

2021 4th International Conference on Information and Communications Technology (ICOIACT 2021)

**Virtual Conference
30 August 2021**



**IEEE Catalog Number: CFP21L86-POD
ISBN: 978-1-6654-3395-2**

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IEEE Catalog Number:	CFP21L86-POD
ISBN (Print-On-Demand):	978-1-6654-3395-2
ISBN (Online):	978-1-6654-3394-5

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Sunday, August 29

Sunday, August 29 13:00 - 15:00 (Asia/Jakarta)

Practice: Free Practice + Simulation

Rooms: Breakout Room A, Breakout Room B, Breakout Room C, Breakout Room D, Breakout Room E

Chair: Akhmad Dahlan (Universitas Amikom Yogyakarta, Indonesia)

Meet with The Committee Team. Preparing for Conference Day. Simulation and Check Connection for Zoom Meeting. Contact Center : Open Q & A all about conference. Etc

Monday, August 30

Monday, August 30 6:45 - 7:00 (Asia/Jakarta)

Log In: JOIN ZOOM ROOM

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Chairs: Rifda Faticha Alfa Aziza (Universitas Amikom Yogyakarta, Indonesia), Yoga Pristyanto (Universitas Amikom Yogyakarta, Indonesia)

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Monday, August 30 7:00 - 8:30 (Asia/Jakarta)

1A: Parallel Session 1-A

Breakout Room A

Chair: Tonny Hidayat (Universitas Amikom Yogyakarta, Indonesia)

7:00 Dissipation of Terahertz Wave Radiation on A bolometer Connected with A Cross Bowtie Antenna.....1

Catur Apriono and Hendry Steven Marbun (Universitas Indonesia, Indonesia)

Detection of THz wave radiation is a critical issue to develop a reliable and compact THz system. An antenna combined with a bolometer to capture the incoming electromagnetic wave radiation offers a solution to overcome the problem. However, the antenna's radiation absorption pattern, delivered, and dissipated power in the bolometer are some considerations to design an optimum detector performance. The expected high performance is determined by the power dissipation from the incoming radiation. This paper investigates the dissipation of THz wave radiation on the bolometer by combining it with a cross-bowtie antenna by simulation using CST Microwave Studio. The considered cross design aims to increase the incoming radiation absorption when more than one radiation polarization comes to the detector. The cross antenna increases the dissipated power in the bolometer by capturing both horizontal and vertical radiation polarization. The dissipated power is less than the expected of two times of the optimum single dipole antenna. This result indicates that, even though the main beam is broader than the

single bowtie, it occurs with a rotation of about 45 degrees. These results show that the cross technique can increase the antenna bolometer sensor detection in the THz frequency.

7:15 *Intrusion Detection System Model Based on Gated Recurrent Unit to Detect Anomaly Traffic.....5*

Omar Muhammad Altoumi Alsyabani (Universitas AMIKOM Yogyakarta, Indonesia); Ema Utami and Anggit Dwi Hartanto (Universitas Amikom Yogyakarta, Indonesia)

In this study, we proposed the Gated Recurrent Unit method to develop an Intrusion Detection System to detect traffic anomalies. This model was trained in several scenarios to get the best model. Scenario variations were carried out on the learning rate, the activation function and the optimization function. We used the CIC IDS 2017 dataset because it has the latest types of attacks. The dataset was divided into 3 parts, namely training, validation and a test with a ratio of 60%, 20% and 20% respectively. The model was compiled with a binary cross-entropy loss function. Measurement of the results was done using metric accuracy and F1 Score. The experimental result shows that the model with the highest accuracy is obtained from a model that used a learning rate of 0.0001, the LRelu activation function and the Adam optimization function with accuracy and the F1 score reaching 97.7739% and 97.7979% respectively. These results exceed the accuracy of previous studies on the same dataset and the same case classification. On the other hand, it can be concluded also from the study results that the models compiled using the Adam optimized have higher accuracy than the models compiled using Stochastic Gradient Descent. Our studies have not been able to figure out what types of attacks that the model detects. Therefore, we suggest conducting a further study of the multiclass classification case. In addition, further studies are also needed to increase the speed of the model in studying data so that it can be applied in real time to a production environment.

7:30 *Field Measurement of Digital Terrestrial Television DVB-T2 on Urban Area: Validation of Link Budget Model using GIS..... 11*

Eva Febiyani, Martianda Anggraeni and Ida Anisah (Politeknik Elektronika Negeri Surabaya, Indonesia)

Indonesia established Analog Switch-Off (ASO) in 2018 and has not been fully implemented. The government applies terrestrial digital television (DVB-T2) as the digital television standard in Indonesia. This is of course influenced by various parties ranging from the government as regulators, TV stations as service providers, and the public as consumers. In this study, measurement of digital DVB-T2 terrestrial television broadcasts in urban areas under constant conditions will be carried out to ensure a successful transition. Service quality has been carried out in the Surabaya area with 2 television stations that have switched digital terrestrial television broadcasts to DVB-T2 broadcasts. The measurement of the received power was carried out at 22 points with a distance of 3 km to 13 km. The measurement results will be strengthened by the comparison of simulation results that have been carried out based on transmitter specifications using the Okumura-Hatta and Walfisch Ikegami propagation models that are suitable for urban areas. From the results obtained based on field measurements, the Okumura-Hatta model is closer to the measurement results when compared to the Walfisch Ikegami model which has a value far from the results of field measurements. The results will be displayed on a web-based GIS for easy understanding.

7:45 *Influential Factors In Adopting Blockchain Technology for eGovernment: A Systematic Review of Empirical Research..... 17*

Yose Supriyadi and Yudho Sucahyo (University of Indonesia, Indonesia)

Over the last few years, the increasing interest in blockchain technology has caused many attempts to implement it in the public sector. Some countries have adopted blockchain in their government and realize the benefits of technology, and some others have not met yet even postpone the initiative of using blockchain. Several factors have influenced blockchain technology adoption for eGovernment in some countries. This review study aims to indicate the factors that influence blockchain adoption in the government sector by conducting a systematic literature review of empirical studies to gain a different insight and gain more evidence.

8:00 *CFO Estimation for Multi-user Uplink SC-FDMA Using Null Subcarrier and Deterministic Approach.....23*

Harsha Harsha (Indian Institute of Technology Patna, India); Sushant Kumar and Shivani Singh (Indian Institute of Technology, Patna, India); Sudhan Majhi (Indian Institute of Science, India & Indian Institute of Technology Patna, India)

Estimating multiple carrier frequency offsets (CFOs) in the presence of multiple users is a crucial task in a single carrier frequency division multiple access (SC-FDMA) uplink system. We proposed a blind and fast CFO estimator using null subcarriers for SC-

FDMA systems. The proposed method utilizes the property of measuring the energy within the null subcarriers for the estimation of multiple CFOs. A cost function is derived that minimizes the signal power at null subcarriers while estimating the correct CFOs. The complexity arising due to larger iteration in the grid search method has been further minimized by using the deterministic approach. The mean square error (MSE) is used to investigate the performance of the proposed estimator. The simulation results are validated by theoretical performance analysis and compared with existing works over frequency selective fading channel environment.

8:15 Utilization of remote sensing data for thermal comfort estimation in the coastal urban of Jakarta.....29

Fitria Nucifera (AMIKOM University, Indonesia); Widiyana Riasasi (Universitas AMIKOM Yogyakarta, Indonesia); Yuhei Yamamoto and Kazuhito Ichii (Center of Environmental Remote Sensing (CeRES), Chiba University, Japan)

Remote sensing has been completing limitation of meteorological data observed on the station. Meteorological data of temperature and humidity is necessary to estimate thermal comfort. As a coastal urban area, Jakarta has been experiencing rapid urbanization that leads to densely populated and built-up area. The objective of this study is to measure thermal comfort by estimating Discomfort Index. MODIS land surface temperature (LST) used to obtain air temperature. The temperature dew point data was derived from ERA5 climate data. The data was validated by meteorological station data, afterward were computed and classified based on the Thom's discomfort index. Seasonal analysis for thermal comfort was represented by 4 seasonal period included DJF (December, January, February), MAM (March, April, May), JJA (June, July, August), and SON (September, October, November). The results show that discomfort index values were varied by season. Generally, the dry season (JJA) tends to be less discomfort than the rainy season (SON and MAM). JJA is the peak of dry season which is characterized by lower temperature and lower humidity. MAM and SON are the transition season which is characterized by higher temperature and higher humidity.

