Welcome to the Third International Conference on Computational Science and Information Management! ICoCSIM-2019 is going to be held in Lombok, Indonesia from 21 March to 24 March 2019. The Third International Conference on Computational Science and Information Management (ICoCSIM) is dedicated to discuss about challenges in both areas of Computational Science and Information Management. It thereby will present a consolidated view to the interested researchers in those fields.

The ICoCSIM conference is a joint collaboration between: the Faculty of Computer Science and Information Technology (Fasilkom-TI) of Universitas Sumatera Utara, Faculty of Computer System and Software Engineering of Universiti Malaysia Pahang, Department of Computer Engineering and Informatics of Politeknik Negeri Medan, AMIK Tunas Bangsa Pematang Siantar, Bumigora University, Mataram University, and West Lombok Regency. ICoCSIM-2019 will be held in Aruna Senggigi Resort and Convention Hotel, Mataram, Lombok, INDONESIA. The theme of the conference is “Unlimited Endeavor for Finding Future IT Improvements.” The event will be held over three days, with presentations delivered by researchers from international community, including from internationally recognized keynote speakers.

The Third ICoCSIM-2019 Conference Proceedings will be published as an open access volume of Journal of Physics: Conference Series (IOP Publishing Ltd, Bristol, UK), indexed by Scopus. All accepted papers will be published by IOP, a proceedings publisher. After the conference, those papers that are recommended for a journal publication will be asked to be extended to up to 30 pages.
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Instructional Development and Formative Evaluation of English Grammar for Online Learning

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Abstract

The development of instructional becomes a major part of online learning. Instructional module helps the lecturers to decide type of appropriate technology. Formative evaluation needs to be done in ensuring effectiveness of the development of online learning. Online learning is a technological advance in learning and has become one of the best ways to generate the substitution effect for classroom learning. Students should learn grammar to increase student’s grammatical competence, to give performance support in writing, reading, speaking, and listening. That is why this study develops an online English grammar instruction module. This study concludes that: building online instructional of English grammar not only needs to be accompanied by an explanation of the subject matter in English but also accompanied by using the mother tongue language especially if English is as foreign language for the students. The best form of English grammar online instructional is an artificial representative of the face-to-face learning model in explaining the lesson, the order of the material taught and the presentation of the material. This study results also indicated, instructional of online English grammar is not only preferred by students, but also students prefer the existence of an animated lecturer image in explaining teaching material.

Keywords: online learning, English grammar, student, formative evaluation, instructional design, foreign language
Instructional Design for Online Learning of Algorithm and Programming

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Abstract

The purpose of this study is to evaluate formative the development of online learning of Algorithm and Programming. Each instructional design must be facilitated by multimedia in supporting student learning styles to achieve a better level of learning success. The best approach in developing online learning module is to use learning strategies by overcoming or minimizing the weaknesses of learning that exists today. However, online learning is useful in overcoming learning styles of students who do not like face-to-face classroom learning. The strength of online learning is its ability to utilize various forms of multimedia: text, audio, still and moving visuals, and other forms for learning purposes. The results of this study concluded that online learning of Algorithm and Programming will achieve better results if online teaching material is equipped with text, audio, pointer images, chat forums, and animated images. Each flowchart in online learning Algorithms and Programming must also be shown the application of an application computer program, so that each student is not only good at making flowcharts but also proficient in making application computer programs. Most students argue that online learning of Algorithms and Programming is as effective as face-to-face learning.

Keywords: Instructional, online, face-to-face, learning style, student, learning design
Design of Gas Detection System Based on Internet of Thing

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ABSTRACT

Gas leak detectors are necessary to prevent explosions and fires from leaking gas from tubes used in households, small and medium enterprises and industries. Based on the data of research results (BSN, 2008) in 5 provinces, obtained many conclusions that do not meet the quality requirements of SNI. For 100% hose does not meet SNI requirements, 66% tube valve, 50% gas stove, 20% regulator, and 7% tube. This sample was taken as many as 9 pieces in each province. This gas leakage detector is based on the Internet of Thing (IoT), which works to detect the existence of gas leaks and useful to prevent the occurrence of explosions and fires. The advantage of this tool in addition to sound alarm is also connected to the internet to give a warning via smartphone owned by the owner of the house or business owner so that gas leakage can immediately be known. This tool uses Arduino Uno as its processor and gas sensor that can detect various types of gas, especially LPG (Liquefied Petroleum Gas).

Keywords: Detection, Gas Sensor, Liquefied Petroleum Gas, Internet of Thing
Analysis of Influence Coaching For Success, Participative, Affiliative, Visionary and Situational (CoPAViSit) Methods at Operations Management of Cellular Telecommunications Companies In Medan City

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Abstract: The development of the telecommunications industry in Indonesia is determined by the company's ability to manage operations. This can be done by using the coaching for success, participative, affiliative, visionary and situational methods. Coaching for success is done by treating people as they want to be treated, that is by indirectly giving punishment, participative is done by taking part in the problems faced by company management, affiliative is done by maintaining good relationships with employees and company partners, visionary is done to support progress company, situational is done by looking at the condition of the company that is required to be able to implement the marketing industry 4.0. This research method uses a quantitative approach, the type of quantitative descriptive research with the nature of research that is explanatory. The data used are secondary data, namely employees of Telkomsel's Inbound and Outbound call centers in Area of Regional I of Medan City as many as 800 people. The sampling technique used in this study using the Slovin formula so that the number of samples used in this study was 89 people. Sampling uses a simple random sampling approach. The results obtained in this study are coaching for success methods have a negative and significant influence, participative and affiliative, have a positive and significant influence, while visionary and situational have no influence on the operational management of cellular telecommunications companies in Medan City.

Keywords: Affiliative, Coaching For Success, Operation Management, Participative, Visionary, Situational.
Handling Problems of Credit Data for Imbalanced Classes using SMOTEXGBoost

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Abstract. Some researchers find data with imbalanced class conditions, where there are data with a number of minorities and a majority. SMOTE is a data approach for an imbalanced classes and XGBoost is one algorithm for an imbalanced data problems. This research uses SMOTE and XGBoost or abbreviated as SMOTEXGBoost for handling data with an imbalanced classes. The results showed almost the same accuracy value between SMOTE and SMOTEXGBoost at 99%. While the value of AUC SMOTEXBoost has a more stable value than SMOTE that is equal to 99.89% for training and 98.51% for testing.

