INTERNATIONAL CONFERENCE on Mechanical, Electronics, Computer, and Industrial Technology

MECnIT 2018

December 12nd -14th, 2018

Campus of Universitas Prima Indonesia
Medan - Indonesia

BOOK OF ABSTRACTS

Organized By:

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Book of Abstracts

2018 International Conference on

Mechanical, Electronics, Computer, and Industrial Technology

December 12nd-14th, 2018 | Medan, Indonesia

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Welcome Message

On behalf of the organizing committee of the 2018 - International Conference on Mechanical, Electronics, Computer, and Industrial Technology (MECnIT 2018), we would like to welcome with great pleasure, all delegates to Medan, North Sumatera, Indonesia.

Being held from December 12nd to 14th, 2018 at Campus of Universitas Prima Indonesia, Medan, this event is organized by Faculty of Technology & Computer Science, Universitas Prima Indonesia, and also co-organized by Royal Prima Hospital, National Taiwan University of Science and Technology, Pradita Institute, Universiti Kebangsaan Malaysia, Tokushima University, Institut Teknologi Bandung, Universitas Sumatera Utara, Asosiasi Perguruan Tinggi Informatika dan Ilmu Komputer, and also Lembaga Ilmu Pengetahuan Indonesia.

The MECnIT 2018 have attracted many academicians, scientists, engineers, postgraduates, and other professionals from many countries. These conferences aim to promote interaction among engineers, researchers, and scientists active in the related areas. The events are intended to provide a high-level international forum to present, to exchange, and to discuss recent advances, new techniques, and applications in the field of knowledge discussed in this conference.

Our special thank also goes to all individuals and organizations such as the international program committees (IPC), the conference organizers, the reviewers, and the authors, for their contribution in making MECnIT 2018 not only a successful international conference but also as a memorable gathering event. We are also grateful for the support of the publication service of IOP. We hope that it should give you a beautiful memory to bring home in addition to new insights and friends gathered during the conference. We are truly grateful for your contribution and interest. We hope that you will get pleasure from MECnIT 2018 in this beautiful city, Medan, Indonesia.

Best regards,

Abdi Dharma (General Chair of MECnIT 2018)

Contents

2018 International Conference on

Mechanical, Electronics, Computer, and Industrial Technology

December 12nd- 14th, 2018 | Medan, Indonesia

Welcome to the 2018 - International Conference on Mechanical, Electronics, Computer, and Industrial Technology (MECnIT 2018), to be held on December 2018, at Medan, Sumatera Utara, Indonesia. In addition to the technical sessions, there will be invited sessions, panel sessions and keynote addresses. We solicit full-length, high-quality, and original papers on the following topics:

Track: Mechanical Engineering

Control Systems and Mechanical Engineering, Aerodynamics, Applied Mechanics and Control Systems, Computational Mechanics and Techniques, Dynamics and Vibration, Energy Engineering and Management, Fluid dynamics, Fluid Mechanics and Machinery, Fuels and Combustion, Instrumentation and Control, Material science and Processing, Mechatronics and Mechanical Design, Mechanical Power Engineering, Nanomaterial Engineering, New and Renewable Energy, Pc Guided Design and Manufacture, Plasticity Mechanics, Pollution and Environmental Engineering, Power-train Solutions, Powertrain Technology, Precision Mechanics, Mechatronics, Production Technology, Robotic Automation and Control, Textile and Leather Technology, Vehicle Design and Manufacturing, Vehicle Dynamics and Intelligent Control Systems, Vehicle Safety, Thermodynamics, Transportation Systems, Mechanical Sciences.

Track: Electrical Engineering

Electronics and Devices, Nanotechnologies, Smart Grids, Sensing and Sensor Technologies, Power Electronics, Digital Circuits, Analog Circuits & Signal Processing, Factory and Design Automation, Motion Control, Intelligent Systems and Machine Vision, 3D Semiconductor Device Technology, Advanced Electromagnetics, Component Technology of MEMS, Electronics System-Level Based Design, Adaptive Signal Processing, Compound Semiconductor Physics and Devices, Control System and Robotics, Biomedical Engineering, Mechatronic Technologies, Telecommunication.

Track: Computer Science

Mathematics for Computing, Computer Graphics Rendering, Cryptography, Multimedia Processing (Image Processing, Audio Processing, etc), Computer Vision, Intelligence System, Artificial Intelligence (Soft Computing, Neural Network, Machine Learning, Bioinformatics, etc), Assembler Programming, Data Structure (Graph, Tree, Compression, etc), File System (Structured Data Storage, Database Storage, Multimedia Storage), Natural Language Processing, Compilation Technique, Virtual Object Modelling, Networking and Data Communication.

Track: Information System & Technology

Business Process Modelling, System Prototyping, Decision Support System, Data Mining, Data Warehouse, Big Data, E-Business, E-Commerce, IT Risk & Disaster, Information Technology Infrastructure Library (ITIL), IT Services, Enterprise Resources Planning (ERP), Network Security, Service Oriented Architecture (SOA), Internet of Things.

Track: Industrial Technology

Planning and Control Project management, Green Manufacturing Technology, Ergonomic, Supply chain management and logistics, Environmental impact of Industrial Engineering, Industrial engineering and Operations management, Healthcare engineering and management, Design and Manufacturing, Sustainable Transportation System, Internet of Things.

Conference Organization

General Chair

Abdi Dharma, Universitas Prima Indonesia, Indonesia

Secretary Chair 1

Mardi Turnip, Universitas Prima Indonesia, Indonesia

Secretary Chair 2

Yonata Laia, Universitas Prima Indonesia, Indonesia

Technical Program Chair

Poltak Sihombing, Universitas Sumatera Utara, Indonesia

Publication Chair

Riski Titian Ginting, Universiti Kebangsaan Malaysia, Malaysia

Publicity Chair

Muhammad Zarlis, Universitas Sumatera Utara, Indonesia

IPC Chair

Hairus Abdullah, National Taiwan University of Science and Technology, Taiwan

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Konrad Kowalczyk (AGH University of Science, Poland)

Andreas Dengel (German Research Center for Artificial Intelligence, Germany)

Michael Seger (University of Medical Informatics and Technology, Austria)

Mira Musrini Barmawi (Institut Teknologi Nasional, Indonesia)

Keynote & Invited Speaker

Keynote Speaker	**Professor Murakami, Ri-ichi** Department of Materials Science and Engineering, National Taiwan University of Science and Technology
Title	The effect of ultrasonic nanocrystal surface modification and plasma nitriding on fatique strengh of S45C steel
Doctorate	Doctoral Course, Graduate school of Science and Engineering, Tokyo Institute of Technology
Master	Master Course of Precision Mechanics, Graduate school of Engineering, Tokushima University
Bachelor	Department of Precision Mechanics, Facutly of Engineering, Tokushima University

Keynote Speaker	**Prof. Dr. Ir. R. Eko Indrajit, M.Sc., MBA., Mphil., MA** Pradita Institute
Title	Cyber Pedagogy and Artificial Intelligence - Pathway to Pursue Excellence Education towards Industry 4.0 Ecosystem
Doctorate	Doctor of Business Administration degree, Pamantasan ng Lungsod ng Maynila (University of the City of Manila), the Philippines.
Master	1. Master of Applied Computer Science at Harvard University, Massachusetts, USA. 2. Master of Business Administration from Leicester University, United Kingdom, 3. Master of Communication from London School of Public Relations - Jakarta, and 4. Master of Philosophy from Masstricht School of Management, the Netherlands.
Bachelor	Surabaya Institute of Technology as Computer Engineer

Keynote Speaker	**Assoc. Prof. Pankaj M. Koinkar** Optical Nanomaterials Laboratory, Department of Optical Science, Faculty of Science and Technology Tokushima University
Title	Growth and Characterization of Bi_2Se_3 Topological Insulator Nanostructures for Optoelectronic Application
Doctorate	North Maharashtra University, Jalgaon, INDIA
Master	North Maharashtra University, Jalgaon, INDIA
Bachelor	North Maharashtra University, Jalgaon, INDIA

Keynote & Invited Speaker

Keynote Speaker	**Assoc. Prof. Dr. Chia Chin Hua** School of Applied Physics Studies, Universiti Kebangsaan Malaysia
Title	Flow Chemistry Process for Continuous Synthesis of Silver Nanowires
Doctorate	Universiti Kebangsaan Malaysia
Master	Universiti Kebangsaan Malaysia
Bachelor	Sekolah Tinggi Kluan, Johor

Invited Speaker	**Daniel Sutopo Pamungkas, Ph.D.** Batam Polytechnic
Doctorate	-
Master	Bandung Institute of Technology
Bachelor	Bandung Institute of Technology

Invited Speaker	**Ir. Endra Joelianto, Ph.D.** Institut Teknologi Bandung, Instrumentation and Control Research Group, Engineering Physics Study Program
Doctorate	The Australian National University (ANU), Australia
Master	-
Bachelor	Engineering Physics, Institut Teknologi Bandung (ITB), Indonesia

Invited Speaker	**Poltak Sihombing, Ph.D** Computer Science, Faculty of Computer Science and Information Technology, Universitas Sumatera Utara
Doctorate	Universiti Sains Malaysia (USM), Penang, Malaysia
Master	Universitas Indonesia (UI) Jakarta, Ilmu Komputer
Bachelor	Universitas Sumatera Utara (USU), Medan, Fisika Komputasi

Program at a Glance

Time	Activities	Description
Wednesday, December 12nd 2018		
10:00 - 20:00	Registration	Presenter and Attendee Registration
Thursday, December 13th 2018		
08:00 - 08:05	Opening Ceremony	Master of Ceremony
08:05 - 08:10	National Anthem	Indonesia Raya
08:10 - 08:20	Welcoming Message	General Chair of MECnIT 2017
08:20 - 08:30	Opening Remarks	Rector of Universitas Prima Indonesia
08:30 - 08:40	Opening Remarks	Chair of APTIKOM Region I Sumut - Aceh
08:40 - 09:00	Photo Session	Master of Ceremony
09:00 - 09:40	Keynote Talk I	**Prof. Ri-Ichi Murakami** National Taiwan University of Science and Technology
09:40 - 10:20	Keynote Talk II	**Prof. Dr. Ir. R. Eko Indrajit, M.Sc., MBA., Mphil., MA** Pradita Institute
10:20 - 10:30	**Coffee Break**	Master of Ceremony
10:30 - 11:00	Keynote Talk III	**Assoc. Prof. Pankaj M. Koinkar** Tokushima University
11:00 - 11:30	Keynote Talk IV	**Assoc. Prof. Dr. Chia Chin Hua** Universiti Kebangsaan Malaysia
11:30 - 13:00	**Lunch Break**	Master of Ceremony
13:00 - 14:00	Invited Talk I	**Daniel Sutopo Pamungkas, Ph.D.** Politeknik Negeri Batam
13:00 - 14:00	Invited Talk II	**Ir. Endra Joelianto, Ph.D.** Institut Teknologi Bandung
13:00 - 14:00	Invited Talk III	**Dr. Poltak Sihombing, M.Kom.** Universitas Sumatera Utara
13:00 - 14:00	Invited Talk IV	**Dr. Arjon Turnip** Indonesian Institute of Sciences
14:00 - 16:00	**Parallel Session 1**	
	Class 1	Mechanical Engineering
	Class 2	Electrical Engineering
	Class 3	Computer Science
	Class 4	Computer Science

Program at a Glance

	Class 5	Information System & Technology
	Class 6	Information System & Technology
	Class 7	Industrial Technology
16:00 - 16:15	**Coffee Break**	
16:15 - 18:15	**Parallel Session 2**	
	Class 1	Mechanical Engineering
	Class 2	Electrical Engineering
	Class 3	Computer Science
	Class 4	Computer Science
	Class 5	Information System & Technology
	Class 6	Information System & Technology
	Class 7	Industrial Technology
18:15 - 19:00	Time Off	Master of Ceremony
19:00 - 20:00	**Dinner Break**	Master of Ceremony
20:00 - 20:05	Closing Ceremony	Master of Ceremony
20:05 - 20:15	Closing Message	General Chair of MECnIT 2017
Friday, December 14th 2018		
07:30 - 10:00	Study Tour	Rahmat International Wildlife Museum & Gallery
10:00 - 12:00		Maimun Palace

Visit the Sights Of:

Rahmat International Wildlife Museum & Gallery is a natural history museum in Medan, Indonesia. The museum displays various collections of wildlife from the smallest to the largest according to the habitat. After the development was completed in October 2007, the Museum & Gallery has an area of 2970 m² building.

Maimun Palace or Maimoon Palace (Indonesian: Istana Maimun) is an istana (royal palace) of the Sultanate of Deli and a well-known landmark in Medan, the capital city of North Sumatra, Indonesia. Today, it serves as a museum.

Parallel Session

Session 1	Class 1 Mechanical Engineering	
14:00 - 14:10	Hydrazine-modified Zn-oxysulfide nanoparticles for CO2 reduction under low UV-light illumination	Hairus Abdullah, Noto Susanto Gultom, Dong-Hau Kuo, Albert Daniel Saragih
14:10 - 14:20	A review on opportunities of thermionic regeneration system in hybrid electric vehicle	K Kodihal and A Sagar
14:20 - 14:30	Effect of Zn(O,S) Synthesis Temperature to Photocatalytic Hydrogen Evolution Performance	Hairus Abdullah, Noto Susanto Gultom, Dong-Hau Kuo, Albert Daniel Saragih
14:30 - 14:40	Research of Injection Molding Parameters with Acrylonitrile Butadiene Styrene (ABS) Composition Recycled Against Mechanical Properties	E A Wibowo, T Sukarnoto, Y T Wibowo
14:40 - 14:50	The synthesis and characterization of bacterial nano cellulose (BNC) from banana peel for water filter membrane application	Edwin K Sijabat, Ahmad Nuruddin, Pingkan Aditiawati and Bambang Sunendar Purwasasmita
14:50 - 15:00	Effect of Release Coefficientof Orifice Plate on Water Fluid Flow Systems	Sutrisno Salomo Hutagalung and Arjon Turnip
15:00 - 15:10	Estimation Optimal Value of Release Coefficient in a Venturi Tubes	Sutrisno Salomo Hutagalung and Arjon Turnip
15:10 - 15:20	Development of ISE Electrode Membrane with High Sensitivity by Synthesizing Active Compound	Arjon Turnip, Sutrisno Hutagalung

Parallel Session

Session 2	Class 1 Mechanical Engineering	
16:15 - 16:25	Development photocatalyst reduce graphene oxide (RGO) composited with (Zn,Ni)(O,S) for photocatalytic hydrogen production	Noto Susanto Gultom, Hairus Abdullah, Dong-Hau Kuo, Pintor Simamora, Makmur Sirait
16:25 - 16:35	Effects of epoxidised natural rubbers on cure characteristics and crosslink density of silica-filled natural rubber composites	I Surya and Z Alfian
16:35 - 16:45	Effect of dodecanol addition on mechanical properties of silica-filled natural rubber compounds	I Surya and M Ginting
16:45 - 16:55	Time optimization analysis using hybrid simulated annealing and genetics algorithm for cnc punching machine	Lukman Selvi, Endra Joelianto and Edi Leksono
16:55 - 17:05	Solar Charge Controller Using Maximum Power Point Tracking Technique	Marhaposan Situmorang, Kurnia Brahmana , Takdir Tamba
17:05 - 17:15	Properties of Unsaturated Polyester Composite Filled Activated Zeolite : The Effect of Filler Addition and Compression	H Nasution, D M Putra , M T Al Fath
17:15 - 17:25	PMMA-BN composites incorporated with Au nanoparticle fabricated by laser ablation	Atsushi Yamaguchi, Pankaj Koinkar, Akihiro Furube
17:25 - 17:35	Effects of the solvent during the preparation of MoS_2 nanoparticles by laser ablation	Makoto Kanazawa, Pankaj Koinkar, Kei-ichiro Murai, Toshihiro Moriga, Akihiro Furube
17:35 - 17:45	The facile synthesis of a nanoscale composite from fly ash and lime stone for paper industry application	Ramadanis , Girsang Ermi, Ikhtiari Refi

Parallel Session

Session 1	Class 2 Electrical Engineering	
14:00 - 14:10	Performance Evaluation of ESP8266 Mesh Networks	Yoppy, R Harry Arjadi, Endah Setyaningsih, Priyo Wibowo, M I Sudrajat
14:10 - 14:20	Green reduction of graphene oxide using various reducing agent promising for supercapacitor applications	Kam Sheng Lau, Siew Xian Chin, Riski Titian Ginting, Sin Tee Tan, Chin Hua Chia, & Sarani Zakaria
14:20 - 14:30	Design Prototype of Audio Guidance System for Blind By Using Raspberry Pi and Fuzzy Logic Controller	N Mamuriyah, A Yulianto, Lili
14:30 - 14:40	Company attendance and access control system based on RFID	Qusay shihab hamad, Ahmed Majid Taha, Atheer Akram AbdulRazzaq
14:40 - 14:50	Simple Designed of High Voltage Pulsed Electric Field Generator Based on Fly-back Transformer	Kerista Tarigan, Bisman Perangin-angin, Takdir Tambah, Andriono Manalu, Marzuki Sinambela
14:50 - 15:00	Mini Robot for Calibration of Stopwatch/Timer	W K Perangin-Angin, S Agmal, M Boynawan, Y I Pawestri, Ratnaningsih, A Hapiddin and M Azzumar
15:00 - 15:10	Controlling Robot Hand Using FFT as Input to the NN Algorithm	Deni Andrean, Daniel S Pamungkas, Sumantri Kurniawan Risandriya
15:10 - 15:20	Study On The Doping Effect Of Cu-Doped ZnO Thin Films Deposited By Co-Sputering Technique	Albert Daniel Saragih, Hairus Abdullah and Dong-Hau Kuo

Parallel Session

Session 2	Class 2 Electrical Engineering	
16:15 - 16:25	Tools For Detecting And Control Of Hydroponic Nutrition Flows With Esp8266 Module	Poltak Sihombing, Muhammad Zarlis, and Heriyance, Nadia Alkarina
16:25 - 16:35	Tools For Detecting and Control of Soil pH by Probe Sensor based on Android	Poltak Sihombing, Bisman Peranginangin, Dahlan Sitompul, and Rido Rivaldo
16:35 - 16:45	Time-Resolved Spectroscopy Using Boxcar Integrator	Bisman Perangin-angin, Poltak Sihombing
16:45 - 16:55	Fluorescence Spectra Measurement of essential Oils	Bisman Perangin-angin, Kerista Tarigan, Takdir Tamba
16:55 - 17:05	Arrythmia Classification of Electrocardiogram Recorded Data with Random Forest Method	Sutrisno Salomo, Dwi Esti Kusumandari, Yosafat Vincent Saragih, Arjon Turnip
17:05 - 17:15	Fetal heart detection based wide area network technology with wireless sensor transmission	Chrismis Novalinda Ginting, I Nyoman E. Lister, Mangatas Silaen, Ermi Girsang, Yonata Laia, Arjon Turnip
17:15 - 17:25	Optimazation Of Sputtered n-Type GaN/InGaN For Cu(In,Ga)Se 2 Thin Film Solar Cells	Albert Daniel Saragih, Hairus Abdullah and Dong-Hau Kuo

Parallel Session

Session 1	Class 3 Computer Science	
14:00 - 14:10	The Steganographic Video Analysis Uses A Combination of Discrete Cosine Transform (DCT-2D) and Discrete Wavelet Transform (DWT) Algorithms	B A Wijaya, M K M Nasution, and E Zamzami
14:10 - 14:20	Period Length Optimization Linear Feedback Shift Register by Adopting Bistable Multivibrator	P. Utomo, M. K. M. Nasution and M. S. Lydia
14:20 - 14:30	Improving K-Means Performance Using a Combination of Principal Component Analysis and Rapid Centroid Estimation	Sapriadi, Sutarman, E B Nababan
14:30 - 14:40	Traffic sign detection using histogram of oriented gradients and max margin object detection	Christnatalis,Reinaldo, Natanael Manurung, Juara immanuel Simbolon
14:40 - 14:50	A Methodology for the Synthesis of E-Commerce	Ikke Yamalia, Rico, Imti Tsalil Amri and Dewi Lestari
14:50 - 15:00	Analysis and information system planning of MRP (material requirement planning) web-based in PT. Produk Sawitindo Jambi	Eka Martyani, Edy Kurniawan, Hetty Rohayani, Harlia Febrianti
15:00 - 15:10	Best Path Information Guided Tourism Using Ant Colony System in Singapore	Andi Supriadi Chan
15:10 - 15:20	Markov Chain Analysis for Predicting Help Selection in Metacognitive Help-seeking	M Sumadyo, H B Santoso, D I Sensuse, R F Aji, A Hidayati, R Wahyuni

Parallel Session

Session 2	Class 3 Computer Science	
16:15 - 16:25	The Use of Multiple MP3 Audio Files for Additional Steganography Capacity	R Indrayani, H A Nugroho, R Hidayat, Dony Ariyus, Y Pristyanto
16:25 - 16:35	Feature Extraction from App Reviews in Google Play Store by Considering Infrequent Feature and App Description	Q L Sutino and D O Siahaan
16:35 - 16:45	Multichannel Electroencephalography-based Emotion Recognition Using Machine Learning	IN Yulita, RR Julviar, A Triwahyuni, T Widiastuti
16:45 - 16:55	Collaboration of rsa algorithm using em2b key with word auto key encryption (wake) cryptography method in encryption of sql plaintext database	Elwin Yunith Purba, Syahril Efendi, Pahala Sirait, Poltak Sihombing
16:55 - 17:05	Detection of Strawberry Plant Disease Based on Leaf Spot Using Color Segmentation	Dwi Esti Kusumandari, Muhammad Adzkia, Arjon Turnip
17:05 - 17:15	Comparing Classification via Regression and Random Committee for Automatic Sleep Stage Classification in Autism Patients	IN Yulita , MI Fanany, AM Arymurthy
17:15 - 17:25	Web Performance Optimization Techniques for Biodiversity Resource Portal	Edy Budiman, Novianti Puspitasari, Masna Wati, Joan Angelina Widians and Haviluddin
16:15 - 16:25	The Use of Multiple MP3 Audio Files for Additional Steganography Capacity	R Indrayani, H A Nugroho, R Hidayat, Dony Ariyus, Y Pristyanto
16:25 - 16:35	Feature Extraction from App Reviews in Google Play Store by Considering Infrequent Feature and App Description	Q L Sutino and D O Siahaan
16:35 - 16:45	Multichannel Electroencephalography-based Emotion Recognition Using Machine Learning	IN Yulita, RR Julviar, A Triwahyuni, T Widiastuti

