon, Ericson D Dimaunahan and Alejandro H. Ballado, Jr. (Mapua University, Philippines)*

Abstract There has been a steep rise in contactless payment during COVID-19. The rapid improvements of miniaturized sensors and biometric recognition systems for face identification, fingerprint, iris, and voice are conducive and fit during this rise of COVID-19. Thus, non-contact interactions are the most effective way to fight against the spread of the virus and any other diseases. One of the most used is iris scanners and speech recognition. The study promotes contactless payments to address the accompanying issues in cash aid distribution particularly in the DSWD 4Ps, where it has a two-tier biometric security system which is iris recognition and speech recognition. This can provide the same type of service and securities as a normal ATM while removing the worry of getting different kinds of viruses and diseases. Testing the iris recognition system, a False acceptance ratio of 13% and 3% of False Rejection rates were achieved. While for the testing of speech recognition, a False Acceptance Ratio of 8.98% and False Rejection Ratio of 6.76% were achieved. Given this an average error rate of 10.92%

Paper Id	**3D-1570778592**	*Session* **3D**

Title **Efficient Scaling of Convolutional Neural Network for Detecting dan Classifying Pneumonia Disease**

Authors *Sofia Sa'idah (Telkom University, Indonesia); I Putu Yowan Nugraha Suparta and Syifa Rezki Fauziah (Telkom University & Universitas Telkom, Indonesia)*

Abstract Lung is one of vital human organ. When lung is suffered by any cause, it will impact on the body's metabolic processes. One of disorder in the lung is pneumonia. Pneumonia is caused by pathogenic microorganisms, namely bacteria, viruses, and fungi. In this study, pneumonia diseases are classified using deep learning method, which is EfficientNet Architecture Convolutional Neural Network. This study is using secondary data which 2430 data were used. About 486 data were used for testing process and 1944 data used for training process. By using this method, it can be concluded that the system designed is able to classify 3 types of x-ray images. The results obtained in this study are 89.09% accuracy and 1.8934 loss. For other parameters such as f-1 score, recall and precision, the average value for each are 0.87;0.91 and 0.89.

Paper Id	**3D-1570778600**	*Session* **3D**

Title **Optimization Placement of SVC and TCSC in Power Transmission Network 150 kV SUMBAGUT using Artificial Bee Colony Algorithm**

Authors *Yulianta Siregar (University Sumatera Utara, Indonesia); Zulkarnaen Pane (Universitas Sumatera Utara, Indonesia)*

Abstract Voltage profile and minimize power losses is the most challenging part of power system and Flexible AC transmission system (FACTS) devices support to sustain and advance voltage profile and minimize power losses. But, choosing the suitable FACTS device and its optimal placement in the network is a matter of concern, this paper presents a Artificial Bee Colony (ABC) Algorithm to find the optimal location and sizing parameters of FACTS device in transmission network. The different FACTS device are implemented, such as SVC, TCSC and combination SVC-TCSC. SVC, TCSC and combination SVC-TCSC are compared to determine the optimal placement in the system for improve voltage profile and minimize power losses. The transmission network 150 kV SUMBAGUT is used for this purpose. The results show that he combination of SVC-TCSC is the most efficient to improve voltage profile and minimize active power losses.

Paper Id	**3D-1570778705**	*Session* **3D**

Title **Pneumonia Detection using Dense Convolutional Network (DenseNet) Architecture**

Authors *Maria Susan Anggreainy (Bina Nusantara University, Indonesia); Ajeng Wulandari (BINUS University, Indonesia)*

Abstract Pneumonia is a dangerous disease that attacks the respiratory system, causing pain in the chest when breathing. The disease killed more than two million people in one year in 2017. Photo the resulting chest X-ray will be checked manually and require proper lighting by doctor to get the type of pneumonia. Therefore, we need a method to classify pneumonia of the Chest X-ray image automatically. Pneumonia classification systems have been developed, but still produce low accuracy. In this research we developed a classification system using DenseNet and compared its accuracy with previous studies using ResNet. The results show that there is a 9% performance using DenseNet is better than using ResNet.

Paper Id	**3D-1570778764**	*Session* **3D**

Title **Classification of Speech Signal based on Feature Fusion in Time and Frequency Domain**

Authors *Domy Kristomo (Universitas Teknologi Digital Indonesia, Indonesia)*

Abstract The design of speech recognition system requires the reliable feature extraction process. It has an essential function since a good feature can help to improve the classification rate. Nowadays, the classification of stop consonant is a challenging task, due to the several factors that influence the accuracy of classification. Research that focuses on words formed by stop consonants syllable has not been widely studied by previous local researchers Feature fusion is one way that can be done in improving the performance of the pattern recognition and classification system. In this paper, we propose three feature set of the feature fusion by using Discrete Wavelet Transform (DWT) at 7th level decomposition with Daubechies2, Wavelet Packet Transform (WPT) at 4th level decomposition with Daubechies2, Autoregressive Power Spectral Density (AR-PSD), and Statistical method to classify stop consonant word speech signal. According to the experimental results, the classification accuracy for WPT + Statistical, DWT + Statistical, and AR-PSD + Statistical were 94,72%, 92,22%, and 76,38% respectively.