1B: Parallel Session 1-B

Breakout Room B

Chair: Widiyana Riasasi (Universitas AMIKOM Yogyakarta, Indonesia)

7:00 User Satisfaction Analysis Model of Google Classroom for Online Lectures in Covid-19 Pandemic.....35

Nailis Syafi'ah (Amikom Purwokerto University, Indonesia); Hidetaka Nambo (Graduate School of Natural Science and Technology, Kanazawa University, Japan); Imam Tahyudin (Universitas Amikom Purwokerto, Japan)

Google Classroom is one of e-learning platform used for online lectures in COVID-19 (Coronavirus Disease) pandemic at Amikom Purwokerto University. As one of the most widely used e-learning platform, so it is interesting to evaluate the satisfaction of Google Classroom user for improvement purpose in the future. The methods used in this research are End User Computing Satisfaction (EUCS), Unified Theory of Acceptance and Use of Technology (UTAUT), Technology Acceptance Model (TAM), and Human Organization Technology (HOT FIT). These methods used to determine user satisfaction level and compare the accuracy of four methods in measuring user satisfaction of Google Classroom application. The test analysis used is validity test, reliability, user satisfaction test, and Multiple linear regression test. The performances present that they are satisfied with Google Classroom application, the percentage of average value obtained from each method: EUCS of 77.57%, TAM by 80.33%, UTAUT by 72.35%, and HOT FIT by 78.34%. The accuracy comparison of four methods results shows that the best method used in measuring the user satisfaction level of Google Classroom applications is using Human Organization Technology (HOT FIT) method with average results of RSquare value is 28.22%.

7:15 Analysis of Digital Population Services for the Poor in Palembang City Using the Information Technology Infrastructure Library (ITIL) Framework.....41

Darius Antoni (Universitas Bina Darma, Indonesia); Reni Septiyanti (Universitas Bina Darma & Student Universitas Bina Darma, Indonesia); Muhamad Akbar (Universitas Sriwijaya & Universitas Bina Darma, Indonesia); Muhammad Izman Herdiansyah (Universitas Bina Darma, Indonesia)

As it is known that the city government of Palembang has implemented e-government, but how much e-government can help the Palembang city government to interact between the government and all levels of society including the poor in Palembang

city. In its application, the condition of e-government services is still insufficient for the infrastructure to support e-government services for the poor in Palembang city. To design e-government services such as good digital population services, it is necessary to design IS / IT services for people in Palembang City with the Service Design stage in the 2011 Version of the Information Technology Infrastructure Library (ITIL) Framework so that they can be accepted by all levels of society including the poor in Palembang city. This study uses a qualitative approach. The results of this research are in the form of a digital population service information system design such as administrative and population services, Family Hope Program (PKH) services and digital archive storage services based on the Service Design stages in ITIL Version 2011 that have been carried out, namely the Service Catalog Management process and Service Level Management in the form of documents. Service Level Requirements, Service Level Agreement and Operational Level Agreement.

7:30 Critical Success Factors of IT Outsourcing in Indonesian Public Sectors: A Case Study at Employment Social Security Agency.....47

Jontri Pakpahan (Universitas Indonesia, Indonesia); Muhammad Rifki Shihab (Faculty of Computer Science, Universitas Indonesia, Indonesia)

Employment Social Security Agency is one of the public legal entities in Indonesia. This entity has to protect all workers through employment social insurance programs. To keep its effectiveness of services for the public, Employment Social Security Agency uses IT outsourcing in managing the IT services. When Employment Social Security Agency acquires IT services externally, it will engage in relationships with a service provider. As an IT service manager, the IT division has to be able to ensure the successful implementation of IT outsourcing and support business processes. Thus, the aim of this research is to identify critical success factors within the public sector's IT outsourcing in Indonesia. The Analytical Hierarchy Process (AHP) method was used to analyze and rank the success factor. There are 14 factors evaluated, which categorized as Organizational Environment, Contract/Project Characteristics, Project Management, Partnership Management category. Based on the highest rank in each category, showed that the most important factor is Top Management Support, Project Management Skill, Knowledge Transfer and Project Budget and Size.

7:45 E-Readiness to Use Tegal City Small Medium Enterprise in the Information Technology Adoption Process Using the technology organization environment Model.....53

Pandu Rizal Pangestu, Rahmat Yasirandi and Rio Guntur Utomo (Telkom University, Indonesia)

Measurement readiness use of information technology is essential for every business entrepreneur especially those in MSME, in times that are already developed these businesses are required to take advantage of technologies that have been developed can affect the level of income from a business. Researchers use the T-O-E (technology, organization, and environment) model to be able to understand the process of information technology adoption and the factors that can influence it. The object of this research is MSME actors in Tegal City, precisely in West Tegal District. The sampling technique used was proportional area sampling method. This study uses partial least square (PLS) regression statistical techniques. All of the proposed hypotheses are answered, and H4 gets the highest t-statistic value is 13.102 so that it proves that the use of information technology (IT Usage) affects the quality of information technology (IT Value) of the MSME in the city of Tegal.

8:00 Challenges and Opportunities of Online Learning Implementation During COVID-19 Pandemic: A Lecturers' Perspective.....59

Ahmad Faza, Harry Budi Santoso and Panca O. Hadi Putra (Universitas Indonesia, Indonesia)

COVID-19 pandemic has changed the way of learning is conducted in several countries. Face-to-face interaction was prohibited to help prevent the spread of virus even further. This situation urge transition from face-to-face to long distance learning. Lecturers' participation of using e-Learning platforms is one of the main factors that made the transition successful. However, lecturers faced many challenges during the transition period. This study aims to identify challenges and opportunities that came from online learning based on lecturers' perspective. Systematic literature review (SLR) used to identify challenges and opportunities of online learning from previous studies. The findings of current study show three majors themes related to challenges, namely individual, institutional, and technological. Furthermore, it also found that online learning have opportunities to explore new way of teaching and using technology for learning purposes. For example, utilizing online learning tools for course assignment or quiz.

8:15 Low-Cost IoT Devices for Measuring Carbon Dioxide Inside A Classroom with Plants without Air Ventilation.....65

Boby Siswanto (Bina Nusantara University, Indonesia)

Air quality inside a classroom will determine the comfort level of its inhabitants. Carbon dioxide, temperature, and relative

humidity are primary gasses determining the air quality level inside a classroom. Carbon dioxide exceeds 1000 ppm based on ASHARE might cause drowsiness or disturbing health level. Many research has already been done by implementing air ventilation control or placing plants inside a classroom. This research applies low-cost IoT devices to monitor carbon dioxide value inside a classroom, costly USD 35.92 on primary devices. Two classrooms are compared, one without plants and another with plants inside. The measurement taken on 9.00-13.00 due to this is the peak time of carbon dioxide concentration based on previous research. Found that 500 ppm decreased on carbon dioxide concentration value in a classroom with plants

1C: Parallel Session 1-C

Breakout Room C

Chair: Rhisa Aidilla (Universitas AMIKOM Yogyakarta, Indonesia)

7:00 Reliability Improvement of UWB Tracker for Hospital Asset Management System.....69

Febby Purnama Madrin (School of Biomedical Engineering); Eko Supriyanto (UTM, Malaysia)

With a limited number of workers or staff in the hospital, it is not possible to manually monitor all of the medical device in the hospital. Many medical devices were lost by mistake, many assets went unused because they were not well-stocked, and many assets were destroyed without recognizing it. This will undoubtedly be very negative to hospitals in terms of resources, which are often expensive, and will, of course, diminish the effectiveness and efficiency of medical services. The necessity for hospitals to modernize their technology is apparent. The rapid advancement of technology allows us to overcome these issues, in fact, IoT-based technology is now so advanced that paper-based technology must be gradually phased out. The technology is a real-time location system (RTLS), there are many different ways to implement this technology, one of them is to use Ultra-Wide band (UWB) technology, with this solution, hospitals can track the location of their medical device, as well as other information. DWM1001 is one of the UWB modules that researchers can develop, but its deployment in hospitals still need more research and reliability. This study will address techniques for improving the reliability of anchor mapping and hybrid Wi-Fi solutions as backup solutions.

7:15 Smart Light Control Using Thermal Sensor As Human Presence Detection.....75

Mario Roostandi, Timotius Austin Nathaniel, Dafin Qinthara and Boby Siswanto (Binus University, Indonesia)

Internet of Things (IoT) is one of the technologies that are currently growing and develop really fast. By using and utilizing IoT to the fullest, we can make our daily activities in live a lot easier. For example, with IoT technologies we can control the use of electricity consumption in our home remotely with ease. With this very fast development on IoT, we want to try to use IoT technologies and apply these technologies to our daily lives. Therefore, we trying to create a smart lighting system that can allow us to save more on electricity usage by only turning on the light when it detects presence of human. The system is utilizing thermal sensor to detecting human presence. Thermal camera is chosen rather than motion sensor because by using computer vision, this system is much more accurate than using motion sensor, and also by using thermal sensor it solved privacy problem that plague normal camera system.

7:30 Experiment on Distance Measurement Using Single Camera.....80

Dany Eka Saputra (Bina Nusantara University); Aloysius Senjaya, Joshua Ivander and Alex Chandra (Bina Nusantara University, Indonesia)

One of the methods to achieve context-aware appliance in smart energy concept is to use computer vision. To develop a low-cost context-aware streetlight system, it is imperative to develop a computer vision system that can calculate the distance of a human using a single camera. This paper presents the result of experiment on distance calculation using a single camera. The experiment uses pinhole camera model and triangle similarity concept to measure human distance from a camera. The result of this experiment shows that for shorter distance, less than 200 cm, the calculation accuracy is quite good with less than 10% error from the actual distance. However, for longer distance the calculation error rose to 20%. This error is due to the difference between the reference height and the actual height of human target used in the experiment.