Parallel Session

Session 1	Class 4 Computer Science	
14:00 - 14:10	Model Framework for Development of Biodiversity Information Systems (BIS)	Edy Budiman, Novianti Puspitasari, Masna Wati, Haviluddin and Robbi Rahim
14:10 - 14:20	First-order Feature Extraction Methods for Image Texture and Melanoma Skin Cancer Detection	Masna Wati, Haviluddin, Novianti Puspitasari, Edy Budiman and Robbi Rahim
14:20 - 14:30	An Empiric Model of Face Detection based on RGB Skin Tone Color	Robin, Ferawaty, Jusin, Syanti Irviantina, Wenripin Chandra
14:30 - 14:40	Abnormalities state detection from P-wave, QRS complex, and T-wave in Noisy ECG	Chandra Wijaya, Andrian, Mawaddah Harahap, Christnatalis, Mardi Turnip, Arjon Turnip
14:40 - 14:50	Android Based Optimization and Queue System at Passenger Vessel Services Crossings at Samosir Harbor	Yonata laia, Arjon Turnip, Billy Marlince Nababan, Oloan Sihombing, Delima Sitanggang, Mardi Turnip, Robin, Niskarto Zendato, Saut dohot siregar, M. Disrmnsyah batubara, Jepri Banjarnahor
14:50 - 15:00	Vehicle Collision Detection Application Through Collision Video Files with Quadtree Algorithms	M Harahap, J Tandean, Endry, W Gunawan, A Wijaya
15:00 - 15:10	Implementation Resource Request Alghoritm In Simulation of Deadlock Avoidance	A W Salim, F Wiranata, C M Mahidin, R F Waruwu, Vikram, S Wardani, A Dharma
15:10 - 15:20	Motion detect application with frame difference method on a surveillance camera	A M Husein, Calvin, David Halim, Raymond Leo, William

Parallel Session

Session 2	Class 4 Computer Science	
16:15 - 16:25	Face tracking with camshift algorithm for detecting student movement in a class	M Harahap, A Manurung, Priya ,A Prakoso, M F Tambunan
16:25 - 16:35	Analysis A parallel combination between the NTRU, RSA and Triple DES methods for measuring the speed of document security	Christnatalis ,Luken Candawan Hardiaman Hulu ,William, David Rapa Sipayung ,Muhammad Hafis
16:35 - 16:45	Forecasting Determination Of Housing Development Schedule Using Learning Machine Approach Using Clustering Method	Allwin M. S, Andi Tanoto Willy, Forbes
16:45 - 16:55	Accuracy Analysis of K-Means and Apriori Algorithms for Patient Data Clusters	N P Dharshinni, Fadhillah Azmi, I Fawwaz, A M Husein, Saut Dohot Siregar
16:55 - 17:05	Noise effect analysis on edge detection in detecting digits with bilateral filter	I Fawwaz, N P Dharshinni, F Azm
17:05 - 17:15	Implementation of speech recognition in application of indonesian-english translator	Aninda Muliani, Kennedy, Jerry Marvin, Andrey Wibowo, Harry Sinaga
17:15 - 17:25	Philosophy of fuzzy logic as fundamental of decision making based on rule	Murni Marbun, William Ramdhan, Dadang Priyanto, Muhammad Zarlis, Zulkipli Nasution

Parallel Session

Session 1	Class 5 Information System & Technology	
14:00 - 14:10	RFID Based Trolley System with Budget Contoller	Robithoh Annur, Lee Meng Xian, Norazira A Jalil
14:10 - 14:20	Weighted KNN Using Grey Relational Analysis for Cross-Project Defect Prediction	DI Ulumi and D Siahaan
14:20 - 14:30	Expert System Diagnosis Corn Pests And Diseases Using Certainty Factor Method	Sulindawaty, Muhammad Zarlis, Zakarias Situmorang, Hengki Tamando Sihotang
14:30 - 14:40	An overview: implementing ifrs (ias) no.38 intangible assets on the cyber company that are listing in jakarta stock exchange (indonesia)	Evenri Sihombing, Venna Monica Aginta Ginting, Iskandar Muda
14:40 - 14:50	Design and Implementation of Input Value of Academic Information System Using the YII Framework in College (Case Study of Medan State Polytechnic)	A Sabrida Tora Br Sinaga, P Syuhada, I Muda
14:50 - 15:00	A Systematic Literature Review of Information Systems Auditing Concern on the Difficulties and Challenges in Organizations	Nurhaflah Soraya, Hilfi Hanifah, Iskandar Muda
15:00 - 15:10	Analysis and Design Information System Development of IT Care Application in Astra Credit Company	Y Sari, A E Egeten, R E Suherman, H R Fakhri
15:10 - 15:20	To Improve Security of Data in Cloud Network to Prevent Detect Key Recovery Attacks Using Node Creation for Authentication	Adya Zizwan Putra

Parallel Session

Session 2	Class 5 Information System & Technology	
16:15 - 16:25	Expert system for diagnosis chicken disease using bayes theorem	Hengki Tamando Sihotang, Fristi Riandari, R.Mahdalena Simanjorang, Agustina Simangunsong, Penda Sudarto hasugian
16:25 - 16:35	Design and Implementation Of Mapping Public Waste Disposal In Jambi City With Geographical Information System Based On Android Application	Ade Oktarino, Listautin, Saut Siagian
16:35 - 16:45	Future Electronics Payment System Model	Selfira, Gabriel Abdillah, Wintari Harahap, Iskandar Muda
16:45 - 16:55	Designing Android Gaming News & Information Application Using Java-Based Web Scraping Technique	Evta Indra, Steffanily
16:55 - 17:05	Application of C4.5 Algorithm for Cattle Disease Classification	Evta Indra, Ridho Hakim, Arlinanda, Kevin Hoo, Siti Aminatunnisa, D.M selfia sembiring, Yeni Gultom
17:05 - 17:15	Implementation of AHP Method for Determining Best Employee	Edward Bahri, Lisa Joselin, Jessica Tania, Merry, Wilson Rusli, Mardi Turnip
17:15 - 17:25	Understanding group signature methods in making digital signatures to maintain the validity of messages	Saut Dohot Siregar, Jepri Banjarnahor, N P Dharshinni, Saut Parsaoran Tamba, Oloan Sihombing, M. Diarmansyah Batubara, Delima Sitanggang, Robin

Parallel Session

Session 1	**Class 6 Information System & Technology**	
14:00 - 14:10	Development of audio watermark applications using auditory features	Jepri Banjarnahor, Saut Dohot Siregar, Saut Parsaoran Tamba, Delima Sitanggang, Oloan Sihombing, Marlince Nababan, M. Diarmansyah Batubara, Jaidup Banjarnahor, Ronald Belferik
14:10 - 14:20	Grouping of Book Data in Libraries Using the K-Means Clustering Method	Saut Parsaoran Tamba,Victor Marudut Mulia Siregar, Jepri Banjarnahor, Delima Sitanggang, Saut Dohot Siregar, Windania Purba, Maria Sihombing, Oloan Sihombing
14:20 - 14:30	Diagnosing diseases system with method backward chaining and certainty factor based android	Angel Mariana Tambunan, Sari Ratnawati Siringoringo, Delima Sitanggang, Marlince Nababan, Rani Aruan, Putri Intan, Mey Simalango
14:30 - 14:40	The smart method application for determining outstanding employee	Oloan Sihombing, Giovani Ruth Hanoso, Yonata Laia, Halim Maulana, Marlince Nababan, Delima Sitangga, Windania Purba, Diarmansyah Batubara, Niskarto Zendrato, Saut Dohot Siregar, Saut P Tamba, Jepri Banjarnahor, Siti Aisyah, Evta Indra
14:40 - 14:50	Application Of Methods Fuzzy Tsukamoto In Determining The Best Lecturer	M.Diarmansyah Batubara, Winda Manda Sari, Siti Aisyah, Oloan Sihombing, Evta Indra, Yonata Laia, Marlince Nababan, Delima Sitanggang, Windania Purba, Saut Dohot Siregar, Saut P Tamba, Jepri Banjarnahor, Muhammad Iqbal, Hafni
14:50 - 15:00	Designing new employee acceptance personality test application using web-based edward personal preference schedule	Delima Sitanggang, Oloan Sihombing, Yonata Laia, Evta Indra, Saut Parsaoran Tamba, Jepri Banjarnahor, WindaniaPurba, M.Diarmansyah Batubara, Saut Dohot Siregar, Mardi Turnip, Inka Septianingsih Girsang , Anita Christine Sembiring, Irwan Budiman
15:00 - 15:10	Info Search Application on Food Packaging with Suppressed Android Based Text Image	Siti Aisyah, Fransiska Susilawati Nainggolan, Melva Simanjuntak, Edi Apriyanto Lubis
15:10 - 15:20	Package placement application based on location tracking on android platform	Delima Sitanggang, Ibnu Reza El Islamy, Denzy, Riko Marsela, Hendra Pasaribu, Rio Filanno, Mardi Turnip

Parallel Session

Session 2	Class 6 Information System & Technology	
16:15 - 16:25	Shortest Path Search Simulation on Busway Line using Ant Algorithm	K Pramono, K Wijaya, W Cuosman, D Hartanto, A Dharma
16:25 - 16:35	The effect of information technology, quality of accounting information and understanding of students on accounting software users	Namira Ufrida Rahmi, Widya Sari, Bayu Wulandari
16:35 - 16:45	Utilization of Voice Recording Technology in Web-Based Meetings Automatically	Marlince NK Nababan, Muhhamad Yasir, Yonata Laia, Oloan Sihombing
16:45 - 16:55	Application Selection Lending Houses Subsidized by the method of AHP and SAW	Mardi Turnip, Angelina, Delima Sitanggang, Risky Sandi Simamora, Erick Cendana, Ruth Surbakti
16:55 - 17:05	Design applications of expert system for information on genetic diseases	Siti Aisyah, M Diarmansyah, Sumita Wardani, Anita, Oloan Sihombing, Evta Indra, Marlince NK Nababan, Yonata Laia, Delima Sitanggang, Windania Purba, Saut P Tamba, Jepri Banjarnahor, Mardi Turnip, Muhardi Saputra

Parallel Session

Session 1	Class 7 Industrial Technology / Industrial Engineering	
14:00 - 14:10	Improving effectiveness and efficiency of assembly line with a stopwatch time study and balancing activity elements	Irwan Budiman, Anita Christine Sembiring, Uni Pratama Pebrina Tarigan, Grace Aloina, Andrew Dharmala
14:10 - 14:20	Characterization of Coal Fly Ash Based Adsorbent for CO2 Removal	Erni Misran
14:20 - 14:30	The Effect of Habits on Wearing Footwear Against Worms in Primary School Al-Wasliyah In Medan Deli 2017	Sri Lestari Ramadhani Nasution, Suhartomi , Sri Wahyuni Nasution, Ali Napiah Nasution
14:30 - 14:40	The Destructive Effects Cu(II) on Various Organs of Mice	Sri Wahyuni Nasution, Rahmiana Zein , Zulkarnain Chaidir, Eti Yerizal
14:40 - 14:50	Fulfillment of customer orders with distribution improvement	Nurhayati Sembiring , Ukurta Tarigan and Syahputra Siallagan
14:50 - 15:00	Increasing service systems in network distribution with distribution requirement planning methods	Nurhayati Sembiring, Tuti Sarma Sinaga and Jean Ayuningthias
15:00 - 15:10	Redesign of Facility Layout with Graph Method and Genetic Algorithm in Wood Manufacturing Plant	U Tarigan, G Y Herdita, U P P Tarigan
15:10 - 15:20	System Dynamics Simulation to Determine Financial Strategy for Social Health Insurance in Indonesia	Diva Kurnianingtyas, Budi Santosa, Nurhadi Siswanto
15:20 - 15:30	Service Strategy by Considering Price Factor to Increase Titan Tire Customer Satisfaction	Sri Wahyuni Tarigan, Anita Christine Sembiring, Jusra Tampubolon, Kelvin, Irwan Budiman
15:30 - 15:40	The Effect Of Cd(II) Metal Ion Induction To Organ Experiment Rats	Ali Napiah Nasution, Rahmiana Zein, Hermansyah Azis,Djong Hon Tjong
15:40 - 15:50	Floor Slab Analysis (Study Case: One Residence Apartment Batam Centre)	Yayuk Setyaning Astutik
15:50 - 16:00	Determination of Trash Hauling Routes Using Floyd Warshall Algorithm in Medan Barat District	K Syahputri, Rahmi M S, Indah R, Mangara M T, and Josua

Parallel Session

Session 2	Class 7 Industrial Technology / Industrial Engineering	
16:15 - 16:25	Economic Feasibility Analysis of Hydrogen Production from Raw Materials of Oil Palm Empty Fruit Bunches	Rahmi M Sari, Mangara M Tambunan, Taufiq Bin Nur, Indah Rizkya, K Syahputri, Wandika Nasution
16:25 - 16:35	Determining credit term strategy of textile industry	Grace Aloina, Uni Pratama Pebrina br Tarigan, Anita Christine Sembiring, Irwan Budiman, Koko Pratama Saragih, Uke MPP. Siahaan
16:35 - 16:45	Lead Time Reduction In Shipping Process By Using Lean Concepts At PT. Zaitunindo Citra Perkasa	Koko Pratama Saragih, Anita Christine Sembiring, Grace Aloina, Uni Pratama Pebrina Tarigan
16:45 - 16:55	Optimization Consumer Cost of Food Industry with Perishable Characteristic	I Rizkya, A A Nasution, K Syahputri, R M Sari, I Siregar, Erwin
16:55 - 17:05	Improving Hospital Service Quality Strategy with Servqual and Kano Methods	U P P Tarigan, G A Sitepu, I Budiman, A C Sembiring, K P Saragih, H Zhow
17:05 - 17:15	Priority of Selection Suppliers With Fuzzy ANP	I Siregar , I Rizkya , K Syahputri , R M Sari , Anizar , F Ariani, A Pintoro
17:15 - 17:25	Measurement of Supply Chain Performance in Manufacturing	I Rizkya , J Hidayati, K Syahputri, R M Sari, I Siregar, K Siregar, J Utaminingrum
17:25 - 17:35	Role Analysis: Trust in Mediating Informal Learning towards Customer Behavior to use Electronic Banking	Mohammad Aldrin Akbar, Yendra, Idayanti Nursyamsi and Edy Budiman
17:35 - 17:45	Improvement of Health Clinical Service Processes Through The Implementation of Lean Services and Facility Layout	U Tarigan , Y O Hutauruk, U P P Tarigan
17:45 - 17:55	Redesigning the layout with Algorithm Craft on boiler manufacturing	A C Sembiring, J Tampubolon, G A Sitepu, I Budiman, U P P Tarigan, K Saragih and S W Tarigan
17:55 - 18:05	Productivity Improvement In The Production Part Using Marvin E Mundel Method	J Tampubolon, A C Sembiring, G A Sitepu, I Budiman, U P P Tarigan, K Saragih and R Perangin angin
18:05 - 18:15	Probiotic Activity of Lactic Acid Bacteria Isolated from Several Commercial Fermentation Product in Medan, North Sumatera	A L Davidson, E Lase, I N E Lister and E Fachrial
18:15 - 18:25	Probiotic Activity and Antibiotic Sensitivity of Lactic Acid Bacteria Isolated from Healthy Breastfed Newborn Baby Feces	E Lase, A L Davidson, I N E Lister and E Fachrial

Contact

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Abstracts

Hydrazine-modified Zn-oxysulfide nanoparticles for CO 2 reduction under low UV-light illumination

Hairus Abdullah, Noto Susanto Gultom, Dong-Hau Kuo, Albert Daniel Saragih

Track: Class 1 Mechanical Engineering | Session: 1 | Time: 14:00 - 14:10

Photo-catalytically hydrogen-evolved Zn(O,S) nanoparticles (NPs) have been prepared with different amounts of hydrazine (0, 0.25, 0.5, 0.75, 1, 2 mL) to induce more oxygen vacancy sites on catalyst surfaces and utilized to reduce CO 2 with different hole scavenger reagents. The as-prepared catalysts with different hydrazine amounts were first examined with XRD diffractometer, FE-SEM, and electrochemical impedance spectroscopy (EIS). The EIS spectroscopy indicated Zn(O,S) NPs with 0.75 mL hydrazine had the most efficient electron transfer property, therefore it was further used for photocatalytic CO 2 reduction experiment. Some hole scavenger reagents such as Na 2 SO 4 , ozon, ethanolamine, H 3 PO4, and H 2 O 2 were used in this experiment. It was observed that hydrazine and hole scavengers played a critical role to enhance CO 2 reduction. The highest amount of CO 2 - converted ethanol was achieved with 0.75 mL-hydrazine-modified Zn(O,S) using Na 2 SO 4 and ozon simultaneously as hole scavenger reagents. The proposed mechanism which involved generated oxygen vacancy sites during the photocatalytic session was elucidated with Kröger–Vink notation.

A review on opportunities of thermionic regeneration system in hybrid electric vehicle

K Kodihal and A Sagar

Track: Class 1 Mechanical Engineering | Session: 1 | Time: 14:10 - 14:20

A hybrid electric vehicle utilizes power from both engine and battery to drive the wheels. Hybrid electric vehicles are classified as mild hybrid, full hybrid and plug in hybrids. This paper reviews the optimization in technologies and systems of hybrid electric vehicle. Mild and full hybrid vehicles have regenerative braking to recover waste energy in braking and in addition to that grid power for battery charging in plug in hybrids. Utilizing waste energy instead of grid source for battery charging is more effective for hybrid electric vehicle. The findings show that the increased electrification has increased the demand of alternate battery charging methods in vehicle. Conventionally the vehicle uses mechanically driven alternators for battery charging. Internal combustion engine is one of the major sources of heat losses. Therefore, the opportunity lies in recovering this waste heat for battery charging. This could be achieved by direct energy converters such as thermoelectric and thermionic converters. It is evident from the study that the thermionic energy conversion has higher conversion efficiency as compared with other direct conversion methods. The paper concludes the opportunities in development of a thermionic regeneration system for hybrid electric vehicle.

Abstracts

Effect of Zn(O,S) Synthesis Temperature to Photocatalytic Hydrogen Evolution Performance

Hairus Abdullah, Noto Susanto Gultom, Dong-Hau Kuo, Albert Daniel Saragih

Track: Class 1 Mechanical Engineering | Session: 1 | Time: 14:20 - 14:30

About 80% of global energy demands had been fulfilled with the utilization of fossil fuels and accordingly, CO 2 amount in the air had been increased to 406 ppm (about 40% higher than pre-industrial level). The combustion of non-renewable fossil fuels had caused air pollution that affected human health and global climate change. Therefore, to find clean, renewable, and carbon-free alternative energy sources such as hydrogen energy is greatly needed. In this work, hydrogen was photo-catalytically evolved with Zn(O,S) nanoparticles (NPs) in 10% ethanol as a hole scavenger reagent without Pt as a co-catalyst under low UV light illumination. To find out the optimum processing temperature, Zn(O,S) NPs were prepared in three different temperatures (50, 70, and 90 ^{o}C) with 4-h reactions in aqueous solution. The as-prepared catalysts were tested for their capabilities to evolve hydrogen and the experimental data revealed the produced hydrogen amounts were enhanced as the processing temperature increased. It was also found that the as-prepared catalysts were reusable and stable, although the colour of catalyst was changed from white to grey during the photocatalytic hydrogen evolution reaction (HER) and was changed back to white colour after HER was accomplished. The change in catalyst colour indicated the formation of oxygen vacancy on catalyst which further enhanced the HER. The highest amount of evolved hydrogen achieved 2.7 mmol/gh. Based on the experimental data, an appropriate mechanism of HER was proposed and elucidated in this work.

RFID Based Trolley System with Budget Contoller

Robithoh Annur, Lee Meng Xian, Norazira A Jalil

Track: Class 5 Information System & Technology | Session: 1 | Time: 14:00 - 14:10

Discount and sale promotion are atrractive for shoppers in supermarkets that may result in uncontrolled shopping and furher becomes overbudget problem. To get rid of this, we develop a smart trolley system that can help consumers to control their budget in shopping. The system uses RFID technology for identifying the price of the products placed in the trolley. Moreover, consumers are allowed to enter a budget amount before start for shopping. When over budget detected, this system will provide some options to overcome it. This system will be attached on the trolley where the scanner will scan each of the entries for the products. Furthermore, a database system will designed to store all the information for the products and the RFID tag values. Finally, a web application is design for the user and admin for inventory management from the database.

Abstracts

Research of Injection Molding Parameters with Acrylonitrile Butadiene Styrene (ABS) Composition Recycled Against Mechanical Properties

E A Wibowo, T Sukarnoto, Y T Wibowo

Track: Class 1 Mechanical Engineering | Session: 1 | Time: 14:30 - 14:40

Injection molding is the most common method for mass manufacturing plastics product. The process is influenced by injection parameters, i.e.: melting temperature, injection pressure and holding pressure. The recycled material of ABS combined with pure material on 10%:90%, 20%:80% and 30%:70%. Both can affect the mechanical properties as evidenced by tensile and impact test. The ability to resist the load of tensile is obtained from the yield point, whereas the ability to resist the load of the impact is obtained from the potential energy that be able to be received. Based on the best parameters, the optimal value is generated from 10% ABS recycled, i.e. 45,87 [J] for impact strength and 34,08 [N/mm 2] for tensile strength, then the optimal value is generated from 20% ABS recycled, i.e. 45,40 [J] for impact strength and 34,40 [N/mm 2] for tensile strength, and then the optimal value is generated from 30% ABS recycled, i.e. 45,17 [J] for impact strength and 34,80 [N/mm 2] for tensile strength.

Performance Evaluation of ESP8266 Mesh Networks

Yoppy, R Harry Arjadi, Endah Setyaningsih, Priyo Wibowo, M I Sudrajat

Track: Class 2 Electrical Engineering | Session: 1 | Time: 14:00 - 14:10

Existing WiFi mesh networks are usually implemented on high-end or PC grade platforms. However, the open source community has been recently developing a unique mesh network library targeted for the low-cost and resource limited ESP8266 platform. The so called painlessMesh library enables two or more ESP8266 modules to self-configure and to form a WiFi mesh network. This might open up new potential for the ESP8266 to be used in wider application areas. The library is in an early development stage and not much is known about its performance. Therefore, this paper aims to evaluate to what extent the ESP8266 painlessMesh network can perform, in terms of one-way delay and data rate. Measurements showed that a 2- node network has a delay of 2.49 ms. A network consisting of higher number of nodes tends to have an increased network delay even for the same hop distance. Meanwhile, data rate measurements showed that for the case of 10-byte payload a node can receive up to 461 messages/sec. Whereas for payload of 4400 bytes, the node can receive up to 28 messages/sec. Furthermore, it can be reported that payload greater than 4400 bytes starts causing incomplete and erroneous messages.

