



Enabling Collaboration to Escalate Impact of Research Results for Society



Hyatt Regency | Yogyakarta - Indonesia | 12-13 September 2019





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The 4th International Conference on Computer Science and Computational Intelligence

The 4th International Conference on Computer Science and Computational Intelligence 2019

(ICCSCI 2019)

Hyatt Regency, Yogyakarta - Indonesia, 12-13 September 2019

Enabling Collaboration to Escalate Impact of Research Results for Society

School of Computer Science

Bina Nusantara University

2019

Publisher of the proceedings

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Determining Total Vertex Irregularity Strength of $Tr(4, 1)$ Tadpole Chain Graph and its Computation
A Study of the Sensitivity of the Fuel Consumption to Driving Strategy by Micro Simulation
Classification of the Structural Integrity by the General Vibration Method
Feature Pyramid Networks for Crowd Counting
Features Importance in Classification Models for Colorectal Cancer Cases Phenotype in Indonesia
Adjustment Factor for Use Case Point Software Effort Estimation (Study Case: Student Desk Portal)
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Combination of Test-Driven Development and Behavior-Driven Development for Improving Backend Testing Performance
Optimum Nutrition Intake from Daily Dietary Recommendation for Indonesian Children using Binary Particle Swarm Optimization Algorithm
MobileNet Convolutional Neural Networks and Support Vector Machines for Palmprint Recognition
Automatic Sleep Stage Classification using Weighted ELM and PSO on Imbalanced Data from Single Lead ECG
Itinerary Recommendation Generation using Enhanced Simulated Annealing Algorithm
A Review of Recent Advancements in Appearance-based Object Recognition
The Comparison Firebase Realtime Database and MySQL Database Performance using Wilcoxon Signed-Rank Test
Social Media Web Scraping using Social Media Developers API and Regex
Technological Factors of Mobile Payment: A Systematic Literature Review
Mobile Financial Management Application using Google Cloud Vision API
MVC Architecture: A Comparative Study Between Laravel Framework and Slim Framework in Freelancer Project Monitoring System Web Based
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ABOUT PROCEDIA COMPUTER SCIENCE

Open Access

Area Editors: J. O. Aje, S. Baek, I. Bojanova, F. Bouthillier, F. J. Cantú Ortiz, A. Carswell, I. Casas, G. Darkazalli, E.A. Edmonds, C. Ghezzi, R. Khan, M. Koval, M. Levy, B. Lin, R. V. McCarthy

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What is Procedia Computer Science?

Launched in 2009, *Procedia Computer Science* is an electronic product focusing entirely on publishing high quality conference proceedings. Procedia Computer Science enables fast dissemination so conference delegates can publish their papers in a dedicated online issue on ScienceDirect, which is then made freely available worldwide.

Conference proceedings are accepted for publication in Procedia Computer Science based on quality and are therefore required to meet certain criteria, including quality of the conference, relevance to an international audience and covering highly cited or timely topics. Procedia Computer Science will cover proceedings in all topics of Computer Science with the exception of certain workshops in Theoretical Computer Science, as our Electronic Notes in Theoretical Computer Science http://www.elsevier.com/locate/entcs are the primary outlet for these papers. The journal is indexed in Scopus, the largest abstract and citation database of peer-reviewed literature.

PREFACE

Widodo Budiharto^a, Derwin Suhartono^a, Alexander A. S. Gunawan^a, Dewi Suryani^a, Meiliana^a, Hanry Ham^a, Azani Cempaka Sari^a

^aComputer Science Department, School of Computer Science, Bina Nusantara University, Jakarta, Indonesia 11480

The 4th International Conference on Computer Science and Computational Intelligence (ICCSCI 2019) is annual forum for researchers, engineers, and scientist to disseminate their knowledge and research on Computer Science, Computational Intelligence, and Information Technology. We are pleased to announce the theme of the ICCSCI 2019 is "*Enabling Collaboration to Escalate Impact of Research Results for Society*". The conference warmly welcomes prospected authors to submit their research and idea to ICCSCI 2019 and share the valuable experiences with the scientist and scholars around the world.

ICCSCI 2019 received 156 manuscripts from eleven countries, namely Indonesia, China, Finland, India, Malaysia, Nigeria, Oman, Philippines, Singapore, Taiwan, and United States of America. After careful review process of 156 manuscripts, 87 manuscripts were accepted or approximately 56% rate of acceptance. These manuscripts are divided into seven tracks:

- 1. Intelligent System and Machine Vision
- 2. Software Engineering, Information Security and Networks
- 3. Big Data and Information Technology
- 4. Foundations of Computing and Theoretical Computer Science
- 5. Computational Linguistic and Audio Processing
- 6. Internet of Thing and Robotics
- 7. Multimedia, Game Development and Virtual Reality

We would like to appreciate all participants, keynote speakers, reviewers, and committee for the contributions to the conference program and proceeding. We would like to express our gratitude to the reviewers for the valuable review and suggestion, so that we can maintain the quality of this proceeding very well. This conference is held in success collaboration between Program committee and Technical committee. We would like to thank Elsevier for supporting publication of this conference proceeding.

We are looking forward for the next event in computer science and computational intelligence in the future.

GENERAL SCHEDULE

The 4th International Conference on Computer Science and Computational Intelligence (ICCSCI) 2019 Hyatt Regency Yogyakarta – Indonesia Ballroom Semeru

Day 1 - Inursday, 12 September 2019		
Time	Program Detail	
08.00-08.30	Registration	
08.30-09.30	Opening	
09.30-10.00	Coffee Break	
10.00-11.00	Keynote Speaker I Michel Valstar, PhD "Behaviomedics – Objective Assessment of Clinically Relevant Expressive Behaviour"	
11.00-12.00	Keynote Speaker II Dr. Sani Muhamad Isa "Land Use Change Analysis and Prediction of Bodetabek Area Using Remotely Sensed Imagery"	
12.00-13.00	Lunch	
13.00-15.00	Parallel Session I	
15.00-15.30	Coffee Break	
15.30-17.30	Parallel Session II	
18.00-21.00	Gala Dinner	

120 2010

Day 2 - Friday, 13 September 2019

Time	Program Detail
08.00-08.30	Registration
08.30-09.30	Keynote Speaker III Oskar Rinadi "The Development of Indonesian Smart Speaker Platform"
09.30-10.00	Coffee Break
10.00-11.00	Keynote Speaker IV Dr. Somnuk Phon-Amnuaisuk "Promoting Citizen Well-being through Scene Analysis"
11.00-13.00	Lunch
13.00-15.00	Parallel Session III
15.00-15.30	Coffee Break
15.30-17.30	Parallel Session IV
17.30-18.30	Closing

PARALLEL SESSION SCHEDULE

Day 1 Thursday, September 12th, 2019 Parallel Session 1

Room	Ballroom Semeru - Hyatt Regency Yogyakarta	
Time	13:00 - 15:00	
Chairman	Michel Valstar, PhD	

ID	Author	Title
1694	Favorisen Rosyking Lumbanraja	An Evaluation of Deep Neural Network Performance on Limited Protein Phosphorylation Site Prediction Data
2039	Indah Agustien Siradjuddin	Combination of Term Weighting and Integrated Color Intensity Co-occurrence Matrix for Two-Level Image Retrieval on Social Media Data
1940	Dillip Kumar Ghose	Stream Flow Forecasting in Mahanadi River Basin using Artificial Neural Networks
2015	Enny Itje Sela	Osteoporosis Identification Based on the Validated Trabecular Area on Digital Dental Radiographic Images
2230	Kahlil Muchtar	Attention-based Approach for Efficient Moving Vehicle Classification

Day 1 Thursday, September 12th, 2019 Parallel Session 1

Room	Merapi 1 - Hyatt Regency Yogyakarta
Time	13:00 - 15:00
Chairman	Dr. Sani Muhamad Isa

ID	Author	Title
1764	Puspita Anggraini Kaban	Biclustering Method to Capture the Spatial Pattern and to Identify the Causes of Social Vulnerability in Indonesia : A New Recommendation for Disaster Mitigation Policy
1834	Suharjito	A Comparison of Prediction Methods for Credit Default on Peer to Peer Lending using Machine Learning
1905	Suharjito	Early Detection of Diabetes Mellitus using Feature Selection and Fuzzy Support Vector Machine
2209	Ruci Meiyanti	Evaluation of Interoperability Maturity Level: Case Study Indonesian Directorate General of Tax
2212	Arif Budiarto	Comparing the Accuracy of Multiple Commercial Wearable Devices: A Method

Day 1 Thursday, September 12th, 2019 Parallel Session 1

Room	Merapi 3 - Hyatt Regency Yogyakarta
Time	13:00 - 15:00
Chairman	Andry Chowanda, PhD

ID	Author	Title
1913	Derwin Suhartono	Gender Demography Classification on Instagram based on User's Comments Section
1920	Alexander A S Gunawan	Music Recommender System Based on Genre using Convolutional Recurrent Neural Networks
2052	Retno Kusumaningrum	Word2Vec for Indonesian Sentiment Analysis towards Hotel Reviews: An Evaluation Study
1932	Fadhila Yasmine Azalia	Name Indexing in Indonesian Translation of Hadith using Named Entity Recognition with Naïve Bayes Classifier
1936	Derry Jatnika	Word2Vec Model Analysis for Semantic Similarities in English Words

Day 1 Thursday, September 12th, 2019 Parallel Session 2

Room	Ballroom Semeru - Hyatt Regency Yogyakarta
Time	15:30 - 17:30
Chairman	Dr. Alexander Agung Santoso Gunawan

ID	Author Title		
1917	Arko Wirarespati	Automotive Security with Authorization and Tracking via GPS	
1946	Aldrin C. Tasong	Idrin C. TasongDesign and Development of an IoT Application with Visual Analytics for Water Consumption Monitoring	
2221	Valdi Stevanus	Development of Smart Trolley System Based on Android Smartphone Sensors	
2211	Benfano Soewito	Websocket to Support Real Time Smart Home Applications	
1988	Benfano Soewito	The Use of Android Smart Phones as a Tool for Absences	

Day 1 Thursday, September 12th, 2019 Parallel Session 2

Room	Merapi 1 - Hyatt Regency Yogyakarta	
Time	15:30 - 17:30	
Chairman	Dr. Suharjito	

ID	Author	Title
2206	Irene Anindaputri Iswanto	Object Tracking Based on Meanshift and Particle-Kalman Filter Algorithm with Multi Features
2023	Arif Budiarto	Fast and Effective Clustering Method for Ancestry Estimation
2042	Noor Ifada / Mochammad Kautsar Sophan	Enhancing the Performance of Library Book Recommendation System by Employing the Probabilistic-Keyword Model on a Collaborative Filtering Approach
2189	Andry Chowanda	Deep Learning for Visual Indonesian Place Classification with Convolutional Neural Networks
2200	Andry Chowanda	Implementation of Optical Character Recognition using Tesseract with the Javanese Script Target in Android Application

Day 1 Thursday, September 12th, 2019 Parallel Session 2

RoomMerapi 3 - Hyatt Regency YogyakartaTime15:30 - 17:30ChairmanDr. Derwin Suhartono

ID	Author	Title
1943	Wildhan Satriady	Quranic Latin Query Correction as a Search Suggestion
1944	Fajar Achmad Yusup	Narrator's Name Recognition with Support Vector Machine for Indexing Indonesian Hadith translations
1928	Devi Oktaviani	Building a Database of Recurring Text in the Quran and its Translation
1947	R.M. Syachrul Muharam Adi Koesoemah	Person Entity Recognition for the Indonesian Qur'an Translation with the Approach Hidden Markov Model-Viterbi
1948	Deni Cahya Wintaka	Named-Entity Recognition on Indonesian Tweets using Bidirectional LSTM-CRF

Day 2 Friday, September 13th, 2019 Parallel Session 3

Room	Ballroom Semeru - Hyatt Regency Yogyakarta
Time	13:00 - 15:00
Chairman	Oskar Riandi

ID	Author	Title
2040	Teguh Ikhlas Ramadhan	Rule Based Pattern Type of Verb Identification Algorithm for The Holy Qur'an
1945	Tjeng Wawan Cenggoro	Analysis of Acoustic Features in Gender Identification Model for English and Bahasa Indonesia Telephone Speeches
2065	Suyanto Suyanto	Indonesian Chatbot of University Admission Using a Question Answering System Based on Sequence-to-Sequence Model
2185	Bagas Adi Prayitno	Segment Repetition Based on High Amplitude to Enhance a Speech Emotion Recognition
2214	Rike Adelia	Indonesian Abstractive Text Summarization using Bidirectional Gated Recurrent Unit

Day 2 Friday, September 13th, 2019 Parallel Session 3

Room	Merapi 1 - Hyatt Regency Yogyakarta
Time	13:00 - 15:00
Chairman	Andry Chowanda, PhD

ID	Author	Title
2213	Annisa Aditsania / Putu Harry Gunawan	Enhancement of Indonesian License Plate Number Image using Shock Filtering Equation
2186	Rinda Narriswari	Bayesian Forecasting for Time Series of Count Data
2208	Syarifah Diana Permai	Spatial autoregressive (SAR) model for average expenditure of Papua Province
2203	Yulyani Arifin	Nitipyuk: A Crowdsourcing Marketplace for Personal Shopper
2225	Hanry Ham	Resepfinder as an iOS-Based Local Cooking Recommendation