7:45 Artificial Neural Network in Classification of Human Blood Cells Using Faster R-CNN.....86

Ike Verawati and Ivan Daniel Parlindungan Hasibuan (Universitas Amikom Yogyakarta, Indonesia)

Blood cells are an element found in the human body that has a function in the body's working mechanism. In the medical world, blood can be used as a source of diagnosis of a source of disease, this is because there is a lot of important information

contained by blood cells. In conducting the analysis of blood cells, it includes a series of laboratory tests, one of which is a test to determine the morphology of the blood cells. In laboratory tests carried out by doctors and medical personnel, it is usually still done manually, which has a low level of accuracy and precision. This can be caused by the knowledge, physical condition, and also the concentration of the doctor and also the laboratory staff, which makes it possible to get different analysis results. In manual laboratory tests, this can be overcome by creating an automated system that can classify human blood cells using artificial intelligence. In this research, the Faster R-CNN algorithm used 364 images of human blood cells. From the experiment above, the data is divided into 328 training data and also 36 testing data, it can be seen that Faster R-CNN has an accuracy of 94.92% in classifying human red blood cells and white blood cells.

8:00 Comparative Study of Kalman Filter and H infinity Filter for Current Sensorless Battery Health Analysis.....92

Wahyu Sukestyastama Putra and Jeki Kuswanto (Universitas Amikom Yogyakarta, Indonesia); Wahid Miftahul Ashari (Universitas Amikom Yogyakarta & Jl Ring Road Utara, Ngringin, Condong Catur, Indonesia); Muhammad Kopravi (Universitas Amikom Yogyakarta, Indonesia)

The battery is an important component in an electric vehicle. Batteries are connected in series into a battery pack to meet system voltage requirements. Problems will arise if the health conditions of the battery cells used are not uniform. For this reason, it is necessary to analyze the health of the battery cell on the battery pack. Analysis of the health of each battery cell will increase the cost of A Battery Management System because it uses many sensors. This work performs a comparison of the Kalman Filter and H infinity Filter algorithms to analyze the health of battery cells without using a current sensor. Reducing the current sensor will provide financial benefits because the current sensor is one of the expensive sensors in the BMS. The comparison results show both methods can estimate the battery cell voltage. The estimation results are then used to determine the residual voltage in each battery cell. A battery that has a good condition when compared to other battery cells in the battery pack will provide the smallest residual value. The Kalman Filter method provides a better sensitivity picture than the H Infinity Filter, although it needs to be validated in the next research.

8:15 Ambient Assisted Living for Elderly Care and Monitoring in COVID-19 Pandemic.....98

Shovon Bhowmick (Brac University, Bangladesh); Tarek Ferdous (BRAC University, Bangladesh); Raihan Momtaz (Brac University, Bangladesh); Md. Golam Rabiul Alam (BRAC University, Bangladesh)

In late 2019, a novel Coronavirus broke out from China, which has dispersed all over the globe and has taken away countless lives. Despite the fact that every person is at risk of getting infected with the virus, older people are more likely to fall victim to the virus due to their declining immune systems. Although there has been significant development of vaccines, it is seen that the mutation of the COVID-19 has made it tough to control with the medication available. Due to an uncountable number of Coronavirus strains, many countries are now facing several waves of the pandemic. Assisted living technologies are evolving with time to give people a better life. This technology can be used for older people in Coronavirus pandemic situations as most of the older people have physical and cognitive impairments. In this paper, we have proposed an IoT-architected system incorporated with Artificial intelligence and deep learning that can help diagnose COVID-19 in older people. The proposed architecture will collect all the data from different medical IoT sensors and relay them to the cloud, where the system will process and help us monitor the health of older people. This information could be seen from a dedicated dashboard where the user would be able to get diagnosis status of COVID-19 by our system. In order to be prepared for any future pandemic, this type of system will be beneficial.

1D: Parallel Session 1-D

Breakout Room D

Chair: Gardyas Adninda (Universitas AMIKOM Yogyakarta, Indonesia)

7:00 Fake Video Detection using Modified XceptionNet.....104

Imam Kusniadi (Universitas Amikom Yogyakarta, Indonesia); Arief Setyanto (Universitas AMIKOM Yogyakarta, Indonesia)

Deepfakes are a significant threat to society from the development of deep learning technology, which is able to manipulate digital images. Manipulated digital content potentially become disinformation. This study proposes the task of detecting fake video

using the XceptionNet architecture through transfer learning. The proposed algorithm train and test with publicly available datasets FaceForensics ++. The dataset is pre-processed to filter the face only using MTCNN. This research proposes an improvement of XceptionNet architecture with fine tuning and transfer learning. The purpose of this study is to determine the effect of architectural changes and the number of frames per video (FPV) towards the accuracy. Research shows the addition of 3 fully-connected layers in front of the softmax layer with the fine tuning lead to superior accuracy. The highest testing accuracy achieved on CelebDF dataset at 83,75%.

7:15 Classification of Brain Tumour MRI Images using Efficient Network.....108

Anggi Zhaputri (Universitas Amikom Yogyakarta); Mardhiya Hayaty (Universitas AMIKOM Yogyakarta, Indonesia); Arif Dwi Laksito (Universitas Amikom Yogyakarta, Indonesia)

Deep learning is a machine learning method that gains excellent attention from researchers in recent years. Deep Learning considered a success in solving various complex problems in the medical image area. Brain tumour disease is a deadly disease that causes sufferers to have a low life expectancy after being diagnosed. Diagnosis from experts also takes much time, and experts diagnosis results depend on their experience. Therefore, we need an automatic classification that can help experts in making decisions. CNN has been paid much attention to the abilities of complex classification. Subsequently, there are many state-of-the-art models from the improvement of CNN. Efficient Network is one of CNN models that proposes high accuracy and less computational. Therefore, this study proposed using the Efficient Network architecture to classify the types of glioma, meningioma, and pituitary brain tumours. Efficient Network has eight levels of category, which are from EfficientNet-B0 to EfficientNet-B7. This study obtains accuracy the best results in EfficientNet-B1 and EfficientNet-B2, which achieved a high accuracy of 96%.

7:30 Evaluation of Deep Transfer Learning Models in Glaucoma Detection for Clinical Application.....114

Manop Phankokkruad (King Mongkut's Institute of Technology Ladkrabang, Thailand)

The clinical information supports the doctors in diagnosing the diseases and making the right decisions. Glaucoma is the leading cause of irreversible blindness disease. Vision loss can be avoided by early stage detection and right treatment. This study has proposed the deep transfer learning of the CNN model for detecting the glaucoma using ResNet50V2, VGG16, InceptionV3, and Xception. The proposed models help in the diagnosis of the patients who have glaucoma. The model with CNN architecture was used to learn from training the Glaucoma image dataset. Since the existing dataset has a small number of images, this study uses the data augmentation techniques to increase the virtual number of images. The results reveal that the proposed models have performed the classification task for detecting glaucoma. The proposed model achieved an accuracy level of VGG16, ResNet50V2, InceptionV3, and Xception are 97.27%, 94.53%, 95.31%, and 94.92%, respectively. Furthermore, this study evaluates the models by considering the clinical performance parameters include accuracy, precision, specificity, sensitivity, and F1 score. All models provide the high confidence values. The evaluation reveals that the deep transfer learning model with VGG16 architecture is the highest performance in tests. The VGG16 model achieved the average AUC-ROC value of 98.94%.

7:45 Efficient Deep Learning Architecture for Facemask Detection.....119

Arief Setyanto (Universitas AMIKOM Yogyakarta, Indonesia); Kusri Kusri (AMIKOM Yogyakarta University, Indonesia); Theopilus Bayu Sasongko, Adhitya Bagasmiwa Permana and Andhy Panca Saputra (Universitas AMIKOM Yogyakarta, Indonesia)

Since COVID-19 pandemic all over the world, wearing mask become mandatory in public space. In order to enforce the new normal behaviour, regulators need to ensure every person is wearing a mask in order to avoid the spreading of the viruses. Before the pandemic, there were a number of closed-circuit televisions (CCTV) installed in public space for security purposes. The research aims to identify algorithms with acceptable classification quality and at the same time low computing complexity. This research aims to identify the algorithm to identify Face Mask. This research uses two public datasets, the first dataset has two labels with and without mask, and the second dataset consists of three labels (facemask, improper use of facemask and proper use of facemask). This research examines some well known deep learning architectures which are VGG, MobileNet, MobileNetV2, EfficientNet B0, NasNetMobile. A modification of VGG to reduce the number of parameters is also examined. An evaluation of the classification performance and execution time in the testing set is carried out on binary and three class dataset. According to the experiments, Modified VGG with 7 layers with 1.6 Million parameters consistently achieves fastest performance. The classification performance for three class dataset is achieved by Modified VGG (CVGG-7) at 100% while for the binary facemask classification is achieved by MobileNetV2 at 99.7%

8:00 CRAM: A Credit Risk Assessment Model by Analyzing Different Machine Learning Algorithms.....125

Aquib Turjo, Yeaminur Rahman, Mynul Karim, Tausif Biswas, Ifroim Dewan and Muhammad Iqbal Hossain (Brac University, Bangladesh)

Predicting the risk while lending money has always been a challenge for financial institutions. To make such decisions many banks or financial organizations follow different techniques to analyze a set of data. Manual prediction and analysis of credit risk can not only be very hectic but also quite time-consuming. To solve this issue, what is needed is a system that ensures high predictive accuracy and optimality. Machine Learning algorithms such as various Regression models, Gradient Boosting, Deep Learning, Neural Networks, Ensemble Learning and others can be used to anticipate whether a consumer is eligible for taking a loan with high accuracy. In this paper, an attempt has been made to find a good ML algorithm that shall help various banks and/or financial institutions to reliably predict the credit risk on an individual by analyzing appropriate datasets. Following that, a highly accurate result for said institutions can be ensured, which they can use to determine whether a consumer requesting credit should be allotted credit or not.

