Program Book

ICWT 2020

6th International Conference on Wireless and Telematics

http://icwt-seei.org/2020/

September 3-4, 2020
Trans Luxury Hotel & Virtual Conference
Bandung, Indonesia

6th International Conference Wireless and Telematics (ICWT) 2020

Conference Record Number 50448

Table of Contents

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Message from the General Chair

It gives me great pleasure to welcome you to the 6th International Conference on Wireless and Telematics (ICWT) 2020. ICWT is one of the conferences which are organized by Telecommunications Engineering Research Group, School of Electrical Engineering and Informatics, Institut Teknologi Bandung (STEI–ITB). This year, the 6th ICWT 2020 is held in Bandung, Indonesia.

ICWT has been expected to become one of the important conferences in Indonesia in the area of information and communications technology. This conference provides a forum for universities, industries, government, and public sectors to expose and exchange their innovative ideas and methods.

Since 2015, this conference has brought together a tremendous and rich diversity of authors and speakers to share ideas and new perspectives on a wide range of research on information and communication technologies topics. This year, we have more than 80 submissions whose authors span not only from domestic universities but also from our overseas colleagues, such as: Malaysia, Lybia, India, Republic of Korea, and Sri Lanka.

The 6th ICWT 2020 will not happen without the hard work of the organizers behind the scenes. We had an excellent team that has worked very hard to organize ICWT 2020. I would like to thank Universitas Islam Negeri Sunan Gunung Djati as our co-host, the steering committee; International advisory committee; Our Sponsors; and particularly I want to thank all members of the Technical Program Committee for their hard work in providing thorough and insightful reviews on time. Special thanks also go to

all authors since ICWT 2020 would not be possible without the contributions of the authors.

Finally, I wish all participants a successful and fruitful conference. I hope you will find this program interesting, useful, and stimulating.

Dr. Tutun Juhana, S.T., M.T.
General Chair

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Technical Program

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6th ICWT 2020
Conference Program – at a Glance

Thursday, 3 September 2020 (Day 1)	
08.00 - 08.30	**REGISTRATION**
08.30 - 08.35	**General Chair Report & Welcome Remarks** Dr. Tutun Juhana, S.T., M.T. General Chair 6th ICWT 2020
08.35 - 08.40	**Opening Speech** Dr. Hj. Hasniah Aliah, M.Si Dean of Faculty of Science and Technology of UIN SGD
08.40 - 08.50	**Photo Session**
08.50 - 09.10	**COFFEE BREAK**
09.10 - 10.50	**Parallel Sessions 1** Offline Room-1, Offline Room-2, Online Room-1, Online Room-2
10.50 - 12.10	**Parallel Sessions 2** Online Room-1, Online Room-2
12.10 - 13.00	**LUNCH BREAK**
13.00 - 15.00	**Parallel Sessions 3** Online Room-1, Online Room-2
15.00 - 15.40	**COFFEE BREAK**
15.40 – 17.00	**Parallel Sessions 4** Online Room-1, Online Room-2
Friday, 4 September 2020 (Day 2)	
08.00 - 08.20	**REGISTRATION**
08.20 – 10.00	**Parallel Sessions 5** Online Room-1, Online Room-2
09.40 - 17.00	**Additional Parallel Sessions** Online Room-1, Online Room-2
	ICWT Committee Meeting
END OF CONFERENCE	

Thursday, 3 September 2020 (Day 1)		
Parallel Sessions 1		
	Offline Room-1	**Offline Room-2**
	Track: Offline 1	Track: Offline 2
09.10 - 09.30	Paper ID 060222	Paper ID 060232
09.30 - 09.50	Paper ID 060228	Paper ID 060250
09.50 - 10.10	Paper ID 060230	Paper ID 060253
10.10 - 10.30	Paper ID 060239	Paper ID 060256
10.30 - 10.50	Paper ID 060240	Paper ID 060257

Thursday, 3 September 2020 (Day 1)		
Parallel Sessions 1		
	Online Room-1	**Online Room-2**
	Track: Telecommunication Systems and Devices-1	Track: Telematics Systems and Software-1
09.10 - 09.30	Paper ID 060003	Paper ID 060001
09.30 - 09.50	Paper ID 060213	Paper ID 060224
09.50 - 10.10	Paper ID 060017	Paper ID 060242
10.10 - 10.30	Paper ID 060018	Paper ID 060246
10.30 - 10.50	Paper ID 060237	Paper ID 060249
Parallel Sessions 2		
	Online Room-1	**Online Room-2**
	Track: Telecommunication Systems and Devices-2	Track: Technology Strategic Planning and Regulation
10.50 - 11.10	Paper ID 060006	Paper ID 060010
11.10 - 11.30	Paper ID 060011	Paper ID 060212
11.30 - 11.50	Paper ID 060023	Paper ID 060016
11.50 - 12.10	Paper ID 060061	Paper ID 060348
12.10 - 13.00	**LUNCH BREAK**	

Thursday, 3 September 2020 (Day 1)		
Parallel Sessions 3		
	Online Room-1	**Online Room-2**
	Track: Artificial Intelligence Applications	Track: Modeling, Simulation, and Performance Analysis
13.00 - 13.20	Paper ID 060325	Paper ID 060008
13.20 - 13.40	Paper ID 060326	Paper ID 060221
13.40 - 14.00	Paper ID 060244	Paper ID 060234
14.00 - 14.20	Paper ID 060254	Paper ID 060241
14.20 - 14.40	Paper ID 060258	Paper ID 060245
14.40 - 15.00	Paper ID 060259	Paper ID 060247
15.00 - 15.40	**COFFEE BREAK**	
Parallel Sessions 4		
	Online Room-1	**Online Room-2**
	Track: Internet-of-Things-1	Track: Telematics Systems and Software-2
15.40 - 16.00	Paper ID 060227	Paper ID 060019
16.00 - 16.20	Paper ID 060231	Paper ID 060020
16.20 – 16.40	Paper ID 060235	Paper ID 060236
16.40 - 17.00	Paper ID 060243	Paper ID 060062

Friday, 4 September 2020 (Day 2)		
Parallel Sessions 5		
	Online Room-1	**Online Room-2**
	Track: Internet-of-Things-2	Track: Telematics Systems and Software-3
08.20 - 08.40	Paper ID 060329	Paper ID 060060
08.40 - 09.00	Paper ID 060233	Paper ID 060063
09.00 - 09.20	Paper ID 060338	Paper ID 060064
09.20 - 09.40	Paper ID 060255	Paper ID 060065
09.40 - 10.00	Paper ID 060052	Paper ID 060066

Thursday, 3 September 2020 Offline Room 1: 09.10 – 10.50	
Track : Offline-1	
Time	**Title / Author**
09.10 - 09.30 Paper ID 060222	**The Analysis Of Unbalanced Assignment Problems Using The Kotwal-Dhope Method To Develop A Massive Open Online Course** *Elis Ratna Wulan, Amelia Pratiwi, Qiqi Yuliati Zaqiah, and Mahmud*
09.30 - 09.50 Paper ID 060228	**Fuzzy Logic-Based Pressure Control System on Triaxial Test Equipment** *Hendri Maja Saputra, Hikmadi Arafat, Lia Kamelia, Nanang Ismail, M. Ali Ramdhani and Tedi Priatna*
09.50 - 10.10 Paper ID 060230	**The Implementation of Mamdani's Fuzzy Model for Controlling the Temperature of Chicken Egg Incubator** *Indri Nurfazri Lestari, Edi Mulyana and Rina Mardiati*
10.10 - 10.30 Paper ID 060239	**The Purpose of Bellman-Ford Algorithm to Summarize the Multiple Scientific Journal Articles** *Dian Sa'adillah Maylawati, Cecep Nurul Alam, Muhammad Fakhri Muharram, Muhammad Ali Ramdhani, Abdusy Syakur Amin and Hilmi Aulawi*
10.30 - 10.50 Paper ID 060240	**Deep Learning Approach to Bullying Classification on Twitter Social Media** *Cepy Slamet, Arif Krismunandar, Dian Sa'adillah Maylawati, Jumadi Jumadi, Wildan Budiawan Zulfikar and Muhammad Ali Ramdhani*

Thursday, 3 September 2020 Offline Room 2: 09.10 – 10.50	
Track	**: Offline-2**
Time	**Title / Author**
09.10 - 09.30 Paper ID 060232	**Design of Arduino Uno Based Duck Egg Hatching Machine with Sensor DHT22 and PIR Sensor** *Adam Faroqi, D T Ismail, Mufid Ridlo Efendi and M Ali Ramdhani*
09.30 - 09.50 Paper ID 060250	**The Monitoring System Prototype Of Health Condition For Home Care Patients Base On Internet Of Things** *R. Gilang Fauzi Yusuf, Eki Ahmad Zaki Hamidi, Lia Kamelia and Ulfiah*
09.50 - 10.10 Paper ID 060253	**Design of Prototype Monitoring System Base Tranceiver Station (BTS) Base on Internet of Things** *Pajar Abdul Malik Hambali, Syamsuddin, Mufid Ridlo Effendi and Eki Ahmad Zaki Hamidi*
10.10 - 10.30 Paper ID 060256	**Design of Prototype Smart Home System Base on LoRa** *Sarah Opipah, Husnul Qodim, Deni Miharja, Sarbini, Eki Ahmad Zaki Hamidi and Tutun Juhana*
10.30 - 10.50 Paper ID 062570	**Interface Application Design for Smart Home Based on LoRa** *Muamar Wildan, Eki Ahmad Zaki Hamidi and Tutun Juhana*

