APTIKOM

The 6th International Conference on Informatics and Computing (ICIC) 2021

ICIC 2021

PROGRAM BOOK

NOVEMBER 3 - 4, 2021

IEEE INDONESIA SECTION

https://icic-aptikom.org

WELCOME MESSAGE FROM HEAD OF APTIKOM

Assalamualaikum warahmatullahi wabarakatuh

A new life style is here. Landscape of things are changed. Technology of industrial revolution 4.0 and Covid-19 become the triggering factors to radical changes. Everything becomes data. Automation systems flourish to capitalize the digital life. Playing field of workforces also changed, from traditional workforces to digital workforces. More digital skills set are needed in order to capitalize and respond to the challenges and opportunities in this disruptive situation.

This ICIC 2021 presents and discusses how these landscapes of things and workforces are changing and what are the skills set needed for Indonesians' workforce. A radical change is needed in our educational systems. Besides that, data business driven should be established in order to improve performances. In order to survive and gain competitive advantages, we have to expedite the digital transformation. All those issues become the main reason of ICIC 2021 choose the theme of this year conference "Empowering Artificial Intelligence to Accelerate Digital Transformation in the Era of the Industrial Revolution 4.0".

We are very optimistic, through this conference and with all coordinated efforts in education, research and development, and community services, we can contribute significantly to science and technology advancement in Indonesia, and be ready to welcome society 5.0.

Welcome to join ICIC 2021

Thank You

Prof. Ir. Zainal Arifin Hasibuan, PhD.
Head of APTIKOM

MESSAGE FROM THE GENERAL CHAIR

It is my great pleasure to warmly welcome you to the Sixth International Conference on Informatics and Computing (ICIC 2021) held for the second time, ONLINE. The ICIC is a conference series which is conducted annually by APTIKOM, the Indonesian Association of Higher Education in Informatics and Computing. This year the main theme of the conference is **"Empowering Artificial Intelligence to Accelerate Digital Transformation in the Era of the Industrial Revolution 4.0"**, with an intention to bring up more awareness in our society on the importance of Artificial Intelligence in the current era and beyond.

The ICIC conference series as a flagship conference of APTIKOM serves as an arena for academicians and their students, experts and practitioners from the industry to meet, present, and have fruitful discussions on their research works, ideas, and papers in the wide areas of Computing which covers Computer Science, Information Systems, Information Technology, Software Engineering, and Computer Engineering. The conference is set to provide opportunities for participants from both academia and industry to share and exchange knowledge as well as the cutting-edge development in the computing field. It is expected that the ICIC participants will be able to take away new thinking and horizon from this conferential meeting to further their works in the area.

There are 164 papers submission and only 80 papers are accepted which is around 48% acceptance rate only. The accepted papers will be presented in one of the 8 regular parallel and tracks sessions and will be published in the conference proceedings volume. The diversity of authors come from 6 different countries.

All accepted papers are submitted to IEEE Xplore. IEEE Conference Number: ## 54025. Catalog Number: CFP21G52-ART ISBN: 978-1-6654-2155-3

On behalf of the ICIC 2021 organizers, we wish to extend our warm welcome and would like to thank for all Keynote Speakers, Reviewers, Authors, and Committees, for their effort, guidance, contribution and valuable support. We would like to also extend our gratitude to IEEE Indonesia Section for technically co-sponsored this event.

I wish you all a most wonderful, enjoyable, and productive conference in this ICIC 2021.

Thank you.

Wa billahi taufiq wal hidaayah.
Wallahul muwaffiq ila aqwamit tharieq.

Wasalaamu ‘alaykum warahmatullahi wabarakaatuh.

Yusuf Durachman

Organizing Chair

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KEYNOTE SPEAKERS

Prof. Dr. Teddy Surya Gunawan

International Islamic University Malaysia

Teddy Surya Gunawan received his BEng degree in Electrical Engineering with cum laude award from Institut Teknologi Bandung (ITB), Indonesia in 1998. He obtained his M.Eng degree in 2001 from the School of Computer Engineering at Nanyang Technological University, Singapore, and PhD degree in 2007 from the School of Electrical Engineering and Telecommunications, The University of New South Wales, Australia. His research interests are in speech and audio processing, biomedical signal processing and instrumentation, image and video processing, and parallel computing. He is currently an IEEE Senior Member (since 2012), was chairman of IEEE Instrumentation and Measurement Society – Malaysia Section (2013 and 2014), Professor (since 2019), Head of Department (2015-2016) at Department of Electrical and Computer Engineering, and Head of Programme Accreditation and Quality Assurance for Faculty of Engineering (2017-2018), International Islamic University Malaysia. He is Chartered Engineer (IET, UK) and Insinyur Profesional Madya (PII, Indonesia) since 2016, and registered ASEAN engineer since 2018.

Prof. Ismail Khalil, Ph.D

Johannes Kepler University Linz, Austria

Ismail Khalil (http://www.iiwas.org/ismail/) is the deputy head of the institute of telecooperation, Johannes Kepler University Linz, Austria, since October 2002. He is the president of the international organization of Information Integration and Web-based Applications & Services (@WAS). He holds a PhD in computer engineering and received his habilitation degree in applied computer science on his work on agent's interaction in ubiquitous Environments in May 2008.

He currently teaches, consults, and conducts research in Mobile Multimedia, Cloud Computing, Agent Technologies, and Web Intelligence and is also interested in the broader business, social, and policy implications associated with the emerging information technologies. Before joining Johannes Kepler University of Linz, he was a research fellow at the Intelligent Systems Group at Utrecht University, Netherlands from 2001-2002 and the project manager of AgenCom project at the Software Competence Center Hagenberg Austria from 2000-2001.

Dr. Khalil has authored around 100 scientific publications, books, and book chapters. He serves as the Editor-in-Chief of 4 international journals and 2 books series. His work has been published and presented at various conferences and workshops.

PROGRAM STRUCTURES

Wednesday, November 3rd, 2021

Venue: Virtual – Zoom Platform

08.00-09.00	**REGISTRATION**						
09.00-09.30	**CONFERENCE OPENING** MC: Mr. Agus Priadi, M.Pd & Mrs. Cicih Nuraeni, M.Pd • Conference Report by Conference Chair, Yusuf Durachman • Opening Remark by Head of APTIKOM Prof. Ir. Zainal Arifin Hasibuan						
09.30-11.00	**KEYNOTES I:** Prof. Dr. Teddy Surya Gunawan **(Department of Electrical and Computer Engineering, International Islamic University Malaysia)**						
11.00-12.30 Session 1 Zoom Breakout Room	Track 1 Paper Presentation	Track 2 Paper Presentation	Track 3 Paper Presentation	Track 4 Paper Presentation	Track 5 Paper Presentation	Track 6 Paper Presentation	Track 7 Paper Presentation
	MEETING BREAK						
13.00-14.20 Session 2 Zoom Breakout Room	Track 1 Paper Presentation	Track 2 Paper Presentation	Track 3 Paper Presentation	Track 4 Paper Presentation	Track 5 Paper Presentation	Track 6 Paper Presentation	Track 7 Paper Presentation
14.30-16.00 Session 3	**KEYNOTES II:** Prof. Ismail Khalil, Ph.D **(Deputy Head of the Institute of Telecooperation, Johannes Kepler University Linz, Austria)**						
16.00-16.30	**CLOSING CEREMONY** • **Best Paper Announcement** • **Next Conference Announcement** • **Closing Statement by Secretary General of APTIKOM Mr. Prof. Dr.rer.nat. Achmad Benny Mutiara**						

PRESENTATION SCHEDULE

DAY	Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7
WED	3	69	11	67	57	131	63
11.00 - 12.30	4	79	15	70	72	144	26
	24	82	25	77	76	146	20
	43	97	28	107	80	156	119
	133	110	141	109	91	123	105
	73	112	162	121	99	128	56
WED	44	12	47	31	84	111	58
13.00 - 14.30	45	13	48	32	85	113	127
	49	14	50	37	89	114	117
	64	19	59	38	90	115	125
	137	42	163	158	101	129	159
	160		164	157	102	130	

SESSION 1 – 11.00 – 12.30

Track 1

IS/IT	3	Aang Darmawan, Daniel Siahaan, Tony Dwi Susanto, Achmad Nizar Hidayanto, Aang Subiyakto and Tony Yulianto	Adapting The User-Centered Cognitive Walkthrough (UC-CW) for Assessing the User Experience of Smart Regency Mobile-Apps Service in Indonesia
IS/IT	4	Aang Darmawan	Adaptation of the meCUE 2.0 Version for User Experience(UX) Measurement Approach into Indonesian Context
IS/IT	24	Eka Miranda, Mediana Aryuni, Richard Richard and Adrian Giovanny Tanara	Health Care Mobile Application Development for Sub-District Primary Health Care: How and Why
IS/IT	43	Albertus Widiantoro, Bernardinus Harnadi and Hendra Prasetya	Examining the Adoption of Mobile Payment Service: Expectation Confirmation Model with Trust
IS/IT	133	Amalia Rahmah	Designing Early Warning System for Course Completion using Learning Management System
IS/IT	73	Nashrul Hakiem, Herlino Nanang, Asep Taufik Muharram, Velia Handayani, Rosa Adelina and Siti Ummi Masruroh	The Technology Acceptance Model on Electronic Letter (E-Letter) Application

Track 2

IS/IT	69	Lista Meria, Qurotul Aini, Nuke Puji Lestari Santoso, Untung Rahardja and Shofiyul Millah	Management of Access Control for Decentralized Online Educations using Blockchain Technology
IS/IT	79	Lukman Rosyidi, Warsono Warsono and Muh. Syaiful Romadhon	Design of Blockchain Implementation for Supervision of Vaccine Distribution: Indonesia Case
IS/IT	82	Yosua B. Putrapratama, William Adjandra, Adhitia Wiraguna, Dana I. Sensuse and Nadya Safitri	Knowledge Reuse Evaluation in Software Development: Case Study on a Startup Company
IS/IT	97	Fx Hendra Prasetya, Bernardinus Harnadi, Albertus Dwiyoga Widiantoro and Agus Cahyo Nugroho	Extending ECM with Quality Factors to Investigate Continuance Intention to Use E-learning
IS/IT	110	Akmal Silva Pratama, Eidelina Maghfirah, Faiz Ramadhan, Joharotul Jamilah and Raudatul Zanah As	The Role of Indonesian Education-based Startup in Enhancing the Learning Quality of High School Students in COVID-19 Pandemic Era
IS/IT	112	Foni Agus Setiawan and Puji Rahmadi	IndoAlgae: The Database of Indonesian Native Strains of Potential Marine Micro and Macro Algae

Track 3

CE/CS	11	Ryan Gusti Nugraha, Mochamad Yoga Wibowo, Prasetyo Ajie, Hanny Hikmayanti Handayani, Ahmad Fauzi and Anis Fitri Nur Masruriyah	Implementation of Deep Learning in Order to Detect Inapposite Mask User
CE/CS	15	Bayu Yasa Wedha, Daniel Avian Karjadi, Erick Dazki, Handri Santoso and Richardus Eko Indrajit	Analysis of IoT adoption on Trucking Logistics in various Industry in Indonesia
CE/CS	25	Ben Rahman	Detection of Heart Disease Classification Model Using K-Nearest Neighbor Algorithm
CE/CS	28	Andi, Carles Juliandy, Robet, Octara Pribadi and Robby Wijaya	Image Authentication Application With Blockchain to Prevent and Detect Image Plagiarism
CE/CS	141	Faiqa Adnan and Muhammad Shoaib Farooq	Text Summarization Techniques Using Natural Language Processing: A Systematic Literature Review
CE/CS	162	Bambang Mardisentosa, Untung Rahardja, Kenita Zelina, Fitra Putri Oganda and Marviola Hardini	Sustainable Learning Micro-Credential using Blockchain for Student Achievement Records

Track 4

CE/CS	67	Wanda Vernandhes, Nur Sultan Salahuddin, R.R Sri Poernomo Sari and Trini Saptariani	Happy Hypoxia Early Detection Tool in IoT Based for COVID-19 Patients Using Blood Oxygen Levels (SpO2) Sensor, Body Temperature and Electrocardiogram (ECG)
CE/CS	70	Zaenal Mutaqin Subketi, Suhadi Suhadi, Ramdani Ramdani, Suroso Suroso, Rudi Budi Agung and Miftakhus Surur	Internet of Things-based Early Warning Car Theft Security System Using Smartphones
CE/CS	77	Suhadi Suhadi, Marisa Marisa, Muhamad Nur, Prima Dina Atika, Sugiyatno Sugiyatno and Davi Afandi	Internet of Things-based Analysis of Factory Production Machine Damage Detection System Model Using Case-Based Reasoning Method
CE/CS	107	Andreas Renaldy Darmawidjaja and Eri Prasetyo Wibowo	Design and Simulation of Antipodal Vivaldi Antenna (AVA) AT 2.6 GHz For 5G Communication Optimation
CE/CS	109	Bayu Kumoro Yakti, Sarifuddin Madenda, Sunny Arief Sudiro and Purnamawan Musa	Processing Speed Comparison of The Least Significant Bit (LSB) Steganography Algorithm On FPGA And Matlab
CE/CS	121	Desy I. Puspitasari, Alfath R. Kholdani, Adani Dharmawati, Muhammad E. Rosadi and Windha M.P. Dhuhita	Stroke Disease Analysis and Classification Using Decision Tree and Random Forest Methods

Track 5

CS/I	57	Doni Purnama Alamsyah, El Miana Assni Ernamia and Asti Herliana	Implementation of Text Mining for Sentiment Analysis of Online Lectures During the Covid-19 Pandemic
CS/I	72	I Made Agus Wirawan, Retantyo Wardoyo and Danang Lelono	Comparison of Baseline Reduction Methods for Emotion Recognition Based On EEG Signals
CS/I	76	Muhammad Said Hasibuan	Smart Mall to Reduce Crowds During the COVID-19 Pandemic
CS/I	80	Hanny Haryanto, Aripin, Acun Kardianawati, Umi Rosyidah, Erna Zuni Astuti and Erlin Dolphina	Fuzzy-based Dynamic Reward for Discovery Activity in Appreciative Serious Game
CS/I	91	Fabianaugie Jametoni and Dany Eka Saputra	A Study on Autonomous Drone Positioning Method
CS/I	99	Albertus Widiantoro, Adi Wibowo and Bernardinus Harnadi	User Sentiment Analysis in the Fintech OVO Review Based on the Lexicon Method