Paper Id	**3D-1570779034**	*Session* **3D**
Title	**Spectro-temporal Filtering based on The Beta-divergence for Speech Separation using Nonnegative Matrix Factorization**	
Authors	*Mahmoud Fakhry (Aswan University, Egypt)*	

Abstract Nonnegative matrix factorization (NMF) has shown high effectiveness to perform supervised speech separation. In this context, nonnegative spectral basis matrices representing sources in an observed mixture, are trained independently. The trained matrices are used later to compute the corresponding nonnegative temporal activation matrices. Estimations of the source signals in the mixture are obtained through Wiener gains by minimizing the Euclidean distance between true and estimated source signals. In this paper, we propose to quantify such a distance using the Beta-divergence (beta-divergence), which has been successfully used to accomplish NMF. The proposed gains are derived by minimizing the distance measured by the divergence, and it is involved afterward in the context of supervised NMF for speech separation. The experimental evaluation concludes that the gain computed by the Beta-divergence with beta = 1.5, provides better performance comparing to the conventional Wiener gain.

Paper Id	**3D-1570779110**	*Session* **3D**

Title **Semantic Inpainting of Images using Deep Learning**

Authors *Sumathi G and UmaDevi M (SRM Institute of Science and Technology, India)*

Abstract Computer Vision enables computers to retrieve information from digital images and use the inferred data to perform the required task. Image inpainting, a computer vision technique, helps to reconstruct damaged images by refilling the missing pixels, called holes, using the relevant and known pixels, so that repaired image looks very natural and realistic. Traditional inpainting methods generally fill the holes by matching the most similar pixels in the surrounding known regions, focusing to reconstruct the exact ground truth image, leaving behind the texture and quality. Currently, many deep learning methods produced drastic improvements in visual quality and texture and also look for the semantic context of the image. However, achieving success on high resolution images with complex structures remains challenging. This paper imparts an intensive vision of the existing inpainting methods by providing a comprehensive description of the methods used, datasets and evaluation metrics for all the analyzed techniques.

Paper Id	**-1570758407**	*Session*

Title **Plug-in Electrical Vehicle Charging Station Power Management Strategies with ZSI supported Five Phase DSTATCOM**

Authors *K. P. Prasad Rao, Yuva M, Harika Nagalakshmi A and Kaivalya K*
(PSCMR College of Engineering and Technology, India)

Abstract Nowadays, Electric Vehicle Technology has been developed and it has been implemented by the INDIA Government for the safety of the public. But, the running of electric vehicles has been suddenly increasing there can be a charging problem occurs. To avoid the difficulty, this paper produces one of the solutions to maintain the quality of power at charging stations. Zero Source Inverter (ZSI) based Five Phase DSTATCOM (FPDSTATCOM) has been introduced to maintain the quality of power at charging stations. To control the proposed FPDSTATCOM, the Five Phase Synchronous Reference Frame (FPSRF) controller is discussed. The validation of work has been carried out in MATLAB - Simulink and corresponding results are presented.

Paper Id	**-1570759328**	*Session*

Title **A CPW Fed Aperture Coupled MTS Multi band Antenna**

Authors *Lalit Reddy Muthyala, Chilukuri Sulakshana and Meghana Anumula (Vardhaman College of Engineering, India)*

Abstract This paper presents an annular ring metasurface (MTS) Patch antenna with multi band characteristics. The geometry of the antenna is 0.42λ0 × 0.42λ0× 0.02λ0 (where λ0 is the lower resonating frequency i.e.2.42GHz). An aperture coupling through CPW is used to feed the uniform MTS radiating structure to resonate at multiple frequencies 2.42GHz, 2.86GHz, 6.3GHz, 6.94GHz and 7.96GHz. It is observed to have a good bandwidth and higher gain values at the targeted frequencies with the maximum gain of 9.81dB and thus used in WLAN, C band applications like weather radar systems and satellite communications.