Keyword—SMOTE, SMOTEXGBoost, AUC, Accuracy.
Abstract — Steganography is an art and techniques to hide data within data that can be applied to images, video files or audio files. Along with the Internet growth, threats to confidential information security needed is greater. Various threats in the Internet such as hackers and crackers that makes people worry about the security of information that will be sent. In this study aims to develop the steganography inside audio files as a cover using the Lifting Wavelet Transform (LWT) and Dynamic Key techniques coupled with AES encryption. This technique marks a frame that will be the Dynamic Key and then the confidential data is AES encrypted using the already Dynamic Key, and then the encrypted data is embedded in the audio cover frame using the LWT. The confidential data can be decrypted vice versa by using the already marked frame without having to enter the key manually. The technique used is still under development stage in the Android SDK and still runs simulated inside the Android Emulator. With the development of this steganography application, this application is expected to run well on Android-based devices and can provide convenience, confidentiality and security in the delivery and reception of information anytime anywhere.

Keywords — lifting wavelet transform, dynamic key, audio steganography
Performance Of Distance-Based K-Nearest Neighbor Classification Method Using Local Mean Vector And Harmonic Distance

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Abstract

K-Nearest Neighbor is one of the top ten algorithms data mining in the classification process. The low accuracy results in the K-NN classification method because this method uses the system majority vote which allows the selection of outliers as the closest neighbors and in the distance model used as a method of determining similarity between data. In this process it is evident that local mean vector and harmonic distance can improve accuracy, where the highest increase in average accuracy obtained in the set data wine is 6.29\% and the highest accuracy increase for LMKNN is obtained in set data glass identification which is 16.18\%. Based on the tests that have been conducted on all data sets used, it can be seen that the proposed method is able to provide a better value of accuracy than the value of accuracy produced by traditional K-NN and LMKNN.
Determination of Giving 'Tips' Using Fuzzy Logic To Determine Restaurant Customer Service Satisfaction

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Abstract
Fuzzy logic can be used to represent obscurity based on terms such as high, old, hot, cold, and so on. Fuzzy logic can extend the range of truth values to all real numbers in intervals between 0 and 1. Numbers in this interval represent the possibility that the statement given is “true” or “false”. The use of fuzzy logic can be used in everyday life, such as in the fields of medicine, engineering, agriculture, transportation, environmental science and also in economic and business applications. As in this study, it was used to calculate the ideal amount of ‘tips’ for restaurant waiters based on the service provided by restaurant waiters. The method used in this study is to use Mamdani fuzzy logic with the process of defuzzification using the Centroid of area (COA). The results of this study are that it can be determined the value crisp of giving tips to restaurant waiters is 45 thousand rupiah provided that the service provided for service = 7 (Excellent) and food service = 8 (Delicious).

Keywords: fuzzy logic, tips, fuzzy inference, defuzzyfication
Document Clustering Analysis using Cosine Similarity and K-Main

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Abstract

Clustering is a useful technique that organizes a large number of non-sequential text documents into a small number of clusters that are meaningful and coherent. Effective and efficient organization of documents is needed, making it easy for intuitive and informative tracking mechanisms. In this paper we proposed clustering documents using cosine similarity and k-main. The experimental results show that based on the experimental results the accuracy of our method is 84.3%.

Keywords: document clustering, cosine similarity, k-main
Comparative evaluation of Tabu search hyper-heuristic against its low-level meta-heuristic constituents

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Abstract. Hyper-heuristics present a superior form of hybridization of meta-heuristics. Unlike typical meta-heuristic hybridization which requires low-level integration of two or more meta-heuristics, hyper-heuristics offers meta level separation (as domain barrier) of each participating low-level meta-heuristics and permits adaptive selection between them. Owing to the prospects of improving the generality of its application to general optimization problems, this paper evaluates the performance of a Tabu search based hyper-heuristic (called HHH) against its individual low-level meta-heuristics constituents. The results based on its application to t-way test suite generation problem indicate that HHH outperforms all its individual low-level constituent meta-heuristics (LLH) consisting of particle swarm optimization (PSO), global neighbourhood (GNA) algorithm, cuckoo search (CS) algorithm and teaching learning based optimization (TLBO) algorithm. However, there is a time performance penalty as overhead to perform the runtime adaptive selection of each LLH.

Keywords: Hyper-heuristics; t-way testing; tabu search
Abstract

This research makes the system in decision making for tourists who will visit an area. In making decision decision systems using the Bayes algorithm. Bayes's theorem was put forward by a 1763 British Presbyterian minister named Thomas Bayes. In this study Bayes's theorem is used to calculate the probability of occurrence of an event based on the influence obtained from the observations. In this paper, the Naive Bayes algorithm is used to support the Decision Making System (DSS) to determine the best and strategic location in determining hotel accommodations, especially for tourists who are associated with having mediocre funds in traveling to Lombok Island. In this study applied a number of criteria and data sets obtained from questionnaires from some visiting tourists. There are 3 variables including Hotel Prices, Distance, and the presence or absence of transportation from tourist destinations, from the three variables, to the training dataset. So that in the future there will be questions in the form of data testing to answer the decision whether the hotel can be take or not by looking at the highest probability value.

Keywords: Tourism, DSS, Naive Bayes, Probability, training data, data testing, dataset
Assessing the Symbiotic Organism Search Variants using Standard Benchmark Functions

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Abstract

Symbiotic Organism Search (SOS) is one of the latest meta-heuristics algorithm created to solve optimization problems. Combining the fact that this new algorithm is parameter-less (no need for tuning) and having a superior performance compared with other meta-heuristics algorithm, the interest to investigate and enhanced this algorithms had emerged. In this paper, we presents a new version of SOS by looping the current algorithm rather than doing it one after the other. The target of this paper is to find the effect of changing the structure of algorithm from original SOS by testing it with a few benchmark functions. We found that by using a loop structure, it can find a better solution in some of the benchmarks functions as compared from the original SOS.