Track 6

CS/I	131	Suko Pernanda, Moh Wibowo and Nur Rokhman	Sarcasm Detection of Tweets in Indonesian Language Using Long Short-Term Memory
CS/I	144	M. Mustakim, Retantyo Wardoyo, Khabib Mustofa and Gandes Retno Rahayu	Latent Dirichlet Allocation for Medical Records Topic Modeling: Systematic Literature Review
CS/I	146	Apriandy Angdresey, Ivana Valentine Masala, Vivie Deyby Kumenap, Michael George Sumampouw, Kristian Alex Dame and Ivan Daniel Reynaldo Riady	A Communication Assistant Application for the Deaf
CS/I	156	Doni Setyawan, Retantyo Wardoyo, Moh Wibowo and E. Elsa Hardiana Murhandarwati	Malaria Classification Using Convolutional Neural Network: A Review
CS/I	123	Siska Puspitaningsih, Suryono Suryono and Farikhin Farikhin	Design and Implementation of an Emergency Pregnancy Referral Application Using Rule-Based Expert System Forward Chaining Method
CS/I	128	Arief Hidayat, Kusworo Adi and Bayu Surarso	Determine Felder Silverman Learning Style Model using Literature Based and K-Means Clustering

Track 7

IS/IT	63	Jakiatin Nisa, Mirza Desfandi and Tri Suryaningsih	Development of WebGIS of the Level of Community Participation in Flood Mitigation and Preparedness
IS/IT	26	Muhammad Yoma Putra Perdana, Arini Arini, Andrew Fiade and Iik Muhamad Malik Matin	Fuzzy Multi Criteria Decision Making for Optimization of Housing Construction Financing
IS/IT	20	Hendy Maulana Jaya Saputra, Tegar Palyus Fiqar, M. Gilvy Langgawan Putra and Lovinta Happy Atrinawati	Service Agreement Development for Information Technology Help Desk at University Using ITIL V3 2011 and COBIT 2019
CE/CS	119	Putri Rizki Amalia and Edi Winarko	Aspect-Based Sentiment Analysis on Indonesian Restaurant Review Using a Combination of CNN and Contextualized Word Embedding
CE/CS	105	Mochamad Yazid Gupron and Umaisaroh Umaisaroh	Network Automation for CE Router with Route Leaking in MPLS-VPN Network
CE/CS	56	Tedy Sepdiansah and Mochammad Akbar Marwan	Design and Analysis of Rectangular Patch MIMO 2x2 Antenna With DGS and Inset Fed for 5G Network

SESSION 2 – 13.00 – 14.30

Track 1

IS/IT	44	Erna Hikmawati and Kridanto Surendro	Adaptive Rule from the Viewpoint of Philosophy of Science
IS/IT	45	M. Gilvy Langgawan Putra, Rama Yogaswara and M. Ihsan Alfani Putera	Analysis Effect of User Experience on Understanding Rate of Student Using Academic Information System in Higher Education with Honeycomb Method
IS/IT	49	Bryanza Novirahman, Yudho Giri Sucahyo and Arfive Gandhi	Monetization Model Suggestion of Islamic Education Technology Application
IS/IT	64	Inayatulloh Inayatulloh, Enggal Sriwardiningsih, Novan Zulkarnain, Maisyarah Rahmi, Ni Luh Ariningsih Sari, Yenny Desnelita and Novingky Ferdinand	Factors Impact E-Learning System in Higher Education in Indonesia
IS/IT	137	Muhammad Junaid Anjum and Muhammad Shoaib Farooq	SDN based V2X Networks for Disaster Management: A Systematic Literature Review
IS/IT	160	Mohamad Ikbal Albana, Akhmad Baidun, Rena Latifa and Muthia Rahmah	The Predictor of Costumer Loyalty of Online-Based Transportation Application

Track 2

SE	12	Richardus Indrajit	Risk Mapping against Cyber Attack Trend in the Perspective of National Defense and Military Sector in Indonesia
SE	13	Richardus Indrajit	The Taxonomy of Cyber Threats to National Defense and Security
SE	14	Richardus Indrajit	Unraveling the Complexity of Developing a National Cyber Defense Sovereignty Policy: A Case Study of Indonesia
SE	19	Gladys Indri Putri, Nuryadin Nuryadin, Richardus Eko Indrajit, Erick Dazki and Handri Santoso	Analysis of Teacher and Student Responses to the Use of a Web-based Learning Management System (LMS) during COVID-19 Pandemic.
SE	42	Novrianto Batara and Suyoto Suyoto	Indonesian Typical Food Recommendation System Using Machine Learning and Chatbot for E-Wallet

Track 3

CE/CS	47	Muhammad Rifki Rusandi, Edi Sutoyo and Vandha Pradwiyasma Widartha	Convolutional Neural Network for Sentiment Analysis of Beaches Reviews in Tripadvisor
CE/CS	48	Afina Ramadhani, Edi Sutoyo and Vandha Pradwiyasma Widartha	LSTM Approach for Sentiment Analysis of Tourists Review on Beaches in Tripadvisor
CE/CS	50	Yuslena Sari, Andreyan Rizky Baskara and Rika Wahyuni	Classification of Chili Leaf Disease Using the Gray Level Co-occurrence Matrix (GLCM) and the Support Vector Machine (SVM) Methods
CE/CS	59	Arif Wicaksono Septyanto, Isnaini Rosyida and Suryono Suryono	A Fuzzy Rule-Based Fog-Cloud for Control the Traffic Light Duration Based On-road Density
CE/CS	163	Ari Pambudi, Suryari Purnama, Tsara Ayuninggati, Nuke Puji Lestari Santoso and Anggun Oktariyani	Legality On Digital Document Using Blockchain Technology: An Exhaustive Study
CE/CS	164	Pramodkumar Aylapogu, Kalivaraprasad Baditha and Ravichand S	A Novel Voltage Level-Up shifter Design for Power Efficient Methods Using Dual Current Mirror Technique

Track 4

SE	31	Dennis Michael, Erick Dazki, Handri Santoso and Richardus Eko Indrajit	Scrum Team Ownership Maturity Analysis on Achieving Goal
SE	32	Rosa Delima, Retantyo Wardoyo and Khabib Mustofa	Automatic Requirements Engineering Model using Goal-Oriented Modelling with Text Pre-Processing Technique
SE	37	Yuslena Sari, Mutia Maulida, Endi Gunawan and Johan Wahyudi	Artificial Intelligence Approach For BAZNAS Website Using K-Nearest Neighbor (KNN)
SE	38	Hutomo Try Wibowo, Eri Prasetyo Wibowo and Robby Kurniawan Harahap	Implementation of Background Subtraction for Counting Vehicle Using Mixture of Gaussians with ROI Optimization
CS/I	158	Abdul Rahman, Ermatita Ermatita, Dedik Budianta and Abdiansah Abdiansah	Prediction Of Paddy Plant Height With Vermicompost Fertilizer Treatment On Tidal Land Using ANFIS Method
CS/I	157	Anis Masruriyah, Hasan Basri, Hanny Hikmayanti, Ahmad Fauzi, Ayu Juwita and Deden Wahiddin	The Rise Efficiency of Coronavirus Disease Classification Employing Feature Extraction

Track 5

CS/I	84	Irvanizam Irvanizam, Natasya Azzahra, Inayatur Nadhira, Zulfan Zulfan, Muhammad Subianto and Intan Syahrini	Multiple Criteria Decision Making Based on VIKOR for Productive Economic Endeavors Distribution Problem
CS/I	85	Arif Laksito, Ainul Yaqin, Sumarni Adi and Mardhiya Hayaty	Neural Network Optimization for Prediction of Student Study Period
CS/I	89	Irawan Afrianto, Christover Ramanda Moa and Sufa Atin	Prototype Blockchain-Based Smart Contract For Freelance Marketplace System
CS/I	90	Gede Angga Pradipta, Retantyo Wardoyo, Aina Musdholifah and I Nyoman Hariyasa Sanjaya	SMOTE for Handling Imbalanced Data Problem : A Review
CS/I	101	Adi Suheryadi, Muhammad Anis Alhilmi, Willy Permana Putra, Kurnia Adi Cahyanto and Firdaus Firdaus	Vehicles Position Tracking in Parking lots Using K-Nearest Neighbor and Fingerprinting Based on RSSI Bluetooth
CS/I	102	Ragiel Hadi Prayitno, Sunny Arief Sudiro and Sarifuddin Madenda	Avoiding Lookup Table in AES Algorithm

Track 6

CS/I	111	Murahartawaty Arief and Mustafa Bin Matt Deris	Text Preprocessing Impact for Sentiment Classification in Product Review
CS/I	113	Farrel Athaillah Putra, Dwi Anggun Cahyati Jamil, Briliantino Abhista Prabandanu, Suhaili Faruq, Firsta Adi Pradana, Riqqah Fadiyah Alya, Heru Agus Santoso, Farrikh Al Zami and Filmada Ocky Saputra	Classification of Batik Authenticity Using Convolutional Neural Network Algorithm with Transfer Learning Method
CS/I	114	Aa Zezen Zaenal Abidin, Mohd Fairuz Iskandar Othman, Aslinda Hassan, Yuli Murdianingsih, Usep Tatang Suryadi and Zulkiflee Muslim	Verifying Waste Disposal Practice Problems of Rural Areas In Indonesia Using the Apriori Algorithm
CS/I	115	Muhammad Arif Azhari Halim, Mohd Fairuz Iskandar Othman, Aa Zezen Zaenal Abidin, Erman Hamid, Norharyati Harum and Wahidah Md Shah	Face Recognition-based Door Locking System with Two-Factor Authentication Using OpenCV
CS/I	129	Riama Kristallia, Hermawan Setiawan and Siti Manayra Sabiya	Design and Building Hands-On Vulnerable Web Application as a Software Security Educational Media
CS/I	130	Intan Maratus Sholihah, Hermawan Setiawan and Olga Geby Nabila	Design and Development of Information Sharing and Analysis Center (ISAC) as an Information Sharing Platform

Track 7

CS/I	58	Armin Lawi, Nadya Nurlaiyla and Kasbawati Kasbawati	Comparative Performance of Buffer Management in Delay Tolerant Networks: A Case Study of Delivery Data Simulation in Remote Islands of Sulawesi
CS/I	127	Firman Sriyono, Kusrini Kusrini and Asro Nasiri	DETECTING HATE SPEECH IN TWITTER USING LONG SHORT-TERM MEMORY AND NAÏVE BAYES METHOD
CS/I	117	Muhammad Satria Buana and Eko K. Budiardjo	Gap Analysis of Software Requirements Implementation in Scrum: A Systematic Literature Review
CS/I	125	Banteng Widyantoro, Arini Arini, Husni Teja Sukmana and Iik Muhamad Malik Matin	The Effectiveness of Forward-Backward Combination Method in Dynamic Programming
CS/I	159	Muhammad Haris Al Farisi, Arini Arini, Luh Kesuma Wardhani, Yusuf Durrachman and Iik Muhamad Malik Matin	K-Means Algorithm and Levenshtein Distance Algorithm For Sentiment Analysis of School Zonation System Policy

PARTICIPANT GUIDELINES

PRESENTER

Each paper accepted to ICIC 2021 must be presented by the registered co-author during the online conference. Each paper will be given MAXIMUM 15 minutes (10 minutes for presentation + 5 minutes for Q&A). The video conferencing platform chosen by ICIC 2021 is Zoom. It is preferred that presentations are given live in the virtual conference room. If the presenter's Internet connection quality is not sufficiently good to run a live presentation, a pre-recorded video of the talk must be played.

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ABSTRACT PAPER

ICIC 2021

Paper ID: 3

Adapting the User-Centered Cognitive Walkthrough (UC-CW) for Assessing the User Experience of Smart Regency Mobile-Apps Service in Indonesia

Aang Darmawan, Daniel Siahaan, Tony Dwi Susanto, Achmad Nizar Hidayanto, Aang Subiyakto and Tony Yulianto

Abstract - Because the number of districts in Indonesia is four times that of cities, regency development requires serious consideration. However, very few studies are still available to explore districts from an ICT utility management perspective. This study aims to evaluate the user experience of a mobile-based smart regency application used in regencies. The method used is the User-Centered Cognitive Walkthrough (UC-CW), an enhanced Cognitive Walkthrough (CW) method. In this user experience evaluation method, the evaluator gives scenario-based tasks and several questions to mobile-app users to find problems that interfere with the learning process. This method is suitable for use on systems that have just been released because it can explore users' cognitive processes when using the system. Respondents in the study were ten users of mobile-based smart regency applications. The results show that many problematic features or functions cannot be used, or the data is still empty. This study contributes to the evaluation recommendations of user experience and provides input for application developers and policymakers to pay more attention to the factors that affect the user experience of smart regency application users in the regions.

Keywords: user experience, smart regency, user-centered cognitive walkthrough

Paper ID: 4

Adaptation of the meCUE 2.0 Version for User Experience (UX) Measurement Approach into Indonesian Context

Aang Darmawan

Abstract - The user experience (UX) of an item must be evaluated by assessing its user experience as a key feature of product growth. There are several frameworks for user experience assessment questionnaires, one of which is very popular: meCUE. However, the meCUE framework was originally developed in German, then in English, and no research has yet been conducted to develop the Indonesian version of the meCUE framework. This study aims to adapt the meCUE 2.0 framework into the Indonesian version using cross-cultural adaptation and reliability testing. The meCUE 2.0 framework is a user experience questionnaire consisting of 33 questions detailed in Modules I and II, on Perception of instrumental and non-instrumental product qualities, Module III on Emotions, and Module IV on Consequences. This adaptation version is then tested against the Smart Regency Service Application, namely Pamekasan Smart Mobile Application (PSMA), involving 15 respondents from technical and non-technical backgrounds who will be given facial validity and 60 respondents to verify the validity of the Indonesian version of MeCUE 2.0 for the various populations. The test results of Cronbach's Alpha from the adaptation version in Indonesian for the meCUE 2.0 framework are 0.868 for module I, 0.870 for module II, 0.894 for module III, and 0.841 for module IV, which concludes that this version can be relied on for use by user experience practitioners. This adaptation version is expected to help researchers and user experience practitioners in Indonesia evaluate product user experiences.

Keywords: smart regency, user experience, meCUE

Paper ID: 11

Implementation of Deep Learning in Order to Detect Inapposite Mask User

Ryan Gusti Nugraha, Mochamad Yoga Wibowo, Prasetyo Ajie, Hanny Hikmayanti Handayani, Ahmad Fauzi and Anis Fitri Nur Masruriyah

Abstract - The number of COVID-19 patients that continues to increase has made several countries continue to seek treatment so that they can help COVID-19 patients recover. The increasing number of patients is indicated because many residents still do not comply with health protocols. WHO explains that one of the important protocols is to use masks correctly. Some residents are reluctant to use masks because it makes communication less clear and breathless. Due to these omissions, this study aims to identify the use of masks. This study is able to identify the proper use of masks, the use of inappropriate masks and the face without a mask. The process of this research begins with creating a training model from several images. The model that has been made is used as a reference for identification using CNN. The results of the accuracy of this study reached 0.9935%.