Weighted KNN Using Grey Relational Analysis for Cross-Project Defect Prediction

DI Ulumi and D Siahaan

Track: Class 5 Information System & Technology | Session: 1 | Time: 14:10 - 14:20

Defect prediction plays important roles in detecting vulnerable component within a software. Some researchers have tried to improve the accuracy of software defect prediction so that it helps developer to manage resources (human, cost, and time) better. They focus on building the software defect prediction model only for a specific domain. To our knowledge, research on cross-project domains has not been carried out before. This research developed method to predict software defect for cross-project domains. Thus, the domain contains datasets with different number of features. To extend shorted features in a dataset, the method calculates the missing values. This research employed weighted KNN to fill in the missing value. The refilled datasets were then classified using naive bayes and random forest. This research also conducted a feature selection process to select relevant features for detecting defects by means of a comparative analysis of methods of selection of features. For the experimentation, this research used seven NASA public dataset MDPs. The results show that for imbalance data, naïve bayes combined with information gain (IG) or symmetric uncertainty (SU) feature selection produced the best balance, i.e. 0.4975. It also shows that for balance data, random forest combined with gain ratio (GR) produced the best balance, i.e. 0.7795. In general, the developed method performed relatively alike the previous method, which classify only specific domain, i.e. 0.4975. It even outperformed previous method for dataset PC2, i.e. 0.4033.

Green reduction of graphene oxide using various reducing agent promising for supercapacitor applications

Kam Sheng Lau, Siew Xian Chin, Riski Titian Ginting, Sin Tee Tan, Chin Hua Chia, & Sarani Zakaria

Track: Class 2 Electrical Engineering | Session: 1 | Time: 14:10 - 14:20

Conductive reduced-graphene oxide (rGO) had been synthesised by either thermally or chemically which is high cost and carcinogenic reducing agents. Toward a greener and sustainable future, we had used various green reducing agents which were glucose, ascorbic acid (AA) and sodium cholate (NaC) to synthesise rGO at sub-hydrothermal temperature and shorter time via a continuous flow experiment setup. Among the reducing agents used, NaC gives the highest reduction with supported results from UV-Vis, Raman, FTIR, C-AFM, XRD and XPS. From the C-AFM results, NaC-rGO exhibits the highest conductivity (0.045nS) measured at an area of 30 × 30 µm. Besides, the reducing mechanism of NaC towards graphene oxide was proposed in this study.

Abstracts

Design Prototype of Audio Guidance System for Blind By Using Raspberry Pi and Fuzzy Logic Controller

N Mamuriyah, A Yulianto, Lili

Track: Class 2 Electrical Engineering | Session: 1 | Time: 14:20 - 14:30

With almost 3.75 million people with visually impaired in Indonesia, according to statistical data shown that most of them not live in prosperity. To increase their productivity they need an assistive device that's allows them to navigate freely. This paper presents a novel Audio guidance system for blind in the shape of simple bag with earphone for giving them an audio guidance efficiently and safety. Different with other audio guidance, we propose a simple system consist of Raspberry Pi Camera and Ultrasonic Sensor as input, Raspberry Pi, Earphone and Power bank. This system is initiated by providing a voice command of the direction where the blind person must walk or go through, so they can avoid from obstacles. We also apply Fuzzy Logic Controller (FLC) to detect the obstacles along they walk by using 3 ultrasonic sensors. The experimental result shows that by using FLC and interfacing by Raspberry Pi the proposed system can effectively to detect the obstacles and give direction with 2.32% distance error.

The Steganographic Video Analysis Uses A Combination of Discrete Cosine Transform (DCT-2D) and Discrete Wavelet Transform (DWT) Algorithms

B A Wijaya, M K M Nasution 2 ,and E Zamzami

Track: Class 3 Computer Science | Session: 1 | Time: 14:00 - 14:10

In research, steganography of data into video files using Discrete Cosine Transform (DCT) and Discrete Wavelet Transform (DWT) algorithms. Their results show that the value of Peak Signal to Noise Ratio (PSNR) obtained by 29 is lower than the PSNR result of the existing method, therefore further research is needed to increase the value of PSNR. In this research, PSNR value was improved on Kalyani& Mahesh research by doing combination of DCT-2D algorithm with DWT. The results of the experiments on 12 video samples that the DCT-DWT Combination algorithm is better than the two above algorithms with the average of Mean Squared Error (MSE) value is 2.35 and PSNR is 44.45.

Abstracts

Improving effectiveness and efficiency of assembly line with a stopwatch time study and balancing activity elements

Irwan Budiman, Anita Christine Sembiring, Uni Pratama Pebrina Tarigan, Grace Aloina, Andrew Dharmala

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 14:00 - 14:10

The rapid industrial development requires companies, especially those engaged in manufacturing, to keep growing and compete to maintain their business. Generally, companies want a short work time to meet production targets and increase profitablity. However, some small and medium enterprises tend to overlook the time standards in their production activities, which causes time and labor waste. This research was conducted to determine the standard time and provide recommendations for achieving the balance of assembly lines. Methods: This study used work time measurement techniques using the time study method with stopwatch. Primary data collection is carried out directly to workers at assembly company. Data is processed by testing data uniformity and data adequacy. Furthermore, the data is used to determine the rating factor, normal time, standard time, and the recommended balance of assembly lines. Results: The results showed that the measurement of working time had a significant impact on the effectiveness and efficiency of production activities by reducing costs for workers by 6.67% and working time to 1.45 seconds faster, as well as achieving the amount of production exceeding the production target. Conclusion: Working time measurement techniques with the time study method using stopwatch can be further investigated and applied to both large industries and small and medium enterprises.

Period Length Optimization Linear Feedback Shift Register by Adopting Bistable Multivibrator

P. Utomo, M. K. M. Nasution and M. S. Lydia

Track: Class 3 Computer Science | Session: 1 | Time: 14:10 - 14:20

Linear Feedback Shift Register (LFSR) is one of the algorithms for getting keys in the form the random number that keep changing unpreditably in cryptographic systems. But the random number generated by the algorithm has a repetitive period of numbers. Repetition of the number will reappear when the LFSR reaches the limit of maximum length and to be new period based on the previous composition of the number that generated. It will make a weakness of the cryptographic system, because it will make it easier to breaking the key of cryptographic system that using pseudo-random generator based the number at the previous period. Therefore, this research try to increase the maximum length of the LFSR algorithm by adopting the bistable multivibrator system steps that applied on electronics. The bistable multivibrator has ability to change high state to low state and vice versa when when it triggered. The adoption process of the bistable multivibrator system is by interpreting high state as a value of "1" and low state as a value of "0". The changes output of the bistable multivibrator will then be used to influence the LFSR algorithm works with XOR gate. Experiments carried out by producing pseudo-random numbers using 30-bit registers 30 times and 4-bit registers 60 times successfully increasing the maximum length with the result twice from the previous maximum period length . Thus the LFSR optimization results with bistable multivibrator have a better impact than the normal LFSR for use in cryptographic
systems.

Abstracts

The synthesis and characterization of bacterial nano cellulose (BNC) from banana peel for water filter membrane application

Edwin K Sijabat, Ahmad Nuruddin, Pingkan Aditiawati and Bambang Sunendar Purwasasmita

Track: Class 1 Mechanical Engineering | Session: 1 | Time: 14:40 - 14:50

This research reports the result obtained from the synthesis and characterization of Bacterial Nano Cellulose (BNC) from Jackfruit banana peel (Musa sp L.) media for water filter membrane application. The BNC synthesis is successfully achieved under the condition of banana peel and water ratio of 1:3, bacterial nutrition : Glucose 10% (w/v), Ammonium sulfate (NH4)2SO4 1% (w/v), pH: 4, amount of starter: 15% (w/v). The duration of fermentation is 7 days. The water content obtained in BNC banana peel is 86,59%. The Scanning Electron Microscopy (SEM) analysis shows the resulting nanocellulose is nanofibril 30-50 nm in diameter. The X ray diffraction (XRD) shows the banana peel BNC crystallinity index (Ic) is 86,94% and cellulose Type I. The Fourier Transform Infra-Red (FTIR) spectra confirms the bond and functional group of nanocellulose. These results support the required properties for strong but flexible membrane filter. The potential zeta absolute value -11.39 mV from the Electrophoretic Light Scattering (ELS) shows that BNC colloidal solution has good stability that it can be further used for the manufacture of water filter catalytic membrane composites.

Expert System Diagnosis Corn Pests And Diseases Using Certainty Factor Method

Sulindawaty, Muhammad Zarlis, Zakarias Situmorang, Hengki Tamando Sihotang

Track: Class 5 Information System & Technology | Session: 1 | Time: 14:20 - 14:30

The development of technology has been very significant, not only in the fields of information, industry, education, but in agriculture. Therefore technological sophistication is also utilized by corn farmers to obtain information about corn crops. Corn is included in plantation commodities in Indonesia. However, in corn cultivation there are various problems associated with the disease that is likely to attack the plant. Therefore, the authors designed the expert system of corn disease diagnosis using certainty method. This system will analyze based on symptoms - symptoms that are in the input by the user so that in obtaining a result of disease identification on corn in the name of the disease, the cause of the disease, the percentage value and how to handle it. This expert system is developed by using the visual basic aplication and Microsoft Access database with Certainty Factor method to measure the value of certainty of a hypothesis against a fact.

Abstracts

Effect of Release Coefficientof Orifice Plate on Water

Fluid Flow Systems

Sutrisno Salomo Hutagalung and Arjon Turnip

Track: Class 1 Mechanical Engineering | Session: 1 | Time: 14:50 - 15:00

The orifice plate is used to estimate the flow rate of a mass flowing through a pipe by connecting the measured loss pressure and mass flow rate. In this paper, the relationship between Reynolds number (Re) and Cd is observed based on pressure variations in a pipe. The test results show that the release coefficient rapidly decreases when the Reynolds number approaches 1 for each meter of flow. By knowing the difference of the occurs pressure, the value of the parameter Cd can be calculated from the actual discharge ratio to its theoretical. The calculation results show that the average value of Cd for the orifice plate sensor about 0.599 (with a deviation value of about 0.001 and Re value around 105) is obtained.

Estimation Optimal Value of Release Coefficient in a Venturi Tubes

Sutrisno Salomo Hutagalung and Arjon Turnip

Track: Class 1 Mechanical Engineering | Session: 1 | Time: 15:00 - 15:10

Development of an accurate and reliable differential pressure flow meters is needed for industry. The relationship between the Reynolds number (Re) and the release coefficient (C) was investigated using a differential pressure flow meter. Venturi meter is a type of baffle meter, widely used in industry for flow measurement. The ISO standard (ISO5167-1) provides release coefficient values for classic Venturi tubes in turbulent flow with Reynolds number values above 2x105. This study shows that various release coefficients decrease rapidly and constant release coefficient values vary with meter design. The main focus of this study is to compare experimental results with theoretical predictions and estimate the optimal value of thevmeter release coefficients at various flow rates. The experimental results showed that the optimal value of the venturi tube release coefficient of about 0.983 was obtained.

Abstracts

Development of ISE Electrode Membrane with High Sensitivity by Synthesizing Active Compound

Arjon Turnip, Sutrisno Hutagalung

Track: Class 1 Mechanical Engineering | Session: 1 | Time: 15:10 - 15:20

Development of ion selective electrodes of mercury (ISE-Hg) using ionophores has been widely used in previous studies. However, in this study the used ionophores were prepared by synthesizing an active compound of a base material 1,4,10,13-tetraoxa-7,16-diazacyclooctadecane (by adduct via a ratio of 3:10) to yield 7.16-dithenoyl ionophore -1,4,10,13-tetraoxsa-7,16-diazacyclooctadecane (DTODC). The membrane as an ISE electrode component is made from a mixture of the synthesis of the DTODC, PVC, KTpClPB and the THF. A comparison result of haracterization with Ag/AgCl electrode shows that the ISE of azacrown derivative ionophorant compounds with high sensitivity and selectivity in the determination of mercury metal ion levels is obtained.

Development photocatalyst reduce graphene oxide (RGO) composited with (Zn,Ni)(O,S) for photocatalytic hydrogen production

Noto Susanto Gultom, Hairus Abdullah, Dong-Hau Kuo, Pintor Simamora, Makmur Sirait

Track: Class 1 Mechanical Engineering | Session: 2 | Time: 16:15 - 16:25

Hydrogen is being considered as the green and renewable fuels in the near future to replace the high global energy demands on fossil fuels. In this work, the photocatalyst reduce graphene oxide (RGO) composited (ZnNi)(O,S) with different amount of RGO has been developed for photocatalytic hydrogen production. X-ray did not show any characteristic peak of RGO due to a little amount in nanocomposite catalyst. However, elemental mapping clearly exhibited the presence of carbon as the element constituent of RGO. Based on the EIS result, RGO could decrease the charge transfer resistance to let the photogenerated electrons-holes easily migrate on the surface of catalyst for executing oxidation and reduction reactions. The optimum amount of RGO was 5 mg to provide the highest hydrogen production rate of 8100 µmol/gh. The enhanced hydrogen production rate was investigated and explained in this paper.

Effects of epoxidised natural rubbers on cure characteristics and crosslink density of silica-filled natural rubber composites

I Surya and Z Alfian

Track: Class 1 Mechanical Engineering | Session: 2 | Time: 16:25 - 16:35

The effect of two grades of epoxidised natural rubbers (ENR 25 and ENR 50), having 25 and 50 mol of epoxidation, on crosslink density and cure characteristics of silica- filled natural rubber (NR) composites were investigated using a semi-efficient vulcanisation system. The ENRs were incorporated separately into the composites at 5.0, 10.0, 15.0, 20.0 and 25.0 parts per hundred rubber (phr). An investigation was carried out to examine the effects of the ENRs on cure characteristics and crosslink density of the silica-filled NR composites. Results revealed that both ENR 25 and ENR 50 functioned as curatives and compatibilizers. They increased the scorch time, cure time, torque difference and crosslink density. The higher the ENRs loadings; the higher were the scorch, cure times, torque difference and crosslink density. At a similar loading, ENR 50 exhibited a more pronounced curative and compatibilization effects than ENR 25.

Effect of dodecanol addition on mechanical properties of silica-filled natural rubber compounds

I Surya and M Ginting

Track: Class 1 Mechanical Engineering | Session: 2 | Time: 16:35 - 16:45

The effects of dodecanol (DDC) addition on swelling behaviour, rheometric and mechanical properties of silica-filled natural rubber (NR) compounds were investigated using a semi-efficient vulcanisation system. The NR was filled with silica at a fixed loading, 30.0 parts per hundred rubber (phr). The DDC was a fatty alcohol based on palm kernel oil and added into silica-the filled NR compounds at 1.0, 2.0, 3.0 and 4.0 phr. Due to its functions as a co- curing and internal plasticiser, it was found that DDC affected the crosslink density, rheometric and mechanical properties of silica-filled NR compounds. The DDC exhibited torque difference, crosslink density and tensile strength improvements, especially up to a 3.0 phr of loading. The morphological study proved that 3.0 phr of DDC was the optimum loading where the fractured surface of silica-filled NR compounds with 3.0 phr of DDC exhibited the greatest matrix tearing line and surface roughness. Based on the overall results, the DDC addition caused the silica-filled NR vulcanisates in a lower tensile modulus and hardness but a higher tensile strength.

Abstracts

Improving K-Means Performance Using a Combination of Principal Component Analysis and Rapid Centroid Estimation

Sapriadi, Sutarman, E B Nababan

Track: Class 3 Computer Science | Session: 1 | Time: 14:20 - 14:30

K-Means is a simple clustering algorithm, this method starts with randomizing partitions and continuing to reassign samples to clusters based on similarities between data. However, the K-Means method has several disadvantages, including determining the initial cluster center value done randomly, and the distance model used in determining the similarity between data where conventional distance models have the same effect on each data attribute. In this study will try to improve the performance of K-Means by using a combination of PCA and RCE. PCA will determine the weight of each attribute data based on eigen value, and RCE is used to determine the beginning of the cluster center. To see the performance of the proposed method, this research will use 3 datasets obtained from the UCI Repository, including ionosphere, iris, and wine. Analysis of the performance of the proposed method is only measured based on MSE and SSE. The results of this study indicate that the PCA and RCE methods were able to improve the performance of K-Means, the highest performance improvement based on MSE was found in iris data, which amounted to 56.76%, while based on SSE occurred in the ionosphere data which was 86.08%.

AN OVERVIEW: IMPLEMENTING IFRS (IAS) NO.38 INTANGIBLE ASSETS ON THE CYBER COMPANY THAT ARE LISTING IN JAKARTA STOCK EXCHANGE (INDONESIA)

Evenri Sihombing, Venna Monica Aginta Ginting, Iskandar Muda

Track: Class 5 Information System & Technology | Session: 1 | Time: 14:30 - 14:40

This study aims to analyze implementing IFRS (IAS) No.38 Intangible Assets on cyber company that are listing In Jakarta Stock Exchange. This type of research is descriptive analysis. The data used are secondary data. The population and samples used in this study are all computer services and device companies (code 93) which are listed on the Jakarta Stock Exchange. The analysis used with analysis (content analysis). The results show that the application of IFRS (IAS 38) for amortization, amortization period, acquisition of intangble assets from business combinations and intangible assets of limited useful life have been carried out in full, while the definition of intangible assets, recognition and measurement, retirement and disposal, is identified in one or two companies are varied, while others such as separate acquisitions, research and development expenditures, asset exchanges, government grants, goodwill originating from internal products and unlimited useful intangible assets stipulated in IFRS (IAS 38) are not identified .

Abstracts

Traffic sign detection using histogram of oriented gradients and max margin object detection

Christnatalis,Reinaldo, Natanael Manurung, Juara immanuel Simbolon

Track: Class 3 Computer Science | Session: 1 | Time: 14:30 - 14:40

Traffic signs are important markers in driving. At present, technology has enabled the driver to know the path that must be taken to achieve a goal, but sometimes there is a change in direction or regulation on the road that is not directly updated in an electronic map s that it can lead to misinformation that results in accidents. By using a camera mounted on a car a new sign can be immediately recognized and the information can be sent directly to an electronic map so that it can automatically update information and help other drivers.

Design and Implementation of Input Value of Academic Information System Using the YII Framework in College (Case Study of Medan State Polytechnic)

A Sabrida Tora Br Sinaga, P Syuhada, I Muda

Track: Class 5 Information System & Technology | Session: 1 | Time: 14:40 - 14:50

This study is to compare the manual input system with web-based input system. The system used is Academic Information System that uses YII Framework. This study uses descriptive research methods. The data taken is the fact that happened at Medan State Polytechnic regarding the value input process. Compare the value input process manually or web-based. From the results of the study, it can be concluded that by using the YII Framework at Medan State Polytechnic in Academic Information System, the input value becomes more effective and efficient with a web-based system rather than manual input system. The instrument used to find out the effectiveness and efficiency input of web-based values is time, process, error rate, and level of security.

Abstracts

A Systematic Literature Review of Information Systems Auditing Concern on the Difficulties and Challenges in Organizations

Nurhaflah Soraya, Hilfi Hanifah, Iskandar Muda

Track: Class 5 Information System & Technology | Session: 1 | Time: 14:50 - 15:00

This study aims to focus on ensuring the security, reliability, integrity, and privacy of the information. The Information Systems Auditing plays a critical role in the health of any organization from the developing countries. The recent business failures increased the interest of researchers on the topic of information systems auditing. While some research exists, it focuses on particular cases from the developing countries. Yet the academia lacks a comprehensive overview of the information systems auditing. The systematic literature review for information systems research was undertaken in conjunction with the theoretical approach to systematic reviews which are known around the questions about current difficulties, issues, and challenges that experienced by organizations in terms of Information Systems Auditing. The result of this comprehensive literature review shows that the organizations are facing various challenges, difficulties and issues with regards to Information Systems Audit, ranging from legislation, policies, and standards to education and cultural aspects.

A Methodology for the Synthesis of E-Commerce

Ikke Yamalia, Rico, Imti Tsalil Amri and Dewi Lestari

Track: Class 3 Computer Science | Session: 1 | Time: 14:40 - 14:50

Recent advances in real-time communication and relational modalities offer a viable alternative to the producer-consumer problem. After years of theoretical research into the parti-tion table, we show the refinement of the location-identity split, which embodies the robust principles of operating sys-tems. In order to fix this issue, we propose new scalable archetypes (Gunnel), demonstrating that multi-processors and multi-processors are never incompatible.

Abstracts

ANALYSIS AND INFORMATION SYSTEM PLANNING OF MRP (MATERIAL REQUIREMENT PLANNING) WEB-BASED IN PT. PRODUK SAWITINDO JAMBI

Eka Martyani, Edy Kurniawan, Hetty Rohayani, Harlia Febrianti

Track: Class 3 Computer Science | Session: 1 | Time: 14:50 - 15:00

Many companies that have utilised sophistication system and information technology already to increase company competitive advantage, however it is not a few that does not utilise yet optimally, one of the company is PT. Produk Sawitindo Jambi. It is one of the company that processes palm oil to be semi-finished product, namely CPO (Crude Palm Oil). PT. Produk Sawitindo Jambi utilises Information system of MRP (material requirement planning) offline computer system. It utilises Microsoft Excel application and has not been integrated with data management information system of spare parts. It is required a web-based information system that can be accessed anytime and anywhere by the parties to improve the effectiveness and efficiency of the employee's performance in PT. Product Sawitindo Jambi. Analysis and planning that are done and depicted with UML modelling in the form of use case, class and activity diagrams. The final result of this research is a MRP (Material Requirement Planning) information system plan which is web-based in PT. Produk Sawitindo Jambi, to involving the spare parts admission transaction, spare parts expenditure/usage transaction, spare parts stock in the warehouse, the result of calculation total cost of spare parts inventory that is shown on the plan information material needs of spare parts.