Keywords: Optimization Algorithm, Meta-heuristics, Symbiotic Organism Search
GbLN-PSO Algorithm for indoor localization in Wireless Sensor Network

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Abstract

In this paper, we propose a Global best Local Neighborhood in Particle Swarm Optimization (GbLN-PSO) algorithm for indoor localization in wireless sensor network (WSN). Each unknown node performs localization under the distance measurement from at least three anchors. The node that gets localized will be used as a reference for remaining nodes. A comparison of the performances of PSO and GbLN-PSO in terms of localization error and computation time is presented using simulation in Matlab.

Keywords: Global best Local Neighborhood Particle Swarm Optimization (GbLN-PSO), indoor localization, localization error, computation time.
Real-Time Earthquake Forecasting using Multidimensional Hierarchical Graph Neuron (mHGN)

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Abstract

Various earthquake forecasting technologies have been introduced for a while, but the quality of the results is not yet convincing. The attempt to achieve a stable technology is still very demanding, due to increasing number of earthquake incidences lately. Since it is not trivial working on complex—with numerous parameters—and big data, the research on discovering such earthquake forecast system takes long and winding roads. It is still very difficult to establish a sophisticated system that can be used to forecast earthquake effectively, but the concept of Multidimensional Hierarchical Graph Neuron (mHGN) has opened up a new opportunity to forecast earthquake not only effectively but also in real-time manner. The 91% of its accuracy in recognizing almost 11% distorted/incomplete patterns has given a strong indication that the accuracy of mHGN in forecasting earthquake will be high as well.

Keywords: GN, HGN, mHGN, SLHGN, Pattern Recognition, Earthquake Forecasting
Hybrid Migrating Birds Algorithm Strategy for t-way Test Suite Generation

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Abstract

Hybrid meta-heuristics algorithms have gained popularity in recent years to solve t-way test suite generation problems due to better exploration and exploitation capabilities of the hybridization. This paper presented the implementation of meta-heuristic search algorithms that are Migrating Birds Optimization (MBO) algorithm and Genetic Algorithm (GA) hybrid to a t-way test data generation strategy. The proposed strategy is called Elitist Hybrid MBO-GA Strategy (EMBO-GA). Based on the published benchmarking results, the result of these strategies is competitive with most existing strategies in terms of the generated test size in many of the parameter configurations. In the case where this strategy is not the most optimal, the resulting test size is sufficiently competitive.

Keywords: t-way, Hybrid meta-heuristics, MBO, GA
A Web Deployed Multi-Agent Based Approach for Student-Lecturer Appointment Scheduling in Institutions of Higher Learning

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Abstract

Institutions of higher learning such as universities have been positively influenced by the internet which has facilitated learning and teaching. Likewise, this same internet can also support student lecturer appointments, but currently students and lecturers are faced with issues such as finding free time-slot, difficulty of students to meet supervisor and issues related to managing appointment operations. Therefore, this paper develops a multi-agent architecture and a web based agent appointment scheduling system to support students and lectures in managing appointment scheduling in universities. The agent based appointment scheduling system was implemented as a web system integrated by multi-agents to facilitate students in finding free time-slot, resolving difficulty of students to meet supervisor and also addressing difficult of managing scheduled appointment records by lecturers. The applicability of the agent based appointment scheduling system was evaluated by collecting data using questionnaire from randomly selected 102 students and lectures in Malaysia universities. Furthermore, Statistical Package for the Social Science (SPSS) was employed to analyze the questionnaire data using descriptive and exploratory factor analysis. Findings from this study reveal that the developed agent based appointment scheduling system is applicable in supporting student lecturer appointment scheduling in universities.

Keywords: Multi-agent, Appointment, Scheduling, Students-Supervisor, Institutions of higher learning, Applicability
Serious Games and Preventive Self-Care for Diabetes: A Conceptual Framework

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Abstract

Diabetes is associated with many chronic diseases and disabilities such as ischemic heart disease, renal disease, visual impairment, peripheral arterial disease, peripheral neuropathy, and cognitive impairment among society. World Health Organization (WHO) statistics shows that 422 Million adults suffer from diabetes. 3.7 million of people's death due to diabetes and high blood glucose while 1.5 million people’s deaths caused by diabetes. The risk factors for diabetes can be attacked by genetics, age, family history and some behaviours such as unhealthy diet and physical inactivity. However, some behaviours can be preventing in early stage such as educate people with knowledge or information about balance diet and nutrition food which is good or bad for diabetic patient. To overcome this problem, it requires an interesting approach to educate and keep in people mind the suitable food that help to avoid from diabetes diseases. This prototype application namely as Grab2BeHealthy can be used by public to increase awareness, teaching tool and prevention while the professional healthcare can use it as a consultation tools. This game gives an information related to the healthy and unhealthy food that cause diabetes. The development of this prototype application is based on proposed conceptual framework of serious games for preventive self-care games. Players must grab a healthy food with a challenge and information related to the diabetes while playing the games. An evaluation study by 50 peoples from various gender and age range with basic computer knowledge has been conducted to get learners feedback on the game engine and motivation of playing the games. Thus, in this study, we map the characteristics of the prototype games with the conceptual framework for improving healthcare awareness in preventing diabetes to increase the understanding on healthy food for diabetic patient.

Keywords: Serious Games, Framework, Diabetes, Healthcare
Abstract

Serious games are used in public health for purposes including training, learning, prediction, coaching, diagnostic, rehabilitation and supporting. However, the serious game focuses mainly on user experience and graphical application less attention to apply artificial intelligence (AI). By enhance artificial intelligence, it will have the capability to solve issues especially in the field of public health. This article discussed a review of the use of artificial intelligence in a serious game for public health. The main idea of this paper is to gather all the related articles and create a trend analysis of the use of Artificial Intelligence (AI) in the serious game for public health. The related articles were applied Artificial intelligence (AI) in the area of decision making. The final section was discussed about the new trend and future of Artificial intelligence using metaheuristic algorithms.