Keywords: Convolutional Neural Network, COVID-19, Identification, Image Processing, Mask Detection

Paper ID: 12

Risk Mapping against Cyber Attack Trend in the Perspective of National Defense and Military Sector in Indonesia

Richardus Indrajit

Abstract - The European Union Agency for Cybersecurity study shows that there are 15 (fifteen) types of cyber attacks that will emerge in the next five years. This trend is obtained through an in-depth study of the trend of recent phenomena. The purpose of this study is to try to detect which attacks need attention by the military and state defense sectors in Indonesia. To detect it, a risk analysis method is used in combination with prioritization based on weights. The data was obtained through the involvement of a number of key experts in the field of cyber defense and security. The results of the study show that eight of the fifteen defined threat trends need special attention by the government and cyber security defense practitioners in Indonesia.

Keywords: cyber attack, cyber risk, national defense, military

Paper ID: 13

The Taxonomy of Cyber Threats to National Defense and Security

Richardus Indrajit

Abstract - The pendulum of threats to national defense has shifted to the cyber realm. War no longer uses a conventional approach based on physical attacks, but has shifted to a virtual activity in cyberspace. The occurrence of cyber wars between various countries shows how serious this phenomenon is in the modern age. This research focuses on studying various cross-border cyber attacks that have occurred with the aim of categorizing them based on their common characteristics. The methodology used is a literature study of various case studies that occurred in the past. Approximately thirty publications containing case reports related to the main data in the study. The results show that there are nine types of cyber threat categories to state land and national security.

Keywords: cyber threat, national defense, cyber security

Paper ID: 14

Unraveling the Complexity of Developing a National Cyber Defense Sovereignty Policy: A Case Study of Indonesia

Richardus Indrajit

Abstract - Developing effective policies to build cyber sovereignty is not easy. Such a complex policy ecosystem requires holistic and comprehensive thinking. Indonesia as a developing country feels the need to conduct a thorough study of the issues behind the high complexity. The purpose of this study is to describe and at the same time unravel the complexities of managing cyber ecosystems in Indonesia. The research methodology used is qualitative, where data is obtained through interviews with a number of experts, literature review, and direct observation in the field. The result is a rich picture segmented into eleven main domains, which form the ecosystem of cyber defense.

Keywords: cyber defense, ecosystem, cyber soverignty, rich picture, doctrine

Paper ID: 15

Analysis of IoT adoption on Trucking Logistics in various Industry in Indonesia

Bayu Yasa Wedha, Daniel Avian Karjadi, Erick Dazki, Handri Santoso and Richardus Eko Indrajit

Abstract - Recent years, Internet of Things (IoT) provides new business opportunity in terms of cost reduction, increase in productivity or efficiency to organization. In the context of supply chains, IoT helps trucking logistics to track their assets' health, location, utilization, efficiency and visibility. Indonesia, as the largest archipelago country in the world, mainly relying on truck fleet as its main logistics transportation. Thus, IoT adoption could bring Indonesia's growth and safety in the country. Based on logistic performance index 2018, Indonesia position is 46th in logistic management. One of the parameters is technology adoption especially IoT to improve Logistic company, there are limited study that explore the adoption of IoT in trucking logistics. In this study, companies use IoT technology in their trucks, based on Industry types and spatial distribution is analyzed. Factors that could affect the IoT adoption are being discussed. The IoT adoption level obtained from experts' interview. And then used to analyze 161 company adoption across Indonesia. The result shows that IoT adoption level is between 2 and 3 in the scale of 5 with the highest adoption in Cement industry. Industry that operates in Java and Sumatera islands tend to be more mature on IoT adoption level than other islands for Chemical and Cement industry respectively. Government can make use of this study's result to make policy that cover more wider industry types and location in order to improve the overall trucking logistics performance.

Keywords: IoT, truck fleet, logistics, Indonesia, adoption

Paper ID: 19

Analysis of Teacher and Student Responses to the Use of a Web-based Learning Management System (LMS) during COVID-19 Pandemic.

Gladys Indri Putri, Nuryadin Nuryadin, Richardus Eko Indrajit, Erick Dazki and Handri Santoso

Abstract - This study was to analyze and describe teacher and student responses to the use of the Learning Management System (LMS) during the COVID-19 pandemic. The respondents in this study were 100 teachers and students in Cilacap Regency, Central Java, Indonesia. 90% of respondents choose Google Classroom as LMS that they used. The information collection method used in this study is a survey with a questionnaire. The results of the data were obtained and analyzed qualitatively descriptive. There are 3 aspects that become criteria in this study, there are aspects Software Used., Aspect Content, and Aspect Display. The results categories showed that all aspects contained showed good categories. This proves that LMS helps online learning well during the COVID-19 Pandemic

Keywords: Learning Management System, COVID-19, Education, E-learning.

Paper ID: 20

Service Agreement Development for Information Technology Help Desk at University Using ITIL V3 2011 and COBIT 2019

Hendy Maulana Jaya Saputra, Tegar Palyus Fiqar, M. Gilvy Langgawan Putra and Lovinta Happy Atrinawati

Abstract - The Ministry of Research, Technology, and Higher Education in Indonesia requires each university to implement governance of information technology services. ABC University currently does not have the capability and standards for running an information technology (IT) help desk as part of IT service governance. It will allow the University not to provide services as expected. This problem can be solved by developing the service agreement illustrated in the ITIL V3 2011 and COBIT 2019 frameworks. Three main phases are needed in solving these problems, the preparation phase, the Service Level Requirement (SLR) development phase stage, and the Service Level Agreement (SLA) development phase. In the first phase, the SLR and SLA document structures are obtained and several existing service categories are identified. Subsequently, the service requirements for each service categories, are discussed and defined with the users, which resulted in 74 services defined in SLR and 71 services defined in SLA. The SLR and SLA documents are approved and signed by the ICT Unit Head as chief technology officer and business relationship manager for the IT sector. To use the help desk service can go through two channels, namely e-mail and the university help desk site.

Keywords: COBIT 2019, IT Service Management, ITIL V3 2011, Service Level Agreement, Service Level Requirement

Paper ID: 24

Health Care Mobile Application Development for Sub-District Primary Health Care: How and Why

Eka Miranda, Mediana Aryuni, Richard Richard and Adrian Giovanny Tanara

Abstract - Telemedicine term refers to remote clinical services. Telemedicine technology is frequently used for follow-up visits, consultation, and other clinical services that can be delivered remotely. This research revealed health care mobile application development for sub-district primary health care, how to develop them and why users need them. The result of this research was a health care mobile application for sub-district primary health care in Jakarta. This application was an alternative tool to answer the deficiency of health services and health personnel issues. Moreover, during the Covid-19 pandemic telemedicine and health care mobile application was played an important role in sustainable health care service when the government enforced restrictions on people movement to avoid the spread of the disease. System Development Life Cycle (SDLC) waterfall was performed as an application development method. Evaluation based on the User Experience Questionnaire (UEQ) method was performed to evaluate the application result. User experience evaluation based on UEQ approach was revealed the acceptance of users for this application on attractive and novelty aspect shown positive result but on the other hand negative result shown for perspicuity efficiency dependability stimulation aspects.

Keywords: health care mobile application, SDLC waterfall, User Experience Questionnaire (UEQ), sub-district primary health care

Paper ID: 25

Detection of Heart Disease Classification Model Using K-Nearest Neighbor Algorithm

Ben Rahman

Abstract - Heart disease is a disease that needs to be watched out for and is of special concern, seeing to the WHO report in 2018 as many as 17.9 million people died from heart disease, and especially in Indonesia, heart disease in 2020 became the highest cause of death. This study uses data mining techniques to extract information from the data used. This research provides a scientific contribution, namely detecting heart disease as early as possible. In this case, the author uses the K-Nearest Neighbor Algorithm to classify the data based on the nearest neighbor data. The database is owned in a fairly high volume, so it should be noted that if there is excessive (noise) and irrelevant attributes they will be removed, if they are still used the results of data processing will not be optimal, so data cleaning needs to be done carefully. The selection of the data used was 1243 records and after being selected the data were taken in this study as many as 366 records, with parameters using 12 attributes, real data from hospitals, data consisting of data from patients under surveillance for cardiac care, and data from patients who underwent surgery. medical examination. Therefore, it is necessary to develop a decision support system that assists doctors in taking steps for early detection. Research conducted with the K-Nearest Neighbors algorithm has an accuracy of up to 77% with a value of K = 7.

Keywords: Heart Disease, K-Nearest Neighbors, Forward Selection, Classification

Paper ID: 26

Fuzzy Multi Criteria Decision Making for Optimization of Housing Construction Financing

Muhammad Yoma Putra Perdana, Arini Arini, Andrew Fiade and Iik Muhamad Malik Matin

Abstract - Financing is very important in running a company's business processes. However, in the process, financing is often an obstacle when an organization handles many projects simultaneously. XYZ company is a construction finance company that handles four different projects. Some of the projects are supervised by the same supervisor, making the supervisory function not run optimally. In addition, the budget plan is still made using the manual method. This makes it difficult for decision holders to determine the right budget allocation. As a result, the budget allocation for each existing project is not optimal. This problem can be solved if XYZ company has a decision support system. In this paper, we develop a decision support system based on Fuzzy Multi Criteria Decision Making (FMCDM). FMCDM is a method of decision making by determining the best alternative from existing alternatives based on certain criteria. We use 4 decision alternatives with 8 decision consideration criteria. The organization inputs the budget then the system calculates the value of the degree of optimism. Through experiments conducted, it is known that FMCDM is proven to be able to help companies identify conditions in each project so that the best projects can be prioritized to share financing with projects

Keywords: Fuzzy Multi Criteria Decision Making, Optimization, Financing

Paper ID: 28

Image Authentication Application With Blockchain to Prevent and Detect Image Plagiarism

Andi, Carles Juliandy, Robet, Octara Pribadi and Robby Wijaya

Abstract - Plagiarism was an act that made a disadvantage for the author because of the use of other people's work or ideas without mention any credit. Especially for image plagiarism cause disadvantage for the author's income because in this internet era many image authors sold their work for income. We proposed our model that combined DCT hash and Blockchain to prevent and detect plagiarism images. Our contribution for this research is to prevent plagiarism through the initial authentication process and then to detect image plagiarism on pixel-by-pixel of the image for more accurate plagiarism detection. Blockchain technology also prevented any change to data that was already stored in the Blockchain network, so it can prevent any change to image data and can prevent plagiarism attempts. With this proposed model, we got 100% accuracy for detecting images as plagiarism or not plagiarism. We also added some improvement areas for future research.

Keywords: Image Plagiarism, DCT hash, Blockchain

Paper ID: 31

Scrum Team Ownership Maturity Analysis on Achieving Goal

Dennis Michael, Erick Dazki, Handri Santoso and Richardus Eko Indrajit

Abstract - Many companies have used the Scrum framework for system and product development. In the implementation of the scrum framework, we often encounter obstacles and challenges in the field, one of them is a sense of belonging to the team's work itself. The scrum team should act on their own and already know what to do on each sprint. They are already committed to what they think can be accomplished and can be helped by feeling ownership of the work they do each sprint. If the Scrum team is committed to the work to be carried out, over time it will certainly foster a sense of ownership within the Scrum team itself, including satisfaction with the results they have achieved. The most important thing to a Scrum Team is to remember, that the team is to take ownership of themselves. They are responsible for their own accountability, If they are to be truly self-directed. A lot of research has been done to determine the maturity level of a scrum team with their respective methods such as the Scrum Maturity Model and Agile Maturity Model but not related to team ownership.

Keywords: Scrum Framework, Ownership Model, Scrum Team Agile, Project Management, Maturity Model

Paper ID: 32

Automatic Requirements Engineering Model using Goal-Oriented Modelling with Text Pre-Processing Technique

Rosa Delima, Retantyo Wardoyo and Khabib Mustofa

Abstract - Requirements engineering (RE) is an essential initial stage in the software engineering process. RE activities include elicitation, analysis, specification, and validation. The efficiency of the RE process relies heavily on a systems analyst to perform software specifications. Automation of activities in RE can increase time efficiency. In this study, the Automatic Requirements Engineering Model (AREM) was developed to automate the analysis, specification, and validation processes of the RE. The model was developed by integrating a goal-oriented model and text preprocessing technique. At the elicitation stage, is developed a standard input document that refers to the GORE elements. The requirements analysis was developed by applying the breadth-first search method, forward chaining, and the agent approach. Text preprocessing techniques were used for document extraction and preparation of requirements specifications. The model produces requirements specifications in the form of goal trees, class diagrams, use case diagrams, and sequence diagrams

Keywords: requirements engineering, goal-oriented, text preprocessing, automatic model

Paper ID: 37

Artificial Intelligence Approach For BAZNAS Website Using K-Nearest Neighbor (KNN)

Yuslena Sari, Mutia Maulida, Endi Gunawan and Johan Wahyudi

Abstract - Amil Zakat National Agency (BAZNAS) is a national institution for the distribution of zakat. As one of the main foundations in Islam, zakat is, obviously, very important to be fulfilled. However, it is very often that the data of the recipient became unclear that it caused problems in terms of a fair distribution of zakat. This research tried to offers a solution by doing classification of the recipient of zakat on the BAZNAS websites into two categories: indigent and poor, using the K-Nearest Neighbor method. This research concluded that the accuracy of the K-NN method by using classification report, confusion matrix, and ROC-AUC respectively resulted in accuracy values of 97%, 96.7%, and 97.7%

Keywords: Zakat, Islam, K-Nearest Neighbor, BAZNAS

Paper ID: 38

Implementation of Background Subtraction for Counting Vehicle Using Mixture of Gaussians with ROI Optimization

Hutomo Try Wibowo, Eri Prasetyo Wibowo and Robby Kurniawan Harahap

Abstract - There is an imbalance between the ratio of the number of vehicles of 11% and the addition of new roads or road extensions of 0,01%, especially in Jakarta, Indonesia, which is often an issue that causes traffic problems, one of which is congestion. This paper discusses an implementation of methods to assist traffic manipulation such as tracking and counting vehicles with the aid of computer simulation. This research method uses a video surveillance base and then implements with Mixture of Gaussians (MOG2) for background subtraction with ROI optimization. There are four stages in this method, namely pre-processing, vehicle tracking, vehicle counting, and ROI optimization. The results were obtained in the form of accuracy which is divided into two conditions, namely in the morning and in the daytime. For accuracy, this system has a capability of 86% in the morning and 94,1% in the daytime with each video duration of 30 seconds. This system simulation can be used as a reference for traffic-related bureaus to help manipulate traffic.