Monday, August 30 8:30 - 11:50 (Asia/Jakarta)

Opening Ceremony + 1st Plenary Session

Rooms: Breakout Room A, Breakout Room B, Breakout Room C, Breakout Room D, Breakout Room E

Chair: Alva Muhammad (Universitas Amikom Yogyakarta, Indonesia)

Welcome Speech Opening Remark Plenary Speakers 1 and 2

Monday, August 30 11:50 - 12:30 (Asia/Jakarta)

Break: Break Time

Rooms: Breakout Room A, Breakout Room B, Breakout Room C, Breakout Room D, Breakout Room E

Break Time

Monday, August 30 12:30 - 14:30 (Asia/Jakarta)

2A: Parallel Session 2-A

Breakout Room A

Chair: Tonny Hidayat (Universitas Amikom Yogyakarta, Indonesia)

12:30 Performance analysis of NOMA using different types receivers.....131

Roaa Ali and Saad Ayoob (University of Mosul, Iraq)

The 5G supports several technologies aimed at improving the performance of the communication networks in terms of the sender, channel, and receiver. One of these techniques, NOMA (Non-Orthogonal Multiple Access) that improves transmission performance and channel access. NOMA completes performance in the receiver. This paper analyzes NOMA performance evaluation in two methods. The first method compares the efficiency of different types of NOMA receiver schemes such as ZF (Zero Forcing), ML (Maximum Likelihood), Sphere, and Minimum Mean (MMSE) Square-Error. The second method changes the pattern of user sites for NOMA cell and suggests an optimal NOMA receiver scheme to serve users at the Cell Edge (CE) and obtain a greater user throughput rate. Simulation performed with the Vienna 5G Link Level Simulator (LLS), and modulation type used in encoding is Orthogonal Frequency (OFDM) Division Multiplexing. Also, the low-density parity test (LDPC) coding is used. The results show the influence of the receivers, changing the receivers (ZF, MMSE) does not affect the throughput of the subscribers (UE3, UE4) when reaching transmitted power (17.14 dBm). Also, (MMSE and ZF) receivers achieve better user service performance in (CE) than Sphere type receiver by one-third of the percentage. While ML algorithm achieved similar

performance as ZF, MMSE but at a transmitted power greater than (17.14 dBm).

12:45 Geographical Information System For Mapping Of Settlements Land Potency Index.....137

Robert Marco (Universitas Amikom Yogyakarta, Indonesia); Anik Vega Vitaningsih (Universitas Dr Soetomo & Faculty of Engineering, Indonesia); Anastasia Maukar (President University, Indonesia); Erri Wahyu Puspitarini (STMIK Yadika Bangil & Universiti Teknologi Malaysia Melaka, Indonesia); Seftin Fitri Ana Wati (Universitas Pembangunan Nasional Veteran Jawa Timur, Indonesia)

Rapid population growth is a problem for all regions, especially in big cities. Because uncontrolled population growth will result in an increase in the need for housing, this causes the amount of land needed for settlements to also increase. This paper discusses the use of Geographical Information System (GIS) technology in analyzing spatial data and attribute data (geoprocessing layer) in the form of mapping the suitability of settlements land and determining suitable areas for settlements using the Land Potency Index (LPI) approach. This paper considers parameter weighting using LPI based on topography/relief, lithology, type of soil, hydrology and disaster vulnerability. The results of the geoprocessing layer test carried out on settlements land show that the mapping of the suitability of settlements land has a good land suitability classification category value with a land potential index value of 25. After being overlay with a settlement land suitability map which is classified into three types, namely non-suitable, low-suitable, and suitable. Layer analysis based on these parameters is used to analyze the suitability of the land used in the Jepara districts region.

13:00 Spatial data modeling for mapping of slum region using multi-attribute utility theory method.....143

Robert Marco (Universitas Amikom Yogyakarta, Indonesia); Anik Vega Vitaningsih (Universitas Dr Soetomo & Faculty of Engineering, Indonesia); Anastasia Maukar (President University, Indonesia); Erri Wahyu Puspitarini (STMIK Yadika Bangil & Universiti Teknologi Malaysia Melaka, Indonesia); Seftin Fitri Ana Wati (Universitas Pembangunan Nasional Veteran Jawa Timur, Indonesia)

Slums as one of the social problems that are often faced by almost all areas in big cities. The need for handling efforts in overcoming slum settlements through mapping the distribution and knowing the priorities for handling slum settlements. This paper presents, spatial data modeling to map slum region using a Multi-Attribute Decision Making (MADM) approach based on Geographical Information System (GIS) technology. Mapping of slum region using the Multi-Attribute Utility Theory method based on multi-attribute parameters of the condition of building density, drainage, roads, drinking water supply, waste treatment, trash treatment, and fire protection. The results of the method test show the advantages of mapping slum region which will produce layer of information on slum region, the level of slum region, and the handling of slum region with a precision value of 75%, recall 80%, and accuracy 76%. The results of the trial state that this method has good agreement strength for use in mapping spatial data of slum region using the MADM approach.

13:15 Modeling and evaluating performance for Long-Term Evaluation networks in a part of Mosul city.....149

Mahmood Samir and Saad Ayoob (University of Mosul, Iraq)

A planning of the cellular network is a start step to building any cellular system, and the layout of the cellular network depends on the nature of the geographical area in which that network operates. Many companies that provide mobile phone services has a license to work with a second generation of the cellular systems usually these companies obtains for fourth generation licenses, so they use the same sites to supply a second and fourth generation service. In this work, a studying Long Terms Evaluations performance network of fourth generation for one of the networks operating in Mosul city has been studied and evaluated by building a simulation model that represented really network. Although using the same tower sites to supply second and fourth generations services save construction and operating costs but it may effect of fourth generations' efficiency cellular systems. In this paper, the coverage problems for choosing the same site for second and fourth generation will be discussed, and propose several methods to improve coverage areas, which is estimate by 7% of the total coverage area.

13:30 Analysis of CSIRT Services in Facing Cyber Security Challenges In Indonesia.....154

Muhammad Haidar (Taman Buaran Indah 1 BLok L/290, Duren Sawit, Klender, Duren Sawit & Universitas Indonesia, Indonesia); Yudho Sucahyo (University of Indonesia, Indonesia); Teddy Sukardi (Ikatan Konsultan Teknologi Informasi Indonesia, Indonesia); Arfive Gandhi (Universitas Indonesia, Indonesia)

Along with the rapid development of information technology and supporting several aspects of life, the increase in the use of information technology is directly proportional to the risk of cyber security so that it can cause losses in the form of data theft,

data loss/damage, and obstruction of information flow. In handling information technology security. CSIRT (Computer Security Incident Response Team) is an organization or team responsible for receiving, reviewing, and responding to cyber security incident reports and activities. However, since CSIRT was established, the current CSIRT service in Indonesia has not changed much from when it was first launched, only technology and some cyber security attack and defense techniques have changed but the management principles are considered to remain the same. This study aims to analyze the role and services of CSIRT in Indonesia to deal with the threat of cyber-attacks using the Carnegie Mellon University (CMU) framework. The results of this study are recommendations by mapping the results of research against the FIRST framework so that 10 recommendations can be obtained for the implementation of CSIRT services in Indonesia.