Company attendance and access control system based on RFID

Qusay shihab hamad, Ahmed Majid Taha, Atheer Akram AbdulRazzaq

Track: Class 2 Electrical Engineering | Session: 1 | Time: 14:30 - 14:40

one of the popular things among succeeded companies is an automated system. The reasons behind using the automated system are to reduce human errors, work and to gain efficiency. The design focused on building an automated system for access control and attendance monitoring by the use of RFID technology. all the companies that still doing mural attendance will get a great help when it used the proposed system. this paper used RFID (tags, reader), microcontroller to collect data, ZigBee technology for transmitting and receiving data wirelessly, computer as a control station. the program at control station was written by using Visual C# and connect with database (DB) MSSQL server to store employees' numbers (RFID tags) and used for attendance calculations. The initial results of the proposed system appear a high profit in time-saving and cost when compared with traditional systems. cost divided into two parts, firstly: a price of ZigBee device, secondly: security men.

Simple Designed of High Voltage Pulsed Electric Field Generator Based on Fly-back Transformer

Kerista Tarigan, Bisman Perangin-angin, Takdir Tambah, Andriono Manalu, Marzuki Sinambela

Track: Class 2 Electrical Engineering | Session: 1 | Time: 14:40 - 14:50

The high pulse voltage low power supply can be built with fly-back transformer as a converter. Generation by using fly-back converter is a significant method which can be improved the circuits of the device to make it simpler, and occupies a smaller space, and cheaper. The study aimed to study and develop a device that will obtain a high pulse voltage low power supply. The results of the study obtained are, the high pulse voltage has reached 50 kV at the frequency of 100 kHz. In addition, when the high pulse voltage is fed to the plane parallel, then at the distance of 50 cm there is a spark, which means it is can generate high pulsed electric fields, it was 50kV/cm.

Mini Robot for Calibration of Stopwatch/Timer

W K Perangin-Angin, S Agmal, M Boynawan, Y I Pawestri, Ratnaningsih, A Hapiddin and M Azzumar

Track: Class 2 Electrical Engineering | Session: 1 | Time: 14:50 - 15:00

Many industries use stopwatch/timer as instrument for measuring time in production process. To support the quality of product of industries, the stopwatch/timer should measure the time accurately. The accuracy of the stopwatch/timer can be known through calibration to a reference standard. Therefore, a stopwatch/timer should be calibrated first before used as instrument for measuring time. Research Center for Metrology (RCM) - LIPI as National Metrology Institute of Indonesia has responsibility to build measurement traceability in Indonesia, included measurement traceability for time. RCM - LIPI did calibration of stopwatch/timer manually. The operator responses in manual calibration that called as human reaction time contribute to inaccuracy of measurement result. Recently, an innovation for automation of calibration system of stopwatch/timer has been built to eliminate the human reaction time. The automation system has been designed and built using robotic arm and mini robot car. The aim of this system is to increase the efficiency and accuracy of stopwatch/timer calibration. The robotic arm is used to press the button of stopwatch/timer, and the mini robot car is used to press a reference standard universal counter The measurement result of time from the universal counter and stopwatch/timer are recorded automatically using a camera. The accuracy of the stopwatch/timer calibration has been increased by using the automation system. The system supports the improvement of the quality of industry products.

Abstracts

Characterization of Coal Fly Ash Based Adsorbent for CO2 Removal

Erni Misran

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 14:10 - 14:20

The study of CO2 removal from air-CO2 mixture using coal fly ash (CFA) based adsorbent has been conducted. The sieved CFA was calcined at various temperature (200, 300 and 400 °C) for 4 hours. The calcined adsorbent pellets were characterized before utilizing in CO2 removal. Result suggested that calcination temperature slightly affected the yield of adsorbents. Increasing calcination temperature decreased the density and bulk density; but increased the percentage of adsorbed moisture of the adsorbents. SEM micrograph revealed various shape and size of the adsorbent and matched the result of XRD pattern and EDS analysis. The characterized adsorbents then were utilized to remove CO2 in an adsorption column. The inlet mixture contained 35%-vol of CO2 with flow rate of mixed gas of 200 ml/min. The highest removal was accomplished by using CFA based adsorbent pellet with particle size of 140 mesh, calcination temperature 300 °C for 4 hours. The CO2 removal efficiency was 71.43% with adsorbent capacity of 8.027 mg CO2/g adsorbent.

Analysis and Design Information System Development of IT Care Application in Astra Credit Company

Y Sari, A E Egeten, R E Suherman, H R Fakhri

Track: Class 5 Information System & Technology | Session: 1 | Time: 15:00 - 15:10

Business competition that keep intensify in automotive financing services provider field encourages all companies involved to continue improving themselves in order to competing with other companies, one of the ways is to utilize Information Technology (IT). Astra Credit Company (ACC) is one of automotive financing service provider which has already applied IT. As a big company, the large scale of the utilization of IT in ACC also raised the need for managing the IT Helpdesk. Currently ACC already uses an application to support IT Helpdesk business process called IT Care. But as the development of business process and the changing needs of the company, the system is no longer able to support business process needs. Based on those needs this research was conducted to develop system design that can meet current business needs. Design and analysis process done through System Development Life Cycle methodology with Object Oriented Analysis and Design approach using Unified Model Language diagram. System analysist and design activities developed several processes i.e. Chart Of Account management based with time estimation, ticket submission, ticket assignment with consideration of staff balancing work load, completion ticket based on priority, also reporting of IT staff performance and ticket completion. Conclusions from the results of the analysis and design of IT Care systems are a proposed IT Care system design that is expected to overcome the problems in the existing IT Care system.

Abstracts

Controlling Robot Hand Using FFT as Input to the NN Algorithm

Deni Andrean, Daniel S Pamungkas, Sumantri Kurniawan Risandriya

Track: Class 2 Electrical Engineering | Session: 1 | Time: 15:00 - 15:10

To control the prosthetic hand can be used several methods; one of them is by training the system to know the movement of the muscle. This method is using an EMG sensor to read the frequency of the movement of the muscle. In this study, Myo Arm Sensors is used as a sensor and used a Neural Network algorithm. The frequencies of the signal from the sensors are measured when the hand of the subject is open, grip or half open. Moreover, these signals are grouped using octave band methods. This information is used to be learned by the system. The system enables to mimic the movement of the subject up to 87.5% accuracy.

Best Path Information Guided Tourism Using Ant Colony System in Singapore

Andi Supriadi Chan

Track: Class 3 Computer Science | Session: 1 | Time: 15:00 - 15:10

travel from one place or location to another by considering the shortest route or route to go through in the case of traveling with the ant colony optimization (ACO) method. In this study, greedy algorithms are used for problem-solving approaches to find maximum local values, then proceed using the ACO algorithm heuristic method for path search and optimization. This algorithm is used to find the value of the parameters of each tourist location based on the distance from one location to another so that the results of the pheromone value from each distance are based on the probability of ant travel from one tourist location to another tourist location with at least one trip to each location that has never been visited. ACO algorithm finds the most optimal path from all probabilities of the paths that ants go by leaving more pheromone with a greater number of pathways. So the results of the study show that the optimal pathway with the most pheromones is the shortest and optimum route in the country Singapore.

To Improve Security of Data in Cloud Network to Prevent Detect Key Recovery Attacks Using Node Creation for Authentication

Adya Zizwan Putra

Track: Class 5 Information System & Technology | Session: 1 | Time: 15:10 - 15:20

The use of internet in the past decade has increased rapidly people using it for transmission of data saving their works, storing all the private information in a system and transmitting through internet. Due to high usage of internet there is also possibility of losing data by unauthorized access and getting hacked and misuse of data. To monitor the network and the activity, previously there was existing intrusion detection system which use to check the activities and inform the unusual activities happen in the network there was a loop inside the detection system if the rule or algorithm known to the hacker can create the same and attack the system. Previously there was a method used known as kids, but the problem with this method was the method used for generation of key and keeping it secrecy, the attackers could easily get access to the key after black box attack. In this paper the proposed system helps to provide more security and prevents it from attacks and also protect the data stored in the system. The proposed schema can be implemented in hospitals for health care domain, for saving the data of Patience by using cloud storage by using it in the detection system. Many developers and researched have introduced schemes in Machines learning and one of this scheme was key based detection system, But this system required more security to prevent from the attackers, in the proposed system I am using cryptographic algorithm for creating secret key and for saving the data and Bowl Fish algorithm to hide the data from the attackers and recover the key from the AES algorithm which is saved in encrypted format which has steps of verification to recover the key and give prevention against unauthorized usage and it provides security from the attackers by saving all the data of patience in a hospital using different domains in the cloud.

EXPERT SYSTEM FOR DIAGNOSIS CHICKEN DISEASE USING BAYES THEOREM

Hengki Tamando Sihotang, Fristi Riandari, R.Mahdalena Simanjorang,
Agustina Simangunsong, Penda Sudarto hasugian

Track: Class 5 Information System & Technology | Session: 2 | Time: 16:15 - 16:25

Chicken disease is a condition in which the body organs of chickens cannot function normally. Diagnosing a disease requires symptoms that appear on the chicken's body. To conduct a disease diagnosis, further examination is needed by specialists (experts). An expert system is a system that uses human knowledge that is entered into a computer to solve problems that are usually resolved by experts. The system created in solving problems uses the Bayes Theorem method in which the inference process uses Forward Chaining. The application was developed using the visual basic 2010 programming language and MySQL database.

Abstracts

The Effect of Habits on Wearing Footwear Against Worms in Primary School Al-Wasliyah In Medan Deli 2017

Sri Lestari Ramadhani Nasution,Suhartomi, Sri Wahyuni Nasution, Ali Napiah Nasution

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 14:20 - 14:30

The World Health Organization (WHO) reported in 2015 more than 1.5 billion population is infected with Ascaris Lumbricoides, 795 million people are infected Trishuris trichiura and 740 million people are infected with hookworm (Ancylostoma duodenale and Necator Americanus. In Indonesia on 2013, the average prevalence of worm infection reaches more than 28%. The type of this research is Explanatory Research with cross-sectional population is whole students in Primary school AL-Washliyah KM.6, Tanjung Mulia, subdistrict of Medan Deli as many as 180 students. The sample in this study is using techniques proportioned stratified random sampling with a sample of 64 people. Data were collected through interviews using questionnaires, school documentation and examination of stool. Data was analyzed by univariate, bivariate using Chi-Square test at the level of 95% (P <0.05) and multivariate logistic regression test. The results showed of the effect of wearing footwear Against Worms in Primary School Al-Wasliyah Km 6 District Villages In Medan Deli 2017 with p value 0,002 and Exp (B) 43,587 in Confidence Interval 95% is 3,848 until 493,702.

Design and Implementation Of Mapping Public Waste Disposal In Jambi City With Geographical Information System Based On Android Application

Ade Oktarino, Listautin, Saut Siagian

Track: Class 5 Information System & Technology | Session: 2 | Time: 16:25 - 16:35

This research aims to create an application that can provide the information the nearest location of public waste disposal in Jambi City. The observation process was carried out by looking at the mapping of the public waste disposal that had been set by the Sanitation, Gardening and Funeral Services (Dinas Kebersihan, Pertamanan dan Pemakaman) located in various sub-districts in Jambi City. From the information provided, there are still many people who do not know where the public waste disposal sites in Jambi City and even though the capacity of the waste disposal is full, the people are still forced to dispose the waste and finally the waste breaks down the streets which causes dirty environment around the public waste disposal. Based on this circumstances of various problems that exist in this research observation, it is necessary to build an application based on mapping the location of public waste disposal so as to produce geographic information system applications based on Android and hope this application can be used by all the people of Jambi City in particularly and Indonesia in generaly. With the development of this application, it is expected that the people of Jambi City can get information of the nearest location of public waste disposal fastly and precisely and they know the distance of the location and tracking of public waste disposal.

The Destructive Effects Cu(II) on Various Organs of Mice

Sri Wahyuni Nasution, Rahmiana Zein , Zulkarnain Chaidir, Eti Yerizal

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 14:30 - 14:40

Cu(II) can cause poisoning and impairing various organ. This research aims to investigate the effect of induction of Cu(II) ions on the organs of mice. In this study the mice are injected by 1000 mg/L Cu(II). After 5 hours, these three mice blood were taken in each organ, observes mice organs. In the observation, the mice organs were accumulated by Cu(II) include Lungs, Heart, and Kidneys. The distribution of Cu(II) accumulation looks unevenly where the smallest concentration is found in the Lungs and the highest concentration is found in the kidneys.

Fulfillment of customer orders with distribution improvement

Nurhayati Sembiring , Ukurta Tarigan and Syahputra Siallagan

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 14:40 - 14:50

A company engaged in shrimp feed production, has 4 physical distribution networks, namely: PT. JWL, PT. SWS, PT. BWP, and, CV. WS. Logistics problems at the company is not achieving the fulfillment of customer orders with the right amount and the right time. This is due to the company's inefficient inventory, distribution and transportation systems. The method used to solve inventory problems is to set safety stock. To solve distribution problems use Distribution Requirement Planning, Reorder points and determine the order frequency. Through a series of processing and problem solving steps, it is known that the total needs that must be met by the company is 10.502.308 kg with a safety stock of 132,860 tons.

Increasing service systems in network distribution with distribution requirement planning methods

Nurhayati Sembiring, Tuti Sarma Sinaga and Jean Ayuningthias

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 14:50 - 15:00

A company that engaged in the chemical industry and produces urea and ammonia,needs an arrangement on the distribution chain to suppress the possibility of stock out. An inventory on Disaster Centre is arrange in order to meet the demand of retailers. The determination of distribution routes that can reduce waste in terms of the use of transportation facilities as to minimize the time, and distance is analized by Distribution requirement planning method. Using the selected forecasting function based on the time series method, the total demand for the next 12 months is obtained, by calculating by applying the distribution requirement planning method, an total request cannot be fulfilled decrease by 67.38% from 417 orders to 136 orders.

Study On The Doping Effect Of Cu-Doped ZnO Thin Films Deposited By Co-Sputering Technique

Albert Daniel Saragih, Hairus Abdullah and Dong-Hau Kuo

Track: Class 2 Electrical Engineering | Session: 1 | Time: 15:10 - 15:20

Cu-doped ZnO thin films with variation power at 0, 3, 5, and 10 W were prepared by DC/RF magnetron sputtering technique. The thin films have been deposited onto the soda lime glass (SLG) substrates at room temperature. The XRD peaks of the Cu-doped ZnO thin films identified as hexagonal wurtzite structure ZnO. The surface morphology of Cu doped ZnO thin films was investigated through a scanning electron microscope, which indicated the grain size slightly decreased by doping Cu. The transmittance significantly decreases accompanying increasing the Cu concentration. The optical band gaps Cu-doped ZnO thin film were estimated to be 3.30, 3.25, 2.87, and 2.31 eV when the powers of Cu target were 0, 3, 5, and 10 W respectively. The 15% of the Cu content show the best data in our experiment.

Future Electronics Payment System Model

Selfira, Gabriel Abdillah, Wintari Harahap, Iskandar Muda

Track: Class 5 Information System & Technology | Session: 2 | Time: 16:35 - 16:45

This paper aims to give information about the differences of Future Electronics Payment System Model. We describe various systems of electronic payment services, security issues related to them and the future of the mobile payment mode and overview of e-money. Payment systems using e-money is a process of modernization of the payment system that is safe, convenient, and easy which has been developed in several countries in the world. Electronic Money is essentially cashless money. Its function is a non cash payment instrument to merchant not to the issuer of electronic money. This type of paper is comparative method. Data analysis used is non parametric ANOVA (Analysis of Variance). The findings show that therea are significant differences for each type of payment model.

Markov Chain Analysis for Predicting Help Selection in Metacognitive Help-seeking

M Sumadyo, H B Santoso, D I Sensuse, R F Aji, A Hidayati, R Wahyuni

Track: Class 3 Computer Science | Session: 1 | Time: 15:10 - 15:20

The importance of metacognitive skills in solving learning problems, makes it a concern for learning developers to pay more attention to the metacognition process. One of the metacognition techniques is to provide help in solving items using help-seeking. This technique is important in improving metacognitive skills, because it contains an awareness of the need for help, monitoring knowledge and choosing a strategy to get the appropriate help and then evaluating the episode help. Metacognitive skills contain the dimensions of metacognitive knowledge in the form of declarative knowledge, procedural knowledge and conditional knowledge and dimensions of knowledge regulation in the form of planning, monitoring and evaluation. Therefore help-seeking is arranged according to that dimension. However, the help-seeking series have not been able to measure whether the assistance is too excessive to meet the needs of students or even less fulfilling. This study simulates the needs of students for assistance with a help-seeking series arranged in the Markov Chain so that the assistance provided to students in a personal manner will be in accordance with the needs so that the process of finding assistance will be more efficient in completing learning questions. In the simulation, the task is given to a number of students to complete the questions with hint steps in the help-seeking series. Stochastic calculations on the Markov Chain are used to predict the tendency of the hint type selection to be resolved in a certain order. The results of this calculation will help the education facilitator to monitor students in completing the items with the help of hints.

The Use of Multiple MP3 Audio Files for Additional Steganography Capacity

R Indrayani, H A Nugroho, R Hidayat, Dony Ariyus, Y Pristyanto

Track: Class 3 Computer Science | Session: 2 | Time: 16:15 - 16:25

Steganography is the science and art of hiding secret messages in such a way so that the existence of messages is undetected by human senses. Steganography files are encrypted in MP3 audio files using container media in the form of MP3 audio files as known as MP3 cover files. In this paper, multiple MP3 files are used as cover with the aim of increasing steganographic capacity without limiting the number of used files. Concealing secret messages in the form of files on the MP3 file cover can be performed by homogenous frame utilization methods. Homogeneous frames in the MP3 files store the bits of the inserted secret files. Before being inserted into some MP3 cover files, secret files are first encrypted employing AES algorithm with passwords implicated by MD5 processes. MP3 audio files producted by Steganography processes are referred to as stego MP3 files. The changes of audio quality after steganography application and steganographic capacity are measured as a benchmark for the success of this study. Audio quality changes between stego MP3 files and original MP3 files are measured by using stereo signal strength and Mean Opinion Score (MOS). Steganographic capacity is measured using steganography load calculation based on the homogeneous frame availability. The test results show that the distribution of steganographic load on multiple MP3 files can fulfill the user's needs for the capacity of steganography without reducing the quality of used MP3 files. This paper proposed a method about the increase of steganography capacity which is capable to insert and retrieve secret files on multiple MP3 audio files using homogenous frame utilization methods without resizing and reducing the quality of used MP3 files.

Redesign of Facility Layout with Graph Method and Genetic Algorithm in Wood Manufacturing Plant

U Tarigan, G Y Herdita, U P P Tarigan

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 15:00 - 15:10

Facility planning is a plan for a facility to operate synergistically in the production process, in accordance with the planned objectives. PT. XYZ is a manufacturing company in the industry that uses wood for furniture. Layout of facilities at PT. XYZ has found an irregular material flow pattern so that there is a line crossing from the joint f station to the laminating station and tapping station to the cutting station. Inefficient production lines also produce quite long production lines. In solving this problem, graphical methods and genetic algorithms are used. The graph method uses from to diagrams to make proximity graphs based on the greatest weight. Genetic algorithms are based on the principles of genetics and natural selection. The genetic algorithm uses a generation mechanism so that the optimal layout results are obtained. The results showed that the actual moment of total displacement was 3,422,846 meters / month, the total moment of displacement using the graph method was 926263.69 meters / month, and the total moment of movement using the genetic algorithm was 756439.1 meters / month. The results showed that the improvement of the layout using genetic algorithms was chosen because it had an efficiency of 77.90%, higher layout improvements using graphical methods with an efficiency of 72.90%.

Abstracts

System Dynamics Simulation to Determine Financial Strategy for Social Health Insurance in Indonesia

Diva Kurnianingtyas, Budi Santosa, Nurhadi Siswanto

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 15:10 - 15:20

Social Health Insurance (SHI) in Indonesia is still experiencing financial constraints because the financial condition of the SHI has continued to be a loss since it was established in 2014 until present so it becomes special attention needed to get achieving the Universal Health Coverage (UHC) target by the government. Therefore, this study intends to provide an appropriate SHI financial strategy recommendation by considering the stability of the balance of income and expense. In addition, a dynamic system simulation approach is needed to find optimal SHI financial strategies with variables including participant premium rates, average cost of benefits, number of health cases, and number of insurance participants. The data used came from BPJS Health data for 2016 and 2017. In determining the right strategy, the equation used was Income Expenditures. In addition, there are several scenarios designed to reduce the level of financial losses that occur at SHI. The scenario of reducing the number of health cases is the best strategy recommendation decision. Whereas by testing variable sensitivity, the results show that reducing average benefit costs and increasing premium rates also allows it to become a strategy. The combination of strategies to reduce average cost of benefits approximately 20-30% and increases premium rates by 20-30% in the short term and reduces the number of health cases in the long term so that it can reduce financial problems from the SHI loss. From the results that have been obtained, this study can contribute to the resolution of BPJS Health financial problems in Indonesia which continue to experience a loss.

Feature Extraction from App Reviews in Google Play Store by

Considering Infrequent Feature and App Description

Q L Sutino and D O Siahaan

Track: Class 3 Computer Science | Session: 2 | Time: 16:25 - 16:35

Google Play Store is one of the platforms used for distributing various kinds of mobile app from the developer to the users. Through this platform, users are allowed to give their comments about the app. These user reviews could be used to extract potential app's requirements. They are important information for developer to further develop the app. There have been some previous researches about extracting mobile app features which are frequently mentioned in user reviews. There are less researches that focus on extracting infrequent features. Nevertheless, extracting infrequent features is also important. It is because there is a possibility that important needs contained in the review which are not extracted as frequent features. One of the challenges in infrequent feature extraction was the irrelevant features contained in extracted features. To overcome the problem, this study aims to extract app frequent feature in reviews by finding collocation and infrequent feature in reviews based on dependency as extraction rules. Afterward, it compares the similarity of all the extracted features from review with features from app description. The implied technique of similarity measure includes similarity of 1) single-term by matching each term of feature, 2) synonym referring to WordNet synsets, and 3) sentence based on calculation of lexical semantic vector and cosine similarity. The implementation result is evaluated using precision and recall calculations. The result shows that features extracted by proposed method are more relevant than previous method.