Keywords: Counting Vehicle, Background Subtraction, Mixture of Gaussians, ROI Optimization

Paper ID: 42

Indonesian Typical Food Recommendation System Using Machine Learning and Chatbot for E-Wallet

Novrianto Batara and Suyoto Suyoto

Abstract - E-Wallet or digital wallet is a software that allows users to make purchases or send money to other users through the Internet (online). With this digital wallet, the community's economy in an area will increase because the transaction process is easy, safe, and fast. Sorowako in South Sulawesi, Indonesia, is a mining town that is home to the majority of employees of the nickel mining company PT. Vale Indonesia and in this town, there are still not many payments through digital wallets. Therefore, this research aims to implement digital wallet payment applications such as Gopay, OVO, and Dana for MSMEs in Sorowako Town. In addition, this research also proposes a digital wallet combined with a food recommendation feature because Sorowako Town has a lot of potential for culinary tourism. This system will use Geolocation on the user's smartphone to detect the user's position, machine learning for classification, CBF for filtering, and a chatbot to provide food recommendations through frequently used chat applications such as WhatsApp and Telegram, and Line. Propose solutions in this research can offer Indonesian typical food recommendations from user's e-wallet to user's chat application and help to increase the economy in Sorowako Town.

Keywords: Food Recommendation System,GPS Detection, E-Wallet, Machine Learning, CBF, Chatbot, Culinary Tourism

Paper ID: 43

Examining the Adoption of Mobile Payment Service: Expectation Confirmation Model with Trust

Albertus Widiantoro, Bernardinus Harnadi and Hendra Prasetya

Abstract - This study has a purpose to examine the acceptance of mobile payment services by employing a modified ECM model with Trust. Several related studies on e-commerce and mobile payment have been investigated to derive important variables which can be employed on a proposed model. The model expresses the effect of customers' trust on their satisfaction in using mobile payment services and their continuance intention in using it. The online questionnaires constructed based on the proposed model were distributed to mobile payment users to gather their perceptions in using it. The 338 questionnaires gathered were analyzed statistically by SEM to test the hypotheses of the study. The results of the analysis reveal that customers' trust is an important variable to enhance customers' satisfaction and continuance intention in using mobile payment services. Other results indicate that Trust and Confirmation have a direct effect on the Perceived Usefulness of the services. Furthermore, both Perceived Usefulness and Trust will make consumers feel satisfied and tend to continuance their intention in using mobile payment services. This study contributes to financial service providers in delivering an obviousness, how was the trust of services can make consumers feel satisfy and use the service continually.

Keywords: ECM, Trust, mobile payment, SEM, Continuance Intention

Paper ID: 44

Adaptive Rule from the Viewpoint of Philosophy of Science

Erna Hikmawati and Kridanto Surendro

Abstract - Adaptive rule is a proposed development model of the association rule that answers the weaknesses of previous research and makes an inventory of current needs. In the adaptive rule the minimum support value is determined automatically by the system. In addition, it can generate rules that come from several different databases and rank the rules based on the specified criteria. The proposed adaptive rule can also summarize current issues and user feedback. In order not to become trapped into pseudo-science, this adaptive rule needs to be studied from the philosophy of science. This paper contains a study conducted on the Adaptive rule starting from determining the side of ontology, epistemology, and axiology in accordance with the theory of the Philosophy of Science. In addition, the position of the adaptive rule on the scientific revolutions proposed by Thomas Kuhn was also analyzed to find out the position and opportunities in the future. If it is related to Thomas Kuhn's scientific revolutions theory, the Adaptive rule is currently in a crisis phase. To ensure that the adaptive rule is not pseudo-science, it is also reviewed the deductive testing phase proposed by Karl Popper.

Keywords: Association rule, adaptive rule, scientific revolution, falsification

Paper ID: 45

Analysis Effect of User Experience on Understanding Rate of Student Using Academic Information System in Higher Education with Honeycomb Method

M. Gilvy Langgawan Putra, Rama Yogaswara and M. Ihsan Alfani Putera

Abstract - User experience (UX) is a form of user's perspective, their psychological reaction also their response on how they're using a product, service, or system. Every system should have a good UX in order to minimize user confusion and getting a good feedback from the user. However, from the questionnaire that distributed to 103 users of Kalimantan Institute of Technology's integrated information system, several problems were found. The goal of this study is to find a problem that being mutually agreed by the users, and to prove is UX is affecting the user's understanding rate on using this system. The result of this study found that 321 respondents out of a total of 350 agreed the problem that mutually agreed by the user is on the credible aspect from UX Honeycomb, there are a lot of inaccessible information or a page that didn't show any information, with the approval rate of 91,71%. This study also found that UX is affecting user's understanding rate on using this system, which mean the better the UX, the better user's understanding rate on using this system.

Keywords: Honeycomb, Integrated Information System, Understanding Rate, User Experience

Paper ID: 47

Convolutional Neural Network for Sentiment Analysis of Beaches Reviews in Tripadvisor

Muhammad Rifki Rusandi, Edi Sutoyo and Vandha Pradwiyasma Widartha

Abstract - As a country with much natural wealth, Indonesia tries to utilize beach tourism in Bali to attract tourists. One of the websites in the tourism sector that is widely used by the world community today is Tripadvisor. Through Tripadvisor, tourists can find information about the beaches in Bali. Each beach has reviews written by tourists who have visited. However, reviews on Tripadvisor are unreliable and even biased. Therefore, Sentiment Analysis of Beach Reviews in Bali on the Tripadvisor Website can be a solution. This study uses real datasets from the Tripadvisor website in tourist reviews of the five most favorite beaches in Bali: Seminyak, Nusa Dua, Double Six, Kelingking, and Canggu. The research used the Convolutional Neural Network (CNN) architecture to produce positive and negative label predictions. The sentiment analysis results are visualized into a graph that describes tourist opinions on the five most favorite beaches in Bali. This study also measures the performance of the CNN model in making predictions. The accuracy obtained is 88% on Seminyak beach, 90% on Nusa Dua beach, 90% on Double Six beach, 87% on Kelingking Beach, and 85% on Canggu Beach. The CNN model performance measurement also produces precision, recall, and ROC curve on each beach.

Keywords: Convolutional Neural Network, CNN, Sentiment analysis, Beach, Bali, Tripadvisor

Paper ID: 48

LSTM Approach for Sentiment Analysis of Tourists Review on Beaches in Tripadvisor

Afina Ramadhani, Edi Sutoyo and Vandha Pradwiyasma Widartha

Abstract - Information technology has become an essential component in various fields, one of which is in the world of tourism. This can be seen with the emergence of websites in the tourism sector, such as Tripadvisor. Bali, as a tourist destination that is well known to foreign countries, can use Tripadvisor as a place to promote tourist attractions in Bali, such as beaches. This study will conduct a sentiment analysis of tourist reviews on the five most favorite beaches in Bali, namely Double Six Beach, Seminyak, Nusa Dua, Kelingking, and Canggu, on the Tripadvisor Website. The analysis results determine how tourists' opinions of the five beaches are using the Long Short-Term Memory (LSTM) architecture with sentiment classified in the form of positive and negative labels. This study uses a training and testing ratio of 80:20 with the undersampling method because it has the highest overall accuracy with Double Six Beach 83%, Seminyak 81%, Nusa Dua 84%, Kelingking 81%, and Canggu 84%. The prediction results obtained from the classification results are more dominant on the positive label. In addition to classifying for sentiment analysis, this study also measures the model's performance created by calculating the value of precision, recall, F1-Score, macro average, and weight average for each beach classification result.

Keywords: Long Short-Term Memory, sentiment analysis, beach, Bali, Tripadvisor

Paper ID: 49

Monetization Model Suggestion of Islamic Education Technology Application

Bryanza Novirahman, Yudho Giri Sucahyo and Arfive Gandhi

Abstract - Teknologi Quran International is a startup company that runs on the education of Islam religion especially in Al- Qur'an recitation. Since this company was founded in 2015, there has been no significant profit from applications that can sponsor the operational cost of the company. This then led to the unfocused development of the Learn Quran Tajwid application because most of the employees now have other external projects outside the company. Therefore, the evaluation of the business model is provided to suggest the monetization model so that the company can gain more profit on its side. The challenged-based learning (CBL) methodology is conducted through qualitative data collection with contextual interviews in order to assess the learning theory which has been implemented and finding the perfect in-app purchasing as well as an organic marketing technique that wants to be implemented in the future. The application that is examined by 20 most convenient user samples and stakeholder's recommended domain or subject expert, is available on both platforms, Android, and iOS. The evaluation results show that the monetization model of Learn Quran Tajwid needs to be improved completely since right now there are so many possibilities from the active users who have an opportunity to be taken advantage of by the company. This research can also give benefits to a startup company that wants to have a combination of more sustainable monetization models.

Keywords: Learn Quran Tajwid, Application, Business model evaluation, Monetization model suggestion, E-learning, In-app purchasing, Organic marketing

Paper ID: 50

Classification of Chili Leaf Disease Using the Gray Level Co-occurrence Matrix (GLCM) and the Support Vector Machine (SVM) Methods

Yuslena Sari, Andreyan Rizky Baskara and Rika Wahyuni

Abstract - Chili is a type of vegetable that has a very high economic value. The problem that often occurs in chili plants is that many agricultural losses are caused by disease. Plant diseases are always considered a very serious problem in all countries because economic growth is largely dependent on the agricultural sector in developing countries. In some plant, diseases sometimes caused by bacteria, viruses and fungi. To anticipate this problem, a method designed into a classification system for diagnosing chili leaf disease by applying the Gray Level Cooccurrence Matrix (GLCM) feature extraction method. Then classified using the Support Vector Machine (SVM) method. The output classification of disease diagnoses in chili obtained an overall accuracy level of 88%. The results obtained prove that the method of extracting the features of Gray Level Co-occurrence Matrix (GLCM) and Support Vector Machine (SVM) can be applied to diagnosing chili plants disease.

Keywords: Chili Plant, Classification, Digital Image Processing, GLCM, SVM

Paper ID: 56

Design and Analysis of Rectangular Patch MIMO 2x2 Antenna With DGS and Inset Fed for 5G Network

Tedy Sepdiansah and Mochammad Akbar Marwan

Abstract - This paper presents two design of rectangular patch antenna using MIMO system and inset fed in 5G network which operates frequency at 3.6 GHz. First antenna designed without DGS and the second designed used DGS, and then simulated and analysis. The simulation result show that the antenna without DGS that 494.2 mm2 dimension each patch on FR4 substrate get VSWR of 1,096, return loss of -26.766 dB, bandwidth of 100.6 MHz (3.5426 GHz to 3.6432 GHz) and gain of 6.19 dBi. The antenna with DGS that 275.29 mm2 dimension each patch reduced 55% get VSWR of 1.26, return loss of -18.772 dB, bandwidth of 152.2 MHz (3.5434 GHz to 3.6956 GHz) and gain of 5.16 dBi.

Keywords: Rectangular, Patch Antenna, MIMO, Inset-Fed, DGS, 5G

Paper ID: 57

Implementation of Text Mining for Sentiment Analysis of Online Lectures During the Covid-19 Pandemic

Doni Purnama Alamsyah, El Miana Assni Ernamia and Asti Herliana

Abstract - Strategy against the spread of the Covid-19 virus in Indonesia by enacting Large-Scale Social Restrictions. The implementation of the PSBB forced all universities in Indonesia to close their institutes and conduct lectures online. Online lectures are considered as a solution to continue the teaching process during a pandemic. However, the lack of adaptation and sudden changes caused various responses and public opinions on social media. For this reason, this study aims to conduct text mining on Twitter in order to analyze public sentiment on the topic of "online lectures" the data obtained are classified into 2 classes (positive and negative). The results of the accuracy of the nave Bayes test with the cross validation technique obtained a result of 81.57%. For class precision, positive predictions are 100%, while for negative predictions the results are 73.06% and recall from true positive is 63.13% for true negative is 100%. And for the accuracy of K-Nearest Neighbor 62.10%, for class precision positive prediction is 62.06% while for negative prediction results are 62.13% and recall from true positive is 62.24% for true negative is 61.95%

Keywords: K-NN, Online Learning, Sentiment Analysis

Paper ID: 58

Comparative Performance of Buffer Management in Delay Tolerant Networks: A Case Study of Delivery Data Simulation in Remote Islands of Sulawesi

Armin Lawi, Nadya Nurlaiyla and Kasbawati Kasbawati

Abstract - Delay tolerant networks (DTN) are networks that can be applied in the environment which is very difficult to accept. This network is characterized by high latency, termination, error message probability, and limited resources. Routing and buffer management are two important problems in DTN. In this paper, we use Epidemic Routing Oracle that has improved the performance of the DTN, which can improve the performance of the dropped message. It can also improve the average buffer time to increase the probability of delivery and received messages. The enhancement in shipping probability will reduce the overhead ratio and the average number of hops that can reduce the delivery latency time so as to minimize the delayed message. A good buffer management strategy can determine which messages will be deleted when the buffer node overflows. This strategy is used together to increase shipping rates, reduce delays, increase message distribution and improve network performance in DTNs. This study aims to analyze the performance of the buffer Mean Drop (M-Drop), FIFO Drop, and PP Drop. Our result shows that the performance of buffer management in data transmission on remote islands can increase depending on the utilization of the buffer method. The use of the buffer method will affect the number of messages that will reach the destination

Keywords: Delay tolerant network, Buffer management, M-drop, FIFO-drop, PP-drop

Paper ID: 59

A Fuzzy Rule-Based Fog-Cloud for Control the Traffic Light Duration Based On-road Density

Arif Wicaksono Septyanto, Isnaini Rosyida and Suryono Suryono

Abstract - A traffic light control system is important to reduce traffic jams. Several methods have been proposed to control traffic lights. However, most of them are inaccurate because do not use data on traffic density status. This study proposes an automatic traffic light control system by instilling artificial intelligence and Radio Frequency Identification (RFID) technology which is used to determine the best duration of traffic lights on an intersection. RFID is used to calculate the average speed of vehicles and the percentage of road occupancy in each lane. The average speed value and the percentage of road occupancy are used as inputs for the fuzzy rule-based algorithm. The outputs of the fuzzy rule-based are the status of traffic jams, road occupancy rate on each lane, the average speed of vehicles on each lane, and real time duration of traffic lights. The fuzzy computing process is carried out locally on the fog server via a Wi-Fi gateway to reduce cloud load. We evaluate the rule-based algorithm on an intersection with 4 lanes. The results show that the average speed of lane 1 is middle 0.922, lane 2 middle 0.699, lane 3 middle 0.599 and lane 4 middle 0.621. for fuzzification value of road density obtained lane 1 high 0.409, lane 2 low 0.475, lane 3 mid 0.951 and lane 4 mid 0.858. The conditions of traffic jams using the rule-based are as follows: "Heavy-Clock" for lane 1, "Light" for lane 2, "Light-Heavy" for line 3, and "Light-Heavy" for line 4. The system built-in using RFID technology can calculate average speeds and road occupancy rates accurately.