Thursday, 3 September 2020 Online Room 1: 09.10 – 10.50	
Track : Telecommunication Systems and Devices-1	
Time	**Title / Author**
09.10 - 09.30 Paper ID 060003	**A 3D Multilateration Using RF Burst** *Haifa Nabila, Joko Suryana and Ahmad Izzuddin*
09.30 - 09.50 Paper ID 060213	**Gain Enhancement of Circular Polarization Microstrip Antenna Based on Array 8x2 Element** *Indra Surjati, Syah Alam, Yuli Kurnia Ningsih, Marsun Marsun, Lydia Sari and Justin Tanuwijaya*
09.50 - 10.10 Paper ID 060017	**Low Noise Block Down Converter and Block Up Converter Filters Design for Ku Band** *K. Santoso, I.Y.M Edward, and Iskandar*
10.10 - 10.30 Paper ID 060018	**Block Up Converter Design for Ku Band** *P. Herdian, I.Y.M. Edward, and Iskandar*
10.30 - 10.50 Paper ID 060237	**Prototype Design for Object Coordinate Detection using RP LIDAR Concept** *Satria Fakhri, Edi Mulyana, Rina Mardiati and Tedi Priatna*

Thursday, 3 September 2020 Online Room 2: 09.10 – 10.50	
Track	**: Telematics Systems and Software-1**
Time	**Title / Author**
09.10 - 09.30 Paper ID 060001	**Design and Analysis of the Performance of Voice Switching Control System Prototypes for Air Traffic Control** *Candra Setiawan and Hendrawan*
09.30 - 09.50 Paper ID 060224	**TOPSIS Method on Selection of New Employees' Acceptance** *Diena Rauda Ramdania, Khaerul Manaf, Fikri Rahmat Junaedi, Ah. Fathonih, Ana Hadiana*
09.50 - 10.10 Paper ID 060242	**Decision Support System For Determining Inventory And Sales Of Goods Using Economic Order Quantity Methods and Linier Regression** *Khaerul Manaf, Cecep Nurul, Beki Subaeki, Faiz Kaffah, Ira Rupaida and Aedah B A Rahman*
10.10 - 10.30 Paper ID 060246	**E-Mail Message Encryption Using Advanced Encryption Standard (AES) and Huffman Compression Engineering** *Faiz Muqorrir Kaffah, Yana Aditia Gerhana, Ihsan Miftahul Huda, Ali Rahman, Khaerul Manaf, and Beki Subaeki*
10.30 - 10.50 Paper ID 060249	**E-service: Concept and Application in The Citizen Association Environment** *Beki Subaeki*

Thursday, 3 September 2020 Online Room 1: 10.50 – 12.10	
Track : Telecommunication Systems and Devices-2	
Time	**Title / Author**
10.50 - 11.10 Paper ID 060006	**Radar Cross Section of F35: Simulation and Measurement** *Deri Latika Herda, Joko Suryana, and Ahmad Izzuddin*
11.10 - 11.30 Paper ID 060011	**Error Performance Analysis of IMM-Kalman Filter for Maneuvering Target Tracking Application** *Meutia Yunita, Joko Suryana, and Ahmad Izzuddin*
11.30 - 11.50 Paper ID 060023	**CMA Based Blind Equalization for GFDM Systems** *Effrina Yanti Hamid, Muhammad Reza Averly, Rama Rahardi and Dewa Mahardika*
11.50 - 12.10 Paper ID 060061	**Filtered OFDM for High-speed Railway Communications** *Yoga Prastiya Wibawa, Iskandar, Irma Zakia*

Thursday, 3 September 2020 Online Room 2: 10.50 – 12.10	
Track	**: Technology Strategic Planning and Regulation**
Time	**Title / Author**
10.50 - 11.10 Paper ID 060010	**Analyzing the Initial Deployment of 5G Service in Indonesia: A Literature Survey** *Risyad Riyadi, Devani Claudia Lumban Gaol, Wervyan Shalannanda and Rifqy Hakimi*
11.10 - 11.30 Paper ID 060212	**Analysis of Digital Terrestrial TV Set-Top Box User Behavior at Indonesian Frontier, Outermost, and Underdeveloped Regions** *Wardahnia, Diah Yuniarti, Kasmad Ariansyah*
11.30 - 11.50 Paper ID 060016	**5G Migration Strategy Analysis for Indonesia** *Radifa Akbar Abhesa, Dimas Aji Pangestu, Arba Robbani and Rifqy Hakimi*
11.50 - 12.10 Paper ID 060348	**Evaluation of 5G NR Link Efficiency in 28GHz Spectrum Sharing** *Abdallah A. Abu-Arabia, Iskandar Iskandar and Rifqy Hakimi*

Thursday, 3 September 2020 Online Room 1: 13.00 – 15.00	
Track	**: Artificial Intelligence Applications**
Time	**Title / Author**
13.00 - 13.20 Paper ID 060325	**Speech Emotion Recognition using Convolution Neural Networks and Deep Stride Convolutional Neural Networks** *Taiba Majid Wani, Teddy Surya Gunawan, Syed Asif Ahmad Qadri, Hasmah Mansor, Mira Kartiwi, and Nanang Ismail*
13.20 - 13.40 Paper ID 060326	**A Summarization of the Visual Depression Databases for Depression Detection** *Arselan Ashraf, Teddy Surya Gunawan, Farah Diyana Abdul Rahman, Mira Kartiwi, Nanang Ismail and Ulfiah*
13.40 - 14.00 Paper ID 060244	**Classification of Article Knowledge Field using Naïve Bayes Classifier** *Aldy Rialdy Atmadja, Mohamad Irfan, Abdul Halim, Sarbini*
14.00 - 14.20 Paper ID 060254	**Research Development and Landscape Artificial Intelligence in Indonesia** *Muhammad Alvin Noor Reza, Ririn Herawati, Eki Ahmad Zaki Hamidi and Eueung Mulyana*
14.20 - 13.40 Paper ID 060258	**Image Processing Technique for Smart Home Security Based On Principal Component Analysis (PCA) Methods** *Rai Purnama Rizki, Eki Ahmad Zaki Hamidi, Lia Kamelia and Ramdani Wahyu Sururie*
14.40 - 15.00 Paper ID 060259	**The Comprehensive Review on Detection of Macro Nutrients Deficiency in Plants Base on Image Processing Technique** *Lia Kamelia, Titik Khawa Binti Abdul Rahman, Hoga Saragih and Reni Haerani*

Thursday, 3 September 2020 Online Room 2: 13.00 – 15.00	
Track	**: Modeling, Simulation, and Performance Analysis**
Time	**Title / Author**
13.00 - 13.20 Paper ID 060008	**Heuristic Algorithm for Ring Topology Optimization** *Rokhayah and Nana Rahmana Syambas*
13.20 - 13.40 Paper ID 060221	**Pearson correlation method and web scraping for analysis of islamic content on instagram videos** *Wisnu Uriawan, Agung Wahana, Diah Wulandari, and Rosihon Anwar*
13.40 - 14.00 Paper ID 060234	**Modeling Wall Tracer Robot Motion Based on Fuzzy Logic Control** *Alwan Abdul Zaki, Edi Mulyana, Rina Mardiati and Ulfiah Ulfiah*
14.00 - 14.20 Paper ID 060241	**Design of Automatic Underwater Robot System Based on Mamdani Fuzzy Logic Controller** *Aan Eko Setiawan, Rina Mardiati, Edi Mulyana and Ah Fathonih*
14.20 - 13.40 Paper ID 060245	**Design of Automatic Goods Carrier Robot System Based on Line Sensor and Fuzzy Logic Control Mamdani** *Abdul Mutolib, Rina Mardiati, Edi Mulyana, Aan Eko Setiawan and Ah Fathonih*
14.40 - 15.00 Paper ID 060247	**Ant Colony Algortithm in Selection Suitable Plant for Urban Farming** *Agung Wahana, Ichsan Taufik, Daniel Roberto Ramiraj, Cecep Nurul Alam and Beki Subaeki*

Thursday, 3 September 2020 Online Room 1: 15.40 – 17.00	
Track	**: Internet-of-Things-1**
Time	**Title / Author**
15.40 - 16.00 Paper ID 060227	**All-in-One Application For Smart Home System Base on Telegram Controlled** *Febi Indriyati Rukmana, Edi Mulyana, Lia Kamelia, Akmaliyah and Aep Kusnawan*
16.00 - 16.20 Paper ID 060231	**Design of Heart Rate Equipment Based on Bluetooth Communication on Bike Speedometers** *Adam Faroqi, Hilmy Belawi, M Ali Ramdhani and Eneng Nuraeni, D T Ismail*
16.20 - 16.40 Paper ID 060235	**Fish Feeding Automation and Aquaponics Monitoring System Base on IoT** *Akbar Riansyah, Rina Mardiati, Mufid Ridlo Effendi and Nanang Ismail*
16.40 - 17.00 Paper ID 060243	**Design of Remotely Operated Vehicle (ROV) Robot to Monitor pH, NTU, and PPM Water Data Monitoring Based on IoT** *Mohammad Adhipramana, Rina Mardiati, Edi Mulyana and M Ali Ramdhani*

Thursday, 3 September 2020 Online Room 2: 15.40 – 17.00	
Track	**: Telematics Systems and Software-2**
Time	**Title / Author**
15.40 - 16.00 Paper ID 060019	**Form Feature on Web Based Operation Support System (OSS) VSAT Modem for 3T Regions** *D. K. Adi, I.Y.M. Edward, and Iskandar*
16.00 - 16.20 Paper ID 060020	**Dashboard and Scraping Feature on Web Based Operation Support System (OSS) VSAT Modem for 3T Regions** *M.N. Mahendika, I.Y.M. Edward, and Iskandar*
16.20 - 16.40 Paper ID 060236	***Design and Build an Early Childhood Puzzle Educational Game Using the Fisher Yates Shuffle Algorithm as an Android-Based Scrambler for Snippets*** *Mohamad Irfan, Diena Rauda Ramdhania, Irma Sovia Nita and Tedi Priatna*
16.40 - 17.00 Paper ID 060062	**On the Design of System Interface and Integrator (Syster) for Disaster Mitigation Kit (Dirga Kit)** *Edbert Ongko and Tutun Juhana*