Paper Id	**-1570765288**	*Session*

Title **Analysis the Impact of Technology Adoption on the Behavior of Mutual Investors in Using the Digital Financial Platform**

Authors *Rini Sari (Binus University, Indonesia)*

Abstract Currently, the use of technology is almost comprehensive in the economic and business sectors. One of the current uses of technology has been adopted in mutual fund investment activities. Mutual fund investments can be made through a digital financial platform. Mutual funds are containers used to invest in a collection of instruments in the financial market. Mutual fund investment is currently made as easy as a transaction like online shopping. This study was conducted to determine whether technology adoption has an influence on investor behavior in investing in mutual funds. The independent variables used are perceived ease of use, perceived usefulness and intention of use. This study uses a sample of 1000 investors who have invested in mutual funds in one of the digital financial platforms. This research model uses a structural equation model (SEM) with SmartPLS 3.0 as a statistical analysis tool. SEM is used to determine the linearity relationship between the independent variable and the dependent variable. The results show that the variables perceived ease of use, perceived usefulness and intention of use partially have a positive influence on investor behavior. Variables perceived ease of use, perceived usefulness and intention of use simultaneously have an influence on investor behavior.

Paper Id	**-1570769785**	*Session*

Title **Covid 19 Has a Significant Impact or Not on the Movement of the Rupiah Exchange Rate Through a Predictive Approach**

Authors *A. WIdodo and Dwija Wisnu Brata (Brawijaya University, Indonesia)*

Abstract On March 2, 2020, the government announced that COVID-19 had begun to enter Indonesia. Covid 19 is slowly starting to have a negative effect, where sufferers begin to increase starting March 2 - May 4, 2020, with as many as 11,192 positive cases and 8452 deaths (Haryanto, 2020). At the end of 2020, data COVID-19 in Indonesia as of December 20, 2020, had increased by 15.53% for the number of active cases (Covid19, 2021). The increase in Covid data was due to an increase in positive cases with the addition of 6982 cases nationally. This is getting worse with the increase in positive cases of Covid-19 in January 2021 in 11287 cases, so that if nationally percentage there are 16.02% active cases. The data that is also of concern from this COVID-19 case is the death data, where at the end of December 2020, it was reported that the death data reached 19,880 cases, and in January 2021, it increased by 2.86% to 25,987 cases (Covid19, 2021). Another impact to watch out for is an increase in interest in the US dollar, which is getting bigger and will result in worse economic conditions compared to the 2008 crisis.). The condition of uncertainty is a factor in the fluctuating exchange rate of the rupiah and foreign stock indices. So it becomes an important concern for the government in formulating policies. Therefore, it is necessary to analyze the effect of the pandemic on the rupiah exchange rate and foreign stock indexes on the JCI condition. The results of the research conducted, there are several results that can be analyzed. Based on testing of the model, the F test statistic is 131.3 with an opportunity value of 2.2e-16. The opportunity value of 2.2e-16 has a value that is smaller than (5%), so it can be interpreted that the independent variable on the JCI fluctuating is quite significant as implied in the coefficient of the Covid-19 variable. The variable value of the increase in COVID-19 cases in Indonesia is negative, stating that if every increase in COVID-19 cases in Indonesia by 1 case can reduce the JCI by 0.128%.

Paper Id	**-1570773541**	*Session*

Title **Automatic Personality Prediction using Deep Learning Based on Social Media Profile Picture and Posts**

Authors *Nicholaus Hendrik Jeremy, George Christian, Derwin Suhartono, Muhammad Kamal and Kristien Suryaningrum (Bina Nusantara University, Indonesia)*

Abstract Uploaded content by social media users affected by their personality, for example, the profile photo they use and the posts they publish. In this research, we create an automatic prediction for Twitter users' personalities through their photo profile and their tweet. We also compare the result of prediction using a profile photo to the result of using just their profile picture or their tweet separately. Our learning sample comes from a Twitter user that has taken the 16Personalities test and shared the result on Twitter. Facial feature from profile photo is obtained by using the face detection model that is combined with smile detection such that not only can we obtain the feature of the face, but also their expressions. As for the color, the feature is obtained by their color composition, which is hue, saturation, and value. For tweets, features are obtained by using a pre-trained word vector. Our result shows that image features can predict personality better than text feature and the combination of text and image features. Based on our result, we also found that a single profile picture is capable of reliably predicting personality.

Paper Id	**-1570773823**	*Session*

Title **A Comparative Analysis on Face Recognition System for Criminal Case Identification**

Authors *Angela Putri, Anthony Wijaya, Mikhael Jonathan and Derwin Suhartono (Bina Nusantara University, Indonesia)*

Abstract Human intelligence is evolving rapidly throughout these last years, including the advancement of criminality cases. New state of the art methods should be invented to catch the criminals faces in the world, like soft biometrics, deformation modeling, and genetics, et cetera. Therefore, this paper aims to find the most suitable method for face recognition in identification of criminal cases. Several
methods will be used in this paper, such as soft biometrics, deformation modeling, and genetic algorithms. From this research, the accuracy result of soft biometrics is 79.37%, deformation modeling is 71.82%, and genetic algorithm is 52.29%. According to the accuracy result, the soft biometrics is the most suitable method for face recognition in identification of criminal cases.