Keywords: Serious Game, Artificial Intelligence, Decision Making
Abstract. Disaster trends tend to increase from year to year. The high danger of disasters, such as earthquakes, tsunamis, volcanic eruptions, floods, landslides, droughts, forest and land fires, tornadoes, and extreme weather, as well as high vulnerability and low capacity cause high risk of disasters. In Indonesia throughout 2018 according to data from the National Disaster Management Agency (BNPB) there were 1,999 disasters. Based on these data weaknesses still occur in the evacuation process, especially fatalities. As a result of the various disasters, there have been countless losses both in terms of material and life. Although often affected by disasters, there seems to be no maximum effort in terms of disaster mitigation from the government. Mitigation or efforts to reduce the number of casualties and the level of loss do indeed still not significantly increase. This study proposes a dynamic model in disaster mitigation to maximize the evacuation process. In the research model that has been made before, it can overcome congestion constraints and contraflow conditions provided that the evacuation route is done in one direction. This proposed model overcomes the obstacles in the evaluation process with a two-way dynamic model with an ant philosophy approach.
Analysis of Application of the SAW, WP and TOPSIS Methods in Decision Support Systems Determining Scholarship Recipients at University

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Abstract. This research is an analysis of the application of the SAW, WP and TOPSIS methods to the support system for decision making in college. The types of scholarships provided are PPA education scholarships given by the Kementerian Riset, Teknologi dan Pendidikan Tinggi. The research variables are the attributes or criteria specified by the Directorate General of Learning and Student Affairs as contained in the 2018 Academic Achievement Improvement (PPA) guidebook. Decision Support Systems apply the classic FMADM method SAW, WP and TOPSIS. The results of this study are the application of the three methods of SAW, WP and TOPSIS giving different rankings.
Axiology Of Industrial Revolution 4.0 From The Viewpoint Of The Philosophy Of Computer Science

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Abstract. Science is a subsidiary of philosophy. As a parent, philosophy has a responsibility to guard science in order to keep on the right track. Science building is on three philosophical foundations: ontology, epistemology, and ethical basis. They are all important, no one can be abandoned. Science must remember its duty and mission. Any sophisticated development of a science, should not leave its philosophical foundation, so that science does not come out of its essence, which is to be able to contribute to the life of mankind. Computer science itself has developed so that there are some areas of knowledge that can be specifically learned and understood which at this time we are in the industrial era 4.0. In the industrial era 4.0 a combination of technologies that blur boundaries between physical, digital, and biological where change can be gradual, it can also be systematic. Industry 4.0 can be interpreted as an industrial era in which all entities in it can communicate with each other in real time based on the use of internet technology and in order to achieve the goal of achieving existing value optimization creations from every process in industry.

Keyword: philosophy, computer science, industry 4.0
Abstract. Number of failures play important role in maintenance strategy for industrial equipment, either repairable or non-repairable ones. There are several form of known distribution used to model the failures of an industrial equipment. Weibull distribution, and its hazard function, is among the most used distribution. Most maintenance models in literature mainly consider certain or crisp condition in a deterministic form. However, many real phenomena seem do not suitable to model in such certain or crisp condition. One approach to model a possibilistic uncertainty is by applying the fuzzy number theory. In this paper, we discuss the Weibull hazard function by assuming a fuzzy shape parameter. We look for the number of failures generating by the function using two different methods. The first one assumes that the fuzziness of the shape parameter propagates to the number of failures with the same form of fuzzy number membership. The second one use the fuzziness of the shape parameter in the computation of the number of failures directly, through the concept of alpha-cut or alpha-level. Some comparisons regarding these approaches are presented.

**Keywords:** Triangular fuzzy number, alpha-cut, Weibull hazard function, number of failures
Data Driven Approach with Apriori Algorithm in Processing Stock Items

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Abstract - Data processing for the process of calculation or transformation of input data into information that is easy to understand. In addition, data processing is a process consisting of data storage and data handling activities. Data Mining is one of the fastest growing fields due to the huge need for added value from large-scale databases that are accumulating more and more as information grows. The general definition of Data itself is not known manually from a data set. By showing the correlation of previously unknown data, the store owner can make the decision to progress store. Data Mining is used in many places and fields of application can also vary, data mining learn what are the main factors in the accuracy of the target purchase of a product by consumers. Business intelligence is the process of converting data into information. Apriori Algorithm is one of the data mining algorithms in the formation of association rule mining. Algorithm mining is the process of extracting information from a database, followed by doing frequent item/itemset in the formation of association rule mining in order to get the minimum value of support and minimum confidence value.
Implementation of the Damerau Levenstein Distance Method to Correct Writing Spelling Word Errors in Language Documents Toba Batak

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Abstract. Spelling mistakes in writing a document are often found, spelling errors in the writing can occur due to sound equations or pure typing errors. The word spelling mistakes can change the meaning of the knowledge conveyed by the author and cause misunderstanding of information to the reader. Based on this, a system is needed to overcome the spelling mistakes in the document. This study focuses on overcoming spelling errors in the Toba Batak language documents by proposing a word spelling error correction system using the Damerau Levenstein Distance method, by first making a dictionary of Toba Batak language words, then performing preprocessing stages on Toba Batak language documents and correcting spelling words with four operations, namely insertion, deletion, substitution and transposition that exist in the Damerau Levenstein Distance method. From the results of the system testing the best precision value is 0.96, the best recall value is 1 and can correct spelling with an average accuracy of 92.45%. Word spelling checks often occur in insertion operations if the word is found to be misspelled at the beginning of the letter. The results of the study are very dependent on the completeness of the dictionary of words that have been made and shows that the method of Damerau Levenstein Distance can correct the spelling mistakes of the word well.
Abstract. The rapid development of information technology now has good and bad effects. A bad effect is caused by the presence of individuals who do not understand the philosophy of information technology. By understanding the philosophy of information technology, negative effects will not occur.
Effect of Various Coordinate Points on Social Media