13:45 Comparison of Naïve Bayes Algorithm Model Combinations with Term Weighting Techniques in Sentiment Analysis.....160

Rizqi Sukma Kharisma (Universitas AMIKOM Yogyakarta, Indonesia); Muttafi'ah Muttafi'ah (AMIKOM Yogyakarta University, Indonesia); Akhmad Dahlan (Universitas Amikom Yogyakarta, Indonesia)

Text mining is a basic concept of sentiment analysis and a discipline that combines linguistics and computer science with machine learning techniques. Text mining is used to change the text to be more structured. While machine learning focuses on finding and developing algorithms to build a system that can simulate or imitate a pattern from a dataset. In this study, supervised learning is used which is a basic machine learning technique with comparing the Naive Bayes Classifier algorithm model, namely Multinomial Naive Bayes and Bernoulli Naive Bayes with sentiment objects from Twitter. This study also uses Term Weighting techniques, namely TFIDF and TF-RF in each model. This study was conducted to determine the best combination of each model with Term Weighting and to test the model's accuracy, the researcher uses a random and balanced dataset to find out whether the dataset is very influential in the model. The first step in this research is crawling the data using the Twitter API, then the data is labeled. After the data is labeled, the data will enter an important step in the research, namely preprocessing and term weighting. The data that has been labeled is cleaned and converted into structured data so that the data is ready for analysis. The preprocessing data are weighted using the TF-IDF and TF-RF techniques, then classified one by one using 2 NBC models, so in this study there are 4 model schemes, namely Multinomial and TF-IDF, Bernoulli and TFIDF, Multinomial and TF-RF as well as Bernoulli and TFRF. The last stage of this research is testing using Confusion Matrix, and then validated with K-Fold Cross Validation, testing is carried out to see the best performance of the 4 schemes. The result of the 4 schemes, TF-IDF and TF-RF with Bernoulli Naive Bayes schemes from the results of the Confusion Matrix test produce the best accuracy 61%, and the average accuracy value of the 5-fold validation is 60%. And the one with the lowest accuracy value lies in the Multinomial Naive Bayes model and TF-IDF which is 58% from Confusion Matrix, with an average value of 59% from the 5-fold validation. The researcher conducted several experiments using balanced data, and Bernoulli with 2 word weights had the highest accuracy value.

14:00 Rank-Based Univariate Selection for Intrusion Detection System.....164

Winda Ayu Safitri (Institute Technology of Sepuluh Nopember, Indonesia); Tohari Ahmad (Institut Teknologi Sepuluh Nopember (ITS), Indonesia)

Intrusion Detection System (IDS) is a scheme, which supervises network traffic and monitors suspicious activities in a network system. Nowadays, a potential solution to efficiently detect network intrusions is to use a machine learning (ML)-based IDS system. There are numerous issues with IDS, mainly in the dataset for the training. One of the problems that often arises is increasing detection accuracy and minimizing computation time in training the data. There is a suitable dataset for detecting various intrusions, which is the NSL-KDD. In this dataset, there is a number of features that are redundant and irrelevant to access. We suggest a strategy in this study that can increase IDS performance by combining univariate selection and Support Vector Machine (SVM) for classification. It is ideal for categorization in IDS because it has high performance. Data reduction is used to increasing the accuracy and decreasing computation time.

2B: Parallel Session 2-B

Breakout Room B

Chair: Rhisa Aidilla (Universitas AMIKOM Yogyakarta, Indonesia)

12:30 Decision Tree-Based Bok Choy Growth Prediction Model for Smart Farm.....169

Aldi Susilo, Nyoman Karna and Ratna Mayasari (Telkom University, Indonesia)

Indonesia is an agricultural country that has a dependency on the horticulture sub-sector. Bok choy is included in the mustard

greens group as one of the strategic products from the horticulture. The needs for mustard greens are getting higher. Based on Indonesia's Central Statistics Agency data in 2019, the mustard beans production rate increased only 2.63% higher than in 2018. If it does not meet the desired supply, it opens the possibility of a lack of bok choy supply at the market, resulting in high potential price fluctuations. These conditions initiate relevant system research to help the farmer develop a bok choy crop reference guide, especially in the seeding phase. In reducing the limitations caused by the lack of science and knowledge in the farmer environment, the prediction model is the proposed outcome by considering the use of IoT mechanism that has widely developed. The model is based on a system that integrates IoT's interest in the agriculture field, namely smart farm, for retrieving real-time data based on automatic control, MySQL database for storing data, and machine learning technique to establish the prediction model as the guide for the farmers to find appropriate parameters for planting bok choy. The prediction model performs using Python, a high-level popular programming language due to its ease and open source. Python interprets the bok choy growth dataset based on the irrigation system scenario from the integrated system with the relevant library of data preprocessing interest and the Decision Tree algorithm of the Scikit-learn library to train the model. The system conducts a series of machine learning phases to take the insight analysis needed to create a prediction model. The model performance metrics as the consideration in deciding the outcome model, which are accuracy and precision.

12:45 Developing from 2D to 3D Droplet Modeling and Simulation Using Lattice Boltzmann Method (LBM).....175

Kumara Ari Yuana (Universitas Amikom Yogyakarta, Indonesia); [Arifiyanto Hadinegoro](#) (Amikom Universty Yogyakarta, Indonesia); Indarto Indarto and Deendarlianto Deendarlianto (Universitas Gadjah Mada, Indonesia); Eko Budiana (Universitas Sebelas Maret, Indonesia)

The computational fluid dynamics (CFD) has been playing the important role in engineering fields side by side with experimental fields and theoretical studies. This manuscript develops the three dimensional (3-D) space of droplet modeling and simulation as continuation of writers 2-D previous works. The droplet behavior as the basic components of spray and aerosol based industries and engineering still need much more understanding hydro-dynamically and thermally. The pseudopotential LBM is used to handle two-phase fluids and to develop the modeling. The hydrodynamics of droplet in 2-D and 3-D were simulated here to present the various conditions of droplet contacts angles.

13:00 Imbalanced Class handling and Classification on Educational Dataset.....180

[Irfan Pratama](#) (Universitas Mercubuana Yogyakarta, Indonesia); Yoga Pristyanto (Universitas Amikom Yogyakarta, Indonesia); Putri Taqwa Prasetyaningrum (Universitas Mercu Buana Yogyakarta, Indonesia)

Research that has been done related to EDM using classification methods often researchers are not concerned with the existence of the class imbalance in the dataset. Imbalanced class is a condition where there is a significant difference between the number of instances of the minority class and the number of instances of the majority class. This can cause the performance of the classification algorithm to be not optimal because the majority of classifiers can work properly when the class distribution conditions are relatively balanced in the dataset. Several studies that have been conducted state that handling an imbalanced class on the dataset is a critical step to improving the performance of the classification algorithm. This study intends to show the effect of the imbalanced data problem and find out the better resampling method to be implemented into the machine learning process. The resampling method used in this study are SMOTE, Borderline SMOTE, SMOTE - Tomek. The students' performance dataset used as the data source and classify using several classifiers namely, Logistic Regression, K-NN, CART, Random Forest, SVM, Stacking ensemble method. The SMOTE-Tomek resampling method works best with Random Forest classification that produced 85.8% accuracy on 10-fold cross-validation and 0.89 Geometric Mean which is the best scores among other models.

13:15 Analysis on the Use of Declarative and Pull-based Deployment Models on GitOps Using Argo CD.....186

[Ramadoni Ramadoni](#) (Universitas AMIKOM Yogyakarta, Indonesia); Ema Utami (Universitas Amikom Yogyakarta, Indonesia); Hanif Fatta (Universitas AMIKOM Yogyakarta, Indonesia)

Currently, the problems faced by software developers in implementing the DevOps method include security issues of a person's ability to directly access and change clusters and the ineffective rollback process in the application deployment process to an application platform. The GitOps method was applied in this study to investigate and test how GitOps was able to solve these problems. This research used pull-based deployment and declarative deployment approaches rather than the push-based deployment models commonly used in today's CI/CD pipelines. The Argo CD tool serves as an operator, and Kubernetes serves as a platform for deploying container-based applications. This study is expected to be a recommendation for companies or

institutions as well as individuals who want to start adopting DevOps or who want to take DevOps implementation to the next level using the GitOps method

13:30 The Recommendation System for Increasing the Independence of Micro, Small and Medium Enterprises (MSMEs) Using the Normalized Rating Frequency (NRF) Method.....192

Sri Lestari and Yulmaini Yulmaini (Institut Informatika dan Bisnis Darmajaya, Indonesia); Aswin Aswin (IIB Darmajaya, Indonesia); Rio Kurniawan, Sulyono Sulyono and Yan Aditiya Pratama (Institut Informatika dan Bisnis Darmajaya, Indonesia)

Micro, Small, and Medium Enterprises (MSMEs) have an important role in improving the economy of small communities and the stability of the Indonesian economy. However, they still face various problems such as capital, raw materials, distribution, licensing, and others. This study developed a special treatment recommendation system to increase the independence of MSMEs by adopting a ranking-based method to produce recommendations related to problem-solving steps from MSMEs. The ranking method used Normalized Rating Frequency (NRF). This method performed an aggregation process of the ratings given by MSMEs in looking at the priority level of problem-solving based on previous experience. The result of the experiment showed that an average NDCG value was 0.7916. This explained that the quality of the ranking was good so that it was feasible to be recommended in solving problems in the form of special treatment to acquire to the independence of MSMEs.

13:45 Machine Learning for Security and Security for Machine Learning: A Literature Review.....197

Nuruddin Wiranda (Lambung Mangkurat University & Binotik, Indonesia); Mohammad Fal Sadikin (Philips Lighting at IoT Systems Group, The Netherlands)

This paper is a literature review of the topic of machine learning for security and security for machine learning, where the work is carried out covering 31 research papers related to this topic, and answers three different research questions (RQ) while providing graphs, tables, and statistics to summarize data and easily provides readers with summaries of papers related to this topic.