Friday, 4 September 2020 Online Room 1: 08.20 – 10.00	
Track : Internet-of-Things-2	
Time	**Title / Author**
08.20 - 08.40 Paper ID 060329	**Security Enhancement of Smart Home System using Signature Recognition on Raspberry Pi** *Teddy Surya Gunawan, Nur Asyiqin Hamzah, Mira Kartiwi, Mufid Ridlo Effendi, Nanang Ismail and Rosihon Anwar*
08.40 - 09.00 Paper ID 060233	**Design of Monitoring System of Cage Temperature and Automatic Chicken Feeder Based on Microcontroller** *Adam Faroqi, A N Utama, Edi Mulyana and M Ali Ramdhani, D T Ismail*
09.00 - 09.20 Paper ID 060338	**Development of Voice-Based Smart Home Security System using Google Voice Kit** *Teddy Surya Gunawan, Muhammad Najib Mokhtar, Mira Kartiwi, Nanang Ismail, Mufid Ridlo Effendi and Husnul Qodim*
09.20 - 09.40 Paper ID 060251	**Design of IoT-based Infant Incubator Monitoring System** *Wervyan Shalannanda, Irma Zakia, Erwin Sutanto and Fahmi Fahmi*
09.40 - 10.00 Paper ID 060255	**Design of Prototype Smart Office at Institut Agama Islam Bunga Bangsa Cirebon (IAI-BBC) Based on LoRa** *Iffan Ahmad Gufron, Oman Fathurohman, Miftahur Roifah, Muamar Wildan, Pepen Supendi and Eki Ahmad Zaki Hamidi*

Friday, 4 September 2020 Online Room 2: 08.20 – 10.00	
Track	**: Telematics Systems and Software-3**
Time	**Title / Author**
08.20 - 08.40 Paper ID 060	**On the Design of System Integration and User Interface for Ambient Assisted Living Applicationv** *Muhammad Ghifari Fairuzzaman and Tutun Juhana*
08.40 - 09.00 Paper ID 060	**Performance Evaluation of IEEE802.11p in Nakagami and the Two Ray Ground Propagation Model** *Ayushka Partohap and Tutun Juhana*
09.00 - 09.20 Paper ID 060	**Performance Evaluation of Video Streaming over VANET using Veins Simulator Framework** *Ichsan Sipala and Tutun Juhana*
09.20 - 09.40 Paper ID 060	**Multiple Spanning Tree Protocol Inter-Operability in Multi-vendor Environment** *Hendy Pratama and Tutun Juhana*
09.40 - 10.00 Paper ID 060	**Application for Rural Internet Access Services Logistics Travel Duration in Indonesia** *Wervyan Shalannanda, Radifa Akbar Abhesa, Deas Prouditya Raharjo, Dimas Aji Pangestu, Darien Yoga Adi Prawira, Viandra Nurmalita, Putri Andrawina, Bagas Purwa Sentika, Aidil Firmansyah Putra, Widia Angelina Samosir, Wilson Rustiandy, Ni Nyoman Dheanty Maharani, Amanda Ayu Liviani, Faza Athalah, and Aditya Saputra*

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Internet-of-Things

Paper ID 060227

All-in-One Application For Smart Home System Base on Telegram Controlled

Febi Indriyati Rukmana[1], Edi Mulyana[1], Lia Kamelia[1], Akmaliyah[2], Aep Kusnawan[3]
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***Abstract*— The integration between smartphone and home can create a smart home system. Smart Home is defined as a residence that uses a control system to integrate various automation systems in the home. This research aims to design a smart home control based on Telegram chat. The automatic control system created in this research uses ESP32. ESP32 is a microcontroller equipped with 2.4 GHz Wi-Fi and Bluetooth technology, the ESP32 development kit can be easily found on the market at a low price. LDR sensor used to automatically turn on/off the lighting system. DHT11 was used to measure the room temperature and humidity and controlling the fan. The alarm delay time on the door shows an average of 0.0375 seconds and on the window 0.0358 seconds. The DHT11 sensor temperature reading has an average difference of 0.64 C with a Thermometer. The DHT11 sensor humidity reading has an average difference of 10.3% with the Hygrometer.**

Keywords—DHT11; LDR; smart home; Telegram

Paper ID 060329

Security Enhancement of Smart Home System using Signature Recognition on Raspberry Pi

Teddy Surya Gunawan[1,2], Nur Asyiqin Hamzah[1], Mira Kartiwi[3], Mufid Ridlo Effendi[4], Nanang Ismail[4], Rosihon Anwar[5]
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***Abstract*—Signatures play the most crucial role in human's life as part of their identity. Nowadays, there is a growing interest in the smart home system using the Internet of Things (IoT). Furthermore, signature recognition and verification can play essential roles in finance, banking, home system, insurance and others. The main objective of this paper is to design and implement a signature recognition system on a single board computer, i.e., Raspberry Pi3 equipped with LCD touchscreen. First, the acquired signature image was cropped and resized. Next, a binary image was extracted as features to train the artificial neural network (ANN). The trained ANN was used to classify the input signature, whether it is genuine or forged. The recognition rate of 99.77% was achieved using a confidence level threshold of 85% during testing.**

Keywords—smart home; security enhancement; signature recognition; Raspberry Pi.

Paper ID 060231

DESIGN OF HEART RATE EQUIPMENT BASED ON BLUETOOTH COMMUNICATION ON BIKE SPEEDOMETERS

Adam Faroqi[1], Hilmy Belawi[1], M. Ali Ramdhani[2], Eneng Nuraeni[3]
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***Abstract*— A person heartbeat in a minute or so known as a Beat Per Minute (BPM), is one of the indicators of one's health. Many tools that can help sports activities in cycling, one of the pulse sensors used to be able to detect heart rate. Arduino acts as the brain in this tool. Arduino is powered trough a voltage source of a 9V DC battery. From the voltage source, Arduino will supply the voltage for the pulse sensor and Bluetooth HC-05. Pulse sensor will be given voltage by Arduino of 5V and Bluetooth get voltage equal to 3,3 V. When all component have active which will be shown on LCD which applied to handlebar bike.**

Keywords*— *Arduino, Bluetooth HC-05, Pulse Sensor, Bike

Paper ID 060233

DESIGN OF MONITORING SYSTEM OF CAGE TEMPERATURE AND AUTOMATIC CHICKEN FEEDER BASED ON MICROCONTROLLER

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***Abstract*— Chicken breeders are a type of work that is already familiar to Indonesian people and many chicken farmers still use manual methods to feed chickens and maintain the temperature of chicken coops. Because of that, the role of technology is needed for automatic feeding and monitoring the temperature of the cage so that chicken production reaches its maximum. This study aims to design a monitoring system for the temperature of the cage and chicken feeder automatically using a microcontroller. In this prototype, the feeding process uses DS3231 RTC module and motor servo, for monitoring the temperature of the chicken coops uses DHT22 sensor with lamp as indicator, and arduino uno as a microcontroller. Feeding is carried out based on a predetermined time that is morning at 08.00, afternoon at 13.00 and evening at 18.30. In the temperature control system, the temperature is less than 24 ° C, the lamp will automatically turn on to match the temperature required by poultry, and if the temperature is more than 32 ° C, the lamp will automatically turn off. The results of this study are able to monitor the feeding process and temperature of the cage in chicken farmers automatically.**

Keywords*— Arduino uno, feeding, temperature monitoring, chicken breeders

Paper ID 060235

Fish Feeding Automation and Aquaponics Monitoring System Base on IoT

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***Abstract*— Aquaponics is a cultivation technology that combines fish farming with plants. The degree of acidity (pH) and total dissolved solids (TDS) must be monitored for optimal fish and vegetable growth. In this research, a monitoring system designed for pH and TDS in aquaponics and automation of fish feeding based on scheduling and level of need. Monitoring of pH and TDS as well as automation of fish feeding is done through an Android-based application. Fish feeding is carried out according to a schedule with a specified feed weight. The monitoring system for pH and TDS are carried out in real time. The sensors used in this research are a pH sensor to measure pH values and an analogue TDS sensor to measure total TDS. The communication system used is based on IoT technology. Based on the test results, it is found that the average difference between the readings of the pH sensor and the pH meter is 0.66% and the average difference between the readings of the TDS sensor and the TDS meter is 2.588%. The system has been able to provide fish feed according to a set schedule automatically and with a feed weight as needed with an error rate of only 1%.**

Keywords—Aquaponics, Automation, IoT, pH, Total Dissolved Solid, Schedulling

Paper ID 060338

Development of Voice-Based Smart Home Security System using Google Voice Kit

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***Abstract*—Nowadays, speaker verification and speech recognition to control the smart home system has gained popularity. This paper presents the design and implementation of the voice-based smart home security system using Google Voice Kit, Raspberry Pi 3, relay and magnetic lock. There are two methods implemented in this research, i.e. Cloud Speech algorithm and Assistant algorithm. Three experiments were conducted in this research, including response time to the voice command, multiuser experiment, and multi-environment experiment. Results showed that Cloud Speech algorithm performs better than Assistant algorithm, in terms of processing time and accuracy. Cloud Speech algorithm requires less than 1.67 ms to lock and unlock the magnetic lock. The accuracy of the multiuser experiment using Cloud Speech is 90% on average. Finally, on the various environmental condition, Cloud Speech algorithm has the accuracy of 95%, 90% and 95% for the ambient room, cocktail noise, and loud musical noise, respectively.**

Keywords—smart home; speech recognition; speaker recognition; Raspberry Pi; Google Voice Kit.