Day 2 Friday, September 13th, 2019 Parallel Session 3

Room	Merapi 3 - Hyatt Regency Yogyakarta
Time	13:00 - 15:00
Chairman	Dr. Sani Muhamad Isa

ID	Author	Title
1919	Arif Muntasa	Modeling of the Acute Lymphoblastic Leukemia Detection based on the Principal Object Characteristics of the Color Image
1933	Anranur Uwaisy Marchiningrum	Recommendation of Scheduling Tourism Routes using Tabu Search Method (Case Study Bandung)
1977	Tri Handhika	Modified Average of the Base-Level Models in the Hill- Climbing Bagged Ensemble Selection Algorithm for Credit Scoring
2007	Alexander A S Gunawan	Detection of Vehicle Position and Speed using Camera Calibration and Image Projection Methods
2011	Sucianna Ghadati Rabiha	Analysis of the Indicator's Performance to Predict Indonesian Teacher Engagement Index (ITEI) using Artificial Neural Networks

Day 2 Friday, September 13th, 2019 Parallel Session 4

Room	Ballroom Semeru - Hyatt Regency Yogyakarta
Time	15:30 - 17:30
Chairman	Dr. Somnuk Phon-Amnuaisuk

ID	Author	Title
1664	Suharjito	Saint-Venant Model Analysis of Trapezoidal Open Channel Water Flow using Finite Difference Method
2183	Ro'fah Nur Rachmawati,Iwa Sungkawa,Anita Rahayu	Extreme Rainfall Prediction using Bayesian Quantile Regression in Statistical Downscaling Modeling
2184	Ro'fah Nur Rachmawati,Anik Djuraidah,Aji Hamim Wigena,I Wayan Mangku	Additive Bayes Spatio-temporal Model with INLA for West Java Rainfall Prediction
2191	Anas Bachtiar	Selecting Features Subsets Based on Support Vector Machine-Recursive Features Elimination and One Dimensional-Naïve Bayes Classifier using Support Vector Machines for Classification of Prostate and Breast Cancer
1962	Isnaini Rosyida	Determining Total Vertex Irregularity Strength of Tr(4,1) Tadpole Chain Graph and its Computation

Day 2 Friday, September 13th, 2019 Parallel Session 4

Room	Merapi 1 - Hyatt Regency Yogyakarta
Time	15:30 - 17:30
Chairman	Meiliana

ID	Author	Title
2096	Fergyanto E Gunawan	A Study of the Sensitivity of the Fuel Consumption to Driving Strategy by Micro Simulation
2159	Fergyanto E Gunawan	Classification of the Structural Integrity by the General Vibration Method
1942	Tjeng Wawan Cenggoro	Feature Pyramid Networks for Crowd Counting
2025	Tjeng Wawan Cenggoro	Features Importance in Classification Models for Colorectal Cancer Cases Phenotype in Indonesia
2237	Andy Effendi	Adjustment Factor for Use Case Point Software Effort Estimation (Study Case: Student Desk Portal)

Day 2 Friday, September 13th, 2019 Parallel Session 4

Room	Merapi 3 - Hyatt Regency Yogyakarta
Time	15:30 - 17:30
Chairman	Dr. Alexander Agung Santoso Gunawan

ID	Author	Title
2004	Sukirman	Self-Evacuation Drills by Mobile Virtual Reality Application to Enhance Earthquake Preparedness
2180	Andry Chowanda	Enhancing Game Experience with Facial Expression Recognition as Dynamic Balancing
2202	Hady Pranoto	Increase The Interest In Learning By Implementing Augmented Reality: Case studies studying rail transportation
2216	Andre Mohammad Fadillah	Interactive Gamification Learning Media Application for Blind Children using Android Smartphone in Indonesia
2226	Reinert Yosua Rumagit	Comparison of Graph-based and Term Weighting Method for Automatic Summarization of Online News
2220	Rhio Sutoyo	Designing an Emotionally Realistic Chatbot Framework to Enhance Its Believability with AIML and Information States

ONLINE PARALLEL SESSION SCHEDULE Thursday, September 12th, 2019 BINUS University Anggrek Campus @ Lounge 8th Floor (Room 801)

Online Parallel Session 1

Time07.30-09.30ChairmanI Gede Putra Kusuma Negara, PhD

ID	Author	Title
2192	Riyanto Jayadi	A Design of IoT-based Monitoring System for Intelligence Indoor Micro-Climate Horticulture Farming in Indonesia
2193	Lukius Natanael Phangbertha	Smart Socket for Electricity Control in Home Environment
2223	I Gede Putra Kusuma Negara	Air Pollution Mapping using Mobile Sensor Based on Internet of Things
2229	Andreas	Door Security System for Home Monitoring Based on ESP32
2197	Siti Komsiyah	Applications of the Fuzzy ELECTRE Method for Decision Support Systems of Cement Vendor Selection
1925	Suharjito, Muhammad Taufiq Zulfikar	Detection Traffic Congestion Based on Twitter Data using Machine Learning

Online Parallel Session 2

Time	10.00-12.00
Chairman	Ida Bagus Kerthyayana Manuaba, PhD

ID	Author	Title
2019	Irma Kartika Wairooy	The Use of Role Playing Game for Japanese Language Learning
2046	Henry Brando Junus Sompotan, Andrew Jonatan, Yudhistira Arya Nanda	Analyzing the Factors that Influence Learning Experience through Game Based Learning using Visual Novel Game for Learning Pancasila
2196	Wiwik Andreani, Yi Ying	"PowPow" Interactive Game in Supporting English Vocabulary Learning for Elementary Students
2224	David	Development of Escape Room Game using VR Technology
2207	Jurike V. Moniaga	Map-type Modelling and Analysis of Children Stunting Case Data in Indonesia with Interactive Multimedia Method
1918	Ida Bagus Kerthyayana Manuaba	Combination of Test-Driven Development and Behavior-Driven Development for Improving Backend Testing Performance

Online Parallel Session 3

Time	13.00-15.00
Chairman	Dr.Eng. Nico Surantha

ID	Author	Title
1687	Fanny	Optimum Nutrition Intake from Daily Dietary Recommendation for Indonesian Children using Binary Particle Swarm Optimization Algorithm
1921	Vincent Colin, Aurelia Michele	MobileNet Convolutional Neural Networks and Support Vector Machines for Palmprint Recognition
2030	Nico Surantha	Automatic Sleep Stage Classification using Weighted ELM and PSO on Imbalanced Data from Single Lead ECG
2218	Indra Wijaya	Itinerary Recommendation Generation using Enhanced Simulated Annealing Algorithm
2219	I Gede Putra Kusuma Negara	A Review of Recent Advancements in Appearance-based Object Recognition
2182	Margaretha Ohyver	The Comparison Firebase Realtime Database and MySQL Database Performance using Wilcoxon Signed-Rank Test

Online Parallel Session 4

Time	15.30-17.30
Chairman	Amalia Zahra, PhD

ID	Author	Title
2190	Lusiana Citra Dewi	Social Media Web Scraping using Social Media Developers API and Regex
2199	Yakob Utama Chandra	Technological Factors of Mobile Payment: A Systematic Literature Review
2217	Yudy Purnama	Mobile Financial Management Application using Google Cloud Vision API
1931	Andri Sunardi	MVC Architecture: A Comparative Study Between Laravel Framework and Slim Framework in Freelancer Project Monitoring System Web Based
2013	Ditdit Nugeraha Utama	Systematic Literature Review on Decision-Making of Requirement Engineering from Agile Software Development
2018	Amalia Zahra	Evaluation Model for the Implementation of Information Technology Service Management using Fuzzy ITIL

Webex Online Session

Time	-
Chairman	Lili Ayu Wulandhari, PhD

ID	Author	Title
1911	Anis Azwani Muhd Suberi	Comparative Performance of Filtering Methods for Reducing Noise in Ischemic Posterior Fossa CT Images
2210	Elly Matul Imah	Classification of Emotional State Based on EEG Signal using AMGLVQ

KEYNOTE SPEAKER I

Behaviomedics - Objective Assessment of Clinically Relevant Expressive Behaviour

Michel Valstar, PhD^a

^aSchool of Computer Science, Nottingham University, United Kingdom

Behaviomedics is the application of automatic analysis and synthesis of affective and social signals to aid objective diagnosis, monitoring, and treatment of medical conditions that alter ones affective and socially expressive behaviour. Or, put more succinctly, it is the objective assessment of clinically relevant expressive behaviour. Objective assessment of expressive behaviour has been around for a couple of decades at least, perhaps most notably in the form of facial muscle action detection (FACS AUs) or pose estimation. While often presented alongside work on emotion recognition, with many works presented as a solution to both emotion and objective behaviour assessment, the two problems are actually incredibly different in terms of machine learning problems. I would argue that a rethink of behaviour assessment is useful, with emotion recognition and other higher level behaviours building on objective assessment methods. This is particularly pertinent in an era where the interpretability of machine learning systems is increasingly a basic requirement. In this talk, I will firstly present our labs efforts in the objective assessment of expressive behaviour, followed by three areas where we have applied this to automatic assessment of behaviomedical conditions, to wit, depression analysis, distinguishing ADHD from ASD, and measuring the intensity of pain in infants and adults with shoulder pain. Finally, I will discuss how we see Virtual Humans can be used to aid the process of screening, diagnosing, and monitoring of behaviomedical conditions.

KEYNOTE SPEAKER II

Land Use Change Analysis and Prediction of Bodetabek Area using Remotely Sensed Imagery

Dr. Sani Muhamad Isa^a

^aComputer Science Department, BINUS Graduate Program - Master of Computer Science, Bina Nusantara University, Jakarta, Indonesia 11480

Urban development is one of the logical consequences of economic growth. RTRW (Rencana Tata Ruang Wilayah) is a blueprint of the city development for each city in Indonesia. The local government refers to RTRW to ensure that the city development always conforms with the blueprint. Unfortunately, what happened in reality sometimes doesn't match with the city plan. Bodetabek region (Bogor, Depok, Tangerang, and Bekasi) as the satellite city of the Capital of Indonesia, plays a strategic role in development in Jakarta. The lack of city development monitoring has been causing various problems to the community, such as environmental damages, flooding, garbage accumulation, and improper land uses. It would be very difficult to fix those problems if the local government doesnt take enough preventive actions to avoid it. In this study, we use remote sensing technology for city development monitoring using change detection approach. The use of remote sensing technology provides an effective and efficient way of monitoring land change detection than a land survey. In addition, the availability of remote sensing data for more than 30 years ago is very useful for analyzing land use changes over a long period. We use MODIS MCD12Q1 data (MODIS Terra and Aqua yearly global 500m type land cover) in the Bodetabek region from 2007 to 2017. Besides the spatial analysis, we also use the area of different land cover classes from each year as a reference for evaluating land use changes. The area changes of each land cover class in the 11 years period then used as the input for developing a prediction model. Based on the obtained prediction model for each land cover class, all classes show a linear trend with a positive slope (urban, forest, and wetland) or negative slope (cropland). The best prediction model comes from the urban land cover class, where the changes in land use are very close to a linear trend. The prediction model generated from this study can be used to predict the area of certain land cover class in the future so that it can be used by local governments in city development planning.

KEYNOTE SPEAKER III The Development of Indonesian Smart Speaker Platform

Oskar Riandi^a

^aDirector of PT. Bahasa Kita

Artificial intelligence, speech, and natural language processing technology, increasingly the user experience in term of human machines interaction. In the last few years, the development of smart assistant platforms has grown rapidly. And one of the phenomenal ones is smart speaker. Smart speaker is a type of wireless speaker and voice command device with integrated virtual assistant that offers interactive actions and hands-on activation with the help of wake word. We will explain the developing of Indonesian smart speaker platforms such as speech processing technology both for automatic speech recognition and speech synthesizer for response system. The natural language understanding (NLU) which functions to interpret the intent of voice command and provide an appropriate response to the system. The skill platform, a platform to enhance smart speaker features by involving third parties skill. The IoT platform, that functions to operate voice enable devices such as lamps, smart door locks, air conditioners, and other home appliances. The last but not least is the cloud infrastructure. Smart speakers rely on the concept of client and server platform with multiple concurrent connections. Therefore an appropriate cloud architecture should be configured properly to make the smart speaker platform robust and scalable.

KEYNOTE SPEAKER IV Promoting Citizen Well-being through Scene Analysis

Dr. Somnuk Phon-Amnuaisuk^{a,b}

^aMedia Informatics Special Interest Group, Centre for Innovative Engineering, Universiti Teknologi Brunei ^bSchool of Computing and Information Technology, Universiti Teknologi Brunei

Scene analysis aims to understand the semantic context of interesting scenes through visual and audio information. Machine-vision and machine-hearing could provide automated analysis of the scene and raises appropriate safety warnings and other relevant concerns. Enhanced safety and efficient operations through machine perception are attractive. This is because cameras and microphones are inexpensive sensors and can be quickly installed in desired locations to gather necessary data. In this talk, recent advances in artificial intelligence and machine perception will be reviewed based on various hypothesized scenarios such as smart traffic, smart environment and smart nursery. Feasibility of the application of these technologies to promote the safety and well-being of citizen will be discussed.