Paper Id	**-1570773850**	*Session*

Title **COVID-19 Detection Using Machine Learning Classification Algorithm Based on Symptoms**

Authors *Joseph Christianto, Nathanael Yakim, Tiara Wijaya and Derwin Suhartono (Bina Nusantara University, Indonesia)*

Abstract Since the emergence of COVID-19, all aspects of human life have been disrupted. And with the unclear spread and growth of COVID-19, we must be more prepared and alert to deal with it. Therefore, it requires an application with the help of machine learning that can prevent the spread. In several previous studies, the datasets found were still incomplete and some researchers did not use many algorithms. There is also research that uses photo input to determine whether the person has been exposed to COVID-19 or not. With that, the system created will be based on a complete and latest dataset, then it will be pre-processed and will be processed with 6 machine learning algorithms for COVID-19 classification. After that it will be determined which is the best algorithm that will be used for our application. This application will be web-based, so participants can fill out the form provided and will be given what percentage of participants are affected by COVID-19. With this research, it was found that it was able to make machine learning-based self-assessment applications in it with an accuracy of above 90 percent. And it is hoped that the system that has been created can be useful to reduce the spread of COVID-19.

Paper Id	**-1570773854**	*Session*

Title **Comparing User-Based and Item-Based Collaborative Filtering in Recommendation System on Food Delivery Service**

Authors *Vicktor Hugo Mulyanto, Levi Christian, Filbert Fausta and Derwin Suhartono (Bina Nusantara University, Indonesia)*

Abstract In this pandemic, recommendation systems are much needed in order to help the community control the urge to go outside, especially with the number of red zones in Indonesia. The recommendation system will be used in the most used app during the pandemic, which is the food delivery service app. In order to implement the system, we need to determine which algorithm is the most suitable. For starters, the present study will focus on Collaborative Filtering (CF), which is the most common and has been shown to produce high-quality recommendations. The present study aims to experiment and compare two collaborative filtering algorithms, which are user-based and item-based collaborative filtering. The experiments resulted in item-based collaborative filtering using cosine similarity producing better average MAE and RMSE values, 0.854 and 1.161 respectively. Those results highlight as a default option that can be used when approaching a similar challenge or starting a new recommendation system.

Paper Id	**-1570774021**	*Session*

Title **Efficiency Enhancement of Energy Harvesting in Mobile Wireless Sensor Networks**

Authors *Amin Al Ka'bi (Australian College of Kuwait, Kuwait)*

Abstract In this paper, a proposed method for extending the lifetime of energy-constrained Mobile wireless sensor networks (MWSNs) is presented. This method is based on the fact that RF signal carries both information and energy at the same time. Hence, by increasing the efficiency of energy harvesting from radio frequency (RF) signals, the lifetime of the wireless network can be significantly extended. The Simultaneous Wireless Information and Power Transfer (SWIPT) in this technique enables harvesting of energy by relay nodes which in turn can be used for wireless data transmission. In order to enhance the lifetime of the mobile wireless network, the transmitted RF energy can be recycled at the receiver side. On the other hand, a balance between energy harvesting and wireless data transmission is required in order to maximize the overall efficiency of the system.

In the proposed method, the received power is split into two continuous sets of power streams using arbitrary power splitting ratios. By considering the various power splitting abilities of receivers, a Resource Allocation (ResAll) algorithm is used to find the resource allocation policies. In ResAll algorithm system energy efficiency is achieved by balancing data rate, energy efficiency, power splitting ratio and transmit power. Then Particle Swarm Optimization (PSO) is employed to obtain the optimum resource allocation policies which maximizes the system energy efficiency. A cost function is framed for this purpose and PSO attains maximum energy efficiency by improving the solution of the cost function at each iteration with respect to given constraints.