Paper ID 060243

DESIGN OF REMOTELY OPERATED VEHICLE (ROV) ROBOT TO MONITOR pH, NTU, AND PPM WATER DATA MONITORING BASED ON IOT

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***Abstract*— Water is a very important element for humans. Clean water needs are always increasing, but the supply is running low due to water pollution. Various factors can affect water quality, including pH, turbidity (NTU), and substances that are dissolved in water (PPM). Therefore, water quality monitoring must be carried out quickly to determine the level of water quality that is around. By utilizing technological developments such as robots and internet of things monitoring water can be done in real time. In this study a robot system was developed to carry out water quality monitoring based on internet of things. This system uses a microcontroller, Arduino. The developed robot system is controlled by using a remote controller. The monitoring system developed uses a pH sensor to measure pH, a turbidity sensor to measure NTU, and a TDS sensor to measure PPM. To monitor, cloud server is used as a data viewer and data store. Cloud service used is Thingspeak. From the results of testing the robot system, the robot can be controlled properly, and the robot can be controlled to a distance of 140 meters with a robot speed of 0,46 km / hour. From the results of testing the monitor sensor, sensor can work well with an average speed of sending data for 30 seconds.**

Keywords—Robot, Monitoring, Internet of Things, Sensor, Arduino

Paper ID 060023

CMA Based Blind Equalization for GFDM Systems

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***Abstract* — Blind channel equalization for GFDM systems based on a constant modulus algorithm (CMA) is proposed in this paper. The system implements CMA together with a discrete Fourier transform (DFT) that enables the realization of blind equalizer which is comparable to pilot based system. The symbol error rate (SER) and mean squared error (MSE) are used to evaluate the performance of the proposed equalizer and the obtained results show that the performance of the proposed system is better than that of pilot based system. Its performance also closes to the perfect channel estimation and equalization.**

Keywords — blind channel equalization, constant modulus algorithm, GFDM system

Paper ID 060255

Design of Prototype Smart Office at Institut Agama Islam Bunga Bangsa Cirebon (IAI-BBC) Based on LoRa

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***Abstract*— As the high supervisor of the Bunga Bangsa Islamic Institute, Cirebon (IAI-BBC), he always pays attention to efficiency and enthusiasm in every activity, especially in an office environment, namely the control system and electronic equipment to minimize usage when it is not needed by making a LoRa-based smart office prototype. In this research, the LoRa module is used as a wireless communication module with a far enough coverage so that it can be monitored for office electronic devices. The control system uses ON / OFF for several electronic devices, namely lamps, projectors and security systems using a buzzer, room temperature with an office use scheduling system, the test results of this research are the maximum distance for sending data using LoRa communication as far as 220 meters with an average device system response 3.4 seconds.**

Keywords—IAI BBC, smart office, LoRa

Telecommunication Systems and Devices

Paper ID 060003

A 3D Multilateration Using RF Burst

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***Abstract*—Locating ability to decide target position is exceptionally valuable in numerous application fields. Multilateration is one of the method to get the position prediction using hyperbolic algorithm. This method exploits the Time Difference of Arrival (TDOA) information from least four receivers to get 3D position of target. This paper centers around the passive multilateration by using target's communication burst signal. Received burst signals are being correlated to get the TDOA. At that point by utilizing TDOA and receiver positions information, we can calculate the multilateration algorithm. This paper additionally shows the accuracy of position prediction in some example places of target.**

Keywords—multilateration; signal correlation; TDOA; three dimension

Paper ID 060006

Radar Cross Section of F35: Simulation and Measurement

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***Abstract*—Radar cross section (RCS) is important feature in radar target identification. This paper analyzes RCS of F35 aircraft at 5 GHz. The F35 model used in simulation is simplified version from real model with its small detail parts are treated as metal. The simulation is done by using Physical Optics (PO)- supported software, FEKO. Simulation is done for three different transmitter-receiver polarization configurations:Vertical/Vertical (VV), Vertical/Horizontal (VH), and 45°/45°. Besides simulation, this paper also analyzes measurement RCS of F35 for 45°/45° configuration. This paper shows monostatic RCS and bistatic RCS of F35 model aircraft.**

Keywords—RCS, Physical Optics, Bistatic RCS, Monostatic RCS, FEKO

Error Performance Analysis of IMM-Kalman Filter for Manuevering Target Tracking Application

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***Abstract* – Maneuvering target is one of the important issues in tracking algorithm development. Various techniques are used to improve algorithm performance in maneuvering target tracking. One of quite popular technique is the Interacting Multiple Model (IMM) algorithm. IMM algorithm uses a combination of several types of filter models in the tracking process. In this paper we will compare the error performance of three types of IMM algorithms, namely IMM - Kalman Filter (KF) constant velocity (CV) and constant acceleration (CA), IMM-KF constant velocity (CV) and constant turn (CT), and IMM - KF CV, CA, and CT. The three types of algorithm will also be compared with a single filter KF - CV to see an increase in the performance of the Kalman Filter algorithm on target maneuvers after being combined. The four types of algorithm will be tested in 3 types of generated target trajectories. Based on the simulation results, it is concluded that the IMM-KF that uses 2 types of filter models provide the best error performance compared to other algorithms. These four types of algorithms will also be tested on real measurement data, which is Automatic Dependent Surveillance - Broadcast (ADS-B) measurement data commonly used to support secondary surveillance radar (SSR) at the airports. From the results of the implementation (using ADSB data), the same conclusions are obtained from the simulation results.**

Keywords – Kalman Filter, IMM Filter, Maneuvering Target, Target Tracking

Gain Enhancement of Circular Polarization Microstrip Antenna Based on Array 8x2 Element

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***Abstract*— Gain enhancement of circular polarization microstrip antenna using the 8x2 element array method is proposed in this paper. The proposed antenna is intended to work in the frequency range 10700 - 11700 MHz for microwave radio communication systems. To get the maximum gain, the proposed antenna is optimized using an array with 8x2 elements. From the simulation results using EM simulation software, the return loss is -24.62 dB, VSWR is 1.125, bandwidth is 1397 MHz at the frequency of 10950 MHz. Optimization with the 8x2 element array method has been successfully in increasing the gain of the antenna up to 50.09% compared to the 4x2 element array design. The proposed antenna is suitable to be used for a receiving antenna in a microwave radio communication system.**

Keywords—Microstrip, Antenna, Array, Gain, Microwave

Paper ID 060017

Low Noise Block Down Converter and Block Up Converter Filters Design for Ku Band

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***Abstract*—This paper presents a Ku band Low Noise Block Down Converter (LNB) and Block Up Converter (BUC) filters design. The LNB can convert Ku band signal (10.70 – 12.75 GHz) to L band signal (950 – 2150 MHz), equipped with gain control and mode control features whih is regulated by ARM based microcontroller. This LNB design achieved 55 dB conversion gain from the simulation that has been done. As for the BUC filters, three filters have been created with different requirement, there are L-band filter, Local Oscillator filter, and Ku band filter. And from the results of the experiment, these filters has VSWR value close to 1 with a range of band that fit to the requirement.**

Keywords—Low Noise Block Down Converter, filter, Ku band

Paper ID 060018

Block Up Converter Design for Ku Band

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***Abstract*—This paper deals with the development of block up converter design for Ku band. The input of the block up converter, which is -17 dBm L band (950 – 1700 MHz) input signal will be conditioned and converted to 36 dBm Ku band (13.75 – 14.50 GHz) signal. This block up converter uses novel thermal compensation approach using power detector on the output to detect the signal output and compensate it using variable controlled attenuator that is controlled with Teensy 3.5. From the experimental result, it shows the realized design can output 34.14 dBm average power output and 42.33 dBm maximum power output on Ku band (13.75 – 14.50 GHz) with gain flatness of 0.546 dB and maximum VSWR of 1.727.**

Keywords—Block Up Converter, Ku band

Paper ID 060023

CMA Based Blind Equalization for GFDM Systems

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***Abstract* — Blind channel equalization for GFDM systems based on a constant modulus algorithm (CMA) is proposed in this paper. The system implements CMA together with a discrete Fourier transform (DFT) that enables the realization of blind equalizer which is comparable to pilot based system. The symbol error rate (SER) and mean squared error (MSE) are used to evaluate the performance of the proposed equalizer and the obtained results show that the performance of the proposed system is better than that of pilot based system. Its performance also closes to the perfect channel estimation and equalization.**

Keywords — blind channel equalization, constant modulus algorithm, GFDM system.

Paper ID 060237

Prototype Design for Object Coordinate Detection using RP LIDAR Concept

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***Abstract*—With the development of the times, the mapping and navigation systems are increasingly sophisticated, especially in detection systems. The system can be useful to be implemented in various fields such as search, exploration, military and also in the industrial sector. The ability of proximity sensors such as RP LIDAR (Light Detection and Ranging) to collect environmental information by detecting objects around them is very important in electronic and instrumentation technology. The RP LIDAR sensor has the ability as a detector, so that the sensor can be implemented to detect an object based on the Cartesian coordinates. However, the price of the RP LIDAR sensor is very expensive. So, designing a prototype for object detection based on coordinates was built using the RP LIDAR sensor concept at a relatively cheap price, namely by combining the HC-SR04 ultrasonic sensor with a 360- degree continuous servo motor to build a prototype detector. The ultrasonic sensor is used as a distance detector with the principle of receiving reflected waves from the transmitter, while the continuous servo motor is used as a rotator so that the ultrasonic sensor can rotate 360 degrees according to the angle rotation. The prototype detection test is carried out on a Cartesian coordinate board, by placing the prototype in the zero-degree position and the detection object in quadrants 1, 2, 3, 4 within a distance 5 cm - 50 cm. Based on the test results, it is obtained that the average difference between the prototype reading with manual measurement and calculation, the x-axis is 1.178 and the y-axis is 1.2875. Based on these results, we can conclude that the prototype of this detector is quite good.**

Keywords — Design prototype, Coordinate detection device, RP LIDAR sensor concept, Relatively cheap.

Paper ID 060061

Filtered OFDM for High-speed Railway Communications

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***Abstract* — The challenge of deploying orthogonal frequency division multiplexing (OFDM) for high-speed railways (HSRs) is associated with its high mobility and delay spread. These two conditions introduce loss of orthogonality between the OFDM subcarriers, hence, degrades the system performance. Although OFDM can provide high spectrum efficiency, but due to its inherited rectangular pulse shape, the frequency spectrum produced is not very well localized, which blocks its coexistence with other systems in adjacent carriers. Compared to the conventional OFDM, filtered OFDM (f-OFDM) has a lower out-of-band (OOB) interference and spectrum leakage. Therefore, f-OFDM is attractive to be implemented in high mobility applications such as in HSR, as considered here. By using the Hann and root-raised cosine (RRC) filters, simulation results show that f-OFDM provides better bit error rate (BER) and reduced OOB emission compare to conventional OFDM.**

Keywords—out of band (OOB) emission, Rayleigh fading, asynchronous transmission, long-term evolution (LTE), 5G new waveform.