ABSTRACT LIST

An Evaluation of Deep Neural Network Performance on Limited Protein Phosphorylation Site Prediction Data

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Abstract

One of the common and important post-translational modification (PTM) types is phosphorylation. Protein phosphorylation is used to regulate various enzyme and receptor activations which include signal pathways. There have been many significant studies conducted to predict phosphorylation sites using various machine learning methods. Recently, several researchers claimed deep learning based methods as the best methods for phosphorylation sited prediction. However, the performance of these methods were backed up with the massive training data used in the researches. In this paper, we study the performance of simple deep neural network on the limited data generally used prior to deep learning employment. The result shows that a deep neural network can still achieve comparable performance in the limited data settings.

Combination of Term Weighting and Integrated Color Intensity Co-occurrence Matrix for Two-Level Image Retrieval on Social Media Data

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Abstract

This paper proposes the two-level image retrieval that combines the text and image-based, to overcome the disadvantage of text or image as a query for image retrieval. In the text-based retrieval, three main steps are required. First, text and document preprocessing to retrieve words without affix, punctuation, and any stop words, to build the dictionary. Second, weighting the word from the dictionary, based on the frequency of words in text or document, using the Term Frequency-Inverse Document Frequency Model. Third, the similarity between a text query and the text document is calculated using Cosine Similarity. In the image-based approach for image retrieval, two main steps are required. First, feature extraction using

Integrated Color Intensity Co-occurrence Matrix. This method will obtain two features at once, texture and color feature. Second, the similarity is calculated between an image query and database using Manhattan Distance. Social Media Data, Twitter, with Indonesian tweet and users, is used for the experiments. Image retrieval using a text, an image, and combination of both text and image, are compared in the experiments. The conducted experiments showed that the combination of text and image-based retrieval achieved the highest performance accuracy, compare with text or image-based retrieval.

Stream Flow Forecasting in Mahanadi River Basin using Artificial Neural Networks

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Abstract

Suspended sediment prediction is essential for wearing awayof soil and sedimentation at time of peakinundation period. Several kinds of neural networks have been projected in preceding papers for applications in hydrological events. This research intelligence focuses on assessment of applicability of Recurrent Neural Network (RNN) and Radial Basis Function Network (RBFN) for forecasting flow on daily basis at gauging station in Mahanadi river basin. Superlative performance is assessed on basis of RMSE, R2 which was attained by the precipitation and antecedent flow as model inputs. Based on performance value RNN gives prominent value as compare to RBFN. In case of RBFN three transfer function Tan-sig, Log-sig, purelin are utilized for evaluating model performance. While Tan-sig function used model gives extent value of R2 that is0.9614 and 0.9843 for training and testing phase respectively.

Osteoporosis Identification Based on the Validated Trabecular Area on Digital Dental Radiographic Images

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Abstract

Research for identifying osteoporosis using dental radiographic images is increasing rapidly. Subjects data from various regions and countries have been used by many researchers. This indicates that osteoporosis has become a widespread disease that should be studied more deeply. A method for osteoporosis identification based on the validated trabecular area present on digital dental radiographic images is proposed in this paper. Digital dental radiographic images of subjects were first prepared. This study performs a sequence of morphological

operations to obtain the region of interest (RoI) from the validated trabecular area on the images. The validated area is then evaluated using dice similarity method. Bone mineral density is measured using dual X-ray absorptiometry at two sites to assess the presence of osteoporosis. We propose four statistical features, namely deviation, entropy, homogeneity, and correlation, which are extracted from the RoIs. These four features are obtained through feature extraction followed by feature selection using the C4.5 feature selection method. Thereafter, multilayer perceptron is used to predict the presence of osteoporosis by statistical texture analysis. The average dice similarity coefficient for all of RoIs achieves an index of 0.8924. Multilayer perceptron classifier is an appropriate method in our proposed work, which achieves an accuracy of 87.87%. This research shows that the proposed method using the sequence of morphological operations achieves high similarity for forming validated trabecular area and the four statistical features achieves a good performance for osteoporosis identification.

Attention-based Approach for Efficient Moving Vehicle Classification

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Abstract

In recent years, the convolutional neural network (CNN) has shown great advantages in object classification. In the context of smart transportation, an essential task is to correctly detect vehicles from videos and classify them into different types (e.g., car, truck, bus, and etc.). The classified vehicles can be further analyzed for surveillance, monitoring, and counting purposes. However, at least, there are two main challenges remain; excluding the un-interesting region (e.g., swaying motion, noise, etc.) and designing an efficient and accurate system. Therefore, we introduce a novel attention-based approach in order to clearly distinguish the interesting region (moving vehicle) with the un-interesting region (the rest of the region). Finally, we feed the deep CNN with the corresponding interesting region to boost the classification performance considerably. We evaluate our proposed idea using several challenging outdoor sequences from the CDNET 2014 and our own dataset. Experimental results show that it costs around ~85 fps to classify moving vehicles and keep a highly accurate rate. In addition, compared with other state-of-the-art object detection approaches, our method obtains a competitive f-measure score.

Biclustering Method to Capture the Spatial Pattern and to Identify the Causes of Social Vulnerability in Indonesia : A New Recommendation for Disaster Mitigation Policy

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Abstract

Geographically, Indonesia is a meeting point of three continental plates. Scilicet, the Eurasian Plate, the Indo-Australian Plate, and the Pacific Plate. Therefore, Indonesia is part of the infamous volcanic zone called the "Ring of Fire" and one of the areas prone to natural disasters such as volcanic eruptions, earthquakes, tsunamis, floods, and landslides. This study aims to capture the spatial pattern and identify the causes of social vulnerability in the districts/cities in Indonesia using the biclustering method. The data is extracted from the Indonesian National Socio-Economic Survey (SUSENAS) by BPS-Statistics in 2014. The biclustering result indicates that each district/city has its own social vulnerability characteristics and shows that the vulnerable aspects of each district/city are different. The adjacent observations tend to have social vulenrability characteristics. The results of this study can be used as a reference for national disaster mitigation policy in Indonesia.

A Comparison of Prediction Methods for Credit Default on Peer to Peer Lending using Machine Learning

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Abstract

Social lending or peer to peer lending (p2p lending) has emerged as a viable digital platform where lenders and borrowers can do business without the involvement of financial institutions. P2p lending has gained significant momentum recently, with some platform has reached billion-dollar loan circulation. However, p2p lending platforms are not free from any form of risks. A higher return on investment for investor comes with a risk of the loan and interest not being repaid. For this purpose, this research proposes a tree-based classification method for predicting whether a loan will go bad or default before the loan is approved. The high dimensionality of the dataset needs to be processed and chosen carefully. This paper proposes a Binary PSO with SVM to perform feature selection for the dataset and Extremely

Randomized Tree (ERT) and Random Forest (RF) as the classifiers. In this research, BPSOSVM-ERT and BPSOSVM-RF are compared with several performance metrics. The experimental results show BPSOSVM can produce subset of features without decreasing the performance from the original features and ERT can outperform RF in several performance metrics.

Early Detection of Diabetes Mellitus using Feature Selection and Fuzzy Support Vector Machine

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Abstract

The number of patients that were infected by Diabetes Mellitus (DM) has reached 415 million patients in 2015 and by 2040 this number is expected to increase to approximately 642 million patients. Large amount of medical data of DM patients is available and it provides significant advantage for researchers to fight against DM. The main objective of this research is to leverage F-Score Feature Selection and Fuzzy Support Vector Machine in classifying and detecting DM. Feature selection is used to identify the valuable features in dataset. SVM is then used to train the dataset to generate the fuzzy rules and Fuzzy inference process is finally used to classify the output. The aforementioned methodology is applied to the Pima Indian Diabetes (PID) dataset. The results show a promising accuracy of 89.02% in predicting patients with DM. Additionally, the approach taken provides an optimized count of Fuzzy rules while still maintaining sufficient accuracy.

Evaluation of Interoperability Maturity Level: Case Study Indonesian Directorate General of Tax

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Abstract

Most of the e-Government projects facing problem in integration with external services, hence there is a lack of collaboration and exchange information among different public administration e-services. Directorate General of Tax (DGT) has developed many electronic services, but until today the interoperability maturity level of that services never been assessed. Interoperability Maturity Model (IMM) is a methodology to get insight and evaluate interoperability maturity of public service based on a set of defined attribute and maturity stage. We used IMM as the methodology for interoperability maturity evaluation in this research because it is the most recent, has a complete attribute for each interoperability layer, open resources and has been used in Europe's interoperability improvement program. According to the assessment, DGT's Interoperability maturity is in level 3 for overall areas. In other words, DGT electronic services are at an essential stage. The main component of interoperability best practice has implemented in DGT's electronic services.

Comparing the Accuracy of Multiple Commercial Wearable Devices: A Method

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Abstract

To maintain a good fitness level, performing a minimum daily physical activity is important. Many people think that they have already met the suggested guidelines. However, most of them were wrong when they quantify their activity level using a personal activity tracker device. This problem indicates the need for personal physical activity tracker or wearable device to maintain the fitness level. However, as wide-range wearable devices available today, it is difficult to find the most suitable one regarding the price and quality. This paper proposes a study to explore the association between the quality and the price of the devices. The quality is evaluated by comparing the accuracy of the heart rate sensor and step counter of several wearable devices with the ground truth measurements. The test result is then analyzed using a series of statistical methods including, a paired t-test, Pearson's correlation test, and Bland-Altman plot. Both t-test and correlation coefficient is used to plot the association between quality and price.

Gender Demography Classification on Instagram based on User's Comments Section

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Abstract

Social media has become an integral part of the society. This created a rising demand on social media marketing. New breakthroughs in the field of artificial intelligence have enabled brand owners to boost social media marketing by knowing their target's demography. This study

presents a model to predict gender of social media users based on comments section on Instagram profile by using AdaBoost, XGBoost, Support Vector Machine, and Naive Bayes Classifier combined with a grid search and K- Fold validation. The model was trained with 40,000 comments and managed to get 78.64% on Naive Bayes, 73.41% on XGBoost, 74.56% on AdaBoost and 76.07% on SVM which are generally higher than related studies on this subject. This result shows that Naïve Bayes produces higher accuracy on short text classification and has possibilities to help social media marketing.

Music Recommender System Based on Genre using Convolutional Recurrent Neural Networks

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Abstract

With commercial music streaming service which can be accessed from mobile devices, the availability of digital music currently is abundant compared to previous era. Sorting out all this digital music is a very time-consuming and causes information fatigue. Therefore, it is very useful to develop a music recommender system that can search in the music libraries automatically and suggest suitable songs to users. By using music recommender system, the music provider can predict and then offer the appropriate songs to their users based on the characteristics of the music that has been heard previously. Our research would like to develop a music recommender system that can give recommendations based on similarity of features on audio signal. This study uses convolutional recurrent neural network (CRNN) for feature extraction and similarity distance to look similarity between features. The results of this study indicate that users prefer recommendations that consider music genres compared to recommendations based solely on similarity.

Word2Vec for Indonesian Sentiment Analysis towards Hotel Reviews: An Evaluation Study

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Abstract

Hand-crafted features engineering is a labor-intensive and highly-cost task. In this paper, we implement Word2Vec as an alternative solution of hand-crafted features for sentiment analysis of hotel reviews in the Indonesian language. To obtain the highest performance of sentiment analysis, we evaluate three parameters of Word2Vec include Word2Vec model architecture,

evaluation method, and vector dimension. This evaluation process was implemented towards our proposed corpus for a specific domain, i.e. hotel reviews, consists of 2500 hotel reviews in the Indonesian language (1250 positive reviews and 1250 negative reviews). The result shows that the highest accuracy values are obtained under the combination of the following parameters, namely the architecture of Word2Vec Model is Skip-gram model, the evaluation method is Hierarchical Softmax, as well as the vector dimension is 100. The Skip-gram model results highest accuracy for words that rarely appear, such as in sentiment analysis task, whereas the Hierarchical Softmax provides better results since during the training process using a binary tree model to represent all of the words in the vocabulary and leaf nodes representing rare words so that rarely appearing words will inherit vector representations in it. Furthermore, to obtain the optimal value of accuracy, then we should increase the vector dimensions and amount of data simultaneously.

Name Indexing in Indonesian Translation of Hadith using Named Entity Recognition with Naïve Bayes Classifier

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Abstract

Hadith is believed to be the main source of Islam after Qur'an. The simplicity of obtaining hadith information is currently supported by global access using the internet. The abundance of hadith literature sometimes finds difficulties to obtain the information that needed. Therefore, information extraction is required to facilitate the searching of information in hadith. In this study, the name indexing in Indonesian translation of hadith from nine narrators was built. The model was built using Named Entity Recognition with Naïve Bayes classifier. The features used in this study are title case, POS tag and unigram. This study experimented with individual features and features that were combined. Precision, recall, and F1-Score are employed as evaluation metrics. F1-Score is used in this study to measure the performance of named entity and features. The results of experiments extracted 258 people's names from 13870 token data from 100 Indonesian hadith texts and show that implementing the combination of all features can achieve 82.63% of F1-Score.