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Abstract. Currently information technology has developed rapidly, many have implemented information technology in various fields. It is undeniable that Indonesian people often use social media to interact indirectly, for example uploading vacation photos. But with the rapid advancement of technology itself to find someone’s personal data on the internet today is not something difficult. Conscious or not, many internet users are ignorant of their privacy. What they do in the real world are sometimes all shared on social media in the form of photos or status updates, without choosing which ones can be seen by the public and which will not have a negative impact and can be dangerous for users of social media itself. On the one hand, the location of the presence of the user’s coordinate point is one sensitive information that may not every day other people need to know because it can endanger the user. Other people know where the user is when the user posts a photo or status update, the user indirectly notifies where the User is at that time.
Abstract. Current information has become a very important commodity. The ability to access and provide information quickly and accurately becomes very essential for an organization, both in the form of commercial organizations (companies), universities, government institutions, and individuals (private). The number of computer crimes, especially those related to information systems, will continue to increase so that the security system also needs to be improved. System security refers to protection of all information resources from threats by unauthorized parties. So, an effective system security program needs to be implemented by first identifying various weaknesses and then applying the necessary resistance and protection. For this reason, a variety of new encryption methods have been developed. The encryption method developed is Honey Encryption and Quantum Key Distribution (QKD).
Monitoring and automation plant growth uses image processing and data mining. Data image acquisition in data mining and use knowledge from data mining to respond condition of the plant. The system build to maintain the plant growth in good condition. At the end of this research establish model plant growth for smart farmer.
Abstract. Video steganography is one of concealing techniques in communication by hiding valuable information in the video data. The valuable information can be changed or lost by a third party in communication. This paper proposes a new embedding technique based on histogram analysis in video steganography. The proposed technique utilizes scene change of the video data to embed the message. Scene change detection is determined based on the histogram analysis. The scene change is detected by measuring the absolute difference of block-based histograms. The proposed embedding technique in video steganography is tested against MPEG-4 compression. The experimental results indicate that the proposed method achieves high imperceptibility with minimum visual distortion to the human visual system. The proposed scheme relatively maintains the correctness of the extracted secret message against MPEG compression. The extracted hidden message can resistant against MPEG compression.
DESIGN AND DEVELOPMENT OF MOBILE APPLICATION IN INDONESIAN LANGUAGE LEARNING LEVEL A1

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Abstract-

This paper presents the design and development of mobile application in Indonesian Language Learning. In the globalization era, Mobile application is one of the most concerned method in learning language. This paper demonstrates that how mobile application can provide flexibilities, make the learning easier and more effective and accelerate the learning process. The data was collected from pre-test and interview to see the baseline of respondents competencies. The interface program is designed with Android Studio Operating System. The interface program is designed to give flexibilities required. Furthermore, program code is written by using Android Studio to become an application that can be installed in the users Smartphone. The ready application, then tested by installing it into various types of the Smartphone with various Android platforms to test functions of program application. If there is an error, or if the program doesn’t function properly, then the program is fixed by changing the interface program and program code. After the program application is designed completely, then the program is tested to foreign students who are learning Bahasa Indonesia (BIPA) Level A1 with the same test materials in the post test and interview to see its effectiveness and impact. Pre-test and Post-test data is compared to see if there is an increase in respondents competencies. The research findings shows that there is a significant increase on the foreign students competencies. This increase on the written test shows at 30% and 18% on the interview. The significant increase happened to the group of foreign students who never learn bahasa Indonesia before and this increase shows at 56% compared to the group of foreign students who already learned Bahasa Indonesia with the increase at 12% only. This increase significantly also happened in interview at 32% to the the group of foreign students who never learned Bahasa Indonesia before and for the group of foreign students who already learned Bahasa Indonesia only 8%. This shows that Mobile Application Program is very effective and contribute to the foreign students who just started learning Bahasa Indonesia.

Key Words: Design and Development of Mobile Application, Mobile Application, Indonesian Language Learning
ANN : PREDICTING OF STATE RETAIL SUKUK BASED ON REGION IN INDONESIA

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Abstract. Retail Sukuk is a product of State Sharia Securities (Sukuk) issued by the Government of the Republic of Indonesia in this case the Ministry of Finance and sold to individuals or individuals of Indonesian Citizens through Selling Agents in the domestic Primary Market. This research contributes to the government and the Bank to be able to do the maximum promotion for the next sukuk issuance. The data used is data from the Ministry of Finance. These data are sukuk sales data with series 002-010 based on regional groups. The algorithm used in this study is Artificial Neural Network with Backpropogation method. Variabel masukan yang digunakan adalah kelompok wilayah bagian barat selain Jakarta (X1), kelompok Jakarta (X2), kelompok Indonesia Bagian Tengah(X3), dan kelompok Indonesia Bagian Timur (X4) dengan model arsitektur pelatihan dan pengujian sebanyak 4 arsitektur yakni 4-2-1, 4-3-1, 4-2-3-1 dan 4-3-2-1. The best architectural model is 4-3-1 with epoch 266, MSE 0.009918 and 100% accuracy rate. From this model, predictions of retail country sukuk will be made by region.
Access Control: Ciphertext Policy - Attribute Based Encryption in Cloud Computing

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Abstract

Access control and confidentiality is important features for cloud storage. The cloud service allows data owner to outsource their data to the cloud and through which provide the data access to the users. Although cloud computing brings many benefits, it may suffer from conventional distributed systems’ security attacks. Because the cloud server and the data owner are not in the same trust domain, the semi-trusted cloud server cannot be relied to enforce the access policy. However, storing the data in the untrusted cloud server leads the privacy and access control issues in the cloud. The traditional encryption schemes such as symmetric and asymmetric schemes are not suitable to provide the access control due to lack of flexibility and fine-grained access control. One of the prominent cryptographic technique to provide privacy and fine-grained access control in cloud computing is Attribute Based Encryption. In this paper, access control ABAC framework will be introduced for cloud storage systems that achieves fine-grained access control based on an adapted Ciphertext-Policy Attribute-based Encryption (CP-ABE) approach.