Paper Id	**-1570774055**	*Session*

Title **Implementation of Fuzzy Logic on Microcontroller for Quails Coop Temperature Control**

Authors *Nisa Fadhliana (Institut Teknologi Kalimantan, Indonesia); Sayekti Harits Suryawan (Universitas Muhammadiyah Kalimantan Timur, Indonesia); Ariyadi Ariyadi (Institut Teknologi Kalimantan, Indonesia)*

Abstract Quail (cortunix cortunix japonica) is a type of poultry that is quite popular for its eggs and meat as an alternative protein source. However, for tropical climates such as Indonesia, there are challenges faced by quail farmers, namely heat stress. One way that can be a solution to deal with these challenges is to regulate the room temperature in the quail cage. This study proposes an automatic temperature control system for quail cages using a microcontroller embedded with a fuzzy algorithm to determine the action to be taken to adjust the temperature and humidity of the air in the quail cage. The system that has been successfully developed is tested by comparing the output simulation of the microcontroller with the simulation performed using Matlab software.

Paper Id	**-1570774066**	*Session*

Title **Indonesian Clickbait Detection Using Improved Backpropagation Neural Network**

Authors *Bellatasya Unrica Nadia and Irene Anindaputri Iswanto (Bina Nusantara University, Indonesia)*

Abstract Clickbait has been considered a problem in the modern age of technology, especially in Indonesia where research on Indonesian clickbait detection is still minimal. This paper shows the results of using a modified backpropagation neural network algorithm to detect clickbait using article titles when compared to the standard algorithm. The research compares the results of standard stochastic gradient descent algorithm, minibatch gradient descent algorithm, and a version of stochastic gradient descent with Adam optimizer and three hidden layers. The results show that using Adam optimizer and three hidden layers in stochastic gradient descent algorithm significantly improves the results compared to the standard architecture. The modified algorithm shows a precision score of 78% and a recall and F1 score of 76%, where the standard algorithm has a precision score of 67% and a recall and F1 score of 66%. The resulting algorithm is then implemented to a desktop application, which is considered easy to use.

Paper Id	**-1570774124**	*Session*

Title **Classification of Stress in Office Work Activities Using Extreme Learning Machine Algorithm and One-way ANOVA F-Test Feature Selection**

Authors *Dariswan Janweri Perangin-Angin (Faculty Of Computer Science Universitas Brawijaya, Indonesia); Fitra A. Bachtiar (Brawijaya University, Indonesia)*

Abstract Stress is a condition when humans feel psychological pressure consciously or unconsciously comes from within themselves and the environment. Based on the survey, more than 50% of workers experienced stress at work. Neglecting stressful conditions repeatedly can worsen the performance and health of workers, so need a system to diagnose stress quickly and accurately. Machine learning classification is one of the solutions to problems that are applied to intelligent systems. One
of the machine learning methods that can be used is the Extreme Learning Machine (ELM) algorithm. One-way ANOVA F-test is used as a method of feature selection to require a quick decision so the reduction in features is expected to accelerate the results of the classification. The dataset used is the Heart Rate Variability totaling 5000 samples with 35 features and 3 classes. Based on experiments, the conventional ELM algorithm produces an accuracy of 0.878 while the combination of the ELM algorithm and the One-way ANOVA F-test produces an accuracy of 0.91 with 33 selected features. Thus, the effect of using the feature
selection method can increase accuracy and reduce computational time, and the addition of hidden neurons results in a significant increase in accuracy and computational time.

Paper Id	**-1570774148**	*Session*

Title **Text-Based Emotion Recognition in Indonesian Tweet using BERT**

Authors *Kuncahyo Setyo Nugroho and Fitra A. Bachtiar (Brawijaya University, Indonesia)*

Abstract Human uses social media platform such as Twitter to express feelings and opinions through text about the surrounding issues. Understanding emotions at the subtle level of expressed feelings are essential for better human and computer interactions. The previous emotion recognition approach required many training data and lexical databases. Unfortunately, the availability of very little labeled training data is a limitation and challenge to achieving high model performance. Therefore, in this study, we investigate the BERT language model for emotion recognition in Indonesian-language Tweets. We choose to use fine-tuning instead of using pre-raining, which requires extensive data and resources. Two pre-trained models were used to determine the effectiveness and performance of the proposed model. Experiments show that the proposed model outperforms all existing baseline models, with the highest accuracy is 77%. Another advantage that we analyze is that BERT requires a relatively short computation time. In addition, BERT has a better context representation.

Paper Id	**-1570774231**	*Session*

Title **Study on Factors Affecting Purchase Intention of Indonesian Consumers on Instagram**

Authors *Ono Supriadi (Bina Nusantara University, Indonesia); Bryna Meivitawanli and Hayati binti Monong (International Business Program, Indonesia)*

Abstract The purpose of this study is to test the hypotheses and provide empirical evidence on factors affecting the purchase intention of Indonesian consumers on Instagram. Based on the survey of 237 millennial respondents in Greater Jakarta, we examine how Celebrity Endorsement, Customers' Attitude towards Brand, and Instagram Stories Ads relate to Purchase Intention. The findings show that either factor has a significant and positive effect on purchase intention. This study contributes to the development of a quantitative study of factors affecting the purchase intention on Indonesian consumers on Instagram which shows that model summarized fits the data best.