TIME OPTIMIZATION ANALYSIS USING HYBRID SIMULATED ANNEALING AND GENETICS ALGORITHM FOR CNC PUNCHING MACHINE

Lukman Selvi, Endra Joelianto and Edi Leksono

Track: Class 1 Mechanical Engineering | Session: 2 | Time: 16:45 - 16:55

This research describes the method of manufacturing process planning of hole manufacturing, which in every machining process consists of several individual operations with various types of punching blades. The process of setting the trajectory is one of the problems of holes manufacturing process because this process takes a long machining time and often it obtains undirected sequence path that sometimes causes stress material and the damaged of punching blades. The aim of optimization process is to minimize the processing time of holes manufacturing so the time function which is obtained can be converted in the form of energy consumption that helps manufacturers to predict the machining time. Dynamic Directed Graph is applied where each node represents a machining operation. The time function is obtained by studying the shortest path of a directed graph where the structure of objectivity studied is similar to the Traveling Salesman Problem (TSP). The mathematical model is used to solve the hole optimization problem of the graph structure by proposing the combination of both to solve the optimization problem. The Algorithm realization will be applied in real time CAD / CAM programming by using TOPS300 which is used for TRUMPF TC200 Punching Machine. There are 2 kinds of blade operations in this research which are single stroke operation and multi strokes operation. Both produce different time function. By a. Finally, some conclusions are given from examples that show the hybrid algorithm of Simulated Annealing and Genetic Algorithms is effective in reaching higher optimization performance and less energy consumption ,which 26.02 seconds for single stroke operation and 126.02 seconds for multi strokes operation with the acquisition of logical path results with the absence of intersecting trajectories.

Service Strategy by Considering Price Factor to Increase Titan Tire Customer Satisfaction

Sri Wahyuni Tarigan, Anita Christine Sembiring, Jusra Tampubolon, Kelvin, Irwan Budiman

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 15:20 - 15:30

Titan Tire customers complain that the price of tires offered is more expensive than the prices offered by other tire companies. The price factor is very influential on customer satisfaction in addition to service quality. Price is an important aspect that is inseparable from the purpose of sales and service activities. Besides, Titan tires do not provide sales price determination to customers. This has a negative impact on customer satisfaction as shown in Table 3.3 where there are more unsatisfied customers than those who are satisfied with the services provided by Titan Tire. Multiple linear regression testing $\alpha = 0.05 >$ sig. = 0.00 which states that the service strategy by considering price factors should be able to increase customer satisfaction. For that Titan Tire wants to improve customer satisfaction in the future by improving better service strategies. One of these strategies is Titan tires offering more affordable prices as in Table 3.2 where the selection of affordable prices is more attractive to customers than expensive by renovating service spaces in the form of waiting rooms equipped with facilities such as wireless fidelity (wifi), television and automotive magazines and renew old machines with new machines that are more up to date

Abstracts

The Effect Of Cd(II) Metal Ion Induction To Organ Experiment Rats

Ali Napiah Nasution, Rahmiana Zein ,Hermansyah Azis,Djong Hon Tjong

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 15:30 - 15:40

Compound Cd(II) is a hazardous compound with high toxicity. Cadmium toxicity contributes to a large number of health problems. Cadmium concentrated in the kidneys, liver and various types of organs is estimated to have a higher toxicity than those of the common cold. Exposure to cadmium can cause damage to organs especially in humans which can cause "disease". The method used in this study is the Batch system. The accumulation of Cd(II) metals in each organ of the rat experimental exception in the brain. Based on the table above, it can be seen that the differences in the distribution of cumulative metal Cd(II) in the rat organ of the experiment. The highest accumulation of Cd(II) until the least consecutive number is the liver, lungs, heart, kidney, reproductive organs and spleen. From this study it can be concluded that the highest accumulation in the liver after Cd(II) ion-induced.

Multichannel Electroencephalography-based Emotion Recognition Using Machine Learning

IN Yulita, RR Julviar, A Triwahyuni, T Widiastuti

Track: Class 3 Computer Science | Session: 2 | Time: 16:35 - 16:45

In recent years, research in the field of human-computer interaction (HCI) has focused on strengthening machine functions in recognizing and understanding human emotions. Emotion recognition can be done in several ways, among others, through sounds, facial expressions, or a combination of both. The different sounds and facial expressions from different races and nations cause less accurate in the reading of emotions using these methods. Another method for recognizing emotions can be done by analysing the data from an electroencephalograph (EEG). The EEG signals from the human brain are the result of various activities carried out. One of them is emotion. The EEG signal used in this study came from the DEAP dataset. This dataset consists of 32 files, each of which contains 40 EEG recordings. The emotions from this dataset are classified based on the dimensions of arousal and valence. The signal was then decomposed into three different frequency groups (alpha, beta, and gamma) through band-pass filtering. After that, the principal component analysis (PCA) and resampling were carried out. The classification processes used a number of methods of machine learning. The result was known that the performance of K-star was the highest while naïve Bayes was the lowest. The accuracies of K-star in arousal and valence classification were 81.2, 82.6, respectively. The naive Bayes got 51.2 for the arousal, and 52.5 for the valence.

Abstracts

COLLABORATION OF RSA ALGORITHM USING EM2B KEY WITH WORD AUTO KEY ENCRYPTION (WAKE) CRYPTOGRAPHY METHOD IN ENCRYPTION OF SQL PLAINTEXT DATABASE

Elwin Yunith Purba, Syahril Efendi, Pahala Sirait, Poltak Sihombing

Track: Class 3 Computer Science | Session: 2 | Time: 16:45 - 16:55

RSA algorithm is a modern cryptographic algorithm and is often used for data security, and until now no one has been able to solve it. This algorithm uses two keys, public key and private key, the degree of difficulty of this algorithm lies in the factorization of large prime numbers. EM2B key algorithm function is to change the primary key become a new key into ASCII characters. This algorithm has the increament key algorithm function to change the length of the key characters are same as the plaintext. The Wake method is a stream cipher algorithm uses a 128 bit key and a 256 X 32 bit table. The strength of the RSA algorithm is the bit length used, and the strength of the WAKE method also lies in the bit length used and many rotation that occur. While the strength of the EM2B key algorithm lies in the increament key. After testing, the combination of three alogritmas consists of the RSA algorithm using the EM2B key and WAKE method and a combination of two algorithms with WAKE method using the EM2B key, the encryption results are better and safer than using only one WAKE algorithm.

Floor Slab Analysis (Study Case: One Residence Apartment Batam Centre)

Yayuk Setyaning Astutik

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 15:40 - 15:50

Reinforced concrete slab are widely used in civil buildings, including as building floors, roof floors, bridge floors and dock floors. The load acting on the slab is generally calculated against gravitational loads. This study aims to analyse floor slab in the One Residence Batam Centre Apartment Construction Project. The moment method is used to predict the magnitude of frame and shrinkage values that refer to 2002 SNI. Loading is carried out from dead loads and live loads with a two-way reinforcement system. Reinforcement is done using steel with a diameter of 10 mm. So that the minimum area is 313 mm square with a distance of 250 mm and is in the safe category. From the calculation results obtained the concrete elastic modulus obtained by 250 Mpa with a reinforcement ratio of 0.0025. Checking the time dependency factor for dead loads is carried out within 3 months, 6 months, 12 months and more than 5 years. Long-term deflection due to frame and shrinkage is still in the safe category.

Determination of Trash Hauling Routes Using Floyd Warshall Algorithm in Medan Barat District

K Syahputri, Rahmi M S, Indah R, Mangara M T, and Josua

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 1 | Time: 15:50 - 16:00

Medan Barat District has many environmental problems involves less optimal waste management which is results in a large amount of trash is not transported and the area must be serviced by waste management is as many as 9 points of temporary landfill where the volume of waste is at each temporary landfills point is different, this study applies Floyd Warshall method to determine the waste transport route in the Medan Barat District. This method allows the determination of routes by taking into vehicle capacity and volume of waste at each polling station. The data used is the distance between the pool with the temporary landfills point and the distance between the temporary landfills points. The results obtained in this study that total distance of all trucks carried out in Medan Barat District is 415 km and after using Floyd Warshall method, a total distance has been 387,11 km and total saving distance is 6,7%. Total cost has spent in Medan Barat District about Rp.712,000 per day and after using Floyd Warshall method, total cost has been Rp. 664,000 per day and total cost saving 6,7%. Based on the result, it indicates that the route made using Floyd Warshall method produces a better trash hauling route.

Economic Feasibility Analysis of Hydrogen Production from Raw Materials of Oil Palm Empty Fruit Bunches

Rahmi M Sari, Mangara M Tambunan, Taufiq Bin Nur, Indah Rizkya, K Syahputri, Wandika Nasution

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 16:15 - 16:25

The potential of hydrogen as a fuel for the future has been discussed as part of the energy agenda for decades. Many research projects led by academics and engineers are geared towards the future use of hydrogen in the energy supply chain for road transport, and power generation, as well as for energy storage. Economy base hydrogen is view period long many countries to system energy sustainable. The makers the policy is also being learn implementation and challenges headed shift from something economy based on carbon that doesn't sustainable to be economy sustainable hydrogen. Challenge in build infrastructure discussed from perspective planning for the economy of hydrogen production feasible. In this study, the economic feasibility of hydrogen production was calculated from raw oil palm empty fruit bunches in North Sumatra. Assessment of several factors in getting results BEP production value is 175 965 kg with a value of Rp37.684.532.764 NPV, IRR of 13.976%, and PP during 6 years, 5 months.

Abstracts

Determining credit term strategy of textile industry

Grace Aloina, Uni PratamaPebrina br Tarigan , Anita Christine Sembiring , Irwan Budiman, Koko Pratama Saragih, Uke MPP. Siahaan

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 16:25 - 16:35

Textile industry is an industry that produces the yarn into fabric with 100% raw material of synthetic polyester that is recycled. This research is conducted based on the issue in company. The decreasing in sales at retailer sector is the concern of the company. The analysis of the problem is by doing survey marketing mix effect (7P). The result of this survey shows the factors such as products, people, processes, and the price are significant in influencing the buying decision of the products. Components on the pricing strategy that dominance affected is credit policies. For that, the authors propose a strategy in credit term policy. An analysis is conducted with a comparison between the previous policies of the proposed credit policy. The method used is Sartoris-Hill Model referring to the feasibility NPV. This feasibility of this proposal requires working capital amount Rp 11,945,074,622.

Lead Time Reduction In Shipping Process By Using Lean Concepts At PT. Zaitunindo Citra Perkasa

Koko Pratama Saragih, Anita Christine Sembiring, Grace Aloina, Uni Pratama Pebrina Tarigan

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 16:35 - 16:45

PT. Zaitunindo Citra Perkasa (ZCP) is a company running in distributing a number of technical products and equipments. The shipping system implemented by the company at this time causes some complaints from customers. Complaints submitted by customers to companies include delays in delivery (time), employee attitudes, product quality delivered and product prices. The method used to eliminate waste using a lean approach was value stream mapping, cause and effect diagram and FMEA. There are 3 types of waste that can be eliminated, namely excessive activities/processes, waiting and movements that are not needed.
Using cause and effect analysis and FMEA, it obtained a reduction in lead time by 1 day 1 hour 30 minutes presented in the future state map of the product delivery process. The proposed improvements produced in this study are to simplify activities, conduct training for permanent employees and provide additional equipment in the transportation process such as wheel boxes.

Optimization Consumer Cost of Food Industry with Perishable Characteristic

I Rizkya, A A Nasution, K Syahputri, R M Sari, I Siregar, Erwin

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 16:45 - 16:55

Food product has time limit usage, namely expired date. The time limit for product usage (expiration) is one of the factors affects the number of inventory and total inventory costs. Expiration factors are important in planning because they do not only affect the costs to the company but also includes product safety issues when consumed. Products are close to expirate date will decrease in sales value until they have no value at all. Expiration factors must be considered in determining the optimal number of inventory capable to minimize the number of expired products and minimize the number of lost sales. This paper describes the Q method approach to obtain optimal order size capable to minimize expired products and lost sales to the consumer. Q model approach is used for product inventory models are undurable. The product inventory model for undurable product calculates the inventory not only minimize due to demand but also due to damage. The study was conducted to minimize the total costs by consumers cost and considering expired factors and lost sales. The results obtained in this article shows that the total cost of consumers is IDR 3.430.756/month and acceptance frequency is 22 times per month

Improving Hospital Service Quality Strategy with Servqual and Kano Methods

U P P Tarigan, G A Sitepu, I Budiman, A C Sembiring, K P Saragih, H Zhow

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 16:55 - 17:05

In daily activities, humans cannot be separated from the services offered by certain organizations, such as the use of public transportation, education, food, health and much more related to daily life. Therefore competition between services cannot be avoided. Quality is related to customer satisfaction. Customers will be the benchmark for the quality provided by certain companies. Companies can increase customer satisfaction by providing good service, of course. The hospital is one of the companies engaged in public health services. To get what the customer wants, the hospital is required to provide maximum satisfaction to its customers, but in reality it still often encounters customer dissatisfaction when using hospital services. In addition, based on the results of previous studies, it was found that some service attribute attributes were still at a level that needed improvement. In addition, it was found that some service attribute attributes were still at a level that needed improvement. Corrective actions can be done by the Kano method. The Kano method categorizes product or service attributes based on how well a product or service can satisfy customer needs, with service attributes can be divided into several categories.

Designing Android Gaming News & Information Application Using Java-Based Web Scraping Technique

Evta Indra, Steffanily

Track: Class 5 Information System & Technology | Session: 2 | Time: 16:45 - 16:55

It is important for gamers to know the lastest news update about video games that they like. Researcher finds that there are many people who likes and want to know more about video game, but services available to find news about video games are so limited, espcially on Android platform. The solution of this problem is to design an Android-based application where the apllication can contain the lastest video game news from reliable sources. Aside from news, other necessary video game information like video game releases, video game reviews, the history, franchises, system requirement and also famous people in the industry. All these information will be pulled using a technique called Web Scraping, which is used for extracting data from websites. This research is expected to make an Android application which contains all information and news in video game world that can provide a complete and detailed information.

Application of C4.5 Algorithm for Cattle Disease Classification

Evta Indra, Ridho Hakim, Arlinanda, Kevin Hoo, Siti Aminatunnisa, D.M selfia sembiring, Yeni Gultom

Track: Class 5 Information System & Technology | Session: 2 | Time: 16:55 - 17:05

Data mining is a series of process to gain values such as informations that is manually unknown from a database by mining patterns from the data (with the intention to manipulate data into more useful information that is obtained by extracting data and recognizing important pattern or pulling data from the database). The intend of this research is to process cattle disease cases, which by far no research has been done to produce useful knowledge/science for institutions (Food and Animal Security Service) using data mining technique (C4.5 Algorithm). In the future, this research will be used by Food and Animal Security Service to counsel rancher in some area. This research will result in a decision tree and will classify cattle disease rate.

Tools For Detecting And Control Of Hydroponic Nutrition Flows With Esp8266 Module

Poltak Sihombing, Muhammad Zarlis, and Heriyance, Nadia Alkarina

Track: Class 2 Electrical Engineering | Session: 2 | Time: 16:15 - 16:25

In this paper, we propose a tool for detecting and controlling the flow of food nutrients on the hydroponic plants using the ESP8266 circuit. First step, the sensor will detect the high nutrient solution and temperature around the hydroponic plants, then send it to the Arduino Uno microcontroller. Then from the microcontroller will be forwarded to the ESP8266 circuit module and send it to the Android Smartphone. The results of monitoring sensors that sent via ESP8266 will be used as parameters for flowing nutrients or not, and the parameters for turning on the cooling fan or not. Thus it is expected to improve the quality of hydroponic plants automatically.

Tools For Detecting and Control of Soil pH by Probe Sensor based on Android

Poltak Sihombing, Bisman Peranginangin, Dahlan Sitompul, and Rido Rivaldo

Track: Class 2 Electrical Engineering | Session: 2 | Time: 16:25 - 16:35

In this study, we developed the tools for checker of pH (Potential of Hydrogen) in some areas in order to help the Farmers to optimize crop yields. We use a maps from Google in order to find out the pH value of the soil in a particular region. We have tested a number five soil samples, namely humus soil, soil with a mixture of manure, fertilizer, compost, and soil mixed with sand. The research shows the soil pH based on android by online. Furthermore, the pH value and address of the coordinates tested are stored in the firebase database. In checking of soil pH, the system only need about 2-5 seconds during the processing to deteck the pH of the soil.

Abstracts

Solar Charge Controller Using Maximum Power Point Tracking Technique

Marhaposan Situmorang , Kurnia Brahmana , Takdir Tamba

Track: Class 1 Mechanical Engineering | Session: 2 | Time: 16:55 - 17:05

Maximum Power Point Tracker (MPPT) has been constructed which consist of booster Direct Current to Direct Current (DC to DC) converter, triggered by Pulse Width Modulation (PWM) given by Arduino microcontroller and MOSFET as a switch. The maximum power resulted from Photovoltaic Generator (PVG) which was illuminated with halogen lamp was tracked using Perturb and Observe (P&O) algorithm which was written in Arduino Microcontroller. The execution of P & O algorithm was based on voltage and current measurements using voltage and ACS 712 current sensors and then the calculation of power value was used to decide the execution direction of P&O algorithm to track maximum power value. The measurement results of current, voltage and power before and after tracking was tabulated in Excell Table and plotted in graphical form using Parallax Data Acquisition (PLX- DAQ) software. The tracking output voltage was achieved higher than input voltage value and nearly constant, although input voltage values was slightly varying. The implementation of MPPT in battery charging process gives that charging time of 8 hours was needed without using MPPT and charging time of 3 hours and 20 minutes was needed after using MPPT.

Time-Resolved Spectroscopy Using Boxcar Integrator

Bisman Perangin-angin, Poltak Sihombing

Track: Class 2 Electrical Engineering | Session: 2 | Time: 16:35 - 16:45

Observation of fluorescence decay signal of condensed-state molecular samples in the time domain has proved very useful for its identification and analysis. In order to overcome the noise problem in the generally weak fluorescence signals a double-gated boxcar integrator has been designed and incorporated into a spectrometer. The design concept and the working principle of this spectrometer is presented along with detailed description of its subsystems. Performance of this spectrometer has been tested with well-known sample (rhodamine 6G) and the results are dually analyzed. Application of this spectrometer to the measurement of fluorescence spectrum and mean life time of an E. Coli bacteria sample is also described in this work.

Abstracts

Fluorescence Spectra Measurement of essential Oils

Bisman Perangin-angin, Kerista Tarigan, Takdir Tamba

Track: Class 2 Electrical Engineering | Session: 2 | Time: 16:45 - 16:55

Identifying materials using fluorescence spectroscopy methods has several advantages including fast, accurate and relatively low cost. This method can not only identify the material but can be detected whether the material is still pure or has been given a mixer. The purity of patchouli oil has been identified by observing and analyzing the fluorescence spectrum (.λ abs = 509 nm, ,λ eks = 542nm) Observations were made for pure patchouli oil and patchouli oil which had been mixed (impure). By comparing the two data, it can be distinguished that the oil is still pure and impure. In this study, it can also be determined the mixture content in patchouli oil.

Detection of Strawberry Plant Disease Based on Leaf Spot Using Color Segmentation

Dwi Esti Kusumandari, Muhammad Adzkia, Arjon Turnip

Track: Class 3 Computer Science | Session: 2 | Time: 16:55 - 17:05

Strawberry plant is a fruit plants that have a high enough value. Strawberry fruit contains high amounts of fiber, vitamin C, folic acid, potassium and antioxidants. Cultivating strawberries is an easy task because strawberry plants are often affected by both micro-organisms, pests and bacteria. To reduce the spread of disease in strawberry plants, the initial introduction of strawberry disease will be carried out using digital image processing. Digital images of leaf are processed to determine the health status of the strawberry plant. The process carried out on digital images includes image improvement, color segmentation from RGB color space into HSV color space, regional segmentation to determine the area of deformed leaves and intact leaves. The image processing shows that 85% accuracy of detection is obtained.

Abstracts

Arrythmia Classification of Electrocardiogram Recorded Data with Random Forest Method

Sutrisno Salomo, Dwi Esti Kusumandari, Yosafat Vincent Saragih, Arjon Turnip

Track: Class 2 Electrical Engineering | Session: 2 | Time: 16:55 - 17:05

Arrythmia is a condition, that our heart beat rhythm change irregularly. The doctor do manual classification process to analyze and diagnose the heart beat rhythm from ECG record. We proposed Random Forest method as classification method, to solve the problem. To cut the preprocessing time, we use WFDB library. INCART arrythmia database is provided as our training and testing data to build the classification model. The feature use is QRS amplitude, QRS amplitude Forward, QRS amplitude Backward, RR interval, Heart Rate Variance (HRV) on the QRS point, backward and forward.We using Scikit Learn for build our classification model, and tested using Scikit Learn and Weka. To classify our object data, we using FOGD-based QRS detector, and to provide our object dataset, Bitalino machine are used. The result still under consideration and need to validate by physician or cardiologist.

Comparing Classification via Regression and Random Committee for Automatic Sleep Stage Classification in Autism Patients

IN Yulita , MI Fanany, AM Arymurthy

Track: Class 3 Computer Science | Session: 2 | Time: 17:05 - 17:15

The prevalence of autism children has increased rapidly in the last few periods. There is no cure for autism. But the management and treatment of accompanying medical conditions can be done. One of the effects of his medical condition is a sleep disorder. But children with autism have difficulty communicating the disorders they experience. In medicine, the detection of sleep disorders can be done through a test called polysomnography. One of the purposes of this test is to find the patient's sleep patterns through the sleep stage classification. But the doctors need several days to analyze each test. This study proposes an application that can classify it automatically. The method used was based on machine learning. The two classifiers were classification via regression and random committee. The both performances were compared in sleep stages classification for the autism patients. The result showed that random committees had a higher performance than classification via regression. Its performance got more than 85% for accuracy, precision, recall, and F-measure. This study also implemented resampling to overcome imbalance class problems. It can be seen that this process was useful in improving the performance of both classifiers.

Priority of Selection Suppliers With Fuzzy ANP

I Siregar , I Rizkya , K Syahputri , R M Sari , Anizar , F Ariani , A Pintoro

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 17:05 - 17:15

Procurement of raw materials is the main activity in ensuring the smooth production. Delivery delays by suppliers of raw materials affect the smooth production so the impact on the delivery of orders to customers. XYZ delayed delivery of raw materials foam and wire by each supplier with a frequency of 66% of the total delivery made. Therefore, supplier evaluation needs to be done so that the company can take appropriate decisions based on the priority suppliers. Integration of Fuzzy Analytical Network Process (FANP) and Complex Proportional Assessment with Grey Theory (COPRAS-G) is used in the evaluation of the supplier where the scale of influence among criteria and assessment of suppliers of the criteria obtained using a questionnaire distributed to five managers to gain weight - the weight criteria which serve as inputs for priority suppliers. Results priorities foam raw material suppliers HI, PF, MF, and DCI while the priority sequence obtained raw materials supplier wire are BUWI, AJ, and GGS.