Word2Vec Model Analysis for Semantic Similarities in English Words

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Abstract

This paper examines the calculation of the similarity between words in English using word representation techniques. Word2Vec is a model used in this paper to represent words into vector form. The model in this study was formed using the 320,000 articles in the English Wikipedia as the corpus and then Cosine Similarity calculation method is used to determine the similarity value. This model then tested by the test set gold standard WordSim-353 as many as 353 pairs of words and SimLex-999 as many as 999 pairs of words, which have been labelled with similarity values according to human judgment. Pearson Correlation was used to find out the accuracy of the correlation. The results of the correlation from this study are 0.665 for WordSim-353 and 0.284 for SimLex-999 using the Windows size 9 and 300 vector dimension configurations.

Automotive Security with Authorization and Tracking via GPS

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Abstract

With the ever progressing technology in Indonesia, Information and Technology has rooted and integrates itself with most of today's daily aspect. The automotive industry today is reaching out to wider range of users, being accessible in various shapes, sizes and range of mobility. However, the still ongoing vehicular thefts and the fact that it's also difficult at times to report to authorities in regards of the matter has brought forth several problems, such as lack of necessary means to reclaim vehicles, expensive GPS tracker prices, all while having the aforementioned tools that are not quite user-friendly. Using research and experiments on Arduino micro-controllers, and mobile development using Android Studio SDK, such a system was developed. From this system, which was tested by various ranges of age and occupation, it has been concluded and proven that a creation of fair-priced, user-friendly, and functional tracking system is very much possible. This system also operates offline, which is very useful when users are lacking internet connections.

Design and Development of an IoT Application with Visual Analytics for Water Consumption Monitoring

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Abstract

Water is imperative in the regular day to day existence of the human race. Household people use water to sustain life. Nowadays, household people excessively use water without knowing how much water do they already consume in real-time and are unaware on which faucet in the household has the highest water consumption. With the use of the internet of things (IoT) platform with visual analytics (VA), a real-time water consumption monitoring system has been developed for household and commercialized building applications. In order to get the water consumption data, a Hall Effect water flow sensor is attached to every faucet, which is then processed by a NodeMCU, then pushed to the Heroku cloud database. A Liquid Crystal Display (LCD) alphanumeric screen displays the total volume consumed and the real-time water flow rate for each faucet. To further visualize the water consumption data, a comprehensible chart report about the overall household water consumption from the cloud database can be accessed through a web browser or a mobile device. To achieve an accurate water flow measurement, an initial calibration is being performed for every sensor in the faucet. A test was conducted to determine how accurate the system is in monitoring the correct water consumption. Ten trials of filling up a 10-liter bottle using one faucet, two 10-liter bottles using two faucets, and three 10-liter bottles using three faucets at a time was conducted. The study came up with an overall average accuracy of 99.38%. The study concluded that the developed IoT system can make an accurate water consumption monitoring and can also identify which faucet has the highest consumption using visual analytics.

Development of Smart Trolley System Based on Android Smartphone Sensors

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Abstract

In supermarkets, a shopping trolley or a shopping cart is the necessary tools for purchasing. Traditionally, it is used by customers inside the store to transport goods to the cashier during shopping and designed not to leave the store. It is an inconvenience and time wasted for customers who want to find the desired product in the store by using the traditional shopping trolley. Our goal is to develop an automatic moving trolley with smart shopping devices to solve the problem. Our smart shopping trolley is based on a two-wheeled mobile robot, developed in our previous research. This paper presents the hardware and software design of a smart trolley system. Our smart trolley used IOIO microcontroller and Android smartphone as sensors and controller. The trolley is modeled as a two-wheeled mobile robot. Android smartphone will control the robot by sending a signal to IOIO microcontroller paired with a robot's actuator and monitor the situation using the smartphone camera. Furthermore, we exploited the smartphone compass for robot navigation. This system is also equipped with the indoor positioning system to detect user position using Navisens which based on gyroscope and accelerometer in the smartphone. Finally, the results of the testing on robot navigation are presented. The result is our smart trolley system based on Navisens framework can move and show its location to the user.

Websocket to Support Real Time Smart Home Applications

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Abstract

As we already know, the IoT (Internet of Thing) system has developed and is used in many fields, such as agriculture, security, industry etc. The IoT system requires real time monitoring and this is one of the problems that exists today. Transfering data from the sensor via the internet network to a monitoring device must be less than 300 ms. One process that can cause non-fulfillment of these requirements is a method for displaying the data on a monitor. There are several methods for delivering data from the sensor to a monitor. This paper has been compared between two methods, namely the polling method and the websocket method. The experiment was conducted to compare these two method. The result obtained that the websocket method was better in presenting real time data compared to the polling method. It can be shown in bandwidth usage and memory usage. In the experiment was found that the average of bandwidth usage is 478KB for polling method, and 91KB for web socket method in web based and the memory consumption of websocket less as much as 16% compared to polling method and 15 KB for polling method and the memory consumption of websocket less as much as 22% compared to polling method.

The Use of Android Smart Phones as a Tool for Absences

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Abstract

One of the issues of current attendance system is not being able to record employees who working outside the office. This work discussed a solution designed to solve common operational project problems, especially in attendance and tasklist management activity in companies who has employee working outside of the office. Considering the number of employees who have to visit various places, conventional attendance system is no longer feasible as be the solution. Similar problem occured in tasklist management, with so many employees to manage in different places will make it difficult for Project Manager to assign task and monitor the progress. Based on the problems, solusion was then designed using SDLC Waterfall using the field research data. This research conclude that by using the proposed application, complexity can be reduced and effectiveness can be improved in performing daytoday operational task and make sure that they can be monitored. Moreover, the number of employee who responsible to make reports of projects and attendance can be reduced about 50%.

Object Tracking Based on Meanshift and Particle-Kalman Filter Algorithm with Multi Features

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Abstract

Object tracking is considered to be a key and important task in intelligent video surveillance system. Numerous algorithms were developed for the purpose of tracking, e.g. Kalman Filter, particle-filter, and Meanshift. However, utilizing only one of these algorithms is considered inefficient because all single algorithms have their limitations. We proposed an improved algorithm which combines these three traditional algorithms to cover each algorithms drawbacks. Moreover we also utilized a combination of two features which are color histogram and texture to increase the accuracy. Results show that the method proposed in this paper is robust to cope with numerous issues, e.g. illumination variation, object deformation, non linear movement, similar color interference, and occlusion. Furthermore, our proposed algorithm show better results compare to other comparator algorithms.

Fast and Effective Clustering Method for Ancestry Estimation

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Abstract

Ancestry estimation which provides family history information is one of the most popular services in direct-to-consumer genomic testing. It is also an important task which aimed to reduce the confounding by ancestry on the relationship of genotypes and disease risk in assocation studies. Several methods have been developed to generate the best ancestry estimated scores even though some of them are still facing inefficient computation time. In this paper, a combination method between KMeans clustering and PCA is proposed estimate ancestry estimation from SNP genotyping data. This method was compared with baseline model, called fastSTRUCTURE, in term of the quality of clustering and computation time. Public data from 1000 Genome project is used to train and evaluate the proposed model and the baseline model. The proposed model can successfully generate clusters with better accuracy than fastSTRUCTURE (91.02% over 90.39%). More importantly, it can boost the computation time until 100 times faster than fastSTRUCTURE (from 490 seconds to 4.86 seconds).

Enhancing the Performance of Library Book Recommendation System by Employing the Probabilistic-Keyword Model on a Collaborative Filtering Approach

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Abstract

This paper proposes the probabilistic-keyword CF method for a library book recommendation system. Our focus is to address the sparsity problem commonly occurs on the Collaborative Filtering (CF) approach. The framework of the method consists of four processes. First, building the circulation and keyword matrices respectively based on the book circulation records and the book keyword attribute data. Second, building the keyword model that takes into account both the book circulation records and the book keyword data. Third, building the probabilistic-keyword model that employs a probabilistic technique to calculate the probability of a user to borrow a book conditional to his/her keyword model. Fourth, generating the top-N book recommendations. Experiment results on a library dataset show that our probabilistic-keyword CF method outperforms the traditional user-based and item-based CF methods in

terms of all evaluation metrics. This result conjectures that the probabilistic-keyword CF method that employs the probabilistic-keyword model can enhance the recommendation performance and is able to deal with the sparse dataset better than the traditional methods.

Deep Learning for Visual Indonesian Place Classification with Convolutional Neural Networks

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Abstract

Places classification is one of the points of discussion in the computer vision and robotics community. Some renowned techniques such as local-invariant feature extractors (e.g. Scale-invariant feature transform SIFT, Speeded Up Robust Features SURF), as well as Visual BoW approach were used in place classification problems. Nowadays, deep learning methods such as Convolutional Neural Networks (CNNs) have the advantages towards computer vision problems including place classification problem. Albeit, there are several renowned datasets existed to help the community to learn the models, there is no publicly exists in places dataset for specifically places in Indonesia. This paper presents methodology to collect data of visual places in Indonesia, learn deep features from the data, and classify visual places in Indonesia. We aims to contribute a large dataset as well as deep learning models of places in Indonesian. There are more than 16K images collected and augmented to build the places (specifically places in Indonesia) dataset. The highest accuracy score achieved by the models is 92%.

Implementation of Optical Character Recognition using Tesseract with the Javanese Script Target in Android Application

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Abstract

Recognising characters from text have been a popular topic in the computer vision area. The application can benefit to many problems in the world. For example: recognising text in documents, classifying the text or scripts of documents, plate recognition, etc. Many researchers have been developed the methods for recognising characters in by using Optical Character Recognition methods. Although text recognition problem using Optical Character Recognition has been more or less solved, most of the Optical Character Recognition problem explored is belong to Latin alphabet texts. Meanwhile, there are several languages have non-Latin scripts as the written text. Recognising a non-Latin script is quite challenging as the

contour and shape of the text are relatively different with a Latin script text. This research aims to collect datasets for OCR in Javanese characters. A total of 5880 characters were collected and trained with several methods with Tesseract OCR tools. The models then be implemented to a mobile phone (Android based). The highest accuracy (97,50%) achieved by the model was achieved by combining single boundary box for the whole parts of the character and the separate boundary boxes in main body and sandangan parts.

Quranic Latin Query Correction as a Search Suggestion

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Abstract

This research proposes a method to help correct typo errors, such as wrong letters, missing letters, and additional letters. To date, the Lafzi search system is an example of an effective application for searching Arabic queries based on sound similarity. The Lafzi application helps correct typos due to the sound of Arabic letters that are almost the same as the pronunciation but not correct errors due to typos. Typos could prevent the search system not to display the desired results. This research proposes a solution by employing auto-complete to equipped missing trigram and the edit distance metric to calculate the differentiation value between the corrected query with the initial query. The way the system works is by separating and sorting trigram tokens from queries (user inputs) based on the verse. Each verse that has a missing trigram token will be equipped and re-transformed into a corrected query. Each corrected query will be compared to the edit distance value against the initial query (input from the user), then a corrected query will be taken which has the smallest edit distance value and will be made as a suggested query. The evaluation shows that the proposed method produces the highest recall value at 93.40% and the highest MAP value at 86%. This outperforms the previous Lafzi system approach which achieves recall at 85.23% and MAP at 79.83%.

Narrator's Name Recognition with Support Vector Machine for Indexing Indonesian Hadith translations

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Abstract

The narrator's name in the Hadith is one of the most important components in determining the validity of a hadith, but with the large number of Hadiths that exist, causing the process of determining the validity of a Hadith manually becomes difficult, especially in the Indonesian

Hadith translation. Named Entity Recognition (NER) is a method that aims to find entities in a text document, in this case the entity includes the name of the person, location, organization, etc. This study will discuss the implementation of the Named Entity Recognition to the Indonesian translation of the Hadith collection to find the names of narrators from each Hadith. In this study 200 Hadiths from 9 different books consisting of 31010 tokens and 2241 narrator name entities will be used as datasets. Because of the variety of entity forms and the amount of data used, this study will use a supervised-learning approach, and to maximize performance from the NER system, Support Vector Machine (SVM) is chosen as a classifier model that is known to have good generalization capabilities in classifying data and ability to deal with high-dimensional data. Some combinations of test scenarios on the NER model showed the highest F-1 results of 0.9 with training data totaling 140 Hadiths consisting of 1564 entities and testing 60 Hadiths consisting of 677 entities. The narrator name produced by the NER system will then be used as an index of the Hadiths that have been narrated by the narrator using the Inverted Index method.

Building a Database of Recurring Text in the Quran and its Translation

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Abstract

To understand the Quran better, correct interpretation requires paying more attention to verses in the Quran. From 114 surahs of the Quran, according to al-Khatib al-Iskafi (dead 420 H./1026 M.), only 28 or about 25% do not contain similar or repeated verses. Currently, to get longest recurring verses in the Quran requires manual effort, by searching the Quran verse by verse from beginning to end which takes a long time. This is a problem of longest common substring (LCS) in the Quran. We propose a system using Ukkonen's algorithm to build a database of repetitive text sets. Ukkonen's algorithm is chosen because this method of solving the longest common substring (LCS) problem has better efficiency than previous methods. We use two language translations, Indonesian and Arabic. We use 789 verses or 5 surahs in the Quran. We limit longest repeated text sets containing at least three words. For Indonesian we produced 2341 repetitive text sets, for Arabic we produced 2567 repetitive text sets, which are then stored in the database. After evaluating this system, for Indonesian we obtained precision of 45.9%. Whereas for Arabic, we obtained precision of 55.5%. This research produced a new database that did not exist previously in scientific papers. The resulting database can be used for various studies on the Quran and can also be used to compare with other studies about the Quran. The code and resulting database is available at: https://github.com/deviokta27/Al-Quran.git.