Keywords: radio frequency identification, fuzzy logic, rule-based expert system, traffic light control systems, fog-cloud

Paper ID: 63

Development of WebGIS of the Level of Community Participation in Flood Mitigation and Preparedness

Jakiatin Nisa, Mirza Desfandi and Tri Suryaningsih

Abstract - As the components affected by the hazard, mitigation and community preparedness are essential in minimizing the flood hazard. This study is aimed at mapping the community participation in flood mitigation and preparedness in South Tangerang to be then developed to be a mapping system of South Tangerang through WebGIS. The approach of this study aimed at mapping the level of community participation in flood preparedness and mitigation through WebGIS is using Waterfall method as the system development method. The study shows that WebGIS used to map the level of community participation in flood preparedness and mitigation in South Tangerang has passed a system test that shows the strengths of the developed system where it can be used to find some information related to the physical and social data of the sub-districts in the city that can be accessed whenever and wherever as long as the internet access is available.

Keywords: Flood, Community Participation, Mitigation Preparedness, WebGIS

Paper ID: 64

Factors Impact E-Learning System in Higher Education in Indonesia

Inayatulloh Inayatulloh, Enggal Sriwardiningsih, Novan Zulkarnain, Maisyarah Rahmi, Ni Luh Ariningsih Sari, Yenny Desnelita and Novingky Ferdinand

Abstract - Preceding research on e-learning quality of service were showed mostly in established countries; nevertheless, slight work has been made in emergent countries. This research observes the relations amongst electronic learning quality, e-learning instructor, course material quality and student satisfaction of e-learning, in Indonesia. Analysis data composed from several higher education students in Indonesia. The result show e-learning quality of service has a positive influence on e-learning instructor and material, e-learning service quality has a positive influence on e-learning student satisfaction and e-learning instructor and material has a positive influence on e-learning student satisfaction.

Keywords: service quality, E-learning, student satisfaction

Paper ID: 67

Happy Hypoxia Early Detection Tool in IoT Based for COVID-19 Patients Using Blood Oxygen Levels (SpO2) Sensor, Body Temperature and Electrocardiogram (ECG)

Wanda Vernandhes, Nur Sultan Salahuddin, R.R Sri Poernomo Sari and Trini Saptariani

Abstract - This research was aims to offer a solution for early detection of Happy Hypoxia symptoms in patients with COVID-19 with a microcontroller integrated with various sensors. The installed sensor is used to get data about the current condition or value of the patient's body. The data obtained such as oxygen levels (SpO2) in the blood, heart rate, signals from the electrical activity of the heart and the patient's body temperature will be processed and produce useful information so that it can help the doctor to prognostic or therapeutic. To decide whether the patient is experiencing happy hypoxia, parameters will be set with a threshold value that is guided by medical rules such as oxygen saturation levels in the blood less than 95%, a heart rate that increases drastically above 100 bpm and other values. This Happy Hypoxia early detection tool is based on Internet of Things (IoT) where all data sent from the microcontroller is via the internet. The data that is processed into information is displayed on the monitoring dashboard so that it can help medical experts in monitoring the patient's condition without having to contact directly and also help to make a decision. This is expected to reduce the number of intensive care patients (ICU), invasive care (ventilator and intubation), and patient mortality due to COVID-19.

Keywords: COVID-19, happy hypoxia, medical device, microcontroller, IoT, sensors

Paper ID: 69

Management of Access Control for Decentralized Online Educations using Blockchain Technology

Lista Meria, Qurotul Aini, Nuke Puji Lestari Santoso, Untung Rahardja and Shofiyul Millah

Abstract - The rapid development of information technology, especially the internet, opens up opportunities for the development of better information services in educational institutions. With internet services, information on target students is not limited by space, place, time and distance. Created a network that does not have a service provider acting as a central authority and users have more control over the information so that there are no third parties. So it is proposed as an alternative solution for the current centralized network learning system using Decentralized Online Educations (DOE). Many DOE have been proposed, but the existence of Decentralized Online Educations (DOE) services requires an efficient distributed solution to protect the privacy of academic data. In recent years, a lot of blockchain technology has been implemented into learning systems so it is very suitable for educational institutions that are used to solve academic privacy problems in a decentralized system. Platform this uses blockchain technology as a public education data storage system. In this study, create a manageable and auditable access control framework for Decentralized Online Educations (DOE) using blockchain technology to discuss the definition of privacy policy. It has a public key used by institutions to determine access policies which can be audited using an Access Control List (ACL), whereas to decrypt private data after access permissions are validated on the blockchain it uses the private key associated with the subject's Ethereum account. To provide an evaluation of this approach, use the Rinkeby Ethereum testnet to implement Smart Contracts. And the results of this experiment can show that the proposed Access Control List (ACL) uses Attribute-Based Access Control (ABAC) in the education system. To make it happen, an Access Control List (ACL) is needed.

Keywords: Educations, Management, Blockchain, Decentralized

Paper ID: 70

Internet of Things-based Early Warning Car Theft Security System Using Smartphones

Zaenal Mutaqin Subketi, Suhadi Suhadi, Ramdani Ramdani, Suroso Suroso, Rudi Budi Agung and Miftakhus Surur

Abstract - Car safety when the owner parked his vehicle on the street or at home is very at risk of theft, if the vehicle does not have a double lock it will result in the car being stolen without the owner's knowledge. Car theft is caused by several factors, the main factor is the inadequate car security system, so that the car is turned off if there is theft, sometimes the car alarm does not sound. While the remote control is generally only used to open / close doors and still uses infrared sensors which have a limited range. The car security early warning system is a warning / early detection system to see the condition of the car and information on the parking position (idle) starting from the position of the car theft until the vehicle owner finds out quickly and accurately. In previous research, the use of NodeMCU as a motorized vehicle security system was visually connected to a smartphone device. NodeMCU as an Arduino board that has the ability to access Wireless Fidelity. Passive Infra Red sensor is a sensor that is used to detect infrared rays and only receives infrared radiation from the outside, so that the movement of objects can be known. The purpose of this study is to design a smartphone-based car early warning system. Based on the results of testing the tool made, the accuracy of the system used is 90% which is effective for dealing with the movement of parked cars from theft.

Keywords: Android, Firebase, Pasive Infra Red, Microcontroller, IoT

Paper ID: 72

Comparison of Baseline Reduction Methods for Emotion Recognition Based On EEG Signals

I Made Agus Wirawan, Retantyo Wardoyo and Danang Lelono

Abstract - Emotions play an essential role in human social interactions. Its importance has sparked research on emotion recognition mainly based on electroencephalogram signals. However, differences in individual characteristics significantly affect the electroencephalogram signal pattern and impact the emotion recognition process. Several studies have used the baseline reduction approach with the Difference method to represent the differences in individual characteristics on electroencephalogram signals. On the other hand, the baseline reduction process on signal data, in general, can also use the Relative Difference and Fractional Difference methods. Therefore, the contribution of this research is to compare the performance of the three baseline reduction methods on emotion recognition based on electroencephalogram signals. In this study, feature extraction and representation were also carried out using Differential Entropy and 3D Cube. Furthermore, Convolutional Neural Network and Decision Tree methods are used to classify emotions. The experimental results using the DEAP dataset show that the Relative Difference and Fractional Difference methods are superior in reducing the baseline electroencephalogram signal compared to the Difference method. In addition, the Relative Difference and Fractional Difference methods produce a smoother electroencephalogram signal pattern in the baseline reduction process.

Keywords: emotion recognition, baseline reduction methods, difference method, relative difference, fractional difference, electroencephalogram

Paper ID: 73

The Technology Acceptance Model on Electronic Letter (E-Letter) Application

Nashrul Hakiem, Herlino Nanang, Asep Taufik Muharram, Velia Handayani, Rosa Adelina and Siti Ummi Masruroh

Abstract - Many technologies are built to facilitate activities in conveying information and communication. E-Letter is a web-based application developed to simplify the process of managing the mailing system within the Faculty of Science and Technology (FST) Syarif Hidayatullah State Islamic University, Jakarta. This paper aims to measure the acceptance of the e-Letter system in the Faculty of Science and Technology with a proposed model adapted from the technology acceptance model (TAM) using quantitative methods. The use of the TAM model is an important area of study, although many models have been proposed to explain and predict system use. The TAM model is the one that captures the most attention in Information Systems (IS). This study wants to find out what factors influence users' intentions to use the e-letter system.

Keywords: Technology Acceptance Model, E-Letter, PLS-SEM

Paper ID: 76

Smart Mall to Reduce Crowds During the COVID-19 Pandemic

Muhammad Said Hasibuan

Abstract - The COVID-19 pandemic has changed the way people live throughout the world. One way to spread the COVID-19 virus is through crowds that can be found in shopping centres, such as malls. Mall control during the pandemic is very difficult if you do not use information technology because it can cause crowds. This study proposes to build a smart mall model that is able to overcome the crowd. A Smart Mall consists of 3 features: smart booking, smart tracking, and smart payments. The booking feature provides booking services to visitors before coming to the mall, which is to ensure the existence of the mall according to its capacity. The tracking feature provides monitoring of the presence of mall visitors to provide directions and monitor visitors within the given time limit, and the payments feature provides a non-cash payment method to create a sense of security from cash transactions.

Keywords: Smart Mall, COVID-19, Pandemic

Paper ID: 77

Internet of Things-based Analysis of Factory Production Machine Damage Detection System Model Using Case-Based Reasoning Method

Suhadi Suhadi, Marisa Marisa, Muhamad Nur, Prima Dina Atika, Sugiyatno Sugiyatno and Davi Afandi

Abstract - Computers are essential in industrial processes because they play a part in the life cycle of company-produced product systems. Damage to production equipment happens frequently as a result of a lack of detailed periodic maintenance, making it difficult for operator and technician staff to maintain production machines. Because they are still utilizing the manual approach, repair times are long and costly accurate. Case-Based Reasoning (CBR), a problem-solving technique based on prior experience and applied in the present, is one discipline of computer science that is commonly employed by humans to help and facilitate work. CBR is used to find solutions by exploiting or analyzing previously collected case data. Case representation, case indexing, case retrieval, case adaptation, and case maintenance are the five goals of CBR in knowledge formation. The process of discovering and measuring the case with the greatest closeness is known as case retrieval. The goal of this research is to create a way to automatically detect system failures in machines, so that if a malfunction happens with a CBR-based system, it will be easier to detect early, repair faster, and be more accurate. The accuracy of the system utilized is 90%, according to the results of testing the tools manufactured, and it is effective for managing production machine repairs. While the test error is twenty times with the highest result of 33.33% and the lowest is 0% according to the level of accuracy of the sensor on the object.

Keywords: Detection, Case-Based Reasoning, Ultrasonic Sensor, Microcontroller, Production Machine, IoT

Paper ID: 79

Design of Blockchain Implementation for Supervision of Vaccine Distribution: Indonesia Case

Lukman Rosyidi, Warsono Warsono and Muh. Syaiful Romadhon

Abstract - Vaccination is still one of the most reliable way to deal with pandemic outbreak. The vaccine distribution process involves a lot of data from various parties, which must be maintained its validity and security to provide a basis for making the right public health decisions. Blockchain technology can be a solution to secure data and build trust between parties because data do not only hold on one party but distributed to all parties with cryptographic security. This study aims to design an architectural model of blockchain system for supervision of vaccine distribution by taking Indonesia as the case of implementation. It uses analytical study to identify the possible problems and the stakeholders involved. As the result, it proposed the type of blockchain and the architecture that are most suitable for use in the supervision system. By making valid data readily available to policy and decision makers, it facilitates evidence-based decisions on public health.

Keywords: blockchain, system design, vaccine, pandemics

Paper ID: 80

Fuzzy-based Dynamic Reward for Discovery Activity in Appreciative Serious Game

Hanny Haryanto, Aripin, Acun Kardianawati, Umi Rosyidah, Erna Zuni Astuti and Erlin Dolphina

Abstract - Interactivity and experience as the main characteristics of serious game has made it considered one of the most promising learning tools. Those characteristics supported mainly by game activity. Therefore, activity design is one of the most important element in developing serious game. One of the activity design concepts is to use Appreciative Learning, which consists of the stages of Discovery, Dream, Design and Destiny. The activity of exploration in Discovery stage is the main activity which is dominated by search and exploration. Because it is a search and exploration activity, it takes a long time and contains uncertainty in achievement. Dynamic rewards are needed to support the continuity of this Discovery activity. A good reward keeps the player's focus on searching and exploration by providing indicators of achievement. This study uses fuzzy logic to form dynamic reward behavior in Discovery activities. The criteria used as input are the percentage of exploration and time, which will generate dynamic rewards for Discovery activities. The results of this study, fuzzy logic can produce three levels of variance of reward.

Keywords: appreciative learning, discovery, fuzzy logic, game activity, reward

Paper ID: 82

Knowledge Reuse Evaluation in Software Development: Case Study on a Startup Company

Yosua B. Putrapratama, William Adjandra, Adhitia Wiraguna, Dana I. Sensuse and Nadya Safitri

Abstract - The software development process often faces some problems. In finding solutions for the problems, software development teams often seek previous knowledge. In fact, the search process to find previous knowledge took a long time and the results are not appropriate. The methodology used in this research is qualitative research using Systematic Literature Review, data triangulation, and Design Sprint. This research provides a system design for the reuse of knowledge that results from associations between best practices and practices in organizations. The proposed system has several features to support better knowledge reuse processes in PT XYZ.

Keywords: knowledge reuse, design sprint, software development, knowledge management

Paper ID: 84

Multiple Criteria Decision Making Based on VIKOR for Productive Economic Endeavors Distribution Problem

Irvanizam Irvanizam, Natasya Azzahra, Inayatur Nadhira, Zulfan Zulfan, Muhammad Subianto and Intan Syahrini

Abstract - The office of social affairs has been providing several social welfare assistances for empowering marginalized groups. One of the assistance programs is the productive economic endeavors (PEE) that emphasize increasing the income of micros, small and medium enterprises (MSMEs) to build harmonious social relationships among communities. However, in the past selection process, an officer evaluated potential MSMEs based on requirement data conventionally so that it is very vulnerable to personal subjectivity. Therefore, a Multiple Criteria Decision-Making (MCDM) model was designed to apply to this decision-making process. The model integrated the AHP method with the VIKOR method. First, based on the professional decision-maker judgment in evaluating a pairwise criteria comparison, the AHP determined the acceptable criteria weights automatically, and the VIKOR then utilized them to rank alternatives based on the values of utility and regret measures. After checking the acceptability advantage and stability in decision-making, the results showed that alternative U_5 and U_8 were the compromise solutions representing the closeness to the ideal solution. Finally, this MCDM model is a feasible and suitable tool for dealing with this decision-making problem.

Keywords: multiple criteria decision-making, VIKOR, AHP, productive economic endeavors, social services.

