Power Flow Study of Untransposed Transmission Lines

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ABSTRACT

This paper investigates the unbalanced three-phase power flow, mainly to know the voltage magnitude, current and power each bus and lines. Unbalanced three-phase system can be caused untransposed lines, unbalanced loads or both of them.

In this case, unbalanced of three-phase system is done with making simulation in 14 bus system from IEEE: untransposed lines of balanced loads. This simulation is done with using EDSA software to do phase dependent power flow analysis.

The result of unbalanced three-phase power flow simulation caused untransposed lines of balanced loads is showing the difference among voltage magnitude, current and power in each phase. The greatest unbalanced bus voltage percentage is 2.38%. The total percentage each current a, b and c in untransposed lines of balanced loads are 30.94%, 33.06%, 36.00%. The total percentage each active power a, b and c are 31.26%, 29.31% and 39.43% and the total percentage each reactive power a, b and c are 35.18%, 41.34% and 23.48%.

Index Terms: unbalanced power flow, untransposed transmission lines.

1. Introduction

The transmission system should not introduce any unbalance