Person Entity Recognition for the Indonesian Qur'an Translation with the Approach Hidden Markov Model-Viterbi

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Abstract

Qur'an contains teachings about life given by Allah to the Prophet Muhammad. In the Qur'an, there are a lot of verses. With a large number of verses, it will be very difficult and take a long time for us to find a name. Manually searching for entities will be very difficult and take a long time to be searched. With NER, which is one of the techniques of information extraction that aims to detect entity names, such as people's names, locations, events, and time expected search for entity names in the Qur'an will significantly simplify and shorten the time. Indonesian Qur'an translations will later be used as Inputs, and their names are entity names. The solution to the problem above is to use NER. The Named Entity (NE) Recognition (NER) system will look for name entities people from the corpus that have been created. In applying NER requires a model to detect name entities in a text. Hidden Markov Model-Viterbi is a machine learning algorithm type Supervised Learning which will be applied. In the development of a system for searching names entities for the Indonesian translation of the Qur'an dataset have best F1 results is 76%.

Named-Entity Recognition on Indonesian Tweets using Bidirectional LSTM-CRF

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Abstract

The massive amount of Twitter data allow it to be analyzed using Named-Entity Recognition. Named-Entity Recognition (NER) is a sub-task of Information Extraction that can recognize entities in a text. Most NERs are trained to handle formal text such as news articles, but when applied to informal texts such as tweets, it provides poor performance. The limited number of words, informal and messy grammar on tweets makes it difficult to classify the entities needed. In this study, it was built the model using a combination of deep learning and machine learning approaches, Bidirectional Long Short-Term Memory (BLSTM) and Conditional Random Field (CRF) as the solutions. Entities identified in the form of Person, Location and Organization. The corpus tested included 600 Indonesian tweets comprising 250 formal tweets and 350 informal tweets. The model got the best F1 score results by adding the word embedding type FastText, which are 86,13% for formal tweets, 81,17% for informal tweets, and 84,11% for combined tweets.

Rule Based Pattern Type of Verb Identification Algorithm for The Holy Qur'an

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Abstract

This paper proposes an algorithm for identification of pattern type of verb in classical Arabic. This topic was proposed because of the problem on Arabic Al-Qur'an annotation is an important task. It is important for the processing of the Holy Qur'an data, and provides convenience for those who want to learn Arabic, especially understanding arabic on morphology aspect. Understanding verb is the first step to understand the arabic morphology. The effort is to recognize how the rules regarding the pattern type of verb with the rule based approach read the pattern with prefix , the diacritics and the suffix if the verb. Briefly entered verb (Arabic or transliteration) and its output is an attribute of verb which is pattern type of verb, pronouns and verb pattern with the main rule that is identifying pattern, getting verb attributes and determining verb pattern. Experiments show that the proposed algorithm obtained accuracy at 96.48% with soft calculation method and 89.46% with harsh method calculation method. Resources (code and data) developed and produced by this work are publicly available at https://github.com/gamanspin48/verb-identification-AQ.

Analysis of Acoustic Features in Gender Identification Model for English and Bahasa Indonesia Telephone Speeches

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Abstract

One of the most interesting topics in auditory problem is determining gender of the speaker. In recent years, machine learning has gained significant attentions as a way to build a classifier from labeled data which also can be implemented to build a gender classifier. In this study we develop gender classifier using two different datasets with different languages, English and Bahasa Indonesia. Each data from both datasets is represented by 20 acoustic features. Multi Layer Perceptron (MLP) is used to build the classification model using all these features and trained only on English dataset. This model is evaluated in both dataset to get the performance matrices consist of accuracy, AUROC, precision and recall. Ultimately, using this model we

also identify and compare important features from both dataset to see the different characteristics of English and Bahasa Indonesia speeches.

Indonesian Chatbot of University Admission Using a Question Answering System Based on Sequence-to-Sequence Model

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Abstract

Question and Answering (QA) system is a problem in natural language processing that can be used as the system of dialogs and chatbots. It can be used as a customer service that can provide a response to the customer quickly. A QA system receives an input in the form of sentences and produces the predictive sentences that are responses to the input. Therefore, a model that can learn such conversations is needed. This research focuses on developing a chatbot based on a sequence-to-sequence model. It is trained using a data set of conversation from a university admission. Evaluation on a small dataset obtained from the Telkom University admission on Whatsapp instant messaging application shows that the model produces a quite high BLEU score of 41.04. An attention mechanism technique using the reversed sentences improves the model to gives a higher BLEU up to 44.68.

Segment Repetition Based on High Amplitude to Enhance a Speech Emotion Recognition

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Abstract

Speech Emotion Recognition (SER) is a technology developed on a computer to realize a Human-Computer Interaction (HCI). It is a challenging task since the lack of data. Some data augmentation methods have been created to increase the data variation, but they do not significantly improve accuracy. Therefore, a new additional data augmentation method called Segment Repetition based on High Amplitude (SRHA) is proposed to solve this problem. This method makes some repetitions on the segments that have the highest amplitude. An experiment of 10 times data augmentation, using five standard augmentations and the additional SRHA with a Long Short-Term Memory (LSTM) as the classifier, shows that the proposed SRHA significantly increases the SER accuracy from 95.88% to 98.16%. Other experiments for 20 and 40 times data augmentations also show that the SRHA outperforms the

five standard augmentations. These indicate that the SRHA is a powerful data augmentation method for SER.

Indonesian Abstractive Text Summarization using Bidirectional Gated Recurrent Unit

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Abstract

Abstractive text summarization is more challenging than the extractive one since it is performed by paraphrasing the entire contents of the text, which has a higher difficulty. But, it produces a more natural summary and higher inter-sentence cohesion. Recurrent Neural Network (RNN) has experienced success in summarizing abstractive texts for English and Chinese texts. The Bidirectional Gated Recurrent Unit (BiGRU) RNN architecture is used so that the resulted summaries are influenced by the surrounding words. In this research, such a method is applied for Bahasa Indonesia to improve the text summarizations those are commonly developed using some extractive methods with low inter-sentence cohesion. An evaluation on a dataset of Indonesian journal documents shows that the proposed model is capable of summarizing the overall contents of testing documents into some summaries with high similarities to the provided abstracts. The proposed model resulting success in understanding source text for generating summarization.

Enhancement of Indonesian License Plate Number Image using Shock Filtering Equation

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Abstract

Shock filtering equation is a mathematical model for enhancing image quality in partial differential equation form. In this paper, the equation is implemented to enhance the Indonesian vehicle registration number image. In this research the discretization of time and spatial domains use finite difference method which is a simple and straightforward approximation method. In this paper, several numerical simulations with different final time iteration are given. Here the results show that, the bluring image can be enhanced using shock filtering equation with long time simulation. Using subjective or visually approach, the image with 90-th iteration gives a good quality of visual image compared with the other final iterations. However, this result has lowest image quality metrics performance. The objective measurement

shows that the best quality image is obtained at 10-th iteration, with discrete L^2 -norm error 507.63, Pearson's correlation coefficient 0.961353 and PSNR 386.590 dB.

Bayesian Forecasting for Time Series of Count Data

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Abstract

Time series of count data is not a widely studied research topic. This paper develops Bayesian forecasting method of counts whose conditional distributions given past observations and explanatory variables follow a Poisson distribution. To determine a forecasted value of an observation-driven integer valued autoregressive model, a series of well thought algoritm needs to be developed, resulting in the use of Bayesian framework. This effective algorithm sets is then used for the aforementioned calculation for the modelling of time series count data. To get the demanded results, a particle MCMC algorithm for the autoregressive Poisson regression model is introduced in the equation. Two real-life data sets, monthly demand for medicines type X and type Y (2016–2018) are successfully be analysed. We also illustrate that the Bayesian forecasting is more accurate than the corresponding frequentist's approach.

Spatial autoregressive (SAR) model for average expenditure of Papua Province

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Abstract

Linear regression model can be used to describe the relationship between dependent variable and independent variables. But, if there is a spatial effect in the data, it must use a spatial model. This is because the independent variables that influence dependent variable can be different at each location. Spatial autoregressive (SAR) model is a spatial method that can be used to describe the relationship between dependent variable and independent variables by considering spatial impact. Before SAR model is carried out, it must be tested for spatial effect using Moran's I. This is used to ensure that there are spatial effect in the data. Because if there is no spatial effect, then can be use a global model, that is linear regression model using Ordinary Least Square (OLS). In this paper, OLS and SAR model was used on average expenditure data of Papua. Expenditures must be made by each region in Indonesia due to subsidies from the central government. Papua is a province that has the highest average expenditure compared to other provinces. Therefore, the average expenditure becomes important thing that needs to be considered by the government of Papua. This is because there must be equal distribution of expenditure at each district / city in Papua. The result of this research indicated that there is a spatial effect on the average expenditure data in Papua. Comparison result of OLS model and SAR model showed that SAR model is better than OLS model. Because MAPE, AIC and RMSE of SAR model are smaller than OLS.

Nitipyuk: A Crowdsourcing Marketplace for Personal Shopper

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Abstract

Over the past two years, personal shopper businesses have been increasingly carried out individually through social media. Several web applications offering this type of services have emerged, but they did not come without limitations to certain products and feature availabilities in them. The limitations to individual personal shoppers were raised as the problems that will be discussed in this study. The purpose of this research was to develop an application that can open an opportunity for anyone to become an entrepreneur as well as requester or personal shopper customer. This research involved literature review, comparative analysis of similar applications, application design and evaluation with proportion testing to compare the proportion of users who agreed to those who disagreed with the statements related to the variables evaluated. In addition, an independent test was also performed to find out about the variables related to users' satisfaction with the application. The researchers suggest developing an e-commerce application with an addition of a bidding feature to increase the level of requester-traveler interaction. From the evaluation results, it can be proven that Nitipyuk is useful and easy to use for users. It only needs improvement in the user interface design to better attract users.

Resepfinder as an iOS-Based Local Cooking Recommendation

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Abstract

The process of finding recipes is needed in the world of cooking. This is because recipes play an important role in the process of making dishes such as helping to prepare cooking needs and giving steps in order to produce delicious dishes. The objective of this research is to design a mobile application to help the Indonesian people to access recipes throughout Indonesia. ResepFinder is an application that recommends recipes based on available ingredients and provides solutions to find recipes by using the smartphone camera to detect an object so that the process of finding becomes easy and appealing. Besides that, ResepFinder also allows its user to communicate with others when they encounter a problem. The system design was done by designing the initial framework or work flow in the form of UML diagram and mockup. While the process of conducting research was carried out by spreading several questions through google form and doing some research on study literature to find out users interests toward cooking. The result of this research is an iOS-based mobile application.

Modeling of the Acute Lymphoblastic Leukemia Detection based on the Principal Object Characteristics of the Color Image

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Abstract

The objective of the research is to develop a model to detect the Acute Lymphoblastic Leukemia. This research contributes a model for Acute Lymphoblastic Leukemia Detection using Principal Object Characteristics of the Color Image. We developed method consist of four main stages as follows: enhancement, segmentation, feature extraction, and accuracy measurement. This research proposed seven characteristics as the object feature, which are Energy (EN), Entropy(EP), Shanon Entropy (H(X)), Log Energy Entropy (EE), Mean (ME), Variance (VA), and Correlation (CO). The feature extraction results have been calculated using four measurement methods, i.e. Euclidean Distance, Manhattan, Canberra, and Chebyshev methods. Our proposed method has produced maximum accuracy of 81.54%, 81.54%, 76.92%, and 82.31% for Euclidean Distance, Manhattan, Canberra, and Chebyshev methods, respectively. Lastly, we applied a confusion matrix to compute the accuracy of the experiment. Our proposed method has been evaluated using Acute Lymphoblastic Leukemia-Image Database (ALL-IDB).

Recommendation of Scheduling Tourism Routes using Tabu Search Method (Case Study Bandung)

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Abstract

In 2019, the Indonesian Ministry of Tourism is in the process of improving the Go Digital program for the industrial era 4.0, where the internet has become one of the ways to determine

travel destinations. However, currently, tourists still have difficulties obtaining detailed and complete information about tourist destinations, when visiting several destinations in one trip. Tourists are still having trouble estimating the distance and time needed for tourism independently, without having to depend on travel agents. These problems are often referred to as Traveling Salesman Problems (TSP). Therefore, we provide a solution to solve this TSP problem in the form of a system scheduling and searching route tourist using the tabu search method which enables tourists to find the optimal solution based on travel time, operational hours of tourist attraction, and the time limit of visits per day. Calculations in the tabu search method are combined with the concept of MAUT (Multi-Attribute Utility Theory) to determine the optimal tour based on several criteria: popularity, cost, and the number of attractions to be visited. Then, the test results of the tabu search method are compared with the firefly method. The result shows that the tabu search method is better than the firefly method, where there is an increase in accuracy of 48% in the calculation of fitness values, 47% in running time average, and 27% in the number of tours to be visited during 3 days of tour visits.