Technology Strategic Planning and Regulation

Paper ID 060010

Analyzing the Initial Deployment of 5G Service in Indonesia: A Literature Survey

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***Abstract*— 5G service is already deployed in several countries. But the implementation in Indonesia still in the preparation phase due to the readiness of the spectrum and regulation. Several changes need to be done. The major change is how the regulation can support long term deployment and investment. In this paper, we survey the related works in 5G and outline 6 arising issues for the initial deployment of 5G in Indonesia to achieve a Healthy Industry 4.0 that helps to reshape the current model that supports collaboration and openness.**

Keywords: 5G, collaboration, spectrum sharing, spectrum licensing, regulation.

Paper ID 060212

The Beneficiaries' Behavior in Utilizing Subsidized Digital Terrestrial TV Set-Top Box: a Case of Indonesian Underserved Society

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***Abstract*— Indonesia is in a transition phase of terrestrial television broadcasting migration from analog to digital. In addition to provide better quality and richer features of digital television service, the migration will also save the spectrum so that it can be allocated for other telecommunications services. To accelerate the migration, Indonesian government has been devoting many efforts. One of them is by providing free Digital TV Set-Top Box (STB) for society live in the underserved area as a strategy to encourage them to fully migration to digital television service. However, it has been identified that a number of beneficiaries did not use the STB they received. Therefore, this study attempts to examine factors likely affect the STB use behavior by beneficiaries so that the government can develop better strategies in the future, accordingly. This study uses 2019 secondary data obtained from BAKTI. We use logistic regression to explain the relationship between STB use behavior as dependent variable and STB satisfaction, STB easy of operation, the age of STB since first reception, satisfaction of digital terrestrial television (DTT) socialization by government, average watching duration, the number of television, education, age, and gender as explanatory variables. The result confirms that STB satisfaction, STB ease of use, DTT picture quality, the satisfaction of digital terrestrial television (DTT) socialization, education, and age are 6 out of 10 independent variables statistically significant in explaining the behavior.**

Keywords*— *Digital dividend, Use Behavior, Set-Top Box, Digital Terrestrial Television

Paper ID 060016

5G Migration Strategy Analysis for Indonesia

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***Abstract*—In the recent years, many countries have started to implement the latest form of broadband telecommunication, which is 5G. As a developing country, it is important for Indonesia to start considering advancing their technology as early as possible. To achieve those objectives, a well-developed plan is needed regarding the needs of additional architecture to compensated 5G applications and services requirement. This paper elaborates on the service needed in 5G which shows that eMBB and URLLC is the most demanded service in Indonesia. To fulfill those demanded services, this paper also explains on the migration options that 3GPP has defined and how vendors will deploy 5G by their own migration strategies.**

Keywords—migration, architecture, 5G, Indonesia, service

Paper ID 060348

Evaluation of 5G NR Link Efficiency in 28GHz Spectrum Sharing

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***Abstractct*— Access to higher frequency bands, specifically in the millimeterwave (mm-W) is a promising way in fifth generation new radio (5G NR) wireless systems for meeting data rate requirements such as peak rate greater than 10 Gb/s and cell edge rate of up to 1 Gb/s. However, the emerging 5G NR systems will need to coexist with a number of incumbent systems in these bands. This paper investigates the feasibility of coexistence between a 5G NR system and a fixed satellite service (FSS) earth station (ES) sharing mm-W band, 27.5-28.35GHz (28 GHz) frequency band. The co-channel sharing scenario considers the fifth generation access point (5G AP) system as a victim receiver while the FSS ES as an incumbent interferer transmitter. The performance assessment is studied by conducting the interference model in the uplink direction, then evaluating the link quality at the 5G AP system in term of spectral efficiency using the block error rate as a sharing constraint. We found that FSS ES-to-5G AP separation distance is dominant factor contributing to the link efficiency. It is also found that, performance of 5G AP system is suppressed significantly as FSS ES transmission power increases and reducing FSS ES elevation angle toward 5G AP system. Based on obtained results, the 5G NR system can be developed in sharing scenario with minimizing the protection distance if appropriate design considerations are taken into account.**

Keywords–5G NR, 5G AP, FSS ES, spectral efficiency, protection distance.

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Telematics Systems and Software

Paper ID 060001

Design and Analysis of the Performance of Voice Switching Control System Prototypes for Air Traffic Control

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***Abstract*— Air Traffic Controller (ATC) which functions as a regulator of flight traffic uses voice communication as the main tool in carrying out its duties. The components of ATC that provide voice communication facilities are Voice Switching Control System (VSCS) that uses Circuit Switching (CS) and Time Division Multiplexing (TDM) technology, but this technology is complex and expensive. With advancing technological developments, VoIP communication using packet switching (PS) technology can be a cheaper alternative for voice communication at ATC. Through TCP/IP networks, the integration of VoIP with the communication, navigation and surveillance (CNS) components is also easier to implement. Apart from these advantages, sending voice packets over a packet switching-based network also presents new challenges in the form of communication reliability. The measurement of signal power level from radio transmissions, delay, jitter, packet loss and throughput, is carried out to test the reliability of the prototype related to technical requirements that refer to international standard documents (ICAO and Eurocae).**

Keywords—ATC, VSCS, VoIP, CWP, Signal, delay, jitter, packet loss, Throughput

Paper ID 060019

Form Feature on Web Based Operation Support System (OSS) VSAT Modem for 3T Regions

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***Abstract*—Due to the high usage of VSAT System in 3T Regions and the lack of required supporting software, we propose the usage of specifically built OSS (Operation Support System) as a supporting software for VSAT Modem in 3T Regions. OSS will be built in the form of a web application that is easily accessible. Currently the problem that often occurs in the VSAT System is a network configuration problem caused by human error, this configuration error results in the VSAT system unable to connect to the internet. OSS willl be able to help reduce the occurrence of human errors when configuring Modem and will provide the required digital storage. OSS will also help simplify maintenance requests that will be requested by the users**

Keywords—OSS, Modem, VSAT, Configuration, Web Application

Paper ID 060020

Dashboard and Scraping Feature on Web Based Operation Support System (OSS) VSAT Modem for 3T Regions

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***Abstract*—Due to the high usage of VSAT System in 3T Regions and the lack of required supporting software, we propose the usage of specifically built OSS (Operation Support System) as a supporting software for VSAT Modem in 3T Regions. OSS will be built in the form of a web application that is easily accessible. The current problem is that the modem monitoring media that can be easily accessed by technicians and service users is not yet available which results in both technicians and service users not being able to monitor the modem. The purpose of making the final project OSS is to be able to resolve the existing problem that is to provide modem monitoring media that can be accessed easily.**

Keywords—OSS, Modem, VSAT, Dashboard, Web Application

Paper ID 060224

TOPSIS Method on Selection of New Employees' Acceptance

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***Abstract*— A hospital is a labor-intensive organization that requires many personnel and professions from various disciplines. Employees are one of the determinants of the success of a company. One way that agencies use to obtain qualified employees is by making a selection at the time of employee recruitment. The problem that is often encountered is that parttime employee selection is calculated objectively so that it is less efficient and accurate in the selection process. Decision support systems with the TOPSIS method are considered suitable to assist the personnel section of the public Hospital in selecting prospective part-time employees. TOPSIS is a multicriteria decision-making method based on a concept where the chosen alternative has the closest distance from a positive ideal solution and also has the farthest distance from a negative ideal solution. The completion criteria applied to the selection of employees include the results of written tests, psychological tests, health tests, and interviews. The results of the tests show that the TOPSIS method can be used well in selecting and sorting from the largest to the smallest value with an accuracy rate of 85% in the amount of 20 data.**

Keywords— employee selection, decision support system, Hospital, TOPSIS.

Paper ID 060236

Design and Build an Early Childhood Puzzle Educational Game Using the Fisher Yates Shuffle Algorithm as an Android-Based Scrambler for Snippets

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***Abstract*— Educational game is a game in which there are elements of education that can hone and can increase knowledge, while the puzzle is a game of construction through the activity of installing or matching an object so that it becomes a certain pattern. The Fisher yates shuffle algorithm is a randomization technique in which this algorithm is implemented on puzzle pieces so that the puzzle pieces that come out will be different and rewarding without repetition and duplication. In this study, it can be concluded that the fisher yates shuffle algorithm can determine randomization solutions that are not multiple and do not repeat. Based on the pretest and posttest testing this puzzle education game was able to increase the knowledge of PAUD students by 23.68%, of which the pretest results were 64.13% and the posttest results were 87.81%.**

Keywords— android application, educational game, fisher yates, puzzle

Paper ID 060242

Decision Support System For Determining Inventory And Sales Of Goods Using Economic Order Quantity Methods And Linier Regression

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***Abstract*— Inventory control and sales are important activities for the company to run. Errors in determining the inventory of goods can cause swelling in operational costs so that the company experiences losses. To overcome this problem, a Decision Support System (DSS) is needed that can help make decisions in determining inventory and sales of goods. In this case, the researcher uses the Economic Order Quantity (EOQ) EOQ provides a reference regarding the number of purchases or orders of goods with minimum cost. Meanwhile, to determine the number of future sales, researchers used the Linear Regression method, which looks at the relationship between sales as a response variable and the sales period as a predictor variable. The results of this study can be used to estimate the amount of quantity each time order of goods and predict the number of sales in the next period.**

Keywords : Decision Support System, Economic Order Quantity, Linear Regression, Inventory.