Keywords: Cloud Computing, ABAC, ABE, CP-ABE
Narrative Interpretation of Results of Fasting and Non-Fasting Blood Chemistry Laboratory Test Using Algorithms

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Abstract. Laboratory examination is one way to diagnose the disease and also monitor the development of treatment for a particular type of disease through examination. Blood chemistry tests is an important check to determine the patient’s health condition. The results of the Blood chemistry test are still presented in the form of a manual report that contains a table of abbreviations with its values and units, it then will be read and explained to the patients by the doctors and the nurses. Unfortunately, the doctors and the nurses usually have different interpretations in reading the report. Therefore, to assist doctors and nurses in obtaining the same information, this study proposes the Natural Language Generation (NLG) approach by applying the Bigram algorithm to generate narrative interpretations of the results of fasting and non-fasting blood chemistry test. The steps of this research were data extraction, data interpretation, document planning, microplanning and realization, and report generation. This system changed the numerical system of the test results into Indonesian textual data which became a narrative interpretation in the report on laboratory results of fasting and non-fasting blood chemistry test. The output in this system was a report in the form of a word document. This research test result showed that the level of naturalness of the narrative interpretation of the test results obtained by the doctor reaches 90%.
TEXT FILE COMPRESSION USING HYBRID RUN LENGTH ENCODING (RLE) ALGORITHM WITH EVEN RODEH CODE (ERC) AND VARIABLE LENGTH BINARY ENCODING (VLBE) TO SAVE STORAGE SPACE

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Abstract. The increase of data usage causes problems in data storage, indirectly making the need for data storage also to increase. One alternative solution that can be done is to compress the file so that the file becomes smaller in size so it saves storage space. The algorithm used in this research is the Run Length Encoding algorithm, the Even Rodeh Code algorithm, and the Variable Length Binary Encoding algorithm which are the types of lossless compression. The algorithm will calculate its performance based on Compression Ratio, Ratio of Compression, Redundancy, Compression Time, and Decompression Time. The file that will be used in the data compression process is the file extension *.txt. This study used homogeneous strings (strings that have the same character) and heterogeneous strings (strings that have different characters) in testing the algorithm. In the compression process with a homogeneous string, the combination of the Run Length Encoding algorithm with the Variable Length Binary Encoding algorithm is better than the combination of the Run Length Encoding algorithm and the Even Rodeh Code algorithm with a Compression Ratio of 18.84% and a decompression time of 0.01295 ms. While the compression process on heterogeneous strings from the combination of the Run Length Encoding algorithm with the Even Rodeh Code algorithm is better than the combination of the Run Length Encoding algorithm with Variable Length Binary Encoding algorithms with Compression Ratio of an average of 52.45% and fewer decompression times of 4.93002 ms.
Modelling and Evaluating UMP Examination Timetable
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Abstract

This paper introduces a real world examination timetabling problem from Universiti Malaysia Pahang (UMP). The UMP examination timetabling problem is a capacitated problem which considers room capacity constraint. At present, UMP operates from two campuses situated in Gambang and Pekan. The operation from two distant campuses formed new requirements (i.e. constraints) for the UMP examination timetable. The new constraints complicates the problem further in generating the examination timetable. An example of the new constraints includes scheduling exams into the appropriate campus and schedule similar exams held in different campus into the timeslot. Currently, UMP unable to determine the examination timetable quality due to having no formal mathematical model. Hence, the objective of this paper is to propose a formal mathematical model based on the new UMP examination constraints and to evaluate the quality of the generated examination timetable. Additionally, an implementation using traditional hill climbing algorithm were performed to assess the proposed formal mathematical model and to compare with the examination timetable used UMP. The result shows that the proposed formal mathematical model able to calculate the timetable quality.

Keywords: Examination Timetabling, Scheduling, Graph Heuristic, Hill Climbing
A Review of Feature Selection Techniques for High-Dimensional Data
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Abstract. The growth of high-dimensional data had increased recently. Textual data, microarray gene expression, and images are the example of high dimensional data, making it difficult to process and manage. Therefore, it required dimensionality reduction for classification purposes. In this paper, we reviewed on dimensionality reduction for high dimensional data using feature selection. Feature selection approach is preferable compared to feature transformation in dimensionality reduction for high-dimensional data. Feature selection had extra advantages over feature transformation. Besides, this paper also presented several challenges when dealing with feature selection in high dimensional data classification. In recent years, different feature selection approaches had been applied to high-dimensional data. However, embedded feature selection approach is the most dominant among three approaches (Filter, wrapper and embedded). Hence, in this paper, we outlined several studies on embedded feature selection approach for high dimensional data to provide a bright idea on how to select features in high dimensional data classification. From the review, it can be concluded that embedded feature selection approach is claimed to be the most acceptable approach for classifying high dimensional data.
Automatic Number Plate Recognition for Indonesian License Plate by Using K-Nearest Neighbor Algorithm

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Abstract. Transportation surveillance requires many human resources to cover all the road in a city. The human resources might be reduced by utilizing automation. For example, a task to recognize the license plate can be automated by utilizing CCTVs or surveillance cameras that usually installed in the crossroads. The automatic number plate recognition is required to record the license plate of the vehicle that violates the traffic rules. This number can be processed for future references. This research utilizes K-Nearest Neighbor (KNN) to recognize the license plate. The research is conducted to 125 license plate images which are divided into 100 training images and 25 testing images. The success rate of this research is 92.86%. The condition of the license plate and light intensity influence the recognition result.
Abstract Internet network needs are increasingly rapid in supporting current business needs. This goes hand in hand with requests for IP Address allocations for companies to measure information and business needs. The increasing demand for current IP Address allocation, the fewer the number of IP Addresses available. To fulfill the demand from the use of IP Address, Internet Protocol version 6 (IPv6) or internet protocol was adopted as the next-generation Internet technology. Exchange of IP Address in computer network cannot be separated from the existence of routing protocol. Enhanced Interior Gateway Routing Protocol (EIGRP) also developed with the use of IPv6 to EIGRP for IPv6 (EIGRPv6). The EIGRPv6 routing concept is designed so well that it is capable of handling table routing that is very large and more efficient than the previous EIGRP. In large-scale computer networks must use good security. One method of network security is the Access Control List (ACL) capable of supporting the performance of IPv6. The application of ACL in this study is able to filter the access of network users by using IPv6 Extended ACL. Based on the results of EIGRPv6 network testing, the average packet delivery time is 7.6ms. And the application of IPv6 ACL is able to limit access to Web Servers, ICMP and FTP Servers properly.