Paper ID: 85

Neural Network Optimization for Prediction of Student Study Period

Arif Laksito, Ainul Yaqin, Sumarni Adi and Mardhiya Hayaty

Abstract - The student's study period's in a university was significant in implementing higher education goals and study programs to improve accreditation level. The student's study period's prediction can make higher education institutions' foundation in making future policies. Several factors in implementing students during their studies, including the cumulative achievement index (GPA), affect the study period. Furthermore, the institution often does not consider the conditions or the student's study period's predictive value at its campus. A neural network (NN) is a prediction or classification method that previous researchers have widely used because it is reliable in solving prediction problems. The main problem with improving the accuracy of the NN is the tuning parameter. The neural network model has algorithms for optimization, namely, Particle Swarm Optimization (PSO) and Genetic Algorithm(GA). Based on the experiments and analyses that have been done, the accuracy has been obtained in the GA (GA-ANN) Neural network model with an accuracy score of 71.4%. The score is gained from the parameter specification number of epoch 5, mutation rate = 0.9, layer size 20, tanh activation function, adam solver, and 1000 maximum iteration.

Keywords: study period prediction, neural network, tuning parameter, particle swarm optimization, genetic algorithm

Paper ID: 89

Prototype Blockchain-Based Smart Contract For Freelance Marketplace System

Irawan Afrianto, Christover Ramanda Moa and Sufa Atin

Abstract - Freelancing marketplace is a site or platform that connects two parties in processing service transactions at an hourly rate or per project. A conventional freelancing marketplace is a place for freelancers to find work and transact digitally. This research has the intent and purpose of connecting the two parties between project owners and freelancers in conducting contract agreement transactions safely, transparently, and inexpensively without any third party being involved. The solutions offered to improve transaction management in the long term by implementing smart contracts based on blockchain technology. The software development method uses a prototype because its development requires the role of the user. In the prototype software development method, user involvement is very high to meet user needs. Based on tests carried out, the system can store any information data into the Ethereum blockchain with a smart contract so that its existence can be tracked. The study results show that the application of smart contracts on blockchain technology in supporting digital transactions and agreements can provide transaction management for data stored on each block on the network without a third party directly involved, so that transactions are more transparent and low cost.

Keywords: blockchain, smart contract, prototype, freelance marketplace system

Paper ID: 90

SMOTE for Handling Imbalanced Data Problem : A Review

Gede Angga Pradipta, Retantyo Wardoyo, Aina Musdholifah and I Nyoman Hariyasa Sanjaya

Abstract - Imbalanced class data distribution occurs when the number of examples that represent one class much lower than other classes. This conditioning affects the prediction accuracy degraded on minority data. To overcome this problem, Synthetic Minority Oversampling Technique (SMOTE) is a pioneer oversampling method in the research community for imbalanced classification. The basic idea of SMOTE oversampled by creating a synthetic instance in feature space formed by the instance and its K-nearest neighbors due to the ability to avoiding overfitting and assist classifier in finding decision boundary between classes. In this paper, we review current issue and problem occurs in classification with imbalanced data, performance evaluation in imbalanced data, a survey on an extension of SMOTE in recent years, and finally identify current challenges and future work in learning with imbalanced data.

Keywords: imbalanced data, oversampling, SMOTE, Imbalanced Classification, Synthetic data

Paper ID: 91

A Study on Autonomous Drone Positioning Method

Fabianaugie Jametoni and Dany Eka Saputra

Abstract - The most basic capability of an autonomous drone is its positioning capability. There is various method available to calculate a drone position. To help any new researcher on autonomous drone to choose their option on drone positioning system, a proper categorization is needed. This work provides a taxonomy of drone positioning system. The taxonomy categorizes drone positioning system into two major methods: vision-based and non-vision-based. The taxonomy further divides each method into several sub-method based on the equipment and calculation method. The taxonomy also provides the advantage and disadvantage of each method.

Keywords: drone positioning system, distance measurement, literature review

Paper ID: 97

Extending ECM with Quality Factors to Investigate Continuance Intention to Use E-learning

Fx Hendra Prasetya, Bernardinus Harnadi, Albertus Dwiyoga Widiantoro and Agus Cahyo Nugroho

Abstract - This paper has purpose to investigate the impact of quality factors on satisfaction and continuing intention in using e-learning system. The study employs expectation–confirmation model (ECM) to express the effect of Information Quality, System Quality, Service Quality on Confirmation and Satisfaction and adds Perceived Usefulness and Self efficacy to reveal their effect on Satisfaction. The proposed model was tested using 325 respondents. They are young people that live in digital native culture. The analysis of data was carried out in two stages, the first stage is validity and reliability checking to perform correlation analysis of variables when pass the checking. The second stage, the causal effects of variables are examined using Structural Equation Modelling (SEM) using Partial Least Square (PLS). The findings of the study reveal quality factors as the determining factors for the confirmation of the satisfying and using e-learning continually. The confirmation also was determined by the perceived usefulness of the system and the self-efficacy in using the system. The findings disclose the quality of e-learning system is prominent factor on continuance intention to use the system.

Keywords: e-learning, satisfaction, continuance intention, quality factors

Paper ID: 99

User Sentiment Analysis in the Fintech OVO Review Based on the Lexicon Method

Albertus Widiantoro, Adi Wibowo and Bernardinus Harnadi

Abstract - User reviews are important in the new approach to fintech services. To learn this information, a simple sentiment analysis can make the right observations to support the OVO fintech system in analyzing the success of the fintech system.The analysis has several stages, starting from how to extract comment data from the play store, extracting meaningful information from the play store platform, and extracting the data into valuable information. Moreover, accurate topic modeling and document representation is another challenging task in sentiment analysis. We propose a lexicon-based topic modeling in observing user sentiment simply by looking at the number of words that appear. The proposed system retrieves OVO fintech comment data from the Play Store, removes irrelevant content to extract meaningful information, and generates topics and features from the extracted data using NLTK. Data processing using google collab in Python language where data is used freely. Data analysis using the word cloud method, Exploratory Data Analysis (EDA), correlation analysis between words, ordering the number of words in sentences revealed that OVO comments in that period tended to be negative

Keywords: fintech, lexicon-based, review, OVO-fintech

Paper ID: 101

Vehicles Position Tracking in Parking lots Using K-Nearest Neighbor and Fingerprinting Based on RSSI Bluetooth

Adi Suheryadi, Muhammad Anis Alhilmi, Willy Permana Putra, Kurnia Adi Cahyanto and Firdaus Firdaus

Abstract - Location-based services have become very popular in recent years, among these services are navigation and location determination both indoor and outdoor. Determining of an object location is often an interesting topic for study, various studies have been carried to determine the position of the object using several methods using either GPS, CCTV, Wireless or Bluetooth. One of the interesting cases to study is determine of vehicle position in the indoor parking lots. It is important to record the parking location because it will make easier for newcomers to locate their vehicle in the parking area. Various studies have suggested that Bluetooth is a promising wireless technology in indoor positioning system because of its cost-effectiveness and user-friendly features. In this study, we propose a method for recording parking positions using the K-Nearest Neighbor and Fingerprinting techniques based on RSSI Bluetooth. From the results of our study, it was found that the accuracy about 77% with Precision, Recall and F1-Score pessimistic approach reaching 87%, 85% and 85%.

Keywords: Indoor Positioning System, Smart Parking System, K-Nearest Neighbor, Fingerprinting, RSSI Bluetooth

Paper ID: 102

Avoiding Lookup Table in AES Algorithm

Ragiel Hadi Prayitno, Sunny Arief Sudiro and Sarifuddin Madenda

Abstract - This article describes the AES encryption and decryption process without using lookup tables in the MixColumns transformation. The encryption process consists of transforming subbytes, shiftrows, mixcolumns and addroundkey. The process was carried out for 10 rounds, but in round 10 the mixcolumns transformation was not carried out. The decryption process consists of inverse mixcolumns, inverse shiftrows, inverse subbytes and addroundkey. In this study, the AES encryption and decryption process was carried out using two methods, namely based on the lookup table and without using the lookup table on the MC/IMC transformation. The method in this article is applied to MATLAB software. The experimental results show that the encryption and decryption process using a lookup table is slower than the method without a lookup table. The encryption process without a lookup table on the MC transformation takes 0.091 seconds while using a lookup table takes 0.399 seconds. The decryption process without a lookup table on the IMC transformation takes 0.149 seconds while using a lookup table takes 0.206 seconds.

Keywords: AES, Decryption, Encryption, Matlab, Without lookup table

Paper ID: 105

Network Automation for CE Router with Route Leaking in MPLS-VPN Network

Mochamad Yazid Gupron and Umaisaroh Umaisaroh

Abstract - The utilization of command-line interface (CLI) terminal on network devices such as routers are commonly used, however typing commands manually into CLI terminal is very susceptible to human error. In multiprotocol label switching-virtual private network (MPLS-VPN) there are many devices, such as customer edge (CE) routers are inconvenient to be handled due to manual process that user has to be done in CLI terminal. Network automation process in MPLS-VPN networks is challenging because there are many routing tables that need to be handled. In this paper, the route leak method proposed to overcome these limitations and so that the network automation program can be directly applied to CE routers. The results show that time efficiency slightly up to 15 seconds and 40 seconds faster to discover CE router and to configure CE router respectively compared with manual method by using CLI terminal.

Keywords: MPLS-VPN, Automation, Route Leaking, CLI

Paper ID: 107

Design and Simulation of Antipodal Vivaldi Antenna (AVA) AT 2.6 GHz For 5G Communication Optimation

Andreas Renaldy Darmawidjaja and Eri Prasetyo Wibowo

Abstract - Vivaldi antenna or Vivaldi aerial or tapered slot antenna is a coplanar broadband-antenna, which can be made from a solid piece of sheet metal, a printed circuit board or from a dielectric plate metalized on one or both sides. Antipodal Vivaldi (AVA) is one type of Vivaldi Antenna which is better than other types of Antipodal Vivaldi for 5G communications. It has advantages for the High Gain, improve return loss, high efficiency, enhanced beamwidth, low sidelobe level, (Reduce the sidelobe level and back lobe level), Compact size, Stable radiation pattern, higher Operating Frequencies (1 Ghz to 100 Ghz) and more front to back ratio, which are really suitable for 5G communications. Antipodal Vivaldi Antenna (AVA) work at 2.6 GHz (2.6768 Ghz). The antenna needs to get the Institute of Electrical and Electronics Engineers (IEEE) defined standards which is VSWR ≤ 1, reference impedance 100 ohm, and s-parameter below -20dB. The Antipodal Vivaldi Antenna design process is carried out by using math formulation and experimental methods. For simulate and optimizing it, it uses CST studio suite 2018 software. To get the IEEE defined standards, AVA need to be optimize with changing antenna dimension elements (feed line width) and configure its slots which can lead to physic optimization. The results obtained in the form of slot antenna that works at a frequency of 2.6 GHz (2.6768 Ghz). The results obtained are the value of slot antenna. VSWR has a value of 1.0508971. The return loss is -32.105013. The gain is about 2.697 dB. The antenna has a line

Keywords: 5G Communications, Antipodal Vivaldi Antenna, Vivaldi Antenna, Antenna Parameters

Paper ID: 109

Processing Speed Comparison of The Least Significant Bit (LSB) Steganography Algorithm On FPGA And Matlab

Bayu Kumoro Yakti, Sarifuddin Madenda, Sunny Arief Sudiro and Purnamawan Musa

Abstract - Digital images are images in the form of digital formats or digital media such as hard drives. Digital images consisted of bits (0 or 1) called pixels and have high capacity for storing data and information. Steganography techniques try to hide the existence of confidential data. The Steganography technique perfectly closes secret messages in carrier images with high level security. Information and data will be manipulated so that it can be detected by human eyes. Least Significant Bit (LSB) is the method used in this study. The embedding and extracting processes in the proposed algorithms are performed using matlab software and FPGA-based hardware simulation using xilinx ISE. The purpose of this research is to compare the process speed of the LSB steganography algorithm in the two implementations. the input data on the encryption used is data in binary form and RGB images and output data in the form of stego images. Meanwhile, the input data in the decryption is in the form of a stego image and the output data is in the form of binary data. The experimental results show that the steganography algorithm has been successfully performed on FPGA and matlab. the process on FPGA is faster than the process on matlab. where, the encryption process is 696000 times faster than matlab. Meanwhile, the decryption process is 236000 times faster than matlab.

Keywords: FPGA, LSB, Matlab, Steganography

Paper ID: 110

The Role of Indonesian Education-based Startup in Enhancing the Learning Quality of High School Students in COVID-19 Pandemic Era

Akmal Silva Pratama, Eidelina Maghfirah, Faiz Ramadhan, Joharotul Jamilah and Raudatul Zanah As

Abstract - The COVID-19 pandemic causes transitions and social changes in the learning process from offline to online. On the other hand, the adaptation of formal education to digital learning is not always smooth. In this case, startups in the education sector have a role in advancing education and improving the quality of students in Indonesia, especially high school students. The purpose of this research is to analyze the role of educational startups in Indonesia in improving the quality of high school students during the pandemic. This research uses a mix method approach that combines qualitative and quantitative approaches, where data is obtained through library research, interviews, and distributions of questionnaires to 112 high school students. The results of this research indicate that startups in the education sector have a role in improving the quality of learning for high school students, especially in the quality of Intelligence Quotient in terms of intellectual intelligence which produces data on improving high school student learning in facilitating the understanding of daily tasks from teachers, both school assignments and homework.

Keywords: Startup, Education, Quality, Online Learning

Paper ID: 111

Text Preprocessing Impact for Sentiment Classification in Product Review

Murahartawaty Arief and Mustafa Bin Matt Deris

Abstract - In the significant data era with the Covid-19 pandemic, the e-commerce platform does high product reviews in real-time. Businesses are looking to have a rating and review system to quickly reveal customers' feelings related to their products and services and utilize this ever-growing volume of data to improve their competitive strategies. Amazon is one platform that can generate an enormous amount of such data. However, product review data are often unstructured and difficult to manage. Hence, this experimental study observed text preprocessing impact to process unstructured product review data using SVM, Naïve Bayes, and Decision Tree sentiment classifiers with better accuracy. In terms of evaluation model performance, the SVM performed better with an accuracy of 80,62%, but the Naïve Bayes classifier has minimum execution time. Furthermore, the experimental result using our approach TF-IDF for feature extraction may significantly improve classification accuracy. Therefore, our approach confirms that proper text preprocessing sequence plays an essential role in the classifier's prediction accuracy for unstructured product review data.

Keywords: Product review, Text Preprocessing, Sentiment Classification, SVM, Naïve Bayes, Decision Tree

Paper ID: 112

IndoAlgae: The Database of Indonesian Native Strains of Potential Marine Micro and Macro Algae

Foni Agus Setiawan and Puji Rahmadi

Abstract - Marine algae, both micro and macro algae, are potential marine biological resources as industrial commodities. Indonesia is one of the five largest macroalgae producers in the world and plays a role as a supplier of biomass raw materials in the development of marine algae-based industries. However, Indonesia does not yet have a data center and information on this wealth of resources. In fact, in developing appropriate technology and diversifying innovative products based on micro and macro marine algae, it is necessary to have information from the database of the wealth of these algae resources. Therefore, this study aims to build a database of Indonesian native strains of micro and macro algae (Mikro dan Makro Alga Laut Strain Asli Indonesia [MALSAI]) at the national level and present it in the form of an online information system. The methods used in this research are primary and secondary data collection, web-based information system development, collaborative data entry into the system, and continuous data updating. The availability of an algae database on a web-based and open-access information system at the national level is the first in Indonesia and even at the regional level. The results obtained are: (1) The collection of morphology and distribution data of 100 algae species with 60 specimens obtained from 9 events stored in 4 depositors and (2) the publication of the MALSAI database on the IndoAlgae website at https://www.indoalgae.org.