Paper ID 060246

E-Mail Message Encryption Using Advanced Encryption Standard (AES) and Huffman Compression Engineering

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***Abstract*—E-mail is a means of sending messages electronically based online. Many students, institutions or companies use e-mail as a formal communication tool. However, please note that sending e-mails is done through public channels, namely the internet, making it possible to tap, manipulate data and leak information. Like hacking and theft of millions of unique ID (address) E-mail and passwords that occurred in midJanuary 2019 by the digital attackers. E-mail does not have security on the data sent. Implementation of encrypted messages in e-mails with cryptographic methods can be a solution for securing the data sent. In this study used the Advanced Encryption Standard (AES) and Huffman methods. The final result of this study is the occurrence of text messages using the AES and Huffman methods can be done up to 32.200 characters with an accuracy value of 90.62% and the difference in the performance time of encryption and decryption is 1% with the decryption process a little longer than the encryption process.**

Keywords— E-mail; Cryptography; Advanced Encryption Standard (AES); Huffman Methods; Encryption; Decryption;

Paper ID 060249

E-service: Concept and Application in The Citizen Association Environment

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***Abstract*— Public demands regarding public services, especially the need for excellent service, has encouraged the government to create innovation. Di Indonesia innovation base leads to e-government. E-government is a medium of reciprocal interaction between the community and the government. This is done because of the many problems that arise in society, especially related to bureaucracy and length of service time. Besides, the available human resources have not been able to meet the services that come from the community, and the administrative services are not optimal, causing new problems. Therefore, to answer the above problems, in this case, the researcher makes innovation in the form of a system that can be used as a solution, especially regarding population data collection, public service letters, data collection of births, deaths, and population mutations. The system was built using the prototype method as a guide in carrying out system development. Then the researcher translates the system into a website called e-service. This is because the website not only functions as a medium for disseminating information but the existence of communication with users allows for development into a better system. The results of the study indicate that the system built can overcome the problems that arise. For example, shorten the bureaucracy, the timeliness of administration. So, the conclusion is that the system can be used as a solution to answer existing problems.**

Keywords— E-service, Prototipe, Innovation, Public Service.

Paper ID 060060

Filtered OFDM for High-speed Railway Communications

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***Abstract* — The challenge of deploying orthogonal frequency division multiplexing (OFDM) for high-speed railways (HSRs) is associated with its high mobility and delay spread. These two conditions introduce loss of orthogonality between the OFDM subcarriers, hence, degrades the system performance. Although OFDM can provide high spectrum efficiency, but due to its inherited rectangular pulse shape, the frequency spectrum produced is not very well localized, which blocks its coexistence with other systems in adjacent carriers. Compared to the conventional OFDM, filtered OFDM (f-OFDM) has a lower out-of-band (OOB) interference and spectrum leakage. Therefore, f-OFDM is attractive to be implemented in high mobility applications such as in HSR, as considered here. By using the Hann and root-raised cosine (RRC) filters, simulation results show that f-OFDM provides better bit error rate (BER) and reduced OOB emission compare to conventional OFDM.**

Keywords—out of band (OOB) emission, Rayleigh fading, asynchronous transmission, long-term evolution (LTE), 5G new waveform.

Paper ID 060062

On the Design of System Interface and Integrator (Syster) for Disaster Mitigation Kit (Dirga Kit)

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***Abstract* — Natural disasters that happen in Indonesia contribute to the failure of telecommunication infrastructure in the affected area. As a result, the area is isolated from all forms of telecommunication. The act of Search and Rescue (SAR) done over the vicinity is often ineffective as there is lack of bird's eye view and visualization of the compound; coodination among SAR teams is done through devices that only support voice communication, which does not provide a detailed picture of the ongoing situation. An alternative to overcome this problem is Disaster Mitigation Kit (DIRGA KIT). DIRGA KIT is composed of two main devices: Portable Emergency Transceiver Station (PETS) and Rescuer Telecommunication Pack (RESPACK). However, a means to integrate both items and perform visualization of recorded data is needed to assist users, which is System Interface and Integrator (SYSTER).**

Research of SYSTER is done through literature study and laboratorial experiment. SYSTER consists of two components: integrator and graphical user interface (GUI). Integration is achieved with a mesh network utilizing B.A.T.M.A.N routing protocol and is supported with secure shell (SSH). The GUI is a web application built with Flask microframework and equipped with features to ease usage. A form of database is also added: InfluxDB.

Parameters tested in this research are success of device connection and GUI functions. Result of this research has proven that devices are interconnected and are able to communicate. Moreover, the following features are added on GUI and functions fully: display PETS's and RESPACK's GPS footprint on a map, display potential areas with victims, download data from PETS and RESPACK, configure PETS, display and delete PETS's subscribers list, and display camera shots taken with RESPACK.

Keywords—System Integration, GUI, PETS, RESPACK, DIRGA KIT

Paper ID 060063

Performance Evaluation of IEEE802.11p in Nakagami and the Two Ray Ground Propagation Model

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Abstract — In this work, a performance evaluation of protocols defined in the IEEE 802.11p standard is conducted through the observation of data obtained from simulation using NS-2 software. IEEE 802.11p is a protocol standard used in VANETs as a proposed solution to ITS. The performance parameters observed in this work includes maximum range, throughput and latency for each of the datarate allowed in the standard for a given PER and packet size. Acquisition of required data is done via simulation on NS-2 software using modules available on the NS-2 distribution or any that can be obtained from previous research. The simulation scenario includes multi hop communications with varying number of hops and single hop communications. The wireless channel in this work uses the Nakagami model for urban environments and the Two Ray Ground propagation mode. Simulation results then processed using tools made to obtain the values of the performance parameters. Analysis and conclusions regarding maximum range, throughput and latency for IEEE 802.11p are given.

Keywords— IEEE 802.11p, performance evaluation, throughput, latency, VANET

Paper ID 060064

Performance Evaluation of Video Streaming over VANET using Veins Simulator Framework

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Abstract — This paper discusses the design process and the simulation results on the Veins streaming video data applied to VANET. Methods used in this research are modify some of the modules in the Veins in order to support the simulation of video data with video trace method. Simulations carried out by modeling a Road side unit which transmits video data to numerous of vehicles crossing a street in the city of Bandung. Analysis was performed on data packet reception percentage, throughput, the car's distance from the transmitter and the quality of video received by each node or car. The conclusion was drawn regarding the communication range and transmission range based on the simulation's scenario , the value of average packet throughput on the network and the quality of video received on each car.

Keywords— VANET, Veins, video, streaming

Paper ID 060065

Multiple Spanning Tree Protocol Inter-Operability in Multi-vendor Environment

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Abstract — In a network topology which consists of many switch devices connected redundantly, Spanning Tree Protocol is very necessary to be implemented. This is intended to be able to overcome the problem of traffic looping, where frames sent from the source will only circulate between switch devices and will never reach its destination. Spanning Tree Protocol evolved, from the STP 802.1D standard until now there is a Multiple Spanning Tree Protocol (MSTP) that has a faster recovery time when loops are detected on the network and can reduce the CPU load on the switch in handling the Spanning Tree process.

Along with the advancement of network technology, competition between vendors in producing network devices has also increased. At present there are a lot of switch devices where the operation is sometimes at the same time between the devices of a vendor and other vendor devices. Further testing is needed regarding the compatibility of the Multiple Spanning Tree process between multi-vendor devices.

Keywords— Redundan, Spanning Tree Protocol, Traffic Looping, Multiple Spanning Tree Protocol, Multi-Vendor

Paper ID 060256

Design of Prototype Smart Home System Base on LoRa

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***Abstract*—The smart home system is a system in which there are features for controlling and monitoring household electronic equipment. The smart home application system is a combination of technology and services specific to the home environment. The main purpose of applying LoRa-based smart home system technology in this study is to monitor room temperature and control electronic devices. The communication module used in this research is the LoRa Dragino 915 MHz module. The LoRa Dragino 915 MHz module is used as a communication tool between LoRa Client and LoRa Server. The LoRa-based smart home system prototype that has been built can function properly according to specifications because it can monitoring room temperature in real-time and controlling electronic devices. Also, the range of communication signals between LoRa Client and LoRa Server which is tested in this research can work at a maximum distance of 183 meters in semi-open spaces while in unobstructed space the maximum distance is lower, which is only 63 meters.**

Keywords—LoRa Client, LoRa Dragino 915 MHz, LoRa Server, Perangkat Elektronik, Smart Home.

Artificial Intelligence Applications

Paper ID 060325

Speech Emotion Recognition using Convolution Neural Networks and Deep Stride Convolutional Neural Networks

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***Abstract*— An assortment of techniques has been presented in the area of Speech Emotion Recognition (SER), where the main focus is to recognize the silent discriminants and effective features of speech signals. These features undergo the process of classification to recognize the specific emotion of a speaker. In recent times, deep learning techniques have emerged as a breakthrough in speech emotion recognition for the detection and classification of emotions. In this paper, we have modified a recently developed different network architecture of convolutional neural networks, i.e., Deep stride Convolutional Neural Networks (DSCNN), by taking a smaller number of convolutional layers to increase the computational speed while still maintaining accuracy. Besides, we trained the state-of-art model of CNN and proposed DSCNN on spectrograms generated from the SAVEE speech emotion dataset. For the evaluation process, four emotions angry, happy, neutral, and sad, were considered. Evaluation results show that the proposed architecture DSCNN with the prediction accuracy of 87.8% outperforms CNN with an accuracy of 79.4%.**

Keywords—speech emotion recognition; spectrogram; strides; convolutional neural network (CNN); deep stride convolutional neural network (DSCNN)

Paper ID 060326

A Summarization of the Visual Depression Databases for Depression Detection

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***Abstract*—Depression is the most prevalent mental disorder in our society at present, and most of the population suffers from this issue. Hence there is an extreme need for the depression detection models, which will provide a support system and early detection of depression. There is an important need for relevant data to set up a depression detection model. This paper presents a brief summarization regarding ten depression datasets available, which will guide the researchers to select an appropriate dataset for their depression detection models. This summarization has been done over the non-verbal signs of depression, data collection techniques, clinical definition, and annotations. Moreover, a tabular list of datasets is provided for quick and easy look through.**

Keywords—depression; depression detection; summarization; depression datasets.