14:00 Comparative Analysis of CLAHE and AHE on Application of CNN Algorithm in the Detection of Covid-19 Patients.....203

Buyut Umri (AMIKOM University, Indonesia); Ema Utami (Universitas Amikom Yogyakarta, Indonesia); Mei Parwanto Kurniawan (University of AMIKOM Yogyakarta, Indonesia)

In 2021, Covid-19 is no longer a new threat for people in Indonesia and the world. The virus that has spread since December 2019 has created many transformation in many aspects for society. Various detection tools are emerged continuously to support government in overcoming the Covid-19 pandemic. Numerous cases that continue to grow in community, certainly, also requires detection tools with the best performance to handle this pandemic. In the field of informatics, many researchers use chest X-ray images to detect Covid-19, as a practitioner in informatics, authors attempt to apply several algorithms to get the best performance from Covid-19 detection. The objective of this study is to apply the Contrast Limited Adaptive Histogram Equalization (CLAHE) and Adaptive Histogram Equalization (AHE) algorithms in the detection of Covid-19 using Convolutional Neural Network (CNN) algorithm with VGG19 model. The dataset used in this study was a total of 1000 chest X-ray images and 1000 normal chest X-ray images obtained through Kaggle. The results of this study show that application of CLAHE has the highest accuracy of 99% for Covid-19 detection using VGG19. It is proved that the application of Histogram Equalization is able to improve the detection performance.

2C: Parallel Session 2-C

Breakout Room C

Chair: Gardyas Adninda (Universitas AMIKOM Yogyakarta, Indonesia)

12:30 Towards a Cloud-Based System Architecture for Drain Inspection Robots.....209

Ganesh Sai Apuroop Koppaka, Loke Ji Xian, Rajesh Elara Mohan, Povendhan Arthanaripalayam Palanisamy, Sriniketh Konduri and Charan Satya Chandra Sairam Borusu (Singapore University of Technology and Design, Singapore); Dylan Ng Terntzer (Lionsbot International Pte. Ltd., Singapore)

Complex robotic tasks nowadays are demanding more computational resources than ever before. This results in an increase in load on the computers on-board the robots. This issue can be addressed through leveraging the power of the cloud to offload

computationally intensive tasks. The current paper introduces a robot-cloud system architecture that can accommodate multiple drain inspection robots and fleets. This also provides a flexible arrangement to store the gigantic sensor data, into specific databases, generated from the robot fleet. Throughput tests involving stress loading a developmental virtual machine, in a private cloud, and a Raspberry Pi, from a drain inspection robot, was experimented and presented in the current paper. Latency tests under different networks were also tested while deploying the robot in a drainage.

12:45 *Narrow-Band Internet of Things for Smart Metering Infrastructure in Urban Area: Medan City Case.....215*

Muhammad Adam Nugraha and Muhammad Imam Nashiruddin (Telkom University, Indonesia);
Gunawan Hutagalung (Ministry Communication, Indonesia)

Narrow Band Internet of Things (NB-IoT) is a 3GPP standards-based Low Power Wide Area Network (LPWAN) technology that provides a broad coverage range of connection for many devices, low and efficient power consumption, and easy deployment. However, NB-IoT deployments in an area are varied due to the coverage and capacity size affected by the different geographic, demographic, and economic trends. This research aims to study NB-IoT's deployment for Smart Metering Infrastructure (SMI) in an urban area in Indonesia, namely Medan city, hoping that an adequate and optimal coverage and capacity calculation are accomplished. After conducting the simulations and calculations needed, this research obtained that NB-IoT deployment for SMI in Medan city is feasible by requiring a minimum gateway of 17 sites. Based on the simulations that have been completed. The average acceptable signal level and Signal to Noise Ratio (SNR) in Medan city are -57.79 dBm and -4.37 dB, respectively. Lastly, the average received signal strength (RSSI) is -79 dBm. These results have fulfilled the minimum requirement of implementing NB-IoT in the urban area, the city of Medan.

13:00 *Long Range Wide Area Network Deployment for Smart Metering Infrastructure in Urban Area: Case Study of Bandung City.....221*

Muhammad Imam Nashiruddin and Muhammad Adam Nugraha (Telkom University, Indonesia)

Long Range (LoRa) technology has low power consumption. It supports a wide communication range of more than two kilometers. However, there are numerous hurdles to developing LoRa, including the shortage of extensive use of Long Range Wide Area Network (LoRaWAN) in areas that have urban environments, particularly when it comes to reading the electricity, water, and gas, and other measurement services that are considered to be inefficient since cheating and manipulation can occur. This research aims to study LoRaWAN's deployment for Smart Metering Infrastructure (SMI) in an urban area in Indonesia, namely Bandung city. LoRaWAN uses the unlicensed frequency with a high possibility of interference with similar frequencies. LoRaWAN has limitations in data transmission speeds of 0.3 - 50 kbps. LoRaWAN cannot transmit data directly to the server, so it has to go through a gateway. This research estimates the number of gateways that are required to support SMI device communication. Therefore, this research will analyze and simulate the LoRaWAN network coverage and capacity planning in Bandung city using the simulation software Fork Atoll. Based on the conducted test, Bandung city is labeled as a city with SF 9 and Code Rate (CR) 4 with Relative Signal Strength Index (RSSI) of -129 dBm. The total number of gateways required for Bandung city is five sites. The average acceptable signal level in Bandung city is -92.14 dBm. The average SNR value in Bandung city is -17.49 dB. The average throughput distribution value is 12.1 kbps with a 78% served rate. All of the values obtained have fulfilled the LoRa requirements.

13:15 *Decision Support System of Stock Selection Using Promethee Method.....227*

Tamrizal Am (Universitas AMIKOM Yogyakarta, Indonesia); Ainul Yaqin (Universitas Amikom Yogyakarta, Indonesia)

At the end of 2020 stock investors experienced an increase of 53.47%, dominated by investors in the 18-30 year age range who reached 70% of total new investors in 2020, the data shows an increasing interest in the stock market. As one type of investment that has high risk and high return, the temptation of big profits often makes stock investors less careful when choosing stocks. Beginner investors often make decisions to buy stocks only referring to the stock trend that is currently bullish without paying attention to the fundamentals of stock to be purchased. Lack of adequate analysis of stock fundamentals can increase the risk of loss for investors. In this paper, a decision support system with the Promethee method is designed to assist in determining the stocks to be selected using stock fundamental analysis. The test results show that the designed system can produce stock recommendations with an average accuracy rate of 78%

13:30 *Banjarese Chatbot Using Seq2Seq Model.....233*

Bambang Abdi Setiawan, Ema Utami and Anggit Dwi Hartanto (Universitas Amikom Yogyakarta, Indonesia)

The significant development of chatbot technology began with the implementation of the Seq2Seq model which is based on 2-RNN architecture. Long-term training with vanilla RNN has the problem of vanishing or exploding gradient, so it is necessary to do research that focuses more on optimization steps for this problem. The optimization carried out on the Seq2Seq model is to apply a Long-Short Term Memory (LSTM) gate mechanism with a stable ability to understand long-term information. A Gated Recurrent Unit (GRU) is faster in training and an attention mechanism that can handle long sequence data. Also, gradient descent can minimize the error rate. A combination of gate types, gradient descent, and attention mechanisms needs to be done to produce a better conversational model. The test results of the conversational model performance were obtained by taking into account the metric scores in accuracy, precision, recall, F1, and loss by using 80% train data and 20% test data from 5000 lines of Banjarese conversation. In the 50th epoch, the best score was from testing the LSTM gate model with metric values of accuracy 64,67%, precision 85,20%, recall 62,49%, F1 72,09%, and loss 3,6073.

13:45 Foreign Exchange Prediction Using Machine Learning Approach: A Pilot Study.....239

Sudimanto Sudimanto and Yaya Heryadi (Bina Nusantara University, Indonesia); Lukas Lukas (Universitas Katolik Indonesia Atma Jaya, Indonesia); Antoni Wibowo (Bina Nusantara University & Jakarta, Indonesia)

Foreign Exchange or FOREX trading is not only done on foreign currencies but, FOREX also can be done on several commodities such as Gold, Silver, Oil. Gold is one of the most valuable commodities in the world. Investors began to offer gold as a trading material against foreign currencies. Machine Learning (ML) in the FOREX trading world is usually used to predict future FOREX values. This pilot study aims to see a model from machine learning that has a fairly high level of accuracy in making FOREX predictions. This pilot study using historical data taken from the investing.com database where the FOREX data taken is FOREX XAU/USD data, with a period year from 2019 until 2021, and the indicator used is Moving Average Convergence/Divergence (MACD) technical analysis. The average accuracy obtained after training on the Tree model is 86.3%, the SVM model is 86.6% and the Ensemble model is 86.55%. Testing conducted using machine learning models for Tree, SVM and Ensemble models have the same level of accuracy, which is 88.3%.