Modified Average of the Base-Level Models in the Hill-Climbing Bagged Ensemble Selection Algorithm for Credit Scoring

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Abstract

Performance of credit scoring model is a main concern for financial institutions in determining the credit risk of credit applicants. Credit score will be one of basis for the lender to make a decision, approved or rejected, for any credit applications. There are many methods and approaches that have been modeled for this problem. This study tries to explore further the Hill-Climbing Bagged Ensemble Selection (HCES-Bag) algorithm which has the best performance for credit scoring model as has been analyzed comprehensively in the research conducted by Lessmann et al.1. We modify some average formulas for the base-level models to find out the opportunity for improving the performance of credit scoring model as measured by several performance indicators. Experiment with German Credit Data from the UCI Machine Learning Repository by first using Multivariate Adaptive Regression Splines (MARS) model for features selection demonstrates that the modification average does not affect credit scoring model performance significantly. However, some of them make the credit scoring model performances by using only smaller number of base-level models.

Detection of Vehicle Position and Speed using Camera Calibration and Image Projection Methods

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Abstract

Traffic congestion is the main problem faced by big cities, such as Jakarta. One approach to reduce congestion levels is to improve traffic management that regulates and controls the number of vehicles. To evaluate the impact of traffic management before direct implementation on the highway, traffic modeling can be carried out. Parameters in modeling traffic must be determined from a calibration process where the vehicle is accurately measured for its position and speed. This study aims to propose an efficient calibration procedure with accurate results, based on recorded vehicle movement in perspective view. First, the road image is projected using the Direct Linear Transformation (DLT) method, then the vehicle position is detected using the Background Subtraction and tracked using Mixture of Gaussian (MoG) to determine the vehicle speed. Finally, we develop a prototype of Automated Traffic Flow Monitoring based on Python programming. In the experiment results, the accuracy of vehicle position detection is evaluated based on the Euclidean distance. The average difference between the results of position detection with ground-truth is 12.07 pixels with a camera angle 40°. The percentage of speed measurement accuracy using the DLT projection method is 96.14%.

Analysis of the Indicator's Performance to Predict Indonesian Teacher Engagement Index (ITEI) using Artificial Neural Networks

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Abstract

Research related to the Indonesian Teacher Engagement Index (ITEI) is still being developed to get better predictive accuracy. In this study we conducted an analysis using the Neural Network approach to determine the performance of each dimension obtained from the ITEI database. Root Mean Square Errors values generated when using variables in dimensions related to Nationality Character are quite low, which is 0.151, with a correlation of 0.906 and execution time of 13s. In addition, the Nationality Character Dimension obtained excellent performance predictions when combined with the Positive Education Dimension. The Square Errors Root Mean value can be reduced to 0.102 with 8s execution time. The results of this

analysis will be used as the basis for developing ITEI applications in the future so that the resulting Teacher Profiling can be used as a basis for policies and strategies to improve teacher performance and engagement in the school environment.

Saint-Venant Model Analysis of Trapezoidal Open Channel Water Flow using Finite Difference Method

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Abstract

This study aims to compare the flow characteristics in rectangular and trapezoidal open channel by investigating the effects of Manning coefficient, channel bottom slope, channel width, and channel side slope which represented by modified Saint-Venant equation according to the channel cross section, which are rectangular and trapezoidal, and the slope of channel friction using the Manning coefficient. The equation is solved numerically by using finite difference methods with Forward Time Backward Space approach. The model is simulated by using python-based desktop application to show the flow characteristics. Computational results are displayed in the form of summaries, tables, two-dimensional graphics, and three-dimensional graphics. Validation is done by comparing computational results data with data from the other studies that have been done before and concluded that the simulation results have been valid and indicate compliance with the prior studies. The simulation results show that trapezoidal channel is better at minimizing the risk of flooding than rectangular channel in consideration of smaller discharge, smaller velocity, and lower water level.

Extreme Rainfall Prediction using Bayesian Quantile Regression in Statistical Downscaling Modeling

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Abstract

Statistical Downscaling (SD) is a model that uses satellite data from General Circulation Models (GCM), which in climatology are very useful in predicting climate for the next few decades. GCM data is generally ill-conditioned, which is high dimension and multicollinearity, so a special technique is needed to handle this poorly conditioned. One of the variable selection techniques and handling of multicollinearity which is currently highly developed is regularization techniques including Adaptive Lasso, where selective parameters are adaptive,

which can differ for each regression coefficient. Until now, predictions of extreme rainfall in Indonesia have not used Adaptive Lasso in SD modeling. This paper aims to predict the amount of rainfall (in millimeters) at moderate extreme (quantile 0.75) and high extreme rainfall (quantile 0.9 da 0.95) and handling poorly conditioned GCM data with Adaptive Lasso techniques and building predictive models of local rainfall by utilizing GCM data using the Bayes quantile regression model. Response in the form of monthly rainfall at Indramayu district, West Java Indonesia, and 49 explanatory variables in the form of GCM precipitation data in the period January 1981 - December 2013, which handled multicollinearity and variable selection using the Adaptive Lasso. The results are very satisfying with correlation between predicted and real data is above 0.91 for and the RMSEP is less than 50.

Additive Bayes Spatio-temporal Model with INLA for West Java Rainfall Prediction

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Abstract

Currently in most cases, the inference of spatio-temporal modeling using Bayes regression still utilize MCMC simulations, which has an important issue in their limitation in computational burden. Involving big datasets, the complexity of Bayes spatio-temporal modeling could lead inefficient performance from Bayesian inference via MCMC. This paper aims to predict rainfall in observed and unobserved locations using Bayes spatio-temporal model with the inference of INLA, which has proven capable of providing fast and accurate results. The response variable is monthly rainfall from 57 locations in West Java Indonesia, observed from 1981 – 2017 and assumed to have normal distribution. Our spatio-temporal modeling based on additive framework, which can capture the spatial and temporal random effect as explanatory variables. The spatial random effects are a realization of Gaussian process with spatial dependency follow Matérn model, and the temporal random effects are assumed to have annually cyclic and follow random walk of order two. The model shows satisfying results: the spatio-temporal model able to predict rainfall even for unobserved locations using the spatio-temporal model able to predict rainfall even for unobserved locations using the spatio-temporal characteristics from nearly locations with the correlation between predicted and real data sets is about 0.7 - 0.8 for high to low quantile with RMSE is about 294 for high quantile.

Selecting Features Subsets Based on Support Vector Machine-Recursive Features Elimination and One Dimensional-Naïve Bayes Classifier using Support Vector Machines for Classification of Prostate and Breast Cancer

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Abstract

Deaths caused by cancer are expected to continue to increase, especially for prostate cancer and breast cancer. Both diseases are the most common types of cancer for men and women in the world. The number of deaths can be reduced by the early detection of using machine learning. One of them is the classification of prostate cancer and breast cancer data. Cancer data used has a variety of features, but not all features are essential features. In this study, we used Support Vector Machine-Recursive Feature Elimination (SVM-RFE) and One-Dimensional Naïve Bayes Classifier (1-DBC) as feature selection methods. In both methods, it will get a ranking for each feature. The use of these two methods in the classification of prostate cancer and breast cancer data results in a high level of evaluation. Both of these methods can produce an accuracy rate of 95.61%, the precision of 100%, and recall of 93.61%. In additional evaluation, SVM-RFE has lower running time than 1-DBC.

Determining Total Vertex Irregularity Strength of $T_r(4, 1)$ Tadpole Chain Graph and its Computation

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Abstract

In this research, we examine total vertex irregularity strength (tvs) of tadpole chain graph $T_r(4, 1)$ with length r. We obtain that tvs $(T_r(4, 1)) = \left[\frac{4r+2}{5}\right]$. Further, we construct algorithm to determine label of vertices, label of edges, weight of vertices, and the exact value of tvs of $T_r(4, 1)$.

A Study of the Sensitivity of the Fuel Consumption to Driving Strategy by Micro Simulation

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Abstract

Global warming due to excessive emission greenhouse gases is a significant issue faced by humanity, and collectively, cars and trucks contribute about 20% to the entire global-warming gases. For a reason, recently, many attempts have been endured to reduce the emission and to increase fuel efficiency, including vehicle platooning, better driving strategy, and increasing engine efficiency. This study intends to provide a more detail assessment regarding the effects of the driving strategy to fuel consumption. For the purpose, the vehicle dynamics are quantified by employing the car-following model based on the optimal velocity model. The fuel consumption is estimated from the regression model of Ahn¹⁸. The result suggests that the braking distance strongly affects fuel consumption.

Classification of the Structural Integrity by the General Vibration Method

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Abstract

Traditionally, for the purpose of classifying the integrity of an engineering structure, one may use the information of the natural frequencies or mode shapes or some other measures derived from the two. In this research, we propose a classification method on the basis of the general vibration model. The general vibration model is essentially a set of differential equations describing the dynamics of the structure under consideration. For the purpose of damage detection, a deviation of the general vibration model from the dynamic equilibrium point marks the occurrence of the damage. To demonstrate the effectiveness of the method, we study two simplest dynamical systems consisting of one- and two-concentrated masses subjected to a prescribed dynamic load. The structural damages are introduced artificially by reducing the stiffness of spring in the structures. We find that the general vibration model is more sensitive to damages than the traditional methods.

Feature Pyramid Networks for Crowd Counting

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Abstract

In this paper, we propose the use of Feature Pyramid Networks (FPN) for Crowd Counting problem. FPN previously has been used for retinanet, the state-of-the-art model for object detection. By using FPN, our proposed crowd counting model achieved a state-of-the-art performance for UCF CC 50 dataset with MAE 136.4 and MSE 223.6. The proposed model is also achieved a state-of-the-art MSE value of 7.6 for ShanghaiTech Part B dataset. The code can be accessed at https://github.com/wawancenggoro/fpncc.

Features Importance in Classification Models for Colorectal Cancer Cases Phenotype in Indonesia

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Abstract

Recently there has been an interest in predicting complex disease risk using models that combine the effects of many genetic factors together. These are known as polygenic models and are useful in evaluating risk of disease in patients. These models, however, often do not include important non-genetic factors that are important to the prediction of the disease. In this paper, we explore the prediction of colorectal cancer in Indonesia from non-genetic factors using common machine learning algorithms: XGBoost and Elastic Net. The result of this study identified 8 features with strong importance from both XGBoost and Elastic Net. We recommend including these features as covariates in future genetic association studies of colorectal cancer in Indonesia. Ultimately these models may be implemented as tools to screen patients for colorectal cancer risk.

Adjustment Factor for Use Case Point Software Effort Estimation (Study Case: Student Desk Portal)

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Abstract

With the growth of technology, the requirement for customized software to support business increases and the experts on software development also increases. The more Software Developers means the more competition in Software Development. Software metric for effort estimation is a strategy to use metrics related to effort estimation in software development becomes necessary to determine the effort required to develop the system and hence determine pricing (in the case of software house). Several methods exist to estimate effort. This research discusses the Use Case Point Method using a Student Desk Portal as the study case. The effort calculated based on Use Case method may differ from the actual case. In this paper, the differences are analyzed, and an adjustment factor is constructed to resolve the differences between the effort estimated by use case point and the actual effort placed in the actual software development. A new criterion is introduced by using data from the actual software development, be used as further adjustment to the effort obtained by using Use Case Point method. This new criteria, the simplicity of project is added to be a part of the environment factor. The result is positive, the effort calculated by Use Case Point for three different application is in accordance with the actual result.

Self-Evacuation Drills by Mobile Virtual Reality Application to Enhance Earthquake Preparedness

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Abstract

Traditional evacuation drills by self-rescue practice are a common method used to educate society in communities, companies or schools in Indonesia which involving participants in large numbers. However, the participants in this approach are not always committed and doing it seriously in some cases. Besides, the participants were also unable to feel the earthquake sensation because no shaking at all when practice evacuation drills. For this reason, it is necessary to design a tool that can be used to practice by themselves with no involving many people, but the sensation of shaking can be felt by the users, one way is using Virtual Reality (VR) technology. This study aims to develop VR-based applications that can create a sensation

of shaking such as an earthquake and can be used individually. The method used in this study is initial research, development, testing and analyzing, and recommendations. The development carried out by Unity 3D software which is equipped with GoogleVR plugin. The testing was conducted on 14 students of SMK Batik Batik 1 Surakarta, Indonesia, whose average age of 16 years old and the habit of playing games is 2-3 hours per day on average. From the experiments conducted, 71% stated that earthquake simulations using VR applications are more interesting than animated video, because they can interact with virtual objects directly and the simulations are more realistic. Thus, it can be concluded that the VR application can be used for earthquake evacuation exercises independently, further hope that user preparedness will be better in dealing with natural disasters, especially earthquakes.

Enhancing Game Experience with Facial Expression Recognition as Dynamic Balancing

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Abstract

Player's Experience in the game has been known to be one of the essential keys for the success of the game. There are several methods exist to enhance the player's experiences in the games. One of the unexplored methods is a dynamic balancing system using Facial Expression Recognition. The player's facial expression is captured in real-time while the player is playing the game, and the dynamic balancing system will automatically adjust the game difficulty based on the player's facial expressions. This research aims to empirically explore the implementation of Facial Expression Recognition for a dynamic balancing system to enhance the player's experiences in the game. Two action games (2D and 3D) were developed and evaluated with 60 respondents in two groups. Both groups played the game twice, one with facial expression recognition system as dynamic balancing activated and one without. The results demonstrate that they are statistically significant differences (i.e. improvement) between the baseline and enhanced games with p < 0.01.