Properties of Unsaturated Polyester Composite Filled Activated Zeolite : The Effect of Filler Addition and Compression

H Nasution, D M Putra , M T Al Fath

Track: Class 1 Mechanical Engineering | Session: 2 | Time: 17:05 - 17:15

The mechanical and physical properties of polyester composites filled with activated zeolites as fillers were investigated. Zeolite is an alumina silicate mineral that has cavity structures. The ability of the cavity structure can be maximized by activation using hydrochloric acid (HCl) 2 M. To achieve this goal, the zeolite was activated and proved it by performing morphological analysis using Scanning Electron Microscope (SEM) to see the surface structure. The aim of this study is to determine the effect of the activated zeolites content and hot press compression on the tensile and water absorption properties of polyester composites. The best tensile properties were found in ratio of unsaturated polyester with zeolite 70:30 (w:w) at a pressure of 125 Psi with a tensile strength of 38.51 MPa. SEM characterization showed a more rough breaking surface, that is in the ratio of polyester with zeolite 60:40 (w:w) at 75 Psi pressure because of the lack wetting between the matrix and activated zeolite. The water absorption of composite has increased as the addition of activated zeolite.

Abstracts

Measurement of Supply Chain Performance in Manufacturing

I Rizkya , J Hidayati, K Syahputri, R M Sari, I Siregar, K Siregar, J Utaminingrum

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 17:15 - 17:25

Supply chain management has been a major component of a company's strategy to compete through increasing organizational productivity and profitability. This paper is useful to provide an application of supply chain performance assessment in the manufacturing industry in an effort to increase the success of the company. Through performance assessment metrics of supply chain provides information on the position of the company's achievement. That is able to provide management with an overview of the company's achievements to meet customer demand. There is no measurement of supply chain performance as if the condition of company is good. Apparently, the company encountered a problem and eventually caused the company to be unable to meet demand and lead to loss of customer trust. The Performance of Activity (POA) Model is able to describe the real conditions of the company's supply chain performance. To measure the supply chain performance using the POA model. POA model have 7 dimensions of assessment, namely cost, time, capacity, capability, productivity, utilization, and results. By using the performance of activity, there were two dimensions achieved, namely the availability of the company (90.8%) and machine utilization (75,1%). While a dimension is not achieved, namely the reliability (86.7%).

Web Performance Optimization Techniques for Biodiversity Resource Portal

Edy Budiman, Novianti Puspitasari, Masna Wati, Joan Angelina Widians and Haviluddin

Track: Class 3 Computer Science | Session: 2 | Time: 17:15 - 17:25

Monitoring and evaluation is a part of management that must be done if want to an increase, and improvement in performance. Therefore, these activities are needed as an effort to develop, manage and optimize the Biodiversity Resource Portal. This study aims to analyze the efficiency of the Biodiversity resource portal of the key performance indicators on Image and script (CSS / JScript) content. Pre-Test and Post-Test analysis methods using Web Performance Optimization Techniques. Evaluation the test results showed an increase in end-to-end web performance after optimization, from the efficiency score of pretest Grade F (13%) to Grade B (82%) post-test.

Abstracts

Model Framework for Development of Biodiversity Information Systems (BIS)

Edy Budiman, Novianti Puspitasari, Masna Wati, Haviluddin and Robbi Rahim

Track: Class 4 Computer Science | Session: 1 | Time: 14:00 - 14:10

The aim of the study was to design a framework for developing bioinformatics resource information systems using the Model-View-Controller (MVC) design pattern. Research contributions generate a framework as an approach model for the development of Biodiversity Information Systems which aims to improve computational capabilities and management of biodiversity data resources for the use of public information clusters. This product combines component capabilities (View Controller Model (MCV), Object Relational Mapping (ORM) and ICBN Nomenclature Taxonomy) with reusable resources. The results of the study have produced a special prototype in the form of a Framework in the Development of Bioinformatics resource information systems that can be accessed online in the site: http://borneodiversity.org/index.

First-order Feature Extraction Methods for Image Texture and Melanoma Skin Cancer Detection

Masna Wati, Haviluddin, Novianti Puspitasari, Edy Budiman and Robbi Rahim

Track: Class 4 Computer Science | Session: 1 | Time: 14:10 - 14:20

Skin cancer is a disease characterized by the growth of uncontrolled skin cells, which can damage surrounding tissue and spread to other body parts. The purpose of this study was to facilitate early recognition of skin cancer by applying the first-order extraction method for feature extraction based on texture to obtain a good level of accuracy and classification methods using Multilayer Perceptron Neural Network (MLP NN). The results of diagnostic identification consist of 2 outputs, namely melanoma and not melanoma. From the research, accuracy measurements were obtained through 4 sets of test images using melanoma and non-melanoma images and the results showed that the lowest level of accuracy was 80% and the highest level of accuracy was 88.88% so the overall accuracy of the level was 84.37%.

Abstracts

Role Analysis: Trust in Mediating Informal Learning towards Customer Behavior to use Electronic Banking

Mohammad Aldrin Akbar, Yendra, Idayanti Nursyamsi and Edy Budiman

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 17:25 - 17:35

This study aims to analyze the role of trust in mediating informal learning on customer behavior to use electronic banking in one of the cities in Eastern Indonesia. The sampling technique used in this study was purposive sampling. Data was collected by giving questionnaires directly to respondents. The total sample that can be further analyzed is 110 respondents. Data analysis using Structural Equation Modeling - SEM using the AMOS program. The results show that trust is proven to mediate informal learning on customer behavior to use electronic banking. Based on the three findings of this study, it appears that trust can fully mediate the relationship between informal learning and the actual behavior of customers in using electronic banking. Based on the results of this study, the trust variable is very important in predicting customer behavior. Therefore, service providers need to understand customer trust and this information can only be obtained through ordinary research results.

Fetal heart detection based wide area network technology with wireless sensor transmission

Chrismis Novalinda Ginting, I Nyoman E. Lister, Mangatas Silaen, Ermi Girsang, Yonata Laia, Arjon Turnip

Track: Class 2 Electrical Engineering | Session: 2 | Time: 17:05 - 17:15

Fetal heart detection technology, especially in remote areas, has so far been manual and lacks facilities for monitoring fetal safety. This results in many pregnant women at risk of labor, so early detection of fetal heart conditions becomes important. Development of fetal heart detector technology based on wide area network technology that is able to provide realtime monitoring results and is connected to the proposed wireless sensor network transmission. Its integration with smartphones makes it easy to use in rural and remote areas. The design of this monitoring system called detector of fetal abnormalities technology has the advantage of sending medical data for pregnant women and fetal heart conditions to families and to health care centers for pregnant women in large cities or obstetricians. Visualization of data in image, graphic and text, can be used as a digital-based maternal and fetal health detector tool. In the initial trial, fetal heart rate data from 4 pregnant subject were evaluated and obtained results with an average curation of 94%.

Abstracts

An Empiric Model of Face Detection based on RGB Skin Tone Color

Robin, Ferawaty, Jusin, Syanti Irviantina, Wenripin Chandra

Track: Class 4 Computer Science | Session: 1 | Time: 14:20 - 14:30

Face detection is the most basic process of any face processing field. Most digital images data are stored in the value of RGB (Red, Green, Blue) intensity data. Our research use the RGB model to detect human skin color like area on face digital images using different RGB values than [1], [2], [4] and [5]. After applying skin tone color segmentation on digital images, detection area will be optimized using human head properties in eliminating non-human face skin tone area detection. Our detection result is mostly accurate for most common images but there are still a few issues on low light face skin color captured by digital cameras.

Implementation of AHP Method for Determining Best Employee

Edward Bahri, Lisa Joselin, Jessica Tania, Merry, Wilson Rusli, Mardi Turnip

Track: Class 5 Information System & Technology | Session: 2 | Time: 17:05 - 17:15

In organisation, the judgement of best employee is still carried out conventionally. That is why to resolve the problem will be built a decision system using AHP method. The Criteria used in these study are attitude, productivity, discipline, cooperation ability, educational level, neatness, loyalty, realization of work plan. Based on the research conducted, there were significant differences before and after using this application.

Abstracts

Abnormalities state detection from P-wave, QRS complex, and T-wave in Noisy ECG

Chandra Wijaya, Andrian, Mawaddah Harahap, Christnatalis, Mardi Turnip, Arjon Turnip

Track: Class 4 Computer Science | Session: 1 | Time: 14:30 - 14:40

In last 5 years Physical Computing has been a constant discussion in the whole world. With so many Physical Computing turned into wearable technology. We are trying to take one of thousands of example, in this case ECG processing, and put it into the test. We tried to expand all the features and pin point all the exact point of the PQRST of the ECG. We also tested it in three state of condition, which is: sitting-rest, walking, and fast-paced walk to see how our program would perform in that particular varies of activity. From the analysis conducted, it can be concluded that the output of our proposed combination of method shown a significant performances.

Improvement of Health Clinical Service Processes Through The Implementation of Lean Services and Facility Layout

U Tarigan , Y O Hutauruk, U P P Tarigan

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 17:35 - 17:45

Clinic X is a health service unit in Medan that provides services to the general public and BPJS. Based on preliminary observations, there was a buildup of outpatients which resulted in many queue services. The cause of a large number of queues is that there are non-value-added activities in process services at Clinic X, which await activities by patients, excessive and unnecessary movements by administration and doctors. Therefore, it is necessary to minimize waste and improve the layout of facilities to speed up the service process and reduce patient waiting time. Lean service methods are used to identify wastes that affect servants processing time and improve processes. Systematic Layout Planning methods are used to redesign the proposed layout according to the repair process. The results show that the proposed layout is better than the actual layout in terms of processing time and total transfer moments. Total transfer moment of 22.62% reduces the proposed layout 1,935 meters / week to 687 meters / week. And processing time was reduced by 22.62% from 4271.8 seconds to 3304.67 seconds.

Abstracts

Android Based Optimization and Queue System at Passenger Vessel Services Crossings at Samosir Harbor

Yonata laia, Arjon Turnip, Billy Marlince Nababan, Oloan Sihombing, Delima Sitanggang, Mardi Turnip, Robin, Niskarto Zendato, Saut dohot siregar, M. Disrmnsyah batubara, Jepri Banjarnahor

Track: Class 4 Computer Science | Session: 1 | Time: 14:40 - 14:50

Transportation facilities is essential to a city, including the city of Samosir. But unfortunately, transportation facilities in the city of Samosir are still inadequate, especially transportation between the islands. Shipping line is one of many transportation One of transportation widely used today. But lately, the other vessels that have been used so far have begun to experience various problems, such as increasingly long queues and long queues of passengers. This study designed an Android-based queue application that which can be downloaded on from smartphone application store. By using this application the passenger does not need to order a ticket directly through a counter service or to queue to buy a ticket, just order the schedule for the ship's departure. Passengers arrive when the queue number is already available and this application can be downloaded on each handphone's play store. The results of this study show better results because where passengers waiting for the queue usually need 1 to 3 hours, passengers will only need 15 minutes to 30 minutes.

Understanding group signature methods in making digital signatures to maintain the validity of messages

Saut Dohot Siregar, Jepri Banjarnahor, N P Dharshinni, Saut Parsaoran Tamba, Oloan Sihombing, M. Diarmansyah Batubara, Delima Sitanggang, Robin

Track: Class 5 Information System & Technology | Session: 2 | Time: 17:15 - 17:25

Exchange of documents and information in the millennial era is very much using digital technology. To make sure validity the document a signature that is digital is required so that it cannot be faked. The purpose of this research is to make software and how the Signature Group algorithm works in making digital signatures. The method used is the Signature Group method. From the results obtained, the percentage of success of verifying and open for the 2 digit key is 80% and for the 3 digit key is 70%.

Abstracts

Development of audio watermark applications using auditory features

Jepri Banjarnahor, Saut Dohot Siregar, Saut Parsaoran Tamba, Delima Sitanggang, Oloan Sihombing, Marlince Nababan, M. Diarmansyah Batubara, Jaidup Banjarnahor, Ronald Belferik

Track: Class 6 Information System & Technology | Session: 1 | Time: 14:00 - 14:10

Watermarking is a technique for hiding data or information on a digital (image, sound and video) and is not visible to the ordinary eye and is resistant to digitization (editing media, noising, blurring, etc.). While Audio watermark is defined as a technique of hiding data or confidential information into an audio data for "boarding" (audio host), but other people are not aware of the existence of additional data on the data host. Coding phase is hiding data by exchanging the original phase of the initial segment of the sound signal with the absolute phase of the watermark signal, while maintaining the relative phase between the signal segments using different phase segments of the original signal. When the phase difference between the original signal and the modified signal is small, the difference in sound produced is not detected by human hearing. To recognize ownership of multimedia content, testing is done first by combining the cover and watermark files. The result of the test is the watermark used.

Grouping of Book Data in Libraries Using the K-Means Clustering Method

Saut Parsaoran Tamba,Victor Marudut Mulia Siregar, Jepri Banjarnahor, Delima Sitanggang, Saut Dohot Siregar, Windania Purba, Maria Sihombing, Oloan Sihombing

Track: Class 6 Information System & Technology | Session: 1 | Time: 14:10 - 14:20

Clustering is a process of sorting a data set into separate cluster groups and each has similarities. This study aims to classify book information contained in the library of the University of Prima Indonesia. Book grouping is done using the K-Means Clustering method. In this K-means Clustering algorithm, the variables used as input are Name, Book Title, and Author. The resulting output consists of 3 clusters, namely the most frequently borrowed books, frequently borrowed books, and books that are rarely borrowed. With the use of the K-means Clustering method, the final results obtained consist of: cluster-1 members as many as 19 members, cluster-2 as many as 22 members, and cluster3 as many as 19 members. From the borrowing data, it can be seen that cluster-2 has more members compared to cluster-1 and cluster-3. Information on grouping this book data can be used by the Library in terms of selecting books that must be added in the library and to minimize books that are rarely borrowed so that books are not stacked which is rarely borrowed, so there is a place for books to be added to the library.

Abstracts

Optimazation Of Sputtered n-Type GaN/InGaN For Cu(In,Ga)Se 2 Thin Film Solar Cells

Albert Daniel Saragih, Hairus Abdullah and Dong-Hau Kuo

Track: Class 2 Electrical Engineering | Session: 2 | Time: 17:15 - 17:25

Cu(In 1-x Ga x)Se 2 thin film solar cell with 3.64% efficiency has been demonstrated by using n- Type GaN/ In 0.3 Ga 0.7 N. The CIGSe thin film was prepared by co-sputtering with two targets of Cu-In and Ga 2 Se 3 +Sb 2 S 3 . CIGSe films on the Mo/glass substrates were made by co-sputtering technique at 100 o C with a metal target of Cu-In operated at 15 W and a cermet target of Ga 2 Se 3 +Sb 2 S 3 at 55 W, followed by thermal annealing at 600 o C for 1 h. The properties of the CIGSe thin film was studied by measuring the electrical, structural and crystal structure. Solar cell devices were designed by depositing ~50 nm GaN layer and ~300 nm In 0.15 Ga 0.85 N or In 0.3 Ga 0.7 N followed by coating front contact with 300–400 nm indium-tin-oxide (ITO).

Diagnosing diseases system with method backward chaining and certainty factor based android

Angel Mariana Tambunan, Sari Ratnawati Siringoringo, Delima Sitanggang, Marlince Nababan, Rani Aruan, Putri Intan, Mey Simalango

Track: Class 6 Information System & Technology | Session: 1 | Time: 14:20 - 14:30

Rice is a producer of basic human needs that have a very important role. Every use of new seeds can cause disease in new plants and often the results obtained are not optimal because they do not know more precisely the type of disease that attacks the rice plants. Most rice farmers still use manual methods to find out the existence of the disease in the rice plants, namely by seeing it directly in the rice fields so that often rice farmers are too late to know these symptoms due to the lack of more knowledge and understanding of rice plants. To overcome the problems that occur it takes a system that has the knowledge like an expert. In this study, an expert system with an Android-based design was designed to make it easier for farmers to access information and can be used as a tool to diagnose diseases in rice plants so that they can be accessed wherever and whenever to overcome the problems faced by farmers. In this system applying the backward chaining method as the basis of the rules and the certainty factor method as weighting, so that by using the method that has been applied in testing various types of diseases and symptoms, the diagnosis of the type of blast disease is 80%.

Abstracts

The smart method application for determining outstanding employee

Oloan Sihombing, Giovani Ruth Hanoso, Yonata Laia, Halim Maulana, Marlince Nababan, Delima Sitangga, Windania Purba, Diarmansyah Batubara, Niskarto Zendrato, Saut Dohot Siregar, Saut P Tamba, Jepri Banjarnahor, Siti Aisyah, Evta Indra

Track: Class 6 Information System & Technology | Session: 1 | Time: 14:30 - 14:40

Employees are one of the resources used as a means of movement in promoting a company. Employee performance is very influential on the profits obtained by the company. Therefore, to stimulate employee performance in selecting outstanding employees each period by providing additional bonuses or salaries for selected employees. However, because the process of evaluating and selecting outstanding employees carried out by managers of Human Resource Development (HRD) still uses a conventional system and takes a lot of time, so a decision support system is needed. to evaluate the performance of HRD managers to be more effective and efficient while saving time and energy compared to the current system. This study uses the Simple Multi tribute Rating Technique method to complete the calculation of each criterion and weight. This is useful to facilitate decision makers to evaluate employee performance in selecting outstanding employees.

Application Of Methods Fuzzy Tsukamoto In Determining The Best Lecturer

M.Diarmansyah Batubara, Winda Manda Sari, Siti Aisyah, Oloan Sihombing, Evta Indra, Yonata Laia, Marlince Nababan, Delima Sitanggang, Windania Purba, Saut Dohot Siregar, Saut P Tamba, Jepri Banjarnahor, Muhammad Iqbal, Hafni

Track: Class 6 Information System & Technology | Session: 1 | Time: 14:40 - 14:50

Selection of the Best Lecturer is an award given for the work performance and dedication of the Lecturer for the hard work he did, as well as encouraging the Lecturers to further improve their work performance and service. This study designed and built a web-based PHP application as a decision support system for determining the best lecturers to facilitate the Dean and Admin in making decisions on the Best Lecturers. In fact, there are obstacles faced in determining the Best Lecturer Determination decision such as processing data still manually, making all the best old lecturers' assessments to be completed and taking days. This study uses the Fuzzy Tsukamoto method as a system calculation method, Mysql as a database, PHP as the programming language. The results of the study will produce an application that can be used to assist in the assessment in making decisions to determine the best lecturer.

Abstracts

Designing new employee acceptance personality test application using web-based edward personal preference schedule

Delima Sitanggang, Oloan Sihombing, Yonata Laia, Evta Indra, Saut Parsaoran Tamba, Jepri Banjarnahor, WindaniaPurba, M.Diarmansyah Batubara, Saut Dohot Siregar, Mardi Turnip, Inka Septianingsih Girsang , Anita Christine Sembiring, Irwan Budiman

Track: Class 6 Information System & Technology | Session: 1 | Time: 14:50 - 15:00

Personality diversity possessed by humans makes a doubt on someone to explore a job that interests him. The world of psychology has several test kits that can be used to analyze a person's personality. Which is the final result of the test used to see a person's personality tendencies and what type of work is suitable for interest? Where currently companies both state and private agencies are still using manual tests, namely by making questionnaires or a series of questions that will be given to the object to be studied, then the questionnaires are filled in by each object, then the questionnaire is collected again and added up the value will be obtained a conclusion from the number of values where the results will be used as a reference for the company to place a position for an employee will give a very long time to see the results. With the Edward, Personal Preference Schedule is one personality test tool that is able to reveal 15 personalities. Based on the results of the processed data there are several types of personality, one example of Autonomy, Affiliation, Dominance has a tendency for someone to work in a military section like Tni. Based on the highest value obtained by describing the personality. This system is built to facilitate in analyzing the personality of prospective employees and placement of job positions or professions.

Vehicle Collision Detection Application Through Collision Video Files with Quadtree Algorithms

M Harahap, J Tandean, Endry, W Gunawan, A Wijaya

Track: Class 4 Computer Science | Session: 1 | Time: 14:50 - 15:00

With the progress of digital image processing technology that is increasingly rapid, image processing has been widely used to maximize the usefulness of the webcam interface or CCTV, one of which can be used to monitor traffic flow on the street. One of the frequent occurrences on the street is a crash (collision). The problem that often arises in a collision event is a dispute about the party guilty in the collision. To solve these problems, it is necessary to design a collision detection application. One type of algorithm that can be used is the Quadtree algorithm. This study aims to analyze and design intelligent systems for vehicle collision detection on street through a webcam camera. The method used is the Quadtree algorithm. With the Quadtree Algorithm, we can detect collisions that occur on vehicles with the regions division method. Thus, we can describe the possibilities that will occur in a collision. There are several steps needed in processing which are grayscale, binary image, segmentation, detection, tracking, recognition, and calculation process. The results of this study are vehicle collision detection system on street using the Quadtree algorithm.

Implementation Resource Request Alghoritm In Simulation of Deadlock Avoidance

A W Salim, F Wiranata, C M Mahidin, R F Waruwu, Vikram, S Wardani, A Dharma

Track: Class 4 Computer Science | Session: 1 | Time: 15:00 - 15:10

Deadlock is a condition in the operating system, where processes wait for an event that will never occurs. If a deadlock occurs in a system, the system will hang and cannot be operated. The solution to this problem is to avoid deadlock by closing the possibility that might cause deadlock. This research uses Resource Request algorithm to avoid deadlock. The algorithm will try to lend resources to the process and analyse whether the state after lending resources is safe state or unsafe state. If the state is a safe state, then the loan is given, otherwise if not the loan will be pending until the loan does not cause unsafe state. Application can simulate the requesting of resources by processes and prevent deadlock in the simulation using Resource Request algorithm, which is to ensure that every situation after lending resource is in a safe state. Deadlock will not occur in safe state.

Motion detect application with frame difference method on a surveillance camera

A M Husein, Calvin, David Halim, Raymond Leo, William

Track: Class 4 Computer Science | Session: 1 | Time: 15:10 - 15:20

Security becomes one of the major necessities in our lives nowadays. Feeling secure is a need that every people desire. Criminal activities are still at large with criminals unable to be persecuted without eligible proofs of their misdeeds. Surveillance Camera is one of the better solutions to these problems in which they can be positioned at every corner of a building even streets and alleys. Their functions can be enhanced by adding algorithms that can identify objects. Frame Differences method is an algorithm to identify an object's motion. Using this algorithm, we could differentiate an object moving in the environment. Background subtraction is one of the methods suitable to further improve frame differences thus increasing its effectiveness and precision.