Paper Id	**-1570775242**	*Session*

Title **Comparison of Renewable Energy Output Power Transmission to Loads Via HVAC and HVDC**

Authors *Denis Eka Cahyani, Arya Kusumawardana, Muhammad Afnan Habibi and Langlang Gumilar (Universitas Negeri Malang, Indonesia)*

Abstract Transmission of electrical power from the generator to the load is a very important part of the electric power system. In the transmission system, it is necessary to increase the voltage to minimize power losses. The transmission system commonly used is High Voltage Alternating Current (HVAC). However, in reality the HVAC system can cause large losses. There are other transmission systems besides HVAC, namely High Voltage Direct Current (HVDC). The purpose of this paper is to compare the performance of HVAC and HVDC transmission systems in distributing electricity to variations in transmission distance or conductor line length and transmission voltage variations. The performance of the HVDC and HVAC systems measured is the power losses in the line conductors. In addition, power losses in transformer 1, transformer 2, and active power in HVAC. In addition, power losses at station 1, station 2, and active power at HVDC. The type of power plant used in this paper is renewable energy. The renewable energy consists of photovoltaic and wind power plants. The results for very long transmission distances, HVDC has smaller power losses than HVAC. In addition, HVDC stations have higher power losses than HVAC transformers. Based on the total power losses, overall the total power losses in HVDC is smaller than the total power losses in HVAC.

Paper Id	**-1570775465**	*Session*

Title **Analysis of Distributed Generation Plant Placement Effects on Voltage Stability Improvement using Newton Rhapson Method**

Authors *Muhamad Hanif Rizqullah (Universitas Negeri Malang, Indonesia); Arif Afandi (UM, Indonesia); Sujito Sujito (State University of Malang, Indonesia)*

Abstract The emergence of distributed generation (DG) in the distribution network has several advantages such as reducing system losses, improving the voltage profile, and improving the reliability and continuity of electricity supply. In the placement of DG, DG is placed at the optimum location and operates at its optimum capacity and its measurement has used a method that is newton rhapson. In this study, the placement of DG was carried out at the Asam Coral PLTD. To determine DG-recently done at a time when the distribution network has not been connected with DG. DG placement is done by looking for the largest voltage stability index (VSI) value of each bus, which is on bus 373 of 0.01916970. After the placement of the DG-recently interconnected resulting VSI value of 0.014115536, this change in the VSI value indicates that the placement of the new DG can reduce the occurrence of voltage collapse in the system.

Paper Id	**-1570777491**	*Session*

Title **Cryptocurrency Price Prediction using Time Series Forecasting (ARIMA)**

Authors *Mithileysh Sathiyanarayanan (MIT Square, United Kingdom (Great Britain))*

Abstract Cryptocurrency is a tangible or digital currency protected with the help of Cryptography, making it almost impossible to counterfeit or double. Many cryptocurrency networks are categorized primarily based on blockchain technology. The present socio-economic situation also creates an environment for people to hold less cash and remain marginalized by market trends. To build a profitable Machine Learning prediction model. We begin, by collecting the data from Yahoo Finance website using inbuilt python libraries. Our objective was to perform price prediction of various Cryptocurrencies using Machine Learning, and we have implemented the Autoregressive Integrated Moving Average (ARIMA) Model. We have performed feature engineering on various set of lagged values, on previous day, one for 7 days and another looking back for 30 days. We have forecasted the outcome of the model and plotted the outcome in a responsive chart using Plot graph.

Paper Id	**-1570777498**	*Session*

Title **Fake News Classification with Natural Language Processing**

Authors *Mithileysh Sathiyanarayanan (MIT Square, United Kingdom (Great Britain))*

Abstract We are already dealing with a pandemic of fake news in today's rapidly expanding world of technology and journalism. It is difficult to predict if a news story is fake or not because there are thousands of sites on the internet which suggest different things. This type of misleading information causes a lot of violence and chaos among people. To avoid this, we have worked on "Fake News Classifiers". This classifier segregates the news into fake or real with good accuracy. We have used simple NLP for this project and validated our trained model using 3 machine learning techniques - Multinomial Naive Bayes, Passive Aggressive and Logistic Regression (LR). Kaggle's dataset was used for this project.