Increase The Interest In Learning By Implementing Augmented Reality: Case studies studying rail transportation

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Abstract

Learn a subject, for some people, might be an uninteresting and boring activity, especially when the subject to learn are difficult subjects to understand. Many methods used to change learning activities become more enjoyable and interested. This study proposed a new method in learning activities, by applied augmented reality technology in the learning process. The case study used in this paper are implementation the augmented reality in studied subjects related to train technology. In this study, author implement augmented reality on learning material, combines real and virtual things in one media, in this case a mobile device. The impact of implementation of augmented studied, at the end of experiment, author can conclude when implement augmented reality technology in learning material helps the learning process and increasing the impressive and fun factor in learning process and make the learning process more interested. Implementation of Augmented Reality in learning material gives more information about the object being studied, information about on shapes, textures, and provide more visualization for the object.

Interactive Gamification Learning Media Application for Blind Children using Android Smartphone in Indonesia

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Abstract

The purpose of this research is to develop an interactive learning media application by using gamification approach in smartphone, to help the blind children to improve interest and enthusiasm for learning, and increase their understanding of the material presented. Moreover, the current conditions for the unavailability of interactive learning media for blind children in Indonesian. The process of developing this application uses the Game Development Life Cycle (GDLC) method which consists of initiation, pre-production, production, testing, beta, and release. This application has been tested on several respondents. From this study, developing the useful application, easy to use, and accommodates all their needs.

Comparison of Graph-based and Term Weighting Method for Automatic Summarization of Online News

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Abstract

Text summarization is one of the quickest ways to get the gist of a paragraph or story. In text summarization, there are two ways that can be used: extractive approach and abstractive approach. In this research, the summarization was conducted using extractive approach. The extraction process was conducted by taking a few sentences from a document and combining them into a short summary. The most common method used in conducting text summarization is graph-based method. The authors proposed another method for summarization, namely term weighting method. The purpose of this study is to compare between the result of graphbased method and term weighting method in order to determine the best method for text summarization. The text pre-processing phase involves omitting the stopwords and the affixes. Moreover, the researcher utilized the measurement of Precision, Recall and F-Score. Based on the experiment using the proposed method (term weighting method), the result shows that the average values on Precision and F-score for term-weighting method are 0.296 and 0.280 respectively, which are better than the values of graphbased method. In the end, the result shows that the proposed method, which is the term weighting method, produced better summary compared to graph-based method.

Designing an Emotionally Realistic Chatbot Framework to Enhance Its Believability with AIML and Information States

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Abstract

Chatbot program has been empirically proven help to improve the engagement with users. Moreover, the implementation of a chatbot program in the industry helps the company to reduce their operational costs in engaging with their customers and employees. There are still quite a number of problems existed in order to build a human-like chatbot program. Understanding a natural conversation and replying back to the conversation the interlocutors, keeping the conversation flowing naturally is a cumbersome task for a computer. This research aims to design an emotionally realistic chatbot system to enhance the believability of the chatbot using Artificial Intelligence Markup Language (AIML) and Information State. The results show that there is a statistically significant improvement to the chatbot believability in the system that has emotions variables induced compare to the one without emotions. Moreover, 63,33% of the respondents perceived Aero and Iris as two different individuals. The future work of this research is to deploy and have an exploration of the chatbot system to other cases.

A Design of IoT-based Monitoring System for Intelligence Indoor Micro-Climate Horticulture Farming in Indonesia

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Abstract

Recently, horticulture farming, especially in Indonesia, are facing various obstacles, including the lack of young farmers regeneration, agricultural land decreasing, and climate change. Climate change increase extreme and uncertain weather for horticulture cultivation. Farmers frequently face frequent damage to crops and decreasing in quantity and quality of plants. The development of a monitoring system that can help farmers grow crops is a crucial issue. In this paper, a study for a system for monitoring the performance of indoor micro-climate horticulture is presented. An electronic sensors Internet-of-Things (IoT) board is implemented to monitor the cultivation process. The sensor reading is collected into a database. The database is also integrated with the Indonesian Meteorological Agency data which consists of weather data and daily at the cultivation location. For our future work, the collected data are expected to be used for training machine learning models for the development of intelligence automated indoor micro-climate horticulture.

Smart Socket for Electricity Control in Home Environment

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Abstract

With the increasing use of the internet and dependence on the internet itself, resulting in more and more systems being developed to make the devices, such as computers/laptops, smartphones/tablets, and other devices can be integrated with each other. Internet of Things, is one of the concepts of technology that seeks the integration between these devices. IoT can be used in many fields, for example for smart cities, industrial, medical, and one of the biggest is its use in the home. One example of implementing IoT on smart home is its application to control household appliances, such as air conditioners, light, TVs, and others. From the results of further research, a smart socket with mobile application was developed that can help people to be able to control electronical devices at home. Smart socket designed using Arduino microcontroller. The system created allows users to control the devices for each socket, doesn't control for one power strip. With this system, it can reduce excessive use of electricity as a result forgot to shut down.

Air Pollution Mapping using Mobile Sensor Based on Internet of Things

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Abstract

Air pollution is hazardous to our health, especially carbon monoxide. It can cause diseases such as cough, runny nose, eye irritation, and even death. The main objective of this research is to create a device capable of detecting carbon monoxide pollution levels by using mobile sensors and map the results into heatmaps overlayed on Google Maps. We have implemented an integrated pollution monitoring and mapping system that consists of MQ-7 sensor, GPS, GSM, display module, Arduino board, and web-server. We also evaluated two sampling methods, time-based and distance-based sampling. Based on our experiments, the distance-based sampling method produced well-distributed data and closer to the expected between-samples distances compared to the time-based method. We have also shown that our system can run in real time to monitor the carbon monoxide pollution levels.

Door Security System for Home Monitoring Based on ESP32

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Abstract

Door plays an important role in home security. To secure the house, the occupants of the house will always have the door locked. However, sometimes the house occupants forget to lock the door due to hurry when leaving the house, or they may doubt whether they have locked the door or not. We propose an application called Door Security System which is based on Android using Internet of Things (IoT) technology to monitor the status of the door, controlling the door and increasing security in a house. MQTT cloud is utilized as the communication protocol

between smartphone and door lock system. PIR sensor is implemented in the door lock to detect the movement near the door, while touch sensor is installed on the door handle to recognize the human hand. Should the door is opened by force, the alarm will ring and send notification to alert the house occupant on the existence of intruder in the house. The evaluation results show that motion detection sensor can detect movement accurately up to 1,6 meters ahead, and messages published between smartphone and door lock are encrypted properly so messages are safely sent.

Applications of the Fuzzy ELECTRE Method for Decision Support Systems of Cement Vendor Selection

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Abstract

Fuzzy ELECTRE (Elimination Et Choix Traduisant la Realité) is one of the fuzzy multi criteria decision making methods for resolving the ambiguity of concepts that are associated with decision maker's judgments. In this paper, the proposed methods are applied to a construction company in Indonesia, that is the fuzzy ELECTRE method is applied to cement vendors recommendation problem of PT Wijaya Karya. There are four vendors (A1,A2,A3 and A4) as a recommendation for the best vendor selection. The selection of vendors of raw materials is one of the activities in supply chain management at PT Wijaya Karya. The role of the vendor will contribute to determining the success of this company. After determining the criteria that affect the vendor selection decisions, the results for fuzzy ELECTRE methods are presented.

Detection Traffic Congestion Based on Twitter Data using Machine Learning

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Abstract

Twitter is one of the social media with text and image information that can be used as a source of information to detect traffic congestion in real-time. This study developed a system to detect traffic congestion in Indonesia, especially DKI Jakarta. The system displays the direction of the street according to the name of the street being passed and from each of the names of the streets, resulting in a tweet from the classification. The proposed method uses the Support Vector Machine (SVM) classification with the sigmoid kernel. This study shows that the SVM

classification with the sigmoid kernel (libSVM) has an accuracy rate of 96.24% and that was increased by 2.68% when compared to SVM dot (mySVM). Based on the evaluation result of the proposed system compare to google maps application on detecting traffic congestion, the system could find a similar condition as many as 17 times from 25 of testing.

The Use of Role Playing Game for Japanese Language Learning

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Abstract

In 2018, Japan is the second most popular country to continue studies after the United Kingdom. In this case, because of the need for the world of education and coupled with most Japanese people not wanting to use languages other than the original language, Japanese language is now a very important language. On the other hand it is also seen from a person's language skills, based on the results of a survey of 100 international students who continued their studies in Japan, 81 said Japanese was difficult to understand, because the letters were different from ordinary alphabet letters. Therefore we need a new learning model to attract interest and improve one's Japanese language skills. The model was adopted into the game, by using games it is expected that players can understand the letters hiragana and katakana. The game-making method uses a modified game development life cycle so that game creation can be done maximally and flexibly. Then, by adopting the concept of shodo it can produce proportional writing.

Analyzing the Factors that Influence Learning Experience through Game Based Learning using Visual Novel Game for Learning Pancasila

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Abstract

Games are not only used as a means of entertainment but also can be used as a learning tool. Attractive learning tools can increase the interest of young people or millennial generations, especially for learning conceptual or too theoretical. Pancasila as the basis of the Indonesian nation's life view needs to be understood by the Indonesian people, especially the younger generation. But the way of learning about the Pancasila is currently too theoretical and does not attract young people. Therefore, by making the game that is liked and favorited by young people today is used to study the Pancasila. Through this research the author wants to analyze the factors that can affect learning experience using game-based learning. Researchers use multiple linear regression methods to analyze these factors. The game prototype developed in this study uses the visual novel genre which has an interesting story. There are 101 respondents as samples. The analysis showed that there are two factors that influence game-based learning, namely the gameplay factor and the story of the game. So, it can be concluded that for developing game based learning we need to pay attention to these two factors and through this visual novel prototype game, it can be concluded that the prototype of this game has an interesting game play and a story that is easy to understand.

"PowPow" Interactive Game in Supporting English Vocabulary Learning for Elementary Students

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Abstract

Learning styles that are suitable for generation Z are learning by doing and learning through gadgets. Learning through a game is more fun and beneficial, as proven by some studies. Therefore, in foreign language learning, especially English, many mobile applications are developed and can be downloaded on android phones for free, such as Funland and Monkey Puzzles World Tour. Unfortunately, the application has not been developed based on the needs of Indonesian elementary school students. A game application, called PowPow has been developed to meet those needs in supporting Indonesian students learn English vocabulary. This game has three different themes: house, restaurant and outer space. In each theme, students are motivated to play each prompt question in 30 seconds to complete the game. This application is played by 35 elementary Indonesian students aged 7 to 12 years. After playing the game, it is found out all students agree that this game motivates them to learn English.

Development of Escape Room Game using VR Technology

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Abstract

Escape room is one of the media games that can improve the logic of thinking. Puzzles in the escape room traditionally have disadvantages because the type of puzzle that is made requires a lot of material. The purpose of this research is to produce a game with Escape Room as the

basic theme with Virtual Reality technology. Virtual Reality technology is used to develop presence in users, attendance is about the intimacy of users with the gaming world. By using Virtual Reality, the puzzle elements that are created can be replaced regularly without the need to change the building's skeleton. The development method used is a prototype model using Unity game machines. The research method was carried out using a questionnaire for user analysis. The application generated from this research is the Escape Room VR game that can be played on an Android smartphone that is compatible with Samsung Gear VR. The application can be used as an additional means for traditional Escape Room games.

Map-type Modelling and Analysis of Children Stunting Case Data in Indonesia with Interactive Multimedia Method

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Abstract

Stunting is a major nutritional problem in Indonesia for years. Although the government has done some actions to solve this, the severity of this problem still persist, which means we have to improve the effectiveness of solving this problem. In this journal, we propose an application to integrate the data about stunting cases in Indonesia with its causes details, in hope to increase the effectiveness of government interventions in solving this problem. The application we propose implements interactive multimedia method to increase simplicity, user engagement, intuitiveness, and availability in processing data on stunting case.

Combination of Test-Driven Development and Behavior-Driven Development for Improving Backend Testing Performance

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Abstract

In the process of software development, a testing phase is an important step for detecting the errors. In order to produce a reliable application, this paper discusses the utilization of a combination from two different testing methods, Test-Driven Development (TDD) and Behavior Driven Development (BDD). TDD testing method is a process with a high percentage of code which is tested automatically. However, it could lead to an error when the parameters of the features are changed. Meanwhile, the BDD testing method is a testing method that could perform successfully despite changes to the parameters of the features. This paper discusses the combination of TDD and BDD testing methods, which is called as T-BDD method. By

implementing T-BDD into the Vixio backend system, this paper successfully shows that it could be performed to achieve a high percentage of test-coverage while it could also adapt when the parameters of the features were changed. This paper also shows that the T-BDD testing method performed better compared to using the TDD testing method only.