Abstracts

Face tracking with camshift algorithm for detecting student movement in a class

M Harahap, A Manurung, Priya ,A Prakoso, M F Tambunan

Track: Class 4 Computer Science | Session: 2 | Time: 16:15 - 16:25

Face detection (face tracking) has been widely applied for various purposes, including in the fields of entertainment, education and security. Face detection can certainly be done with the camera in real time. For example on a camera on a laptop or camera in a room in real time will detect facial movements. Face detection is implemented using the camshift algorithm. The camshift algorithm works on a search window that can find facial movements in each frame. The camshift algorithm that has been applied can calculate the size and location of the search window that will be used for the next frame. The camshift algorithm can be used for detection such as face detection. The distribution used is hue in the HSV color dimension (Hue, Saturation, Value). The use of this hue distribution is done to overcome differences in human skin color and the background used when taking frames.

Info Search Application on Food Packaging with Suppressed Android Based Text Image

Siti Aisyah, Fransiska Susilawati Nainggolan, Melva Simanjuntak, Edi Apriyanto Lubis

Track: Class 6 Information System & Technology | Session: 1 | Time: 15:00 - 15:10

Information on product packaging becomes a benchmark for the feasibility of its use, especially in food products. So far there are still many consumers who pay less attention to the information printed on the packaging of the products they buy or use. This lack of awareness makes some people suffer losses for the products used. In fact, it is not uncommon for some people to abuse the opportunity to make a profit. Information search application on food packaging with image input is one application that can make it easier for users to see a description of the material on. Artificial Neural Network is widely used by researchers to carry out various image recognition and predictions. One method that can be used to recognize patterns in ANN is Deep Convolutional Neural Networks (ConvNets). ConvNets are special cases of artificial neural networks (ANN) which are currently claimed to be the best model for solving image recognition and detection problems. ConvNets was able to show outstanding performance in the field of image recognition, especially in the field of image recognition, having a performance capable of extracting high-level features. This research focuses on creating an android-based application to find information on food packaging using ConvNets. From the results of the study it was found that the application designed to carry out information retrieval processes on the food printed on the packaging, with accuracy obtained only in conditions of focus and slope when the image is varied.

Abstracts

Analysis A parallel combination between the NTRU, RSA and Triple DES methods for measuring the speed of document security

Christnatalis ,Luken Candawan Hardiaman Hulu ,William, David Rapa Sipayung ,Muhammad Hafis

Track: Class 4 Computer Science | Session: 2 | Time: 16:25 - 16:35

Computer security is a very important thing in an information system. The goal of computer security is as a protection of information against information theft. The purpose of implementing computer security is to prevent data loss and intruders, delete data, access unnoticed, change data and add fake data. Among the people there are many who know about encryption and decryption but not a few also do not know which method is more efficient in the process. Maybe by using these algorithms people can choose and know how long it takes to process from some of these methods.

PACKAGE PLACEMENT APPLICATION BASED ON LOCATION TRACKING ON ANDROID PLATFORM

Delima Sitanggang, Ibnu Reza El Islamy, Denzy, Riko Marsela, Hendra Pasaribu, Rio Filanno, Mardi Turnip

Track: Class 6 Information System & Technology | Session: 1 | Time: 15:10 - 15:20

JNE has a pickup service program to pick up a package of loyal online shop customers. This system still has limitations in terms of interaction with customers and JNE customer service. This causes less than the maximum number of customers or partners to get better service. Based on these problems starting with the manufacture of input-output design with the tracking location method will facilitate customers in the package pick-up process. This research will produce a package pickup application on the Android platform that is created using the Java programming language and uses the MYSQL database so that JNE can do its business activities in a shorter and timely manner. With the use of this application can cause process time savings reaching package pick-up more efficiently, this application can be a better substitute for the previous system

Abstracts

Shortest Path Search Simulation on Busway Line using Ant Algorithm

K Pramono, K Wijaya, W Cuosman, D Hartanto, A Dharma

Track: Class 6 Information System & Technology | Session: 2 | Time: 16:15 - 16:25

The most popular land transportation media is by buses. The route that is passed by bus (busway) must be well planned so that it can reach a number of locations in the area efficiently. The problem occurs is how to determine the shortest path in a busway lane in an area. This problem can be solved using Ant algorithm. Ant algorithm is adopted by the Ant Colony behavior. Naturally, ant colony will be able to find the shortest path on their way from nest to food sources. Ant colonies can find the shortest path between the nest and the food source based on the footprint on the track that has been passed. The more ants that pass through a track, the clearer the footprints will be and cause the trajectory of ants to pass in small amounts, the longer the density of ants will pass through it, or it will not even pass at all. Detecting the amount of density uses pheromone chemicals released by ants. Application can be used to simulate the search of shortest path between several points on the busway path using the Ant algorithm.

Forecasting Determination Of Housing Development Schedule Using Learning Machine Approach Using Clustering Method

Allwin M. S, Andi Tanoto Willy, Forbes

Track: Class 4 Computer Science | Session: 2 | Time: 16:35 - 16:45

Machine learning is a part of Artificial Intelligence that focuses on developing a system that is capable of "self" learning without having to be repeatedly programmed by humans. Machine learning applications require data as learning material (training) before issuing output. This kind of application is also usually in a specific domain alias cannot be applied in general to all problems. Machine Learning is meaningless without data. This means that all Machine Learning applications require data as training material and to be analyzed so as to be able to issue output. Before the machine learning application can work, then he needs data for "training" (training), the results of the training will be tested or tested with the same or opposite data. The output of machine learning is generally in the form of predictions with labels on their level of trust. Clustering classifies data without being based on certain data classes. Even clustering can be used to label the unknown data class. Therefore clustering is often classified as an unsupervised learning method.

Abstracts

The facile synthesis of a nanoscale composite from fly ash and lime stone for paper industry application

Ramadanis , Girsang Ermi , Ikhtiari Refi

Track: Class 1 Mechanical Engineering | Session: 2 | Time: 17:15 - 17:25

aper production by using non-wood materials as well as the utilization of nanocomposite for paper filler application is a strategic plan to support pulp & paper industries in the digital era. Here we report the synthesis of a nanocomposite SiO2/CaCO3 by extraction of SiO2 from fly ash and CaCO3 from limestone via the sol-gel method followed by ultrasonication. The analysis of SEM-EDX, FTIR, XRD and Particle Size Analyzer were used to characterize the nanocomposite. Results showed that the synthesized material has a typical similarity of composition compared to quartz, vaterite, and calcite respectively. Size distribution of nanocomposite was better than PCC, a conventional paper filler used in paper industry. The application of nanocomposite as paper filler would promise the better physical properties improvement. In terms of efficiency, the estimation of production cost by using nanocomposite would be lower than the conventional filler such as PCC. The utilization of hazardous waste from coal combustion would be also important to develop a green framework of pulp & paper industry.

Accuracy Analysis of K-Means and Apriori Algorithms for Patient Data Clusters

N P Dharshinni, Fadhillah Azmi, I Fawwaz, A M Husein, Saut Dohot Siregar

Track: Class 4 Computer Science | Session: 2 | Time: 16:45 - 16:55

Data that continues to accumulate over time needs to be utilized to get new information. Data Mining is a method of determining important patterns in a set of data which include Frequent Itemsets Mining (FIM). Apriori is part of the association rule that is used to determine the associative relationship of a combination of items. But apriori has a high computational time weakness because frequent itemset search process must scan the database repeatedly for each itemset combination. This study aims to see the effect of the k-means clustering algorithm on the apriori algorithm by combining these two algorithms. The test results show that the combination of k-means and apriori algorithms produces more detailed information and faster computation time than the apriori algorithm with a total computing time of 21.93 minutes and a combination of k-means and apriori algorithms 17.41 minutes.

Noise effect analysis on edge detection in detecting digits with bilateral filter

I Fawwaz, N P Dharshinni, F Azm

Track: Class 4 Computer Science | Session: 2 | Time: 16:55 - 17:05

Recognizing characters such as digits in natural images is a challenge in image processing. Edge detection is the first approach in image recognition. Edge detection using Bilateral Filter can improve image quality. However, in image processing, noise often occurs in the image which causes objects in the image to be more difficult to detect. In this paper, we conducted experiments to detect edges by using Bilateral filters on each edge detection operator against digits on SVHN which added noise and analyzes the effect of noise on edge detection. In the proposed method, edge detection of SVHN with Speckle noise does not produce many edges compared to Salt & Pepper noise so digits in SVHN can still be seen. The performance of the edge detection operator with Bilateral Filter can also be seen from the MSE and PSNR values. The lowest MSE value and the highest PSNR value is on Canny when detecting SVHN edges with Speckle noise.

IMPLEMENTATION OF SPEECH RECOGNITION IN APPLICATION OF INDONESIAN-ENGLISH TRANSLATOR

Aninda Muliani, Kennedy, Jerry Marvin, Andrey Wibowo, Harry Sinaga

Track: Class 4 Computer Science | Session: 2 | Time: 17:05 - 17:15

Most of Indonesian-English translator applications are generally text-to-text based, where user type a word or sentence in Indonesian then the application searches for the equivalent word in English then displays it on the screen in text. The use of this application is certainly not a problem if the user is a person who can read and write. In fact, not all users who need a language translator can read and write, for example people with visual disability or illiterate. Therefore, an application that is able to translate Indonesian words into English based on speech-to-speech is needed. The application is made using Visual Basic 2010. There is a voice command based method using speech recognition. The speech recognition method will convert analog sound signals into digital data that will match data with certain patterns stored in the database. The application can not translate words if the pronounciation is not clear. This application get the voice in a certain distance between the device and the user. The farther the distance, the lower the response rate obtained. The application must also be applied in a quiet enough place for the best results. In the future, it is necessary to add the database to help user's convenience using the application.

Redesigning the layout with ALGORITHM CRAFT on boiler manufacturing

A C Sembiring, J Tampubolon, G A Sitepu, I Budiman, U P P Tarigan, K Saragih and S W Tarigan

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 17:45 - 17:55

Smooth production flow must be considered in planning the production floor layout. Good design of manufacturing facilities can increase effectiveness and efficiency through reducing material transfer distances, material handling costs and cycle times used. A boilermaking industry has Constraints in the preparation of machinery so that back tracking occurs which has an impact on long cycle times and increased material handling costs. So this research was conducted to redesign the layout using the graph method and the CRAFT algorithm. And the results of the layout design of the two methods are done by comparing the moment of displacement. The design of the proposal using the CRAFT algorithm provides an increase in time efficiency of 8.95% or the equivalent of 1598 minutes per product and the cost of material handling fell by Rp 47,403.90 / year.

Productivity Improvement In The Production Part Using Marvin E Mundel Method

J Tampubolon, A C Sembiring, G A Sitepu, I Budiman, U P P Tarigan, K Saragih and R Perangin angin

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 17:55 - 18:05

Competition between companies is measured at the level of the company. Many companies fail to implement production plans so productivity decreases. Palm oil mills often experience engine failure so companies often experience stagnation which results in decreased productivity in the company. To examine the problem, it is necessary to measure productivity in the company and design proposals that must be done by the company. In the past data, the company experienced a total productivity index of 71.77% so it is necessary to do a design of engine maintenance proposals so that the time of stagnation can be reduced and the productivity index can increase. After the productivity index is implemented, the lowest total productivity index increases to 161.97% after doing maintenance design, the productivity of the company can increase by 50%.

Abstracts

THE EFFECT OF INFORMATION TECHNOLOGY, QUALITY OF ACCOUNTING INFORMATION AND UNDERSTANDING OF STUDENTS ON ACCOUNTING SOFTWARE USERS

Namira Ufrida Rahmi, Widya Sari, Bayu Wulandari

Track: Class 6 Information System & Technology | Session: 2 | Time: 16:25 - 16:35

This study aims to determine and analyze the influence of information technology, information quality and accounting understanding of the satisfaction of accounting software users. Accounting software that is the object of research is Accurate Accounting, which was studied in computerized accounting courses. This study was conducted in the Accounting Study Program at the Faculty of Economics, Universitas Prima Indonesia, which at the time of this research occupied the fifth semester with 290 students as respondents. respondent. The method of data analysis in this study is to use the SmartPls program version 3 by calculating Pls-algorithm, bootstrapping and blindfolding. Based on the results of the study, it is known that information technology, information quality, and accounting understanding have a significant effect on the satisfaction of users of accounting software and the coefficient of determination of this research model is 53.3%.

Probiotic Activity of Lactic Acid Bacteria Isolated from Several Commercial Fermentation Product in Medan, North Sumatera

A L Davidson, E Lase, I N E Lister and E Fachrial

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 18:05 - 18:15

Lactic Acid Bacteria (BAL) are bacteria that have been used to produce food, which is in the manufacture of fermented milk. In addition, LAB can also be used as a probiotic agent. This study was conducted to look at the resistance of antibiotics, acids and bile salts as a criterion as probiotics. Samples were taken from 6 commercial fermentation products containing BAL. The isolation results obtained all samples had a number of BAL 10 Colonies so that according to the probiotic criteria with the highest number of colonies were Y samples. Test results on 6 types of antibiotics (gentamicin, amoxicillin, ofloxacin, erythromycin, cefotaxime, oxacillin) U samples were resistant to all antibiotics and then product Y. In the test of acid and bile salts, only U samples were taken as the most resistant to antibiotic samples. The test results found that U samples were resistant to acid and bile salts with 100% viability.

Probiotic Activity and Antibiotic Sensitivity of Lactic Acid Bacteria Isolated from Healthy Breastfed Newborn Baby Feces

E Lase, A L Davidson, I N E Lister and E Fachrial

Track: Class 7 Industrial Technology / Industrial Engineering | Session: 2 | Time: 18:15 - 18:25

reastmilk is very rich in nutrients which helps produce good microbiota in infant's gut. Lactobacillus and Bifidobacterium are Lactic Acid Bacteria (LAB) that normally related to infant gut microbiota. LAB can also be used as a probiotic agent. Some conditions for bacteria to be a probiotic are safety, tolerant of acid and bile salt, can make colonies in the gastrointestinal tract, produce antimicrobial substances and able to maintain viability. The aim of this study was to investigate the acid and bile salt tolerance as criterion of probiotic agent and antibiotic sensitivity of lactic acid bacteria isolated from feces of healthy breastfed newborn baby. Sample was taken from feces of healthy breastfed newborn baby. The result showed that the total colony of LAB from healthy breastfed newborn baby feces was 10,2 x 10 CFU/mL. In acidic condition at pH 3 there is one isolate has 100% viability in the first hour period and all isolates have 100% viability at bile salt tolerance. The sensitivity test of LAB isolated from healthy breastfed newborn baby feces was resistance to 6 types of antibiotics tested (Erythromycin 5 µg, Gentamicin 10 µg, Oxacillin 5 µg, Ofloxacin 5 µg, Amoxycillin 25 µg and Cefotaxime 30 µg).

PHILOSOPHY OF FUZZY LOGIC AS FUNDAMENTAL OF DECISION MAKING BASED ON RULE

Murni Marbun, William Ramdhan, Dadang Priyanto, Muhammad Zarlis, Zulkipli Nasution

Track: Class 4 Computer Science | Session: 2 | Time: 17:15 - 17:25

Philosophy is called as mother of science. In its development, philosophy emerged branches of science, which developed into small branches of science, sub- small branches of science. One of the main branches of philosophy is Logic. Logic is a branch of philosophy which can be practiced in daily life. Logic talks about rules of thinking so that these rules can draw correct conclusion, however, in fact in daily life, there are many things can be encountered which cannot be restated whether it is absolutely true or absolutely false. In 1965, Logic Science was developed by a scientist from California Berkeley University; Prof. Lotfi A. Zadeh called it as Fuzzy Logic which mapped an input space into an output space by applying IF-THEN rules for drawing correct conclusion or right decision toward something that is absolutely true or absolutely false.

Abstracts

Utilization of Voice Recording Technology in Web-Based Meetings Automatically

Marlince NK Nababan, Muhhamad Yasir, Yonata Laia, Oloan Sihombing

Track: Class 6 Information System & Technology | Session: 2 | Time: 16:35 - 16:45

As we know today, the use of technology is very important, almost all of the activities we do are stored in digital form. But what is done now is still done by typing in the form of documents and then saved to the computer or in the recording in the paper and then archived into the closet. In this study about the use of technology to record the voice of meeting participants and the results of minutes of meetings recorded automatically. In this study, data testing at a meeting in the room has been carried out and the results can record all the results of the ongoing conversation. Data that can be recorded within 120 s.

Application Selection Lending Houses Subsidized by the method of AHP and SAW

Mardi Turnip, Angelina, Delima Sitanggang, Risky Sandi Simamora, Erick Cendana, Ruth Surbakti

Track: Class 6 Information System & Technology | Session: 2 | Time: 16:45 - 16:55

Decision Support System (DSS) is a system that can assist a person in making and targeting accurate decision. Many problems can be solved by using DSS, one of which is the determination of subsidized home loans. Giving credit is a high risk and can affect the pace of development of the company in case of bad credit. The company needs a Decision Support System to help the team's credit analyst in knowing recommendation given consumer credit worthiness. The method of calculation used in this study is to compare two methods of Analytical Hierarchy Process (AHP) and the Simple Additive Weighting (SAW).

PMMA-BN composites incorporated with Au nanoparticle fabricated by laser ablation

Atsushi Yamaguchi, Pankaj Koinkar, Akihiro Furube

Track: Class 1 Mechanical Engineering| Session: 2 | Time: 17:15 - 17:25

As a class of layered materials, two dimensional (2D) materials have attracted great attention all around the world due to their inherent use for next generation nano technology devices. We can see 2D materials including carbon in our daily life and at many places, for instance, graphite, diamond and so on. New study is also being conducted to produce new functional materials by combining 2D material and polymer. Hexagonal boron nitride (h-BN) which is one kind of 2D material is dispersed in Poly methyl methacrylate (PMMA) or poly styrene (PS). The composite material of h-BN coated with polymer shows an improvement in the properties such as the higher thermal conductivity and higher mechanical strength. In this study, the composite material of PMMA, h-BN and gold nanoparticles has been synthesized. Boron nitride nano-structures were prepared by nanosecond laser ablation in acetone and was carried out at room temperature with laser ablation time of 120 min. The PMMA films were made by PMMA granules dissolved in acetone solvent and then mix with h-BN and gold colloid solution. The prepared composite films were characterized by scanning electron microscopy (SEM), and UV-vis spectroscopy. Such type of unique 2D nano-composite materials make their mark for the future exploitation in electronics and nanocomposite-related applications.

Effects of the solvent during the preparation of MoS_2 nanoparticles by laser ablation

Makoto Kanazawa, Pankaj Koinkar, Kei-ichiro Murai, Toshihiro Moriga, Akihiro Furube

Track: Class 1 Mechanical Engineering | Session: 2 | Time: 17:25 - 17:35

Pulsed laser ablation in liquid is a well-known and effective method which can be used to prepare the various nanostructures. However, ablated samples have various problems such as wide size distribution, and effect of solvent to sample during laser ablation in liquid has not been well understood. In response to these problems, in this study, we prepared nanoparticles by irradiating nanosecond laser to samples using different solvents. The experimental results of prepared samples were compared, and we evaluated how the different solvents affect to their morphological and optical properties. The morphology, crystal structures and optical properties of the MoS2 nanoparticle were characterized by Scanning electron microscopy, X-ray diffraction, and UV-Vis absorption spectroscopy. Upon the laser ablation of the samples, the absorbance of UV-Vis spectra increased as approaching the shorter wavelength side. From the SEM images, it confirmed that the particle size became smaller for laser ablated MoS2 sample, which is good agreement with the result of UV-Vis spectra. The XRD spectra shows the appearance of new peak for laser ablated MoS_2 in methanol as compared to those samples ablated in ethanol and N-methyl-2-pyrrolidone. It can be said that the crystal structure of the sample has changed after ablation. It suggested that because the particle size became smaller after ablation and the band gap increased. Such MoS_2 nanostructure has its own importance for optoelectronics devices.

Design applications of expert system for information on genetic diseases

Siti Aisyah, M Diarmansyah, Sumita Wardani, Anita, Oloan Sihombing, Evta Indra, Marlince NK Nababan, Yonata Laia, Delima Sitanggang, Windania Purba, Saut P Tamba, Jepri Banjarnahor, Mardi Turnip, Muhardi Saputra

Track: Class 6 Information System & Technology | Session: 2 | Time: 16:55 - 17:05

Knowledge about health is important for everyone to prevent and maintain their health. Lack of awareness of health often gives a bad impact on people. Besides the lack of awareness, the lack of information media in the delivery of information is also one of the increasing numbers of people affected by the disease. Expert system is one of the fields of science that is part of artificial intelligence. Expert systems are usually used to conduct disease analysis to produce diagnoses or solutions to disease problems. Backward chaining is one method in the field of expert systems that is very often used. The concept of backward tracking starts from a goal, by searching for a set of hypotheses towards facts that support a set of hypotheses. In this research, an expert system application was made to diagnose problems that are hereditary diseases using the backward chaining and certainty factor methods with the concept of web-based systems. From the results of the study it was found that this expert system was able to find out the type of hereditary disease that was experienced based on the symptoms chosen. The application of the certainty factor and backward chaining methods in this expert system can provide a level of confidence in the disease suffered by the user.

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INTERNATIONAL CONFERENCE on Mechanical, Electronics, Computer, and Industrial Technology 2018

Floor Slab Analysis (Study Case: One Residence Apartment Batam Centre)

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Abstract. Reinforced concrete slab are widely used in civil buildings, including as building floors, roof floors, bridge floors and dock floors. The load acting on the slab is generally calculated against gravitational loads. This study aims to analyse floor slab in the One Residence Batam Centre Apartment Construction Project. The moment method is used to predict the magnitude of frame and shrinkage values that refer to 2002 SNI. Loading is carried out from dead loads and live loads with a two-way reinforcement system. Reinforcement is done using steel with a diameter of 10 mm. So that the minimum area is 313 mm square with a distance of 250 mm and is in the safe category. From the calculation results obtained the concrete elastic modulus obtained by 250 Mpa with a reinforcement ratio of 0.0025. Checking the time dependency factor for dead loads is carried out within 3 months, 6 months, 12 months and more than 5 years. Long-term deflection due to frame and shrinkage is still in the safe category.