Paper Id	**-1570777843**	*Session*

Title **Classification Of Covid Patients Based On Detection Of Lung X-Rays Using Local Binary Pattern Method**

Authors *Dhian Satria Yudha Kartika (Universitas Pembangunan Nasional (UPN) Veteran Jawa Timur, Indonesia); Anita Wulansari and Eristya Maya Safitri (Universitas Pembangunan Nasional Veteran Jawa Timur, Indonesia); Hendra Maulana (Universitas Pembangunan Nasional*

Abstract Several studies were conducted to analyze the impact of the COVID-19 pandemic. The effect of the COVID-19 pandemic has been felt by all levels of society. Some of the immediate effects are economical and psychological because many have died because of the coronavirus. A number of studies were carried out specifically to analyze patients affected by covid 19. Various symptoms were felt by covid 19 patients, ranging from coughing, shortness of breath, fever, and loss of sense of smell or taste. In this study, the focus is on patients who experience symptoms of cough and shortness of breath. Patients who have early symptoms conduct research in a number of clinics or hospitals to perform chest X-rays. On a chest X-ray, you can see the signs that the patient has been infected with COVID-19 or not and has entered the respiratory tract or not. The data from the X-ray photo becomes a digital image dataset for analysis of the spread of the virus that enters the lungs. A total of 864 X-rays were obtained as a dataset in this study. The photo is still raw data obtained from Covid-19 patients, so the dataset still has a lot of noise that needs to be removed. The process to remove unnecessary images will be carried out in a preprocessing stage, including equalizing the pixel size of the image. Datasets that have been processed using previously will add to the value of accuracy and better results. All datasets will have the same size and pixel size so that a standard quality and size is obtained to support the next stage, namely feature extraction. The feature extraction process uses the Local Binary Pattern (LBP) method. The dataset, which was originally an image, will be converted into binary. The testing process on this system using a confusion matrix results in an accuracy of 78.5%. The results of this testing process get a precision value of 78.5%, recall of 78%, and f-measure of 79%

Paper Id	**-1570778098**	*Session*

Title **U-Net based Water Region Segmentation for LAPAN-A2 Multispectral Imagery**

Authors *Kamirul Kamirul (Indonesian National Institute of Aeronautics and Space, Indonesia); Silmie Vidiya Fani (Institut Sepuluh Nopember & LAPAN, Indonesia); Astriany Noer (Indonesian National Institute of Aeronautics and Space, Indonesia); Stevry Yushady CH Bi*

Abstract In this paper, we reported the performance of a deep learning-based segmentation method in extracting water regions from multispectral imageries (MSI) taken by LAPAN-A2 microsatellite. The interested water regions include open seas and the river as well as their branches. The capability of detecting and segmenting the water component on LAPAN-A2 MSI is important as the satellite was dedicated to support maritime surveillance missions on Indonesian waters. Therefore, this capability will help a future water object detection to encapsulate its region of interest, i.e., water. The segmentation has been performed by employing a state-of-the-art of deep learning-based method, U-Net, using 696 training images. This method is considered due to its capability to provide promising accuracy without requiring an extremely extensive amount of training dataset. According to the experiment, the trained U-Net has shown a satisfying result with an accuracy of 89.13% as measured using Intersection over Union (IoU) metric.

Paper Id	**-1570778117**	*Session*

Title **Sentiment Analysis Of Indonesian Government Policies In Handling Covid 19 Through Twitter Data**

Authors *Bagus Sujiwo (Bina Nusantara University, Indonesia); Antoni Wibowo (Bina Nusantara University & Jakarta, Indonesia)*

Abstract This paper presented a sentiment analysis of the Indonesian government's policies in overcoming Covid 19 through twitter data using several classification methods, namely SVM, Naive Bayes, and LSTM. Based on the analysis of the twitter data, it was found that the twitter community in Indonesia gave negative sentiments to government policies in handling Covid 19. From the experimental results, it was found that SVM gave the best sentiment results compared to Naïve Bayes and LSTM by providing an accuracy of 88.5%.

Paper Id	**-1570778275**	*Session*

Title **Channel Characteristics for 5G Systems in Urban Rail Viaduct Based on Ray-Tracing**

Authors *Pei Tang (China Railway Siyuan Survey and Design Group Co., LTD, China)*

Abstract The vision of "smart urban rail transit" requires high-reliability wireless connectivity with the high data rate between trains, infrastructures, passengers and staffs. 5G technology is one of the most promising technologies for wireless communication systems in urban rail. In the paper, based on the ray-tracing simulation technology, the key channel parameters of 5G systems in urban rail viaduct, including path loss, delay spread, angular spread, Doppler shift and Doppler spread are explored. And the channel characteristics are of value for the design and deployments of 5G network in urban rail.