Optimum Nutrition Intake from Daily Dietary Recommendation for Indonesian Children using Binary Particle Swarm Optimization Algorithm

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Abstract

Optimum nutrition intake in daily dietary habit has a significant role for children growth. Nevertheless, the mistakenness in the fulfillment of nutrition still concerned. It happens because an individual does not have much knowledge about the energy content of food and food combination to meet the nutrition requirement. The objectives of this research are to facilitate an individual to obtain the optimum nutrition intake from their daily dietary habit. This paper proposes a Binary Particle Swarm Optimization (BPSO) algorithm to find the optimum combination of food portion and food option for an individual daily dietary habit. The food data is obtained from 'Tabel Komposisi Pangan Indonesia' book which contains more than 1600 kind of Indonesian food. The results show that BPSO provides an optimum nutrition intake accuracy of 99.14%. Moreover, the nutritionist is already validated that this experiment is succeed in recommending a variation of daily dietary habit that meet an optimum nutrition intake for an individual. Based on this result it can be conducted that BPSO can provide the better accuracy of optimum nutrition intake than Genetic Algorithm (GA), while GA can only provide an optimum nutrition intake accuracy of 97.87%.

MobileNet Convolutional Neural Networks and Support Vector Machines for Palmprint Recognition

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Abstract

Due to the ease of handling with low resolution images, low cost hardware and high recognition accuracy, palmprint recognition has been attracting in the recent years. Many different features extracted of the palmprint image have been employed to perform the recognition tasks. Most of the recognition efforts consequently has been put on the designing and obtaining a relevant

set of effective hand-crafted features which is considered to be the drawback of the traditional image based biometric recognition systems. To overcome the aforementioned problem, in this paper we explore the applicability of MobileNet V2 deep convolutional neural networks on palmprint recognition by fine-tuning a pretrained MobileNet neural networks. We also explore the performance of dropout support vector machines (SVM) by training them on the deep features of the similar pretrained networks. The experiments are carried out using datasets provided by Hong Kong Polytechnic University of Science and Technology. The dataset consists of 6000 grayscale images of 128x128 pixels from 500 different palms. It is demonstrated that the proposed schemes exhibit state-ofthe-art performance on the datasets. The second scheme, MobileNet V2 based features with SVM classifier, is able to achieve best average testing and validation accuracy rate of 100% outperforming the best previous reported results.

Automatic Sleep Stage Classification using Weighted ELM and PSO on Imbalanced Data from Single Lead ECG

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Abstract

Sleep stage classification is one of important aspects in sleep studies, which can give clinical information for diagnosing sleep disorder and measuring sleep quality. Due to the difference in sleep stage proportion for every person, the collected sleep stage data are imbalanced naturally, which can lead to high probability of misclassification. Various learning method has been developed to classify sleep stage based on electrocardiogram (ECG) signal. However, to the best of our knowledge, there are no researches which consider the imbalanced dataset problem for sleep stage classification. In this research, a classification model of sleep stage based on ECG signal was developed using Weighted Extreme Machine Learning (WELM) to deal with imbalanced learning dataset and Particle Swarm Optimization (PSO) for feature selection. The research will use the MIT-BIH Polysomnographic Database, which contains 10154 sleep stage annotated ECG data which consist of 17.79%, 38.28%, 4.76%, 1.78%, 6.89%, and 30.5% data of NREM1, NREM2, NREM3, NREM4, REM, and awake stage respectively. From each ECG record, a total of 18 features were extracted and the feature selection process resulted in 10 features which highly affect the sleep stage classification. The proposed model successfully obtained a mean accuracy of 78,78% for REM, NREM and Wake stage classification and 73.09% for Light Sleep, Deep Sleep, REM, and Wake stage classification.

Itinerary Recommendation Generation using Enhanced Simulated Annealing Algorithm

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Abstract

The trend of traveling has increased in recent years along with the easy access to information. Travelers create the itinerary before they are travelling to an area. However, creating itinerary is not easy, many factors need to be considered before deciding where to go, such as the "must visited" places in that area, distance between tourist attractions to be visited within a day, preferred tourist attractions, and other information about the places. Generating the optimized distance itinerary is similar as a Traveling Salesman Problem (TSP). The purpose of this research is to study the combination of simulated annealing and Greedy algorithms to create an itinerary. The initialization process of the simulated annealing algorithm uses Greedy algorithm searching technique and then proceeded with existing optimization step in simulated annealing method. This paper proposed a method of enhanced simulated annealing algorithm and the experiment results show the enhanced simulated annealing increase the effectiveness of simulated annealing algorithm which produce the shortest distance needed to travel places around an area.

A Review of Recent Advancements in Appearance-based Object Recognition

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Abstract

Appearance-based object recognition can be used in various applications such as humancomputer interface and information retrieval. Therefore, many researchers compete with others to present their best in object recognition. Since object recognition has been studied for a long time and encompassed diverse approaches, therefore a review of the latest works is needed. This paper aims to deliver the trends in object recognition researches focusing on instance recognition and foreground detection such as salient object detection and object detection as supporting methods. Covering 34 publications, we survey the approaches, methods, datasets, performance measure, and experimental results. We also present research challenges in object recognition which can be used as suggestions for future works. We hope that our work can provide an overview of the current trends for object recognition and foreground detection methods.

The Comparison Firebase Realtime Database and MySQL Database Performance using Wilcoxon Signed-Rank Test

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Abstract

This study aims to compare Firebase Realtime Database and MySQL performance as Database Management System for our Toddlers Daily Nutritional Needs Mobile Application. The comparison is in terms of Database response time. Their performance is compared using a common CRUD operations. Each operations data is analyzed using Wilcoxon Signed-Rank test. Our comparison results confirm that Firebase Realtime Database is more suitable as our Daily Nutritional Needs Mobile Application Database Management System since it could perform better response time. The key features match our needs to provide Realtime Data and it is also help simplify the process of developing applications.

Social Media Web Scraping using Social Media Developers API and Regex

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Abstract

Nowadays many information can be easily accessed through the internet. Some of social media web applications, such as Facebook, Twitter and Instagram, even provide user with an easy information sharing features. However, the information is presented in the form of a timeline or a feed, which is sometimes not relevant to the user or quite hard to accessed by user because of the redundancy of the information. This situation can be resolved with a Web Scraping method proposed in this paper, that able to search information, combine and present it in a better way according to user preferences. A system is developed to implement the proposed method by using an API that Facebook Developers and Twitter Developers provided. In addition, regular expression (or Regex) which is a language construction that can be used for matching text by using some patterns. Based on experiment conducted in this research, overload information could be suppressed into structure data that store in a database, less redundancy information is presented, and information relevancy could be adjusted to user preferences.

Technological Factors of Mobile Payment: A Systematic Literature Review

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Abstract

In the last 10 years, mobile payment is widely used by anyone and even becomes a needs requirement to perform financial activities. Each financial institution always tries to improve the service in the institution looking for technology-oriented innovation. The mobile payment services that are currently created and through continuous improvement have important functions in the creation of ecosystems ranging from regulators, financial institutions, device manufacturers, retailers to the customer himself. With the increasing use of mobile payment, it is important to know the key factors that make people use mobile payment. The key factor in the use of mobile payment can be an opportunity for financial services to build the right mobile payment for human needs. This research uses a qualitative method with a systematic literature review approach to answering the research question "what is the key factors were found for the human influences using mobile payment from 54 research literature. There are 17 important key technological factors for mobile payment.

Mobile Financial Management Application using Google Cloud Vision API

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Abstract

Money is the main potential conflict in every individual life. Inability to understand financial concepts and risks may lead to wrong decision making then further worsen someone's financial condition. Therefore financial literacy became significant knowledge to have. This financial literacy should be supported by some mechanism to record, monitor, and control an individual financial activity. This study observed the potential value of an mobile-based application "Manage on Money (MoM)" to solve those problem. MoM has three main features for each of those problems. First, "Add Income" and "Add Expense" menu, which is implemented using Google Vision Cloud API Optical Character Recognition (OCR). This menu helps the user record their income and expenses. Second, "Buy or Bye" menu, which is utilizing 50/20/30 budgetting rule. This menu helps the user control their budget usage. Third, "Recurring Transaction" menu, which is implemented using OneSignal API. This menu helps the user monitor their regularly expense and notify them during the due date. Overall score of over than 3 out of 4 was given by the respondent as evaluation of Manage on Money performances and usefulness.

MVC Architecture: A Comparative Study Between Laravel Framework and Slim Framework in Freelancer Project Monitoring System Web Based

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Abstract

Currently, the work of freelancers is very much in demand. Because freelancers can work anywhere and anytime without being bound by a contract with a company or person. But freelancers have difficulty managing their tasks and projects because there is no system to monitor and manage the project. Therefore, the solution is to make the project freelancer monitoring system by implementing the MVC (Model View Controller) architecture model with the PHP Laravel and Slim framework. MVC design patterns are well-known patterns and are used for interactive software system architectures. The way the MVC method works is to separate the main components such as data manipulation (model), display/interface (View) and the process (Controller) so that it is more neat, structured and easily developed. The purpose of this study also compares the MVC Laravel and Slim framework architecture with a performance comparison method on load/stress testing on the dashboard page using Apache JMeter tools with 3 scenarios from samples 1, 100, and 500. Tests are done offline and report format results of performance tests is a Summary Report. The results obtained from performance comparisons using Apache JMeter are that the Slim framework is faster and better than Laravel's framework.

Systematic Literature Review on Decision-Making of Requirement Engineering from Agile Software Development

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Abstract

This paper presents a systematic literature review of agile software development at decision making method for requirement engineering. Presently, agile software development method is operated to cope with requirements that changes dynamically. This study seeks to find out and discuss what types of method that have been exploited for decision making on managing feasible requirements and challenges of decision making in agile software development. Papers reviewed in this study are published from 2017 to present. Resulting 8 papers that have been identified of presenting decision making methods. Using these papers, 11 methods and 7 challenges of decision making identified. This study contributes a review of requirement

management and engineering by providing decision making methods on agile software development and the challenges of decision making for requirement engineering.

Evaluation Model for the Implementation of Information Technology Service Management using Fuzzy ITIL

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Abstract

Information technology (IT) service management is an essential part for development of a company's IT. This case study discusses how to convalesce IT services using the information technology infrastructure library (ITIL) framework and measure service level management (SLM) using Fuzzy ITIL (FITIL) approach. This paper aims to obtain an appropriate model for the measurement of IT service management by using fuzzy approach. Besides that, this paper aims to be able to provide an improving recommendations and IT governance based on current value (as is) and expected value (to be). The research method functioned is by measuring maturity level using best practice of ITIL v3 to condition before and after of improving process based on a questionnaire that has been performed. After obtaining the value of the maturity level for each cycle within ITIL, then the value will be created as an input for FITIL. The manufacture of FITIL is done in 4 stages, namely fuzzification, knowledge base, inference, and defuzzification. The results of the conditions before and after of the improving process have been successful in increasing the level of maturity in each ITIL cycle. The case study indicates an improvement in the increased level of maturity in SLM with FITIL approach.

Comparative Performance of Filtering Methods for Reducing Noise in Ischemic Posterior Fossa CT Images

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Abstract

Posterior Fossa (PF) of head Computed Tomography (CT) image appears to be one of the intricate regions as it is located in the deepest part of the brain. This appears to cause significant degradation in CT image quality due to the effect of beam hardening and bone thickness. Whilst these issues may not fundamentally limit the scanning procedure, it does appear to be the

contributory factors in reducing the performance of the ischemic diagnosis procedure. Thus, it is seen that image filtering is playing an important role in improving the CT image quality and effectively eliminates the influence of Poisson noise in the PF region. Therefore, this paper attempts to assess the feasibility of four different filtering methods; Anisotropic diffusion, Bilateral, Median and Wiener to eliminate noise in the CT image of PF containing ischemic. To the best of our knowledge, this is the first study to report the performance of filtering in ischemic PF. The efficacy of these four filters is evaluated in details using qualitative and quantitative metrics such as Peak Signal to Noise Ratio (PSNR), Root Mean Square Error (RMSE), Structural Similarity Index (SSIM) and processing time. The experimental works demonstrate that Bilateral filtering offers promising results in which this method can eliminate Poisson noise in CT images for ischemic PF with average PSNR, RMSE, SSIM values of 32.95, 5.7416 and 0.9749 respectively. This filter has provided the flexibility of being applicable even in cases where ischemic is presented in PF.

Classification of Emotional State Based on EEG Signal using AMGLVQ

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Abstract

Identifying humans emotional state using electroencephalogram (EEG) signal more precisely than using non-verbal and verbal signals, because emotions are psychological and physiological processes that are connected with personality, motivation, mood, and temperament. EEG is a physiological signal that recorded from brain activity in the form of brain waves through the scalp. In this study, emotional states will be identified based on EEG signals using the Adaptive Multilayer Generalized Learning Vector Quantization (AMGLVQ) algorithm. The dataset used is DEAP: A Database for Emotion Analysis using Physiological and Audiovisual Signals. Emotional conditions that are classified are valence, that is low and high valence. DEAP dataset has imbalanced data characteristics, and one of the advantages of AMGLVQ algorithm is handling classification in imbalanced data conditions. The test results show that AMGLVQ has better performance compared to Random Forest (RF) and Support Vector Machine (SVM).

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