Keywords: IPv6, IP Address version 6, EIGRP for IPv6, EIGRPv6, Access Control List, IPv6 ACL
APPLICATION OF C4.5 AND NAÏVE BAYES ALGORITHM FOR DETECTION OF POTENTIAL INCREASED CASE FATALITY RATE DIARRHEA

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Abstract. Case Fatality Rate or mortality percentage due to some extraordinary events (outbreaks) diarrhea in Indonesia is still above target expected by the government. Several factors have been known to be the cause of diarrhea, but the most influential factor to increase Case Fatality Rate of diarrhea is not known. Therefore, the purpose of this research is to create classification from diarrhea outbreaks data to obtain the data patterns in the form of classification rule that can be applied to detect Case Fatality Rate of diarrhea. Classification used the C4.5 algorithm and Naïve Bayes algorithm. C4.5 algorithm is a popular algorithm with decision tree approach, while Naïve Bayes algorithm is a popular with probabilistic approach in classification. Research implementation uses the stages in Knowledge Discovery in Databases. After obtaining the classification rule, this rule evaluated by Confussion Matrix and Receiver Operating Characteristic Curve. The evaluation was done by using training data and testing data. The evaluation result in this case indicates that C4.5 algorithm has a higher accuracy level than Naïve Bayes. While the factors that most influence in the Case Fatality Rate increase in diarrhea diseases are shelter and sanitation.
The information contained in the research report Indonesian is not well managed digitally. Research report collected in one place as in Unit Penelitian dan Pengabdian Masyarakat (UPPM) in educational institutions, without any further processing to take core information in the research report. This information is required for the preparation of a road map of research at the institution. This paper describes the process for extracting the information on the research report Indonesian with adopt method used Agny. The process of information extraction can make in two step i.e. preprocessing and information group based on criteria. One of the method can be used is rule-based classification for information group and POS Tagging method for preprocessing. Information extraction making with arrange the Searching (S) of criteria based on objective, methods, output, and suggestions in a research report Indonesian. Key Words: Indonesian, information extraction, classification, POS Tagging, rule-based classification.
ABSTRACT

Laboratory is the most important instrument in vocational education. That is a place where student working in vocational education institution. Therefore, big attention for safety aspect becomes the priority. Students practiced under the risk. Thus, they needs safety and healthy in working environment, especially in laboratory. The identification of potential hazards and risks must be done in Laboratory. This study have assessed 5 of potential hazards and risks in Politeknik Negeri Medan laboratory by Likert Scale. This object was divided into 2 assessment, namely likelihood of hazards and severity of consequences. The data are collected based on questionnaire results that involving 100 students with random academic level. The result shows that the highest state is chemical hazards, which accounted for 73.2% in likelihood of hazards, meanwhile electrical hazards contributed of 85% in severity of consequences. These condition are classified as “high” state. The specific attention must be given to “high” state. The action plan table giving an information literacy to help us for determining mitigate action.

Keywords: Vocational Education, Risk Management, Likert Scale
Abstract. To improve the welfare of the community, the Government created a program called Bantuan Stimulan Perumahan Swadaya (BSPS) or better known as house improvement program. One of the implementations is in Kabupaten Serdang Bedagai. Therefore, we need a system capable of grouping the house situation of the poor then ranked to determine the priority in obtaining Program Bedah Rumah. For grouping were done using k-means clustering method consists of several criteria: welfare status, number of individuals in the family, type of floor, type of wall material, type of roof, use of toilet facility, type of toilet, and final disposal place. Then in ranking is used one of the multi-attribute decisions making method Višekriterijumsko Kompromisno Rangiranje (VIKOR). The criteria were used in ranking are the sources of drinking water, the primary lighting source and the cooking fuel. From the test results of 1,180 poor households (RTM) data produced 3 clusters of 538 RTM in cluster 1, then 593 RTM on cluster 2 and 49 RTM on cluster 3. The house improvement program assistance on the first year will be given to 185 RTM, then second year for 162 RTM, third year for 300 RTM, fourth year for 250 RTM, fifth year for 150 RTM and the last year for 133 RTM.
Sentiment analysis of GO-JEK services quality using Multi-Label Classification

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Abstract. One of the most popular online transportation providers in Indonesia is GO-JEK. At first establishment, GO-JEK is only an online taxi motorbike service (in Bahasa Indonesia: ojek) that transform from a conventional taxi motorbike. After several years GO-JEK began to develop more services, like GO-FOOD, GO-SEND, GO-CAR, GO-MART, GO-RIDE, GO-PAY, GO-TIX, GO-BOX and GO-MED. As the GO-JEK services develop into more categories, it makes it more challenging to analyze the sentiment polarity for each services category automatically. An ordinary classification algorithm or single-label classification is concerned with learning from a set of examples that are associated with a single label classification. However, in this case, we want to classify GO-JEK services based two class target which are GO-JEK service categories and polarity sentiment classification. The methodology of this research contains Dataset Preparation, Feature Selection, Basic text mining process, train and split dataset and Classification. We implemented two methods classification which is Multi-Label Classification and a simultaneous classification using the Random Forest Algorithm as a comparison. Based on this dataset, the most mentioned GO-JEK service is GO-FOOD followed by GO-SEND, GO-RIDE, GO-CAR and GO-MART. Based on the service category, GO-FOOD gets the most positive reviews following by GO-RIDE and GOJEK 90. Some service category like GO-SEND and GO-MART get more negative reviews than positive reviews. The accuracy for Multi-label classification method raised 76%. The accuracy for simultaneous classification using Random Forest algorithm produce for service category classification yields 97% and only 78% for sentiment polarity classification. We can see that both of algorithm which is multi-label classification and Random Forest algorithm yields almost the same classification accuracy for polarity sentiment classification. We can conclude that the imperfect accuracy in polarity sentiment classification related to the difficulty to identify the most suitable polarity for each tweet. Many sarcasm tweets and slang words that can not be identified.
Asset Management Information and Tracking System With QR Code Based on the Human Centred Design Method