Paper Id	**-1570778629**	*Session*

Title **'BEST BARK' Dog Care and Owner Consultation System**

Authors *Shalitha Jayasekara, Saluk Bawantha, Dinithi Weerasundara, Isuru Gunarathna and Pradeepa Bandara (Sri Lanka Institute of Information Technology, Sri Lanka); Hansi De Silva (Sri Lanka Institute of Information and Technology, Sri Lanka)*

Abstract Dogs have been known as "man's best friend" for generations, providing friendship and loyalty to their human counterparts. However, due to people's busy lives, they are unaware of the ailments that can affect their pets. However, in recent years, mobile technologies have had a significant impact on our lives, and with technological improvements, a rule-based expert system allows the end-user to enable new types of healthcare systems. The advent of Android OS-based smartphones with more user-friendly interfaces and lower pricing opens new possibilities for continuous monitoring of pets' health conditions, such as healthy dogs, dangerous ingestions, and swallowed objects. The proposed 'Best Bark' Dog care and owner consultation system is a mobile application for dog owners. Four main components for dog owners were implemented after a questionnaire was distributed to the target group of audience and the findings were evaluated. The proposed applications are widely used to provide health and clinical support to dog owners, including suggesting exercise and diet plans and answering queries about their dogs. Additionally, after the owner uploads a photo of the dog, the application provides immediate feedback and a description of the dog's skin disease.

Paper Id	**-1570778992**	*Session*

Title **The Compact 2.4 GHz Hybrid Electromagnetic Solar Energy Harvesting (HES-EH) circuit using Seven Stage Voltage Doubler and Organic Thin Film Solar Cell**

Authors *Irfan Mujahidin (Kanazawa University, Japan)*

Abstract The main factor for the sustainability of Internet of Things mobile devices is the support of wireless energy, especially Hybrid sources, specifically solar cells and electromagnetic high-frequency harvesting circuits. This research proposed a seven-stage 2.4 GHz Rectenna voltage doubler configuration structure compactly combined with organic thin-film solar cells to provide a solution to these problems. Besides that, the advantages of the integrated hybrid circuits with reflectors and solar cells can protect the physical structure of the microstrip antenna, harvest 180 degrees opposite position AC source, and become a backup energy source if one of the AC sources is not active. By optimizing the reflector antenna as a collector of electromagnetic power and placing embedded organic thin-film solar cells, the AC power harvesting component has three layers in its structure: Antenna, Reflector, and Thin Film Solar Cell. The compact microstrip antenna circuit has a gain value of 5.39 dBi with a reflector as an optimization structure. The radiation pattern is directed with theta angle, and the frequency range is 2.38-2.44 GHz based on the measurement analysis. Based on the results of the implementation of the hybrid system, it is explained that the design analysis and measurements carried out have high effectiveness in harvesting energy from high-frequency electromagnetics and complementary thin-film solar cell when analyzed based on the output voltage. The output voltage is 3,8152 V at a light intensity of 680 lux and radiation power of 30 dBm in a near-field area of 20 cm. for a maximum experimental area distance of 200cm, the HES-EH can produce an output power of 1.2651 V at a light intensity of 140 lux and a Radiation power of -5 dBm. So it is very effective to support low-power wireless devices in both far-field and near-field areas.

Paper Id	**-1570779542**	*Session*

Title **Development of Intrusion Detection System using Residual Feedforward Neural Network Algorithm**

Authors *Rushendra Rustam and Kalamullah Ramli (Universitas Indonesia, Indonesia); Nur Hayati (Universitas Muhammadiyah Yogyakarta & Universitas Indonesia, Indonesia); Eko Ihsanto (Universitas Mercu Buana, Indonesia); Teddy Surya Gunawan and Asmaa Hani Halbouni (I*

Abstract An intrusion detection system is needed to secure data, both when stored and transmitted, from security attacks by infiltrating unwanted information through a normal channel. This detection system must be able to distinguish regular information from atypical or hacker-induced information. In addition, the intrusion detection system (IDS) needs to be accurate and fast to analyze traffic data in real-time. Even though much research has been done, there is still a need to improve the detection accuracy and speed due to the massive increase in internet traffic volume and variety. This paper presents a new, efficient, and accurate algorithm for real-time intrusion detection and classification using the Residual Feedforward Neural Network (RFNN) algorithm. The RFNN algorithm is proposed to avoid overfitting, more accurate detection, faster training, and faster inferencing. In addition, the proposed algorithm is quite flexible and easy to modify for various types of intrusion. In this paper, the popular NSL-KDD dataset was used for training and testing. Results showed that the accuracy achieved for 2, 5, and 40 classes is 85.9%, 76.3%, and 70.8%, respectively. Furthermore, the identification speed was 15 μs, 17 μs, and 25 μs, respectively, providing a mean for real-time detection.

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