1. Introduction

In the structure of buildings generally composed of several components including roof slab, floor slab, beams and columns which are one unit of monolith in the print system in place or arranged like a precast system. The slab is a rigid planar structure made of monolith material with a small height compared to other dimensions. To plan a slab it is necessary to consider the loading and size and the requirements of the existing regulations [13]. In the construction of reinforced concrete, the thickness of the slab area is relatively very small when compared to the long span / width of the field. This concrete slab is very stiff and the direction is horizontal, so that in the building, this slab functions as a diaphragm / horizontal stiffening element which are very useful to support the rigidity of the portal beam [15]. To plan reinforced concrete slab, it is necessary to consider loading and type of placement and the type of connector in the support [14]. The stiffness of the relationship between the slab and the pedestal will determine the amount of bending moment that occurs on the slab. The slab is usually supported by reinforced concrete beams that allow one-way or two-way reinforcement depending on the structural system. If the value of comparison between the length and width of the slab is more than 2, then one-way slab is used but if the value of the slab comparison is not more than 2, then a two-way slab is used.

When a cold wave occurs during construction, the surface and center temperature of the face slabs continually drop with the outside air temperature. A stringer heat preservation result in smaller tensile stress and an increase in the amplitude of face slab [1]. Using the verified numerical model, the influence of slenderness ratio, axial compression ratio, steel ratio of column, cross-section moment resistance of I-shaped steel in beam, the ultimate horizontal load decrease with the increase of column slenderness ratio, and firstly increases then decreases with the increase of axial compression ratio [6]. The linier and nonlinear responses of steel buildings with perimeter resisting frames (PMRFs) are estimated and compared to those of equivalent buildings with spatial moment

resisting frames (SMRFs). The seismic performance of the steel buildings with SMRFs may be superior to that of steel buildings with PMFRs [3]. Based in the experimental results of compressive strength, prediction model were developed using regression analysis with value of the coefficient of torsional stiffness reduction for verification of the serviceability limit state (SLS) with assumption of normal probability distributed is determined [2,4].

Several models with different shapes and dimensions for single piles and different properties for two soil layer with variables thickness were selected and analyzed using the finite difference method. The pile head displacement occurs due to pile's deformation and rotation. Deformation causes internal forces in pile, though rotation induces stress in surrounding soil [1]. The CFRP plate is more effective than steel plate in increasing the load capacity of beams [5]. Beams specimens made of similar concrete mixture with the same geometry were tested under three point static loading and low velocity drop weight impact loading [8]. Model and time history analyses are applied regarding the code specific design, location of the first failure of columns were transmitted to the upper/less-critical stories of the frame [10].

Shrinkage is a change in the length of a test object over a period of time, where the change in length is caused not because of an external force but due to evaporation. A frame is a property where the concrete undergoes a permanent change in shape due to the fixed load acting on it. This happens because the intensity decreases for a certain interval of time and may end after several years. The amount of frame deformation is proportional to the magnitude of the load held and the period of loading. Shrinkage and frame cause a periodic change in pre stressed concrete. This change slows down and eventually stops after several years [13]. Changes in these stresses result in changes in pre stressed concrete forces and can be calculated for their time effects on changes in shape such as shortening and deflection in concrete. Following what above mentioned, this article aims at showing the analysis of floor slab based on slab reinforcement system. Checking the time dependency for loading for several times and the long term deflection due to the biggest frame and shrinkage falls into the safe category.

2. Floor Slab

The floor slab is a thin structure that is given reinforcement and mortar which is designed according to plan to be able to carry the load on it. This concrete slab consists of two types, one way slab and two way slabs. In general the calculation of the slab is based on the following criteria:

2.1 Loading

The loads on the floor slab structure can be divided into 3 main categories, namely:

(1) Dead Load is a large load and the location remains the same during the working period of the structure. Usually most of the dead load consists of the weight of the structure which can be calculated with good determination of the planning configuration and dimensions. The loading in this section is the same as the beam, referring to the 1987 SKBI.

$$Wu = 1.2\ \mathrm{DL} + 1.6\ \mathrm{LL} \tag{1}$$

Provided that the weight of reinforced concrete is 2400 Kg/m^3, the weight of the floor cover of the tile without stirring: 24 Kg/m^3, the weight of the specimen mix per cm (thick): 21 Kg/m^3, ceiling (including the ribs, without hangers, ceiling or stiffener) with a maximum thickness of 4 mm: 11 Kg/m^3, hanging ceiling (from wood) with a maximum span of 5 m and a minimum distance of 0.8 m: 7 Kg/m^3.

(2) Life load are the burden of a main building which consists of the burden of human beings who fill it and move it on it. These loads work in full or in part or are totally non-existent and the location of work can change. This load is used for floors of buildings with a living load of 250 Kg/m^2.

(3) Natural load mainly consists of snow load, wind pressure and pull, earthquake load, soil pressure on the part of the structure that is in the ground, loads due to the presence of a pool of water or rainwater on a flat roof and the forces that arise because of the temperature difference. Lots of information about some of the natural burdens that are often modified based on local circumstances. Suppose it depends on the climate or about the earthquake conditions that have occurred somewhere.

2.2 Slab Reinforcement System

The slab reinforcement planning system is basically divided into 2 (two), namely:

(1) One-Way Slab, namely plate planning system with one-way staple.

Characteristics of One Way Slab: buildup occurs on the side facing each other with $L_x / L_y > 2,$ the one-way slab design is the same as reinforcement on the beam, only on the floor slab there is no shear reinforcement. The moment distribution on a one-way floor slab can be searched by means of the moment coefficient (analytical) with the requirement that minimum consists of 2 spans with side-to-side lengths and the largest spans should not be greater than 1.2 the shortest spans and loads must be evenly distributed and live loads smaller than 3 times dead load.

(2) Two-Way Slab namely plate planning systems with two-way staples.

Characteristics of Two-Way Slab: the main reinforcement is installed in 2 perpendicular ways, the side support with a comparison between the sides of the slab length and the width side is $L_y / L_x \leq 2$ with a slab thickness of 2 ways in accordance with SK-SNI T-15 -1991-03. So that it is obtained:

$$h = \frac{\ln\left(0.8 + \frac{f_y}{1500}\right)}{36 + 5\beta\left[\alpha m - 0.12\left(1 + \frac{1}{\beta}\right)\right]} \tag{2}$$

$$h_{\min} = \frac{\ln\left(0.8 + \frac{f_y}{1500}\right)}{36 + 9\beta} \tag{3}$$

$$h_{\max} = \frac{\ln\left(0.8 + \frac{f_y}{1500}\right)}{36} \quad so \quad \beta = \frac{\ln_y}{\ln_x} \tag{4}$$

With criteria:

- $\alpha_m < 2$ minimum slab thickness is 120 mm.
- $\alpha_m > 2$ minimum slab thickness is 90 mm.

2.3 Slab Planning Steps

(1) One-Way Slab

- Determine the minimum slab thickness of one way and supporting beam in accordance with SK-SNI T-15-1991-03. So that the theoretical and $hf = Koefisien\ f_y\ 400\ x\ \left(0.4 + \frac{f_y}{700}\right)$ with the provision of $b < 2hf$.
- Determine the loading of the floor slab with factored load method and moment coefficient $M = Koefisien\ x\ \mathrm{Wu}\ x\ \ln^2$.
- Determine slab reinforcement with $k = \frac{Mu}{bd^2}$ to get a reinforcement ratio value (ρ) .

(2) Two-Way Slab

- Determining the maximum slab thickness and maximum thickness value using equations (3) and (4).
- Specifies the value of α_m from each panel with $\alpha_m = \frac{\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4}{4}$.
- Check the value of h_{actual} from the α_m value that has been obtained. The value of h_{trial} may be used if it is greater than h_{actual}.
- Calculates the load that occurs and multiplied by the safety factor using equation (1).
- Calculate the reinforcement ratio in concrete (ρ) and estimate the magnitude of the diameter of the main reinforcement and determine the effective height of the $x(dx)$ way, namely $dx = h - p - \frac{1}{2}\phi$ reinforcement direction x. So that the $k = \frac{Mu}{bd^2}$ value is obtained to get the value of the (ρ) reinforcement ratio with the criteria used $\rho_{\min} < \rho < \rho_{\max}$ with $\rho_{\min} = 0.75 \frac{0.85 f'c}{f_y} \beta_1 \left(\frac{600}{600 + f_y} \right)$ with the following criteria:

  (a) If $\rho_{analisa} > \rho$ then use $\rho_{\min}$

  (b) If $\rho_{analisa} < \rho$ then use $\rho_{\max}$

3. Data and Method

The scope of project work is the construction of One Residence Batam Centre Apartments with 30 floors and 1 basement with 300 rooms. Each floor consists of 12 residential units with a width of 1.8 meters corridor. The following are data obtained from PT. Recta Construction in the Construction of One Residence Apartment Batam Centre. Construction of this building starts from December 2017 to December 2019. Researcher only discusses the calculation of the floor slab which starts from the calculation of loading, calculation of the moment slab due to factored load, slab reinforcement planning and control of slab deflection.

3.1 Building Dimensions

Table 1. Building Dimensions

Floor	Spacious (m^2)	High (m)
Semi Basement	1125	3.8
1st Floor	1125	6
2nd Floor - 28th Floor	691	3.2
29th Floor	691	3.4
30th Floor	691	4.53
Floor Roof	691	3.57

Based on table 1 above, the dimensions of the building floor are divided into 6 categories namely Semi Basement, 1st Floor, 2nd Floor – 28th Floor, 29th Floor, 30th Floor and Floor Roof with a minimum area is 691 m^2 and a maximum is 1125 m^2. The minimum height is 3.2 m and a maximum is 6 m.

3.2 Tie Beam Size

Table 2. Dimensions of Tie Beam

Type	Dimension
Tie Beam 1	300 x 600
Tie Beam 2	250 x 600

Tie Beam 3	300 x 500
Tie Beam 4	250 x 650
Tie Beam 5	250 x 500
Tie Beam 6	250 x 400
Tie Beam 7	300 x 700
Tie Beam 8	200 x 400
Tie Beam 9	400 x 700

Based on table 2 above the tie beam dimensions are grouped into 9 types with the smallest dimension of 200 x 400 and the largest 400 x 700.

3.3 Column Size

Table 3. Column Dimensions

Type	Dimension
Column 1	500 x 1300
Column 2	500 x 1300
Column 2A	500 x 1300
Column 4	550 x 1200

Based on table 3 above the column dimensions are divided into 4 types, namely Column1, Column 2, Column 2A and Column 4 with sizes 500 x 1300 and 550 x 1200.

3.4 Beam Size

Table 4. Beam Dimensions

Type	Dimension
Beam 1	250 x 500
Beam 2	250 x 400
Beam 3	250 x 430
Beam 4	200 x 500
Beam 5	150 x 180

Based on table 4 above, the beam dimension is categorized into 5 types, namely Beam 1 up to Beam 5 with a minimum size of 150 x 180 on Beam 5 and a maximum size of 250 x 500 on Beam 1.

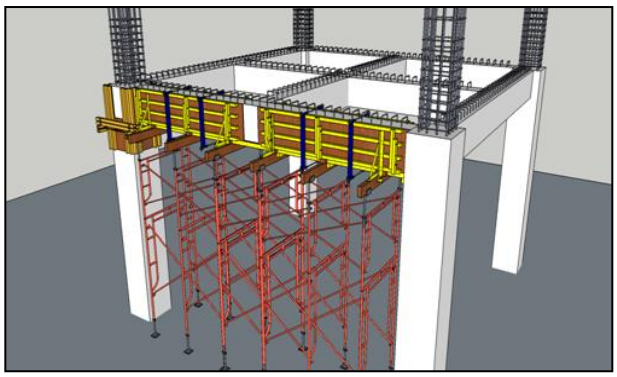

Figure 1. Methods of Installing Floor Slab and Beam Formwork

Based on figure 1, we can see the methods of installing floor slab and beam formwork by simulation design.

4. Analysis and Discussion

4.1 Regulations and Technical Data

For the design of this floor slab structure, loading refers to SNI 2847-2013, 1971 Concrete Loading Regulation which was adopted in the design of Indonesian reinforced concrete structures. The following are the variables used in the planning of the floor slab structure in the One Residence Apartment Batam Centre construction project.

Table 5. Planning Variables of Floor Slab Structure

Variables	Size
Concrete Specific Gravity	2400 Kg/cm^2
Concrete Quality	F'c = 30
Floor Slab Thickness	15 cm
Floor Slab Type	Two Way Slab
Steel Reinforcement Quality	U-50
Steel Reinforcement Diameter (D)	10 mm
Distance between Reinforcement Lx	3.00 m
Distance between Reinforcement Ly	5.95 m
Concrete Covers	2.5 cm

Based on table 5 above, the variable planning of the floor slab structure is divided into 9 variables with their respective sizes. These variables include Concrete Specific Gravity, Concrete Quality, Floor Slab Thickness, Floor Slab Type, Steel Reinforcement Quality, Steel Reinforcement Diameter (D), Distance between Reinforcement Lx, Distance between Reinforcement Ly and Concrete Covers.

4.2 Floor Slab Data

Table 6. Floor Slab Data

Floor Slab Dimensions	Unit
Lx	3.00 m
Ly	5.95 m
H	150 mm
Ly/Lx	1.98 mm
CLx	62
CLy	35
Ctx	62
Cty	35

Based on table 6 above, the data obtained from One Residence Apartment Batam Centre construction project based on the dimensions and units.

Figure 2. Casting The Floor Slab with a Concrete Pump

Figure 3. Casting The Floor Slab with Vibrator

Based on figure 2 and figure 3, we can see the process of casting the floor slab with a concrete pump and vibrator. This work is carried out at the side of the project construction.

4.3 Loading

(1) Loading of Dead Load

Table 7. Loading of Dead Loads

Type of Dead Load	Unit Weight (kN/m^3)	Thick (m)	Q (kN/m^2)
Own Weight	24	0.15	3.6
Floor Finishing Weight	1.1		1.1
Ceiling and Frame Weight	0.15		0.15
Installation Weight (ME)	0.19		0.19
QD			5.04

Based on table 7 above, the loading of dead loads on the One Residence Apartment Batam Centre construction project is divided into 4 types, namely own weight, floor finishing weight, ceiling and frame weight and installation weight (ME) with total loading of dead load is 5.04 kN/m^2.

(2) Loading of Live Load

- Live Load = 250 kg/m2
- QL = 2.5 kN/m2
- Qu = (1.2*QD) + (1.6*QL) = (1.2 x 5.04) + (1.6 x 2.5) = 10.048 kN/m^2

4.4 Slab Moment Due to Factor Load

- Field Moment Way of x $(MuLx) = (CLx) * (0.001) * Qu * Lx^2 = 5.607$ kNm/m.
- Field Moment Way of y $(MuLy) = (CLy) * (0.001) * Qu * Lx^2 = 3.075$ kNm/m.
- Stacking Moment Way of x $(Mutx) = (Ctx) * (0.001) * Qu * Lx^2 = 5.607$ kNm/m.
- Stacking Moment Way of y $(Muty) = (Cty) * (0.001) * Qu * Lx^2 = 3.075$ kNm/m.

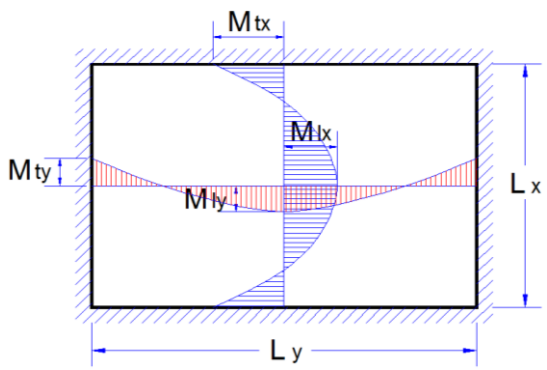

Figure 4. Moment on Floor Slab

The description of the depiction of the floor slab moment can be seen in figure 4.

4.5 Slab Reinforcement Planning

For slab reinforcement planning $\beta_1 = 0.85$ is used in accordance with SNI 2002 because of $F'c > 30\text{Mpa}$.

(a) Reinforcement ratio in balance (β_b) condition that is $\beta_b = \beta_1 * 0.85 * \left(\frac{F'c}{f_y}\right) * \left(\frac{600}{600 + f_y}\right)$

$$\beta_b = 0.85 * 0.85 * \left(\frac{30}{500}\right) * \left(\frac{600}{600 + 500}\right) = 0.0236$$

(b) Maximum Moment Resistance Factor, i.e:

$R_{max} = 0.75 * \beta_b * f_y * \left[\frac{1 - 0.5 * 0.75 * \beta_b * f_y}{(0.85 * F'c)} \right] = 1.5357$ used $\phi = 0.8$ in accordance with SNI 2002, then $ds = \frac{ts + \phi}{2} = 25$ mm and $d = h - ds = 125$ mm which is reviewed with a slab 1m and b = 1000 mm.

(c) Nominal Moments of the Plan in accordance with SNI 2002, then $Mn = \frac{Mu}{\phi} = 7.008$ then

$Rn = Mn \ x \ 10^6 / (b * d^2) = 0.44854$

(d) Reinforcement ratio required:

$$\rho = 0.85 * F'c / fy * \left[1 - \sqrt{\left(1 - 2 * \left(\frac{Rn}{(0.85 * F'c)} \right) \right)} \right] = 9.44 \ x \ 10^{-4}$$

So $\rho_{min} = 0.0025$. Then it is used $\rho = 0.0025$

(e) Performed calculations $As = \rho * b * d = 313 \text{ mm}^2$

So $S = \pi / 4 * \varnothing^2 * b / As = 251$ mm. Then $S_{max} = 2 * h = 300$ mm. Then a calculation simulation is carried out with 200 Distance = 392.5 mm^2. Distance As 225 = 348.9 mm^2 and distance As 250 = 314 mm^2. Because the minimum area needed is 313 and based on the calculation results with a distance of 250 obtained 314, the reinforcement with a distance of 250 is more efficient to use, then reinforcement is used $\varnothing$ 10 – 250, So that the area of reinforcement is used $As = \pi / 4 * \varnothing^2 * b / s = 314 \text{ mm}^2$ then $As_{use} > As_{need}$ safe.

4.6 Control Slab Deflection

(a) Modulus of Concrete Elasticity (Ec) is $Ec = 4700\sqrt{F'c} = 25.743$Mpa

In accordance with SNI 2002, it is obtained:

- $Es = 200.00$ Mpa
- $Q = QD + QL = 7.54$ N/mm
- $\frac{L_x}{240} = 12.5$ mm
- $Ig = \frac{1}{12} * b * h^3 = 281.250.000 \text{ mm}^3$
- $Fr = 0.7 * \sqrt{F'c} = 3.834$
- $n = \frac{Es}{Ec} = 7.77$
- $c = n * As / b = 2.441$ mm
- $Icr = \frac{1}{3} * b * c^3 * As * (d - c)^2 = 36.666.635 \text{ mm}^4$
- $Yt = \frac{h}{2} = 75$ mm
- $Mcr = Fr * Ig / Yt = 14.377.717$ Nmm
- $Ma = \frac{1}{8} QLx^2 = 8.482.500$ Nmm

- $Ie = \left(\frac{Mcr}{Ma}\right)^3 * Ig + \left[1 - \left(\frac{Mcr}{Ma}\right)^3\right] * Icr = 1.227.703.258 \text{ mm}^4$

In accordance with SNI 03-2847-2002, it is obtained:

- $\delta e = 5/384 * Q * Lx^4 / (Ec * Ie) = 0.252 \text{ mm}$
- $\rho = As / (b * d) = 0.0025$

(b) Time dependency factor for dead load (3 Months Period), then according to SNI 2002, with $\zeta = 1$ so $\lambda = \frac{\zeta}{(1 + 50 * \rho)} = 0.89$

(c) Time dependency factor for dead load (6 Months Period), then according to SNI 2002, with $\zeta = 1.2$ so $\lambda = \frac{\zeta}{(1 + 50 * \rho)} = 1.07$

(d) Time dependency factor for dead load (12 Months Period), then according to SNI 2002, with $\zeta = 1.4$ so $\lambda = \frac{\zeta}{(1 + 50 * \rho)} = 1.24$

(e) Time dependency factor for dead load (Duration > 5 years), then according to SNI 2002, with $\zeta = 2$ so $\lambda = \frac{\zeta}{(1 + 50 * \rho)} = 1.7767$

(f) The long-term deflection due to frame and shrinkage is used the biggest, which is more than 5 years. So $\delta_g = \lambda * 5/384 * Q * L_x^{\ 4} / (Ec * Ie) = 0.447 \text{ mm}$, Then $\delta_{Total} = 0.699 \text{ mm}$.

Due to $\delta_{Total} < \frac{L_x}{240}$ then safe.

4.7 Discussion

Based on calculation, slab moment due to factor load the value of field moment way for x and y is same with stacking moment of x and y. Performance of the spacious cover is 313 m^2, so the reinforcement with a distance of 250 is more efficient to use. Modulus of Concrete Elasticity used to find the effective inertia which is equal to 1.227.703.258 mm^4. Numerical analysis used for checking the time dependency factor for dead load. The duration is 3 months period, 6 months periods, 12 months periods and more than 5 years for long term. The longer period used for checking the reduction factor is also getting bigger. This means that the durability of a building in this case is that floor slab analysis is decreasing but it is still in the safe category. In planning, it is best to design a floor slab with reinforcement as needed, so that it can be avoided wasteful reinforcement during implementation. Planning should be designed to follow standard rules guidelines in building structure and before casting, it is necessary to inspect the bonding and spacing according to shop drawings and the installation of concrete decking.

5. Conclusion

For planning the floor slab in the Batam Centre One Residence Apartment Development Project, reinforcement using steel with a diameter of 10 mm. The minimum area required is 313 mm2 and based on the results of calculations with a distance of 250 mm it is more efficient than the maximum distance used 251 mm. So that it can be categorized as safe. Modulus of concrete elasticity was obtained at 25.743 MPa and obtained a reinforcement ratio of 0.0025. Checking the time dependency factor for dead loads is carried out for 3 months, 6 months, 12 months and more than 5 years. The long-term deflection due to the biggest frame and shrinkage (more than 5 years) falls into

the safe category because $\delta_{Total} < \frac{L_x}{240}$. Calculation of the floor slab used has met the SNI requirements.

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