Keywords: potential micro and macro algae, Indonesian native strain, algae database, algae information system, IndoAlgae

Paper ID: 113

Classification of Batik Authenticity Using Convolutional Neural Network Algorithm with Transfer Learning Method

Farrel Athaillah Putra, Dwi Anggun Cahyati Jamil, Briliantino Abhista Prabandanu, Suhaili Faruq, Firsta Adi Pradana, Riqqah Fadiyah Alya, Heru Agus Santoso, Farrikh Al Zami and Filmada Ocky Saputra

Abstract - Batik is one of Indonesia's cultural heritages that UNESCO has recognized as an Intangible Cultural Heritage, so we should be proud and preserve it. However, there are problems in the batik industry related to the labelling of traditional and modern batik products. The prevalence of fraud in printed batik, which is given a price equivalent to written batik, which is much more expensive, and public ignorance of the aesthetic value and authenticity of written batik, can disrupt the traditional batik industry in Indonesia. Based on these problems, the authors innovate to develop a machine learning model that aims to classify the authenticity of batik using the Convolutional Neural Network Algorithm with Transfer Learning Method. The classification process consists of several stages: collecting datasets, preprocessing data, developing CNN models with transfer learning, and compiling and training models. The development of the machine learning model that has been trained produces an accuracy of 96.91%. The author hopes that this research can make it easier for people to distinguish between written and printed batik, minimize the existence of batik price fraud, and increase consumer confidence in batik transactions by ensuring the originality of batik products.

Keywords: Batik, Classify The Authenticity Of Batik, CNN, Transfer Learning, Machine Learning

Introduction

Paper ID: 114

Verifying Waste Disposal Practice Problems of Rural Areas In Indonesia Using the Apriori Algorithm

Aa Zezen Zaenal Abidin, Mohd Fairuz Iskandar Othman, Aslinda Hassan, Yuli Murdianingsih, Usep Tatang Suryadi and Zulkiflee Muslim

Abstract - Verifying a set of most frequent problems is essential before introducing practical solutions using new technology, processes, and practices. This study proposes a way to verify these problem sets. The main contribution of this paper is a method to verify a set of most frequent problems in waste disposal practices previously identified through a survey questionnaire, using Google Earth visualization and the Apriori algorithm. Google Earth is used to pinpoint the geographical locations of existing waste bins, illegal landfills, and people's houses. The distance between the waste bins and the residents' houses, sites of waste disposal by burning, and sites of waste disposal by dumping are then analyzed as a combination of the problems of waste disposal practices. Support, Confidence, multiplication between Support and Confidence, and lift ratio values are then calculated to obtain a combination of the most frequent problems sets. Next, the support value in the Apriori algorithm is compared with the FP-Growth method using Rapidminer. Results obtain support and thus verify data previously obtained from the survey. For a 2-itemset problem and a minimum support value of 0.1, 33% accuracy is obtained, while a 3-itemset problem returns 99% accuracy. We show that our method is useful in verifying data previously obtained from other sources.

Keywords: Waste disposal, Rural Areas, Apriori algorithm, Google Earth

Paper ID: 115

Face Recognition-based Door Locking System with Two-Factor Authentication Using OpenCV

Muhammad Arif Azhari Halim, Mohd Fairuz Iskandar Othman, Aa Zezen Zaenal Abidin, Erman Hamid, Norharyati Harum and Wahidah Md Shah

Abstract - This project develops a face recognition-based door locking system with two-factor authentication using OpenCV. It uses Raspberry Pi 4 as the microcontroller. Face recognition-based door locking systems has been around for many years, but most of them only provide face recognition without any added security features, and they are costly. The design of this project is based on human face recognition and the sending of a One-Time Password (OTP) using the Twilio service. It will recognize the person at the front door. Only people who match the faces stored in its dataset and then inputs the correct OTP will have access to unlock the door. The Twilio service and image processing algorithm Local Binary Pattern Histogram (LBPH) has been adopted for this system. Electric solenoid door lock operates as a mechanism to access the door. Results show that LBPH takes a short time to recognize a face. Additionally, if an unknown face is detected, it will log this instance into a "Fail" file and an accompanying CSV sheet. Therefore, this system provides a proven, secure yet low cost solution to home owners.

Keywords: Face recognition, door lock system, two-factor authentication, OpenCV, home-security

Paper ID: 117

Gap Analysis of Software Requirements Implementation in Scrum: A Systematic Literature Review

Muhammad Satria Buana and Eko K. Budiardjo

Abstract - Scrum becomes the most widely used and dominates agile software development. Various studies discuss the challenges of implementing software requirements in Scrum. However, only a few studies describe the development activity rules that have gaps with implementing scrum. In addition, previous and related studies on this matter only explain the gaps separately for particular development activities rules, there are no studies that discuss overall development gaps activities rules in scrum. This study performed a systematic literature review to compile available studies to obtain comprehensive current knowledge of whole development gaps activities rules based on scrum guide. This study uses one of the methods of a systematic literature review from the Joanna Briggs Institute (JBI), namely Systematic Review of Qualitative Evidence. Based on investigations through the Systematic Review of Qualitative Evidence, there are development gaps activity rules on Product Backlog, Sprint Backlog, Developer, Product Owner, Sprint Retrospective, and Increment.

Keywords: scrum, agile, software requirements, software development, systematic review, systematic review of qualitative evidence

Paper ID: 119

Aspect-Based Sentiment Analysis on Indonesian Restaurant Review Using a Combination of CNN and Contextualized Word Embedding

Putri Rizki Amalia and Edi Winarko

Abstract - Customer's opinion on a product or service is important for the owner or potential customer. However, the large number of reviews makes it difficult to analyze. Aspect based sentiment analysis is the process of determining the sentiment polarity of a sentence based on predetermined aspects. This study investigates an Indonesian restaurant review using a combination of Convolutional Neural Network (CNN) and Contextualized Word Embedding models (ELMo and BERT). We also compare these two models (BERT-CNN and ELMo-CNN) with the combination of CNN and Word2vec (Word2vec-CNN). Our experiments show that the ELMo-CNN model gives the best performance for aspect classification, while the BERT-CNN has the best performance for sentiment classification.

Keywords: Aspect-based sentiment analysis, Restaurant review, contextualized word embedding, CNN, BERT, ELMo

Paper ID: 121

Stroke Disease Analysis and Classification Using Decision Tree and Random Forest Methods

Desy I. Puspitasari, Alfath R. Kholdani, Adani Dharmawati, Muhammad E. Rosadi and Windha M.P. Dhuhita

Abstract - A stroke is a medical emergency that occurs when blood flow to the brain is blocked or decreased, depriving brain tissue of oxygen and nutrients. Stroke is the world's second leading cause of death, according to the World Health Organization (WHO). Stroke patients die within the first year of their illness. To reduce the risk of stroke, simple and effective tools are required. The goal of this study was to look into the classification of stroke potential and come up with a simple and reliable model. The Kaggle database provided the stroke prediction data set, which was based on input criteria such as gender, age, various illnesses, and smoking status. To determine the prediction of the construction model, decision trees and random forest classification methods were utilized. The independent variables determining the incidence of stroke were determined to be age (AUC 0.85), hypertension (AUC 0.62), blood sugar level (AUC 0.61), history of heart disease (0.56), married status (0.60), and body mass index (BMI) (AUC 0.56). Age, hypertension, blood sugar level, and BMI were all valid, with a random forest method accuracy of 98.82 percent and decision tree method accuracy of 95.98 percent.

Keywords: AUC, classification, decision tree, random forest, stroke

Paper ID: 123

Design and Implementation of an Emergency Pregnancy Referral Application Using Rule-Based Expert System Forward Chaining Method

Siska Puspitaningsih, Suryono Suryono and Farikhin Farikhin

Abstract - There are many diseases and disorders in pregnancy that can lead to an emergency pregnancy. Delays in recognizing and making a diagnosis, delays in making decisions and delays in making referrals are three causes of higher maternal and infant mortality rates. Several problems with delays in the diagnosis and referral process have become very important discussions and solutions must be sought. Because good referral management is the key to reducing maternal and infant mortality. Likewise, establishing the right pregnancy diagnosis when it is not too late is one of the efforts to prevent pregnancy emergencies. This study aims to design and implement a rule-based expert system forward chaining method for emergency pregnancy referrals and to measure the level of system accuracy based on the results of validation tests. The input of this research is symptom data which is then processed using a rule-based expert system forward chaining and produces output information on the type of disease and the place of reference. The results of the validation test, the probability value of the system accuracy is 78.4% and the system inaccuracy is 21.6% so that this reference application can be declared to be running well.

Keywords: forward chaining, rule-based system, expert system, diagnosis, emergency pregnancy referral.

Paper ID: 125

The Effectiveness of Forward-Backward Combination Method in Dynamic Programming

Banteng Widyantoro, Arini Arini, Husni Teja Sukmana and Iik Muhamad Malik Matin

Abstract - Determining the shortest path with efficient results is important to achieve the minimum distance and time to arrive at the destination. The problem is that the shortest path algorithm can provide a solution. Among the shortest paths, dynamic programming (DP) is one of the algorithms that can provide the best solution for this problem. Several previous studies only used forward or backward models to provide solutions. Combining forward and backward models can be applied to problems that have search motion criteria. In this paper, we propose a combination of the forward-backward DP model and compare it with the forward and backward models to find parking spaces and measure time efficiency. The forward-backward combination model provides the most effective solution with efficient time consumption

Keywords: dynamic programming, backward-forward, parking, shortest path

Paper ID: 127

DETECTING HATE SPEECH IN TWITTER USING LONG SHORT-TERM MEMORY AND NAÏVE BAYES METHOD

Firman Sriyono, Kusrini Kusrini and Asro Nasiri

Abstract - The information technology's development has been very sophisticated and easy, so that it becomes a lifestyle for people throughout the world without exception Indonesia which also affected by the development of this technology. One of the benefits of information technology is the emergence various kinds of social networking sites or social media such as Facebook, Twitter and Instagram. Technological developments isn't only have a positive impact, but also have a negative impact the crime of insult or hate speech. This study is aims to classify Indonesian hate speech sentences based on hate speech and neutral sentiments using the Long Short-Term Memory (LSTM) method. Research data is obtained from Indonesian-language tweets. In testing process, the LSTM method will be compared with the Naïve Bayes method.

Keywords: hate speech, hate speech detection, long short-term memory, abusive language, sentiment analysis, naïve bayes

Paper ID: 128

Determine Felder Silverman Learning Style Model using Literature Based and K-Means Clustering

Arief Hidayat, Kusworo Adi and Bayu Surarso

Abstract - The student learning process is influenced by several factors, one of which is student learning styles. Learning style is one of the most important factors in the E-learning environment because it can help the system to effectively personalize the learning process of students according to their learning style. Previously, to detect student learning styles by asking students to fill out questionnaires. However, there are problems with this static technique. One of these problems is the lack of students' self-awareness of their learning preferences. In addition, almost all students feel bored when asked to fill out a questionnaire. This research determined the learning style based on the Felder and Silverman Learning Style. This determination process is carried out using student activity data on a pure Moodle learning management system (LMS). The process begins with processing based on the literature to get a vector combination of learning styles. Student activity data is processed to produce data that only contains activities that are included in the selected features. The results of both are combined as input to the clustering process. This research applies the modified K-Means Clustering algorithm. Modifications were made using the learning style combination vector as the initial centroid. The k value used in this study was 8 which came from 8 combinations of learning styles from 3 dimensions used in this study. This is different from the combination of learning styles in FSLSM which has 16 combinations of learning styles originating from 4 dimensions of learning styles. This difference is caused by student activity data that only supports 3 dimensions of learning style.

Keywords: felder and silverman, learning style, literature based, k-means, clustering

Paper ID: 129

Design and Building Hands-On Vulnerable Web Application as a Software Security Educational Media

Riama Kristallia, Hermawan Setiawan and Siti Manayra Sabiya

Abstract - Lack of developer knowledge of software security is one of the vulnerability factors in applications, especially the web, so it is necessary to have educational media that can provide an understanding of software security awareness. In this study, a hands-on vulnerable web application was designed as a media for software security education. The application is developed using a design research methodology with a prototyping development method that produces two parts of the application: the vulnerable and public applications. Both applications were tested using functional testing, security testing, and achievement measurement. Functional and security test results show that the application can run according to the designed functionality and the security case used. The measure of achievement shows that the mean value of the user's score is 3.45 out of 20, the achievement total being 69 out of 184, with a standard deviation of 4.67. It is influenced by the diversity of basic competencies possessed by the user.

Keywords: design research methodology, hands-on learning, vulnerability, web applications security

Paper ID: 130

Design and Development of Information Sharing and Analysis Center (ISAC) as an Information Sharing Platform

Intan Maratus Sholihah, Hermawan Setiawan and Olga Geby Nabila

Abstract - Cyber attacks are the main focus highlighted in all countries globally, both private and public sectors.

It is undeniable that every private and public sector has a significant role in the digital world and cybersecurity. It is a reason for every country to improve and develop everything in cyber technology behind defense or attack. One of the solutions offered is to build a platform that can be used to share information to improve a coordinated and structured cybersecurity defense strategy. Data information, a list of attacks and threats can help stakeholders in each sector identify threats, attacks, and incidents in the cyber world. Therefore, this research will develop a web-based Information Sharing and Analysis Center (ISAC) platform to collect information and view a list of attacks and threats in the cyber world. The list of attacks and threats will be obtained through the Malware Information Sharing Platform (MISP). A two-factor authentication method will be implemented on the login form in the development of the ISAC platform. Two-factor authentication is a method used to secure user data from attackers. The research method used in building this platform is Design Research Methodology (DRM) with a prototyping development method. The results of this study obtained an ISAC portal that can be used to share information and display a list of threats and attacks received from the MISP platform.