Paper ID 060244

Classification of Article Knowledge Field using Naïve Bayes Classifier

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***Abstract*— Scientific articles are articles that contain systematic reports on the results of a study or research, reviewing the articles in the publishing process will be more effective if the articles being reviewed are in accordance with the scientific field of the reviewer. Therefore, a classification process is needed for the article before it is directed to the reviewer. The classification carried out in this study is using the Naïve Bayes Classifier method. The study was conducted using training data as many as 150 articles that already have categories and test data as many as 100 articles. 71 classified test data outputs the appropriate category, while the rest are still inaccurate. Thus, the accuracy value obtained is 71.00%, this result is influenced by the amount of training data used, and the process at the pre-processing stage carried out.**

Keywords—article, journal, classification, naïve bayes

Paper ID 060254

Research Development and Landscape Artificial Intelligence in Indonesia

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***Abstract*—This study aims to find out the map of the development of Artificial Intelligence Research in Indonesia. The development of a study will be interrelated with research that has been done before. The existence of methods, infrastructure, data and others become a consideration when conducting research. The success of a study is supported by the existence of these things. The method used is to browse through the Lens.org website with keywords Artificial Intelligence, Machine Learning, Deep Learning, Artificial Neural Network, Convolution Neural Network, Natural Language Processing, Computer Vision, Backpropagation, and Support Vector Machine. Data sources were also taken from surveys conducted using the Google form platform, where the data from the survey results are still in the form of preliminary results. Data from these two sources are exported and processed into several parts, namely the number of publications, the type of publication, the most active institutions, open access publications, the most publications cited and the application of artificial intelligence technology in life aspects. The most published category is Support Vector Machine. The types of publications that are widely publicized are journal articles and conference proceedings. Institutions that have the most publications in each field are generally Telkom University, University of Indonesia, Bandung Institute of Technology and Sepuluh November Institute of Technology. The most cited paper is in the support vector machine category. Based on these data, Artificial Intelligence Research in Indonesia can be said to have developed rapidly.**

Keywords—Lens.org, Open Acces, Indonesia

Paper ID 060258

Image Processing Technique for Smart Home Security Based On Principal Component Analysis (PCA) Methods

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***Abstract*— Smart home is one application of pervasive computing branch of science. Three categories of smart homes, namely comfort, healthcare, and security. The security system is a part of smart home technology that is very important because the intensity of crime is increasing, especially in residential areas. The system will detect the face by the webcam camera if the user enters the correct password. Face recognition will be processed by the Raspberry pi 3 microcontroller with the Principal Component Analysis method using OpenCV and Python software which has outputs, namely actuators in the form of a solenoid lock door and buzzer. The test results show that the webcam can perform face detection when the password input is successful, then the buzzer actuator can turn on when the database does not match the data taken by the webcam or the test data and the solenoid door lock actuator can run if the database matches the test data taken by the sensor. webcam. The mean response time of face detection is 1.35 seconds.**

Keywords—face recognition; PCA; Raspberry pi; smart homes

Paper ID 060259

The Comprehensive Review on Early Detection of Macro Nutrients Deficiency Based on Image Processing Technique

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***Abstract*—Images are a significant source of data and information in agricultural technologies. The use of image processing techniques had important implications for the analysis of smart farm. The analytical system using digital image processing would classify the nutrient deficiency symptoms much prior than a human could identify. This will enable the farmers to adopt appropriate corrective action in time. The paper discusses various methods used in the detection of nutrient deficiencies in plants based on visual images. The image processing techniques have several stages to get the best results in nutrient deficiency detection, namely image acquisition, image enhancement, image segmentation, and feature extraction. Based on the analyses, it is proved that the image processing technology can support the development of farming automation to accomplish the advantages of low price, high efficiency, and high accuracy. Through analysis and discussion, the paper proposed a new technique in every phase of image processing for the detection of nutrient deficiency as the basis of the implementation in future research. Consequently, the research will support the growth of agricultural automation equipment and systems in more smart approaches.**

Keywords—image processing; nutrient deficiency; smart farm

Modeling, Simulation, and Performance Analysis

Paper ID 060009

New Heuristic Algorithm for Travelling Salesman Problem

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***Abstract*—Nowdays the ring topology has become a standard in network topology design, especially on optical network. Finding the minimum cost to connect all the nodes to create a ring topology network is the challenge. This problem is known as the Travelling Salesman Problem (TSP). This paper proposed a new heuristic algorithm to find minimum cost and minimum computation time in creating a ring topology. Proposed algorithm has 0,102% less accuracy than brute force for less than 15 nodes and 0,754% better than ant colony optimization (ACO). This algorithm takes computation time faster than BAMBANG and gives 15,16% better accuracy than SASHA.**

Keywords—travelling salesman problem; ring topology; brute force; ant colony optimization; heuristic algorithm

Paper ID 060221

Pearson correlation method and web scraping for analysis of islamic content on instagram videos

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***Abstract*—The Indonesian Internet Service Providers Association (APJII) revealed that more than half of Indonesia's population is now connected to the internet. One of the social media that can be accessed using is Instagram. Instagram is a photo and video sharing application that allows users to take photos, videos and apply digital filters. In the video post on Instagram, user can see the number of videos displayed especially for Islamic content. But if more video posts are displayed it, are the user get a lot of likes. In this study used web scraping technology which is useful for retrieving data on Instagram. Then the data were calculated using the Pearson correlation method to determine whether or not the relationship between like variables and the number of likes being strong. So, it can be a benchmark for preachers to know what kind of posts are preferred by Instagram users.**

Keywords—Instagram, Islamic content, Pearson Correlation, Web Scraping;

Paper ID 060234

Modeling Wall Tracer Robot Motion Based on Fuzzy Logic Control

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***Abstract*— Nowadays, robotic technology has experienced amazing progress, especially in the field of the wall tracer robot. This robotic wall tracer will ease any men's work in the areas of industry, manufacturing, and infrastructure. The research of robotic wall tracer have been conducted previously to improve the capability and the performance of robots. In this study, the blue print of wall tracer was created so that the robots are always in the set point position assigned. The motion control system of the wall tracer robots were designed using fuzzy logic, with the input in the form of distance obtained from ultrasonic sensor planted on the peripheral parts of the robots, and the output is manifested in the speed of both left and right wheels. The simulation was carried out using mamdani fuzzy logic models, so the robot can navigate down the wall with input decisions very close, near, middle, far, very far, and output decisions are very slow, slow, normal, fast, very fast. Based on the simulation result, we can concluded that the robot can perform their duties optimally, and could be implemented for the real system.**

Keywords— wall tracer robot, fuzzy logic, ultrasonic sensor, motion control

Paper ID 060241

Design of Automatic Underwater Robot System Based on Mamdani Fuzzy Logic Controller

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***Abstract*— Underwater robot is one of the robots that maneuver under water. This robot is controlled using a remote control or more commonly known as ROV. However, when controlled by the remote often interruptions or connections are often disconnected. Therefore it is necessary to make an underwater robot that can move automatically. In this study a discussion about automatic underwater robot simulation using the fuzzy method. Simulations performed on software to get a model of each membership fuction and get the value of the output. The sensor used is an ultrasonic water resist sensor and the motor used is a brushless motor. The parameters used are for the input is the front sensor distance, rear sensor distance and bottom sensor distance while the output parameters used are the right motor speed, left motor speed, right bottom motor speed and bottom left motor speed. The number of rules used is 125 rules. In this research, a case study with a distance sensor value of 30 cm, 30cm and 60 cm was completed. Then using the simulation, the output value as follows: PWM value for right motor is 17.3 PWM value for left motor 110 while for PWM value for motor bottom is 80. From the values it can be concluded that the robot in the maneuver turns right with the position at a medium height.**

Keywords—Robot, Underwater, Control, Fuzzy logic, Sensor.

Paper ID 060245

Design of Automatic Goods Carrier Robot System Based on Line Sensor and Fuzzy Logic Control Mamdani

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***Abstract*— The development of control system, especially in the field of robotics was improving more progress in efforts to complete human work. One of them is an automatic goods carrier robot system that used in industry. At present, the majority of automatic goods carrier robot system still use a human control. In this paper, a design of automatic system for robotic goods carriers will be presented. One of the challenges in the development of a goods transport robot system is how the robot can run stably when carrying goods. This study presents a design of goods carrier robot system based on line sensors and fuzzy logic control. The input that used in this fuzzy logic system are the light and weight which obtained from the BFD-1000 sensor and barometric sensor. Meanwhile, the output of fuzzy system are the speed of right motor and the left motor, in order to stabilize the robot movement when the load was added. The simulation was is done to get the membership function value. Based on the simulation results using a case study, it is known that the load carried is 210 grams and the living sensor is sensor - 2.5. Then the simulation results obtained speed of right motor PWM value of 21,9 and speed of left motor PWM value of 64,4. So that the robot runs in a straight state.**

Keywords : Goods Carrier Robot; Fuzzy Logic Control; Mamdani; Weight; Speed Introduction

Paper ID 060247

Ant Colony Algortithm in Selection Suitable Plant for Urban Farming

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***Abstract*—Urban Farming is the right solution where this agricultural method is an agricultural method that can take advantage of the narrow open land for farming purposes. Choosing a suitable crop type for a city can give better results. This research by observing the temperature of 5 (five) big cities. The purpose of this study is to select suitable plants for a city according to the temperature of each city. The Ant Colony Optimization (ACO) algorithm is inspired by the observation of an ant colony. Ants are animals that live as a unit in their colony as opposed to being seen as individuals who live independently of the colony. The results of this study provide a selection of plants suitable for cultivation in each city with an the level compatibility of 68 percent.**

Keywords—Urban Farming, temperature, Ant Colony Optimization, plants

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Offline Sessions

Paper ID 060222

The Analysis Of Unbalanced Assignment Problems Using The Kotwal-Dhope Method To Develop A Massive Open Online Course

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***Abstract*— This study discusses the optimal solution of the unbalanced assignment of minimization case in order to develop massive open online course in the Islamic Higher Education by using a new method that is the Kotwal-Dhope Method. The method was formed with the help of the Hungarian method and the Matrix One's Assignment method was resolves the unbalanced assignment problem with a data size 8x4 which aims to minimize the total costs incurred by an Islamic Higher Education. The optimal solution with the Kotwal-Dhope Method begins by adding a dummy of one, carrying out the division operation of each column with the smallest element, after each row and column has a value of one, perform assignments in condition one so that each lecturer has their own job in develop massive open online course. Based on the results of this study it was found that, lecturer B was assigned to do stage 1 (Defining educational content), lecturer D was assigned to do stage 2 (Production and technical integration), lecturer E was assigned to do stage 3 (Communication), and lecturer H was assigned to do stage 4 (Course Animation and Overview). Then the assignments were: B → 1, D → 2, E → 3, H → 4. From the results of the assignment, the optimal solution for the minimum cost is 18 + 23 + 12 + 20 = 73 unit costs.**

Keywords*— *assignment problems; Kotwal-Dhope method; Massive Open Online Course; optimal solution.