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Abstract - At the moment almost surely in all establishments or companies having an inventory system, especially about the processing assets, to get information about the asset takes time and cannot be instantly able to display the data. Based on the above problem the author doing research is to obtain information about the asset information easily, quickly. The method used is to add a QR Code on a label pasted on each asset. Data from the QR code scanned through Android smartphone in the get information directly. In the research tried to research by optimizing the existing inventory system in the modification by adding a web address in the QR Code labels. Using the scan QR has become the default standard Android smartphone in every new. The author sure this article could be useful for anyone who uses the Inventory can be optimal. The results of this application are anyone able to get the status of existing asset information about QR Code, once done testing and implementation results are 99.9% valid.
Implementation of Data Mining in Predicting the Study Period of Students using the Naïve Bayes Algorithm

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Abstract. Application of Data Mining Naïve Bayes Algorithm in predicting student study period, case studies conducted, namely University of Pembangunan Panca Budi can be used to assist the University especially University of Pembangunan Panca Budi in suppressing the number of students who drop out from year to year. Information will be obtained about the student's study period on time and that is not on time or vulnerable to Drop Out. By utilizing software designed to carry out strategies for suppressing students who are vulnerable to Drop Out, assistance can be made or some policies can be made that can be taken to minimize student Drop Out. Application designed using Naïve Bayes algorithm that works based on the shortest distance between two objects by determining the value of k. The value of k is a parameter to determine the closest distance between a new object and an old object. By using data mining techniques, the higher education institutions can utilize student academic data, namely the Grade Point Average (GPA) to predict the student’s study period. In this data mining application consists of testing data and training data with Student’s Identity Number (NIM) input. The program language used in this study is the PHP programming language and database used is MySQL. The results of this data mining application This system can predict the results of the study period classification of students based on the Grade Point Average (GPA) value of the first semester, the average national examination score of high school time, and majors during high school.
Optimization Of Time Series Data Mining With Analysis Cluster

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Abstract. Data mining is an analytical process of knowledge discovery in large and complex data sets. Many studies want to explore data, find information so that knowledge can be obtained through the process of grouping, classification, discovery of rules, associations and visualization of data mining. Periodic data often occurs in business applications and in science that has characteristics such as large size, high dimension and continuously updated unlike traditional databases where the search for similarity is done based on matching, search for similarity in periodic data based on the approach. One common approach is to transform periodic series into other domains so that dimensions are reduced, followed by index mechanisms, research on time series is not optimal because it is still limited to mining data not able to represent time series, able to find patterns in time series data, to change the pattern into a rule. Rule can be found from time series data, but it is still constrained by overfitting and the difficulty of presenting time series data in multi dimensions to be mined, how to find rule from periodic data and how to optimize time series data generated by data mining and create non optimization functions linear to optimize data mining decisions. The basic idea in the method proposed is to do periodic discretization for sub-sequential formation. Then these sub-sequences are grouped through a measure of similarity, then a simple rule-finding technique is applied to obtain hidden rules in the temporal pattern. From the results of this study, by optimizing time series data, information or knowledge or trends and patterns in the database can be generated from uncertain time series data, previously unknown. Decisions or information can be used to make decisions, or forecast in the future.
Abstract. Earthquake Early Warning is very important in order to reduce the number of both mental and material casualties caused by the earthquake. Alertness in disaster mitigation is urgently needed in every area in all countries of the world, especially in Indonesia, which is prone to earthquakes. In this study designed use earthquake early warning vibration sensors to detect earthquakes. The system will be built this serves as an early warning system that will give early warning to the earthquake. The system can detect earthquakes according to the sensors mounted on the disaster site. The results of sensor readings are processed by a microcontroller Arduino Uno and connected to the Internet of Thing. System is also equipped with an alarm and mobile applications to find out the location of the disaster and value of tremor happened.
Abstract— The server is a computer network that served as a waiter. The server itself manage data traffic in a network and provide a resource that can be used by other computers connected in a network. Application monitoring system will be integrated with each other by means of sensors and features ping access points work as expected for these sensors continuously send information server computer. sms gateway that can be attached to respond quickly in case of a problem on the server computer and the temperature exceeds the limit and power supply status has changed so that an administrator can move quickly to do the best course of action, of the relevant information in the can. because basically worked non-stop server, and the server must work with stable without any disturbance then it takes a special attention to caring for and monitoring the server computer to be able to provide uninterrupted service. This application will play an important role to monitor servers that work non-stop and assist an Administrator and Operator Data Center. System Monitoring Application that I created based on the Java programming language.

Keywords— Power Supply, Connected, Network, Application, Sms Gateway, Sensors, Administrator, Operator Data Center, Java, Traffic, Monitoring, Server
Abstract. Finance Technology (FinTech) appears along with changes in people's lifestyles which are currently dominated by users of fast-paced information technology. Fintech definition in Bank Indonesia regulation Number 19/12/PBI/2017 is the use of financial system technology that produces new products, services, technology and/or business models and can have an impact on monetary stability, financial system stability, and also result in the efficient, secure and reliable payment system. Due to the latest developments in IT, various Fintech technologies are being developed. As part of the solution that Fintech industry tried to accommodate, the mobile payment service would be one of the influential factors. Technology plays an important role so that the education system continues to move dynamically and innovatively. In this study Fintech uses personal financial management (PFM) which can provide analysis of personal financial analysis, personal financial health assessments, and financial product recommendation services consisting of investment products, insurance and tools to monitor and control the level of expenditure to fit the planning targets customer finance, as well as providing online payment services that can help in the payment transaction process that is easier, flexible and fast. Fintech is presented in the form of an Android-based mobile payment.