Keywords: cyber attacks,cybersecurity,cyber threats,information-sharing

Paper ID: 131

Sarcasm Detection of Tweets in Indonesian Language Using Long Short-Term Memory

Suko Pernanda, Moh Wibowo and Nur Rokhman

Abstract - Twitter is a massive source of information that can potentially be used to obtain valuable insights about public opinions, public ideas, and public circumstances. Extracting accurate information from tweets, however, is often challenging due to the use of the use of informal, non-standard, and figurative languages including sarcasm. Sarcasm itself conveys messages using words with the opposite literal meaning. Detecting sarcasm, therefore, becomes important task during information extraction from public tweets. This research proposes the use of LSTMs to detect sarcastic tweets in Indonesian language through the extraction of sentence-embedding features. LSTMs themselves have been known to be able to learn sequential patterns appearing in input data so that features extracted by LSTMs are more representative than features that are manually hand-crafted by human. The proposed LSTMs are combined with the Word2Vec model that serves as a word encoder that preserves semantic meaning. The proposed method is evaluated on tweets that are scrapped from the Web using some keywords about recent situations. The experimental results demonstrate that the proposed method is able to achieve an accuracy of 82.13% and an f1-score of 61.31% outperforming the conventional TF-IDF + naïve Bayes sarcasm detector. These results thus prove that sentence-embedding is able to extract features that are more accurate and more discriminative for sarcasm detection.

Keywords: tweets, Indonesian, sarcasm, sentence-embedding, LSTM

Paper ID: 133

Designing Early Warning System for Course Completion using Learning Management System

Amalia Rahmah

Abstract - The number of failing students in courses incompletion has increased at the implementation of distance learning during the Covid-19 pandemic, including at STT Terpadu Nurul Fikri, an IT based major campus in Depok, Indonesia. As known, the implementation of distance learning commonly utilizes a learning management system (LMS) as the main learning media, such as Moodle. It encourages shift in students monitoring using their behavior in using LMS. Therefore, an early warning system using students' at-risk behavior in using the LMS is an opportunity to reduce the failure rate. It is the issue raised in this research. The research carried out these following steps: analyze course completion factors using FGD and students' LMS activity log, formulate to-be-monitored factors, designing early warning system, and recommending how to apply it. The results cover a formulation of factors related to the LMS usage that can be considered in students monitoring and the design of an early warning system for such monitoring.

Keywords: course completion, distance learning, early warning system, LMS, learning management system, Moodle

Paper ID: 137

SDN based V2X Networks for Disaster Management: A Systematic Literature Review

Muhammad Junaid Anjum and Muhammad Shoaib Farooq

Abstract - Disasters in an area or an accident in a city both result in loss of property and lives. To overcome this, a disaster management system needs to be in place, which is efficient for any type of scenario. Through the use of Software Defined Networks and Vehicle-to-Everything, it is possible to create such an effective disaster management system. However, simply defining an architecture is not a solution. Other factors such as the transmission of data and its reliability is also a key research point. In light of this, this article presents a systematic literature review of around 20 research works that was conducted by surveying different architectures and routing protocols of software defined vehicular networks in terms of any disaster related scenario. The major objective of this literature review was to present a review of different proposed architectures and various routing protocols and their subsequent network characteristics in the case of a disaster scenario. Also, different open research issues and challenges are highlighted for any kind of disaster scenario.

Keywords: Software Defined Networks, Vehicle-to-Everything, Disaster Management, Systematic Literature Review

Paper ID: 141

Text Summarization Techniques Using Natural Language Processing: A Systematic Literature Review

Faiqa Adnan and Muhammad Shoaib Farooq

Abstract - In recent years, data has been growing rapidly in almost every domain. Due to this excessiveness of data, there is a need for an automatic text summarizer that summarizes long and numerical data especially textual data without losing its content. Text summarization has been under research for decades and researchers used different summarization methods by using natural language processing and combining various algorithms. This paper presents a systematic literature review by showing a survey of text summarization methods and explains the accuracy of these methods used for text summarization. The paper first introduced some concepts of extractive and abstractive text summarization and also define how deep learning models can be used for the improvement of text summarization. This paper aims to identify the current utilization of text summarization in different application domains. Different methodologies are discussed for text summarization. To carry out this SLR, twenty-four published articles have been chosen carefully for this domain. Moreover, it discusses issues and challenges which are investigated in different application domains using text summarization methods. Lastly, the existing work of different researchers has been carried out for further discussion.

Keywords: Natural language processing (NLP), Text summarization, Extractive Method (EXT), Abstractive Method (ABS), Deep learning

Paper ID: 144

Latent Dirichlet Allocation for Medical Records Topic Modeling: Systematic Literature Review

M. Mustakim, Retantyo Wardoyo, Khabib Mustofa and Gandes Retno Rahayu

Abstract - The fast growth of Electronic Medical Records (EMR) has improved its functionalities and increase its use in secondary functions. EMRs can be used to improve the quality and capacity of physicians and medical students. It is done by using EMRs as a data source for researches and learning. A lot of studies have been done in this area. Various methods are also proposed. One of the methods used in medical records retrieval is Latent Dirichlet Allocation (LDA). Thus, research on LDA for medical records has also been carried out quite a lot. Unfortunately, those researches are still scattered and make it difficult to know the state of the arts of utilizing LDA in the medical records field. Our research intends to explore the studies of the LDA method progress in the medical field. To better present responsible literature study, our research used Systematic Literature Review as a research methodology. The literature review was conducted on studies from 2015 to 2021. The result of the literature review showed that the LDA method had been used in several research topics. And most of the literature used private datasets in their experiments. Some researchers also added a modification in the LDA method. Even though the LDA method proved a great method in medical fields, it has several limitations that need to be overcome.

Keywords: systematic literature review, LDA, medical

Paper ID: 146

A Communication Assistant Application for the Deaf

Apriandy Angdresey, Ivana Valentine Masala, Vivie Deyby Kumenap, Michael George Sumampouw, Kristian Alex Dame and Ivan Daniel Reynaldo Riady

Abstract - A deaf person is someone who has limitations or abnormalities in the organ of hearing that result in the inability to hear with varying degrees of hearing. The impact faced by the deaf people is the inhibition of verbal communication both expressively or speaking, unable to control the power of the voice when speaking, and receptively or understanding the conversation conveyed by the interlocutor. This creates barriers and difficulties for deaf people in communicating. In this paper, we propose an Internet of Things-based communication assistant application for the deaf, by utilizing a microcontroller, pulse sensor, and interfacing electret microphone amplifier. Our web-based application can provide information about the strength of the sound produced and the text of the conversation of the interlocutor. We demonstrated by experiment that our sensor devices and the wireless communication assistant application working properly.

Keywords: Internet of Things, Sensor Device, Intelligent System, Communication Assistant

Paper ID: 156

Malaria Classification Using Convolutional Neural Network: A Review

Doni Setyawan, Retantyo Wardoyo, Moh Wibowo and E. Elsa Hardiana Murhandarwati

Abstract - The Convolutional Neural Networks (CNNs) have been used to classify malaria parasites from blood smear images automatically and successfully gave a good result, thus enabling fast diagnoses and saving the patient. This study presents a review of the existing CNN techniques used for malaria diagnosis, focusing on the architectures, data preparation, preprocessing, and classification. Furthermore, this study discusses why the comparability of the presented methods becomes difficult and which challenges must be overcome in the future. First, we review the current CNN approaches used for malaria classification from existing research articles. Next, the performance and properties of proposed CNN approaches are summarized and discussed. The use of CNN as a feature extractor shows better performance than transfer learning and learning from scratch approaches. Unfortunately, some research uses private datasets for training and testing the proposed model. Thus it is not easy to compare with the other methods. The use of CNN in malaria diagnosis is also still limited to binary classification, namely the normal and malaria-infected erythrocyte class. Future research should use available benchmark public datasets to allow the proposed CNN method comparability and proposed a CNN model for multi-class classification such as species and life stages of malaria-causing plasmodium.

Keywords: malaria detection, CNN, feature extractor, transfer learning, learning from scratch

Paper ID: 157

The Rise Efficiency of Coronavirus Disease Classification Employing Feature Extraction

Anis Masruriyah, Hasan Basri, Hanny Hikmayanti, Ahmad Fauzi, Ayu Juwita and Deden Wahiddin

Abstract - COVID-19 has been an epidemic since the end of 2019. The number of patients with COVID-19 continues to escalate until new variants emerge. The COVID-19 detection procedure begins with detecting early symptoms, furthermore, confirmed by the swab and Chest X-Ray methods. The process of swab and Chest X-Ray takes a relatively long time since in Chest X-Ray some patients have the same symptoms as pneumonia. This study carried out the classification of COVID-19 and not COVID-19 with Discrete Wavelet Transform as feature extraction techniques and deep learning as the classification method. The result of this study capable to identify Chest X-Ray with COVID-19 and the accuracy increased of more than 10% on Support Vector Machine, Decision Tree and Deep Learning. So that, the comparison result showed that feature extraction was able to significantly improve accuracy

Keywords: Coronavirus disease, Digital image processing, Discrete Wavelet Transform, Feature extraction

Paper ID: 158

Prediction of Paddy Plant Height with Vermicompost Fertilizer Treatment on Tidal Land Using ANFIS Method

Abdul Rahman, Ermatita Ermatita, Dedik Budianta and Abdiansah Abdiansah

Abstract - This study aims to implement the ANFIS method to predict paddy plant height based on the treatment of vermicompost organic fertilizer. The dataset used for ANFIS training was taken directly from the observation data on the height of the paddy plant and the results of soil laboratory tests. The ANFIS process consists of 5 inputs consisting of fertilizer treatment, pH, N, P, K and one output, namely paddy plant height. The results obtained from the training data process are that there are 486 rules and the error rate using MAPE is 3.53% or the accuracy level of the prediction results is 96.47%.

Keywords: ANFIS, Prediction, Paddy, Vermicompost

Paper ID: 159

K-Means Algorithm and Levenshtein Distance Algorithm for Sentiment Analysis of School Zonation System Policy

Muhammad Haris Al Farisi, Arini Arini, Luh Kesuma Wardhani, Yusuf Durrachman and Iik Muhamad Malik Matin

Abstract - Equity and quality of education must be guaranteed in the national education system. To that end, the government issued a new student admission policy with a zoning system. To ensure the implementation of new student admissions (PPDB), the zoning system needs to be evaluated for community responses. However, evaluation using conventional techniques still has limitations. Sentiment analysis is a new approach to explore computing-based opinion. In this paper, we conduct a sentiment analysis of the new student admissions system (PPDB) zoning policy. We identify two types of sentiment namely positive and negative. We used the Levenshtein Distance algorithm for word normalization and clustered using the K-Means algorithm. The results of clustering are classified based on the confusion matrix. The data sources that we use are taken from 200 comments on Facebook and Youtube channels. The results obtained from public sentiment towards this policy are more negative sentiments than positive sentiments. The results obtained from the accuracy of the K-Means algorithm are 84%, while the combination of the k-means algorithm with Levenshtein distance reaches 90% accuracy

Keywords: Sentiment analysis, school Zonation, K-means, Levenshtein distance

Paper ID: 160

The Predictor of Costumer Loyalty of Online-Based Transportation Application

Mohamad Ikbal Albana, Akhmad Baidun, Rena Latifa and Muthia Rahmah

Abstract - Customer loyalty of Online transportation application based on information technology increased during the Covid-19 pandemic. Customers continue to use Online transportation application in carrying out daily mobility to avoid exposure to the Covid-19 virus. The research aims to prove the influence of brand trust, service quality, and religiosity on customer loyalty of Online transportation application based on information technology. This research uses a quantitative approach. The study sample amounted to 303 users of Online transportation application Sampling technique application service using accidental sampling. Instruments measuring customer loyalty using measuring instruments from Mcmullan and Gillmore [14], Brand Trust Scale (BTS) from Delgado-Bellester [3], Service quality (Servqual) developed parasuraman [17], and The Centrality of Religiousness Scale (CRS) developed by Huber and Huber [8]. Data analysis techniques use multiple regressions. The results of the analysis proved that the null hypothesis was rejected, meaning that there was a significant influence on brand trust, service quality, and religiosity on customer loyalty with a significance level of 0.000 ($P<0.05$) and R square showing 0.580 or 58 %. Based on regression coefficients show that brand reliability, responsiveness and public practices significantly affect customer loyalty of Gojek-based information technology-based application services.

Keywords: customer loyalty, brand trust, quality of service, religiosity, online-based transportation application

Paper ID: 162

Sustainable Learning Micro-Credential using Blockchain for Student Achievement Records

Bambang Mardisentosa, Untung Rahardja, Kenita Zelina, Fitra Putri Oganda and Marviola Hardini

Abstract - This research objective is to present assessment and management to ensure the confidentiality of documents that are permanent, transparent, and sustainable for students by utilizing Blockchain technology and can be accessed directly by students. Maintained confidentiality of documents allows students to personalize the value of education and produce permanent documentation in formal and informal learning and determine the lifelong learning path of each individual. The method in this research using Study Literature Review to study problems from research with the theme of blockchain-based student achievement credentials in the world of education. The results show that blockchain guarantees a foundation for student achievement record credentials that are durable, secure, and offer solid administration in managing student credentials and they can control them on an ongoing basis. Universities are also given the advantage of increasing student file security and reducing administrative and bureaucratic costs. Further research can be carried out by combining blockchain with AI innovation and the application of private key and decentralized cloud to address issues concerning productivity, flexibility, capacity, and tighter security. With future updates, it is hoped that the use of blockchain in student achievement credentials can become more mature and can be applied to 1000 universities in Indonesia.

Keywords: Blockchain, Learning Credentials, Student Achievement, Blockcert

Paper ID: 163

Legality on Digital Document Using Blockchain Technology: An Exhaustive Study

Ari Pambudi, Suryari Purnama, Tsara Ayuninggati, Nuke Puji Lestari Santoso and Anggun Oktariyani

Abstract - This research uses blockchain-based techniques to overcome the problem of easy diploma counterfeiting in Indonesia. Required authentication by the company using staff can save time. Because the blockchain technique, which has six characteristics, can solve at least four problems, including reducing the number due to peer-to-peer decentralization, and reducing the time spent validating authenticity. To protect the protection system that uses this blockchain, it is necessary to do library research as one of the previous applications of the methods used in previous researchers and continue the goals of previous researchers. In the future, further research on blockchain techniques is needed in case of forgery of other documents so that this technology can be adopted and developed further. Based on the literature study conducted in this research, it is concluded that blockchain technology has a positive impact as a transformation towards new energy and economic acceleration based on green technology, so that digitalization and harmonization of the academic atmosphere can be created, especially through the validity of certificates. The results of this study provides a detailed Experimental Assessment and examines the proposed model for verifying completion certificates using Blockchain Technology.

Keywords: security, blockchain, certificate, verification system, technology

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A Novel Voltage Level-Up shifter Design for Power Efficient Methods Using Dual Current Mirror Technique

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Abstract - In today's VLSI design, the dual supply voltage methodology is commonly employed to reduce power dissipation. To convert low voltages to high voltages, level shifters are used. The Wilson current mirror level shifter was proposed as a low-power, efficient-energy level shifter. Cadence Virtuoso and 45nm technologies were used to implement the suggested design. In 45nm technology, an input voltage of 0.5V to 1V was converted at 1MHz with a power consumption of 1.92nW and a delay of 0.96nS.

Keywords: Dual-Supply, Level-Shifter, Current Mirror, Power Consumption