Paper ID 060228

Fuzzy Logic-Based Pressure Control System on Triaxial Test Equipment

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***Abstract*— One of the tools used to determine soil characteristics is the Triaxial test tool. The pressure of the backpressure system on the Triaxial test equipment using the CU method must be constant due to it will affect the results of the soil sample test on the triaxial tool. The purpose of this research is to create a back-pressure control system with liquid fluid media using Sugeno type fuzzy logic. The system was tested with a variation of 5 types of pressure, namely 1 kg/cm2 , 2 kg/cm2 , 3 kg/cm2 , 4 kg/cm2 , and 5 kg/cm2 . The rise time of the control system without fuzzy is faster, respectively 1.3s, 1.1s, 1.1s, 0.8s, and 0.94 s when compared to the control system using fuzzy, but the control system without fuzzy provides an oscillating response while the fuzzy control system can achieve the stable condition without oscillation. In addition, the overshoot for each tested pressure had a difference of 13%, 15.5%, 18.34%, 16.5%, and 12.8%, respectively. The percentage of fuzzy control system overshoot is less than 3% of the steady-state, while the overshoot of the fuzzy control system is in the range of 15%-20%.**

Keywords*— *fuzzy logic, control system, back pressure, triaxial.

Paper ID 060230

The Implementation of Mamdani's Fuzzy Model for Controlling the Temperature of Chicken Egg Incubator

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***Abstract*— Today, technological developments are developing rapidly in all fields, including in the field of animal husbandry. One of them is the use of technology applied in the process of hatching eggs in chicken farms. The optimal egg hatching process is an important process that influences the failure rate in hatching eggs. In the process of hatching eggs are closely related to temperature. Therefore temperature control is one important factor in the optimal egg hatching process. In this research, a chicken egg incubator prototype system was developed using a temperature control system using fuzzy control. This study discusses the chicken egg incubator system whose temperature is controlled using a logic fuzzy control, so the hatching process can run optimally. The input used in the logistics system fuzzy is the temperature and humidity obtained from the DHT11 sensor. Meanwhile, the output from the fuzzy system is the fan and lamp speed, to reach the temperature required for the system incubator. DHT11 sensor readings for example in the case of the first day at a temperature of 20.00 37.8◦C and humidity 52 % fan speed is 51, while simulations using Matlab obtained 33.8 and manual calculations obtained 33.070. Based on this research we can conclude the temperature control model for this incubator is quite good.**

Keywords—Egg Incubator; Fuzzy Logic Mamdani; Temperature Control

Paper ID 060232

DESIGN OF ARDUINO UNO BASED DUCK EGG HATCHING MACHINE WITH SENSOR DHT22 AND PIR SENSOR

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***Abstract*— Duck Egg hatching machine is a tool to petrify the farmers duck in cultivating duck. In the process of hatchery eggs naturally have a percentage of 70% to 75%. This is what makes the main benchmark in the process of designing a duck egg-based egg hatching machine with DHT22 and PIR sensors. The problem is the concept of how the incubator machine is designed and how the performance of the incubator machine is able to increase the egg percentage to hatch. In conducting this research, it is done by observing directly to the farm. Of the observation was then refortified by taking some literature discussing the egg hatching machine. The literature taken in the form of a handbook is held by the farmer itself as well as an existing research journal. Performance on automatic egg hatching machines designed in this research can increase the percentage of hatch for eggs by 95%. In the process of mechanical immersion by the appliance has been quite stable either in its temperature or humidity.**

Keywords*— *hatching, machine, automatic, sensors

Paper ID 060239

The Purpose of Bellman-Ford Algorithm to Summarize the Multiple Scientific Journal Articles

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***Abstract*—Text is a one of huge type data in the big data era today. It can be processed to be valuable information with Natural Language Processing approach, such as Automated Text Summarization. This study aims to purpose the text summarization automatically for multiple text documents with graph approach at once. The graph approach that purposed in this research as methodology is Bellman-Ford algorithm. This research uses scientific journal articles documents in Indonesian language as the case study. The result of this research is the logical framework based on literature review ana analysis of Bellman-Ford algorithm for automated text summarization. This framework can be implemented and evaluated in the further works.**

Keywords— Bellman-Ford algorithm, extractive summarization, multiple documents, natural language processing, text summarization

Paper ID 060240

Deep Learning Approach to Bullying Classification on Twitter Social Media

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***Abstract*—Cyberbullying is usually through social media intermediaries. The victim of cyberbullying will feel very depressed because of the wide spread of social media that can be seen and accessed by many people and also the privacy of the victim has no meaning, even all the shame and ugliness of the victim can be accessed by many people. The purpose of this study was to analyze the text documents on social media and then classify them into two classes, namely indications of bullying or cleanliness. Word2Vec and LSTM will be combined in this classification model. Based on the testing phase, it can be concluded that there is still a lot of bullying on social media, especially on Twitter. This is evident from a large amount of Twitter data that 81.6% contains bullying words or sentences. The results of this study can be used as a basis for social media managers to take decisive action against bullies.**

Keywords—deep learning; bullying, classification, text mining, LSTM, Long Short Term Memory; Neural Network; Word2Vec

Paper ID 060250

The Monitoring System Prototype Of Health Condition For Home Care Patients Base On Internet Of Things

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***Abstract*— One of the technological advances in the medical world that have become increasingly popular in recent years is the use of telemedicine. Remote patient monitoring systems are designed to obtain many physiological data from patients. This aims to allow the medical team to control the homecare patient's condition in real-time. The monitoring system directly uses the IoT method and the data will be delivered to the medical team via the Telegram application site. The data obtained is the result of the patient's blood pressure using the MPX5050DP series air pressure sensor, the heart rate with a beats-per-minute (bpm) count using a pulse sensor and body temperature with the MLX90614 infrared heat sensor. The patient monitoring system performs data collection with an accuracy of 96.62% systolic blood pressure and 94.74% diastolic value. For the average pulse rate, an accuracy of 92.4% and an accuracy of the value obtained by body temperature is 97.3%.**

Keywords—health condition; patient; Telegram; Telemedicine

Paper ID 060253

Design of Prototype Monitoring System Base Tranceiver Station (BTS) Base on Internet of Things

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***Abstract*— This research is purposed to build a prototype of Base Transceiver (BTS) Monitoring System based on Internet of Things where in a BTS is installed 5 main sensors as parameter for BTS to be real time monitored. Those parameters are : voltage source on BTS is installed with ZMPT101B sensor. Battery voltage on BTS is intalled with DC voltage sensor. BTS door is installed with MC38 sensor. Cable on BTS is installed with SW420 sensor, and BTS room temprature is intalled with DHT22 sensor. All sensors is controlled by Arduino which installed with Ethernet to send data into sensors. Server itself is using Rasberry Pi which installed by NodeRed application to input MQTT as database transceiver to MySQL. MySQL acted as webserver, so data can be displayed on web interface as output for sensors. Sensors quality is also test and compared using calibrated standard measurement device and output of every sensors are examined. Output of ZMPT101B has an error rate of 0,15%, voltage DC 12% of error rate, DHT22 0.46% error rate, MC38 sensors sensitivity speed of 1,3 second and SW420 has sensitivity speed of 1,42 second. Output on website has 3 menu, which are dashboard display, chart display, and data history display as latest data stored in web interface.**

Keywords— BTS, System Monitoring, IOT, Prototype

Paper ID 060256

Design of Prototype Smart Home System Base on LoRa

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***Abstract*—The smart home system is a system in which there are features for controlling and monitoring household electronic equipment. The smart home application system is a combination of technology and services specific to the home environment. The main purpose of applying LoRa-based smart home system technology in this study is to monitor room temperature and control electronic devices. The communication module used in this research is the LoRa Dragino 915 MHz module. The LoRa Dragino 915 MHz module is used as a communication tool between LoRa Client and LoRa Server. The LoRa-based smart home system prototype that has been built can function properly according to specifications because it can monitoring room temperature in real-time and controlling electronic devices. Also, the range of communication signals between LoRa Client and LoRa Server which is tested in this research can work at a maximum distance of 183 meters in semi-open spaces while in unobstructed space the maximum distance is lower, which is only 63 meters.**

Keywords—LoRa Client, LoRa Dragino 915 MHz, LoRa Server, Perangkat Elektronik, Smart Home.

Paper ID 060257

Interface Application Design for Smart Home Based on LoRa

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***Abstract*— Applicated of LoRa technology itself will not separated from an interface who created to connect between humans and computers in this case a smart home device was made. This study aims to design a GUI interface for LoRabased smart home and implement a smart home system using applications that can control LoRa-based household electronic devices. The results of this study are devices for applying LoRa-based smart homes and web-based applications as interfaces so that users can use smart home devices. LoRa Dragino is used as a client and server communication tool and the NodeMCU (ESP8266 Module) is used as a liaison between the server and the user through the GUI interface created. This web-based application is compatible with Android 6.0, 7.1.2, 9.0, 10.0, and iOS 9.3.5, and various browsers such as Internet Explorer, Mozilla Firefox, and Google Chrome. The test results of the interface design are made with a 10 times test of each feature that produces 0% error, which means that the features contained in the interface design are made to work according to plan. The average delay when controlling a household electronic device is 3.86 seconds. The furthest communication distance between the LoRa Server and the LoRa Client is 63 meters in blocked space and 183 meters in semi open space.**

Keywords*— *Client, Interface, LoRa, Server, Smart Home