14:00 Electronic Nose in Classification of Gas Sensor Array Detection Through Flow Modulation.....243

Ferry Wahyu Wibowo (Universitas Amikom Yogyakarta, Indonesia); Wihayati Wihayati (Satya Wacana Christian University, Indonesia)

The sensor array consists of several sensors whose number depends on the analysis of a case to be generated. The electronic nose (e-nose) is similar to how the human sense of smell works. This technology is quite good at detecting gases that can harm human health when humans smell them. This paper utilizes an array of sensors as an e-nose in detecting 12 classes of gases and their concentrations, consisting of acetone 0.1, a mixture of acetone 0.1 and ethanol 0.1, a mixture of acetone 0.1 and ethanol 0.3, a combination of acetone 0.1 and ethanol 1, acetone 0.3, a mixture of acetone 0.3 and ethanol 0.1, acetone 1, a mixture of acetone 1 and ethanol 0.1, air, ethanol 0.1, ethanol 0.3, and ethanol 1. The input feature data used in this gas flow modulation system uses 16 sensors consisting of the Taguchi Gas Sensors (TGS). The dataset used in this paper uses an open dataset to obtain the accuracy and R2 score of the classification model. The classification model applied, in this case, is Gaussian Naive Bayes (GNB), Decision Tree Classifier (DTC), K-Nearest Neighbors (KNN), Random Forest Classifier (RFC), Ada Boost Classifier (ABC), Gradient Boosting Classifier (GBC), Support Vector Classifier (SVC), Neural Network Multi-Layer Perceptron Classifier (NN-MLPC), Gaussian Process Classifier (GPC), Quadratic Discriminant Analysis (QDA), and Bagging Classifier (BC). The best metric result obtained in this classification model is RFC which accuracy and R2 score can produce a value of 100% each.

2D: Parallel Session 2-D

Breakout Room D

Chair: Kumara Ari Yuana (Universitas Amikom Yogyakarta, Indonesia)

12:30 A Cross-Cultural Adaptation of Chatbot Usability Questionnaire (CUQ): Indonesian Version.....248

Corry Elsa (University of Indonesia, Indonesia); Harry Budi Santoso and Panca O. Hadi Putra (Universitas Indonesia, Indonesia)

Chatbots are a highly developed technology, especially in the current COVID-19 pandemic to apply contactless activities. Unfortunately, most of companies that have been implemented chatbot has failed gained benefit from the chatbot. This shows companies need to evaluate usability of the chatbot. One of specific questionnaire to evaluate usability of chatbot is Chatbot

Usability Questionnaire (CUQ). Currently CUQ is only available in English and there is no research that provides CUQ in the Indonesian version. This research focuses on translating CUQ and producing a reliable Indonesian version of CUQ. CUQ needs to be adapted naturally into Indonesian so it can be understood by all types of users. Cross-cultural adaptation approach is used to translate CUQ to Indonesia. The reliability test was run with 100 respondents and resulted in Cronbach's alpha value of 0.749. This value indicated that CUQ is reliable and can be used in chatbot research and evaluation.

12:45 Comparing Holt-Winter and Multi Layer Perceptron in Forecasting The Amount of Rice Supply from Cirebon.....252

Dedy Sugiarto (Universitas Amikom Yogyakarta, Indonesia); Wahyu Hidayat, Dhani Ariatmanto and Ainul Yaqin (Universitas Amikom Yogyakarta, Indonesia)

Rice supply through the Cipinang Rice Main Market is volatile and seasonal with a total supply from all production centers in 2020 of 795179 tons of which 33% or most of it is supplied from the Cirebon area. The existence of climate change associated with shifting planting seasons and shrinking paddy fields makes it necessary to make accurate supply forecasts so that the price control mechanism through rice market operations can run effectively. The supply forecast uses monthly supply data from the Cirebon area from 2011 to 2020 and is forecasted using the Holt-Winter and Multi Layer Perceptron (MLP) methods. The results show that forecasting using the MLP method with two hidden layer produces the most accurate values where the Root Mean Square Error (RMSE) and Mean Absolute Percentage Error (MAPE) values are 544.17 and 2.08, respectively.

13:00 Recommendations for Choosing a Place to Stay in the Greater Malang Area Using SAW and TOPSIS.....256

Wahyu Widi Widayat (Nusantara PGRI University of Kediri, Indonesia); Hastari Utama (Universitas Amikom Yogyakarta, Indonesia); Erna Daniati (Indonesia & Universitas Nusantara PGRI Kediri, Indonesia); Sucipto Sucipto (STMIK AMIKOM Yogyakarta & Nusantara PGRI Kediri University, Indonesia)

Developments in an area must increase the number of people visiting the area. For example, the Malang area is now growing quite rapidly by becoming a center for tourism, education and business destinations in the southern area of East Java. An important need to support visitors during their visit is a place to stay. The Malang area provides many different types and categories of places to stay, one of which is a sharia accommodation. With so many choices, visitors feel confused about which place to stay according to their needs and desires. To make it easier for visitors to determine where to stay, the authors conducted research by applying the SAW and TOPSIS methods, using the main criteria, namely facilities, price, location, and distance from the city center to provide recommendations for the best place to stay according to the needs and desires of visitors. From the results of the calculation of the highest preference values SAW and TOPSIS then used as a recommendation for choosing a place to stay for visitors.

13:15 Data Completeness Impact on Deep Learning Based Explainable Recommender Systems.....262

Deni Lukmanul Hakim (University of Indonesia, Indonesia); Fariz Darari (Faculty of Computer Science, Universitas Indonesia, Indonesia)

Recommendation systems become an important part in helping users find the most fit items in many domains, such as healthcare, transportation, agriculture, media, and e-commerce. The development of an explainable recommendation system was claimed to add more value to improve user satisfaction. Various studies have been conducted regarding the model to solve real world issues. Yet, the impact of data quality in building an explainable recommendation system is still scarce. In this paper, we investigate whether the completeness of data used in building explainable recommendation system will impact the performance of the recommender systems and quality of the explanation. We use the Yelp and MovieLens dataset and train a deep learning explainable recommendation system model, Co-Attentive Multi-task Learning (CAML), on various amounts of data by reducing the data records using algorithm technique to achieve Missing Completely at Random (MCAR) and Missing at Random (MAR), and by eliminating selected features on each dataset. Finally, we evaluated the outcomes based on Root Mean Square Error (RMSE) for rating evaluation and Bilingual Evaluation Understudy (BLEU) & Recall-Oriented Understudy for Gisting Evaluation (ROUGE) for explanation evaluation. Our experiments conclude with Pearson Correlation Coefficient between completeness of data with the evaluation result in each of the experiment. We found out that different types of data reduction and dataset impact differently to the level of the performance of the ratings and explanation.

13:30 TOPSIS in Decision-Making Framework Based on Twitter Sentiment Analysis.....268

Erna Daniati (Indonesia & Universitas Nusantara PGRI Kediri, Indonesia); Hastari Utama (Universitas Amikom Yogyakarta, Indonesia)

Twitter is one of social media that categorized in microblogging. Tweets on Twitter which are short sentences containing an opinion or sentiment. This is very beneficial for the organization or company to conduct analysis. The objective for this analysis is market prediction, general elections, measuring reactions to events or news, and measuring subjectivity. This affects the decision making for the company. Therefore, the role of sentiment analysis is very necessary to get the classification of sentiment in the form of positive, negative, and neutral sentiments. This type of sentiment polarity is used as a criteria for preference modeling so that alternative decisions can be calculated for the final value. This study attempts to propose a decision-making framework based on sentiment analysis. In addition, this research is also an improvement from the previous decision-making framework where decision-making is based on sentiment analysis. Improvements were made to the modeling of the criteria which initially used the SAW method to be changed to the TOPSIS method. Furthermore, the final value of the decision alternatives using TOPSIS is compared with using SAW. The comparison parameters used are in the form of final scores and ranking results. The final score of the SAW method is greater than the TOPSIS end score. In addition, there are differences in the ranking results between the TOPSIS and SAW methods.

13:45 Novel classification method of plastic wastes with optimal hyperparameter tuning of Inception_ResnetV2.....274

Richard Kyung (CRG-NJ, USA); Sahng-Won Lee (Seoul International School, Korea (South))

Plastics have been used extensively over the past few decades. Prior to that, the use of plastics wasn't a major issue, but now we are polluting the ocean with approximately 12.7 million tons of plastic a year, and the damage we are doing to marine life and the ecosystem in general may soon be irreversible. This can be accredited largely to disposable plastics which have regrettably become ubiquitous. Therefore, the objective of this project is to properly classify waste through the use of deep-learning models with fine tuning. By doing this, they are complying with their legal duty of care. Overall, after the classification process, the Inception_resnet_V2 was separated and classified into three different classes: plastic, cardboard, and garbage. VGG19, VGG16, Inception_v3, Xception, and MobileNet were also used for the classification. Principal findings of our research concluded that there were only nominal differences in accuracy compared to the related works, which conducted binary classification. Also, for the optimizer, Nadam had the highest degree of accuracy, and was the highest when the learning rate was 0.01. As the CNN+Autoencoder model and the VGG16 model had a 35% difference in accuracy, we could determine the importance of pretrained models.

14:00 Diabetes Classification Using Support Vector Machine: Binary Classification Model.....280

Sucianna Ghadati Rabiha (Bina Nusantara University, Indonesia); Antoni Wibowo (Bina Nusantara University & Jakarta, Indonesia); Lukas Lukas (Universitas Katolik Indonesia Atma Jaya, Indonesia); Yaya Heryadi (Bina Nusantara University, Indonesia)

One of the health problems that require special attention is diabetes, besides the growth of this disease infection is increasing in various circles ranging from children, adults, men, women and the elderly. So to detect diabetes at an early stage, machine learning algorithms are the right choice to help detect indications of diabetes. This paper presents experimental results related to the exploration of the use of a Super Vector Machine (SVM) for data classification of Diabetes. The model used in this experiment is the Binary Classification Model. Based on the test results, the highest accuracy is obtained by using a total of 700 lines of data, which is 75,7143%. The Best estimated feasible point in Box Constraint is 272.29 with a KernelScale area of 72.627.

2E: Parallel Session 2-E

Breakout Room E

Chair: Dhani Ariatmanto (Universitas Amikom Yogyakarta, Indonesia)

12:30 Impact of Augmentation on Batik Classification using Convolution Neural Network and K-Neareast Neighbor.....285

Dandhi Trimakno (Universitas Amikom Yogyakarta, Indonesia); Kusrini Kusrini (AMIKOM Yogyakarta University, Indonesia)

Augmentation is a technique to increase the amount of data artificially by making more variations of the image such as changing the position of the image, changing the size of the image to changing the color of the image. In this research, the Convolutional Neural Network and K-Nearest Neighbor algorithms were used as classification methods with batik objects. The batik used is limited to 4 classes, namely Kawung, Lunglungan, Megamendung and Parang batik. The data used are 1,443 batik images.

After data augmentation, 6,300 images were obtained for each technique. There are 5 augmentation techniques used, namely Random Noise, Random Rotation, Grayscale, Horizontal Flip and Vertical Flip. In this research, we succeeded in increasing the accuracy of the Convolutional Neural Network and K-Nearest Neighbor algorithms using augmentation techniques. The Convolutional Neural Network algorithm increased an average accuracy of 6% of the five augmentation techniques. Meanwhile, the K-Nearest Neighbor algorithm can increase by more than 12%. The impact of data augmentation in this study is very good, as evidenced by the increase in accuracy in both algorithms. The best accuracy is obtained when using the Vertical Flip technique, the highest accuracy is obtained in both algorithms, namely 96.92% and 81.36% on the CNN and K-NN algorithms.

12:45 Reducing Area Recognition for Vehicle Model Classification using Car's Front Side.....290

Arjun Sutrisno (Hasanuddin University & Makassar, Indonesia); Indrabayu Indrabayu, Intan Sari Areni and Anugrayani Bustamin (Hasanuddin University, Indonesia)

A Car Make and Model Recognition (CMMR) system plays an essential role in Intelligent Transport System (ITS) development. The challenge is identifying the features of a car and simplifying the process of a system. This work presents a system that can handle the challenges. This research aims to classify car models based on global features in the car's front-side view image. The dataset used consists of 5 classes spread into 387 images with 312 train data and 75 test data. The method used in feature extraction is the Bag of ORB Feature (BOF) method, which is a combination of the Oriented and Rotated BRIEF (ORB) feature extraction method and the Bag of Visual Word (BOVW) concept. While at the classification stage, it uses the Support Vector Machine (SVM) method. The results show that the proposed approach can overcome the challenges of CMMR with an F1 score for each class of 96.3%, 91.2%, 87.0%, 81.8%, and 85.7%. In addition, the approach of using the car's front-side view image can also increase the system performance with an average increase of 10% than using the whole car image.

13:00 Convolutional Neural Network for Classifying Retinal Diseases from OCT2017 Dataset.....295

Hanung Adi Nugroho and Rizki Nurfauzi (Universitas Gadjah Mada, Indonesia)

Optical Coherence Tomography (OCT) is an imaging modality that offers real-time, non-invasive high-resolution imaging in the biomedical field. It is widely utilized in ophthalmology to perform diagnostic imaging of the anterior eye and retina structures. Several methods based on traditional image processing and classical machine learning have been widely applied to detect and classify retinal diseases from OCT images with various weaknesses, particularly complex rules and long processing times. Recently, several studies of deep learning in multiple fields, including medical, have manifested promising results. But it is still rarely explored to detect retinal disease on OCT images. Thus, in this study we perform several states-of-the-art of deep learning image classification methods to confirm the best for the large OCT2017 database accommodating eighty thousand images. MobileNet-V2 achieved the highest accuracy of 99.6% compared to the others. The model achieved high performance of accuracy and fast computational time that possible to implement in real-time while assisting ophthalmologists.

13:15 Optimization and Implementation of Adaptation Rate in VVC.....299

Ka-Hou Chan (Macao Polytechnic Institute, China); Sio Kei Im (Macao Polytechnic Institute, Macao)

In the modern world, video has become the basic data of mass communication information. Whether it is entertainment, information release, or collection, daily records, are directly in the form of video applications. Compared with relying on language alone in the past, this can convey more and more intuitive information. As for the industry's participation in video coding research, the field relying on video technology seems to be more active than ever before. These areas include any applications and technologies that need to transmit or store video/image signals. Therefore, without solid and powerful compression technology, the future of all these areas is vague. In view of this, the progress of efficient video compression technology enables us to transmit more pixels over a limited bandwidth channel, which is crucial to the rapid growth of video usage information. As we continue to pursue higher coding efficiency, higher resolution and more complex multimedia applications, the amount of computation per pixel and pixel processing speed will grow exponentially.

13:30 Comparison of Keras Optimizers for Earthquake Signal Classification Based on Deep Neural Networks.....304

I Wayan Mustika (Universitas Gadjah Mada, Indonesia); Hajar Nimpuno Adi (National Nuclear Energy Agency of Indonesia, Indonesia); Faisal Najib (Universitas Gadjah Mada, Indonesia)

This paper presents a comparative study of the gradient descent optimization algorithm found in the Keras library. The optimizers used in this study were Adadelta, Adagrad, Adam, Adamax, Nadam, RMSprop, and SGD. Previous research on earthquake classification was used as a basis for comparing optimizers. CNN and LSTM were used for feature extraction contained in earthquake signals and noise. The dataset used was Stanford Earthquake Datasets (STEAD). RMSprop optimizer continued to outperform the others in terms of accuracy. The observed performance was accuracy. The results showed that the two

earthquake classification models using the RMSprop optimizer outperformed other optimizers. The best accuracy obtained with RMSprop was 99.2%, with a loss of 0.102 for model 1 and 99.0%, with a loss of 0.107 for model 2. Thus, RMSprop was found the most suitable optimizer for algorithms using a combination of CNN and LSTM.

13:45 Face Mask Detection on Facial Images Using Convolutional Neural Network.....309

Perdana Faishal Mulhaq and Suyanto Suyanto (Telkom University, Indonesia)

During this COVID-19 pandemic our social activity are severely restricted, caused of COVID-19 virus which spread rapidly and can perch on any surface including our skin, it will be very dangerous if the virus is penetrating to our body. The virus can enter through the nose, eyes, or mouth. To prevent the spread of this virus, the local government has urged the public to always adhere to health protocols including social distancing and the use of masks in public places. There have been many systems built to assist the community in dealing with this pandemic, Likewise with this study, in this study a system has been built to detect the use of masks on facial images. A dataset of 11,740 face images is collected and learned to the Convolutional Neural Network. With the help of CNN the system will be assisted in the process of object classification and detection. And using the specific model in this system, we using VGG-16. For the pre-processing phase we use the Augmentation Method to increase the result with the hope that it will get good results and can help in this pandemic. Turns out It gives the highest training accuracy of 100% and the highest validation accuracy is 99% and a good result for the test accuracy.

Monday, August 30 14:30 - 14:45 (Asia/Jakarta)

Break: Break Time

Rooms: Breakout Room A, Breakout Room B, Breakout Room C, Breakout Room D, Breakout Room E

Monday, August 30 14:45 - 16:00 (Asia/Jakarta)

2nd Plenary Session + Awarding and Closing Ceremony

Rooms: Breakout Room A, Breakout Room B, Breakout Room C, Breakout Room D, Breakout Room E

Chair: Alva Muhammad (Universitas Amikom Yogyakarta, Indonesia)

Plenary Spreaker 3 Closing Ceremony Awarding Best Paper

Monday, August 30 16:00 - 16:10 (Asia/Jakarta)

Log Out: Leave Zoom Meeting

Rooms: Breakout Room A, Breakout Room B, Breakout Room C, Breakout Room D, Breakout Room E

Chair: Sumarni Adi (Universitas Amikom Yogyakarta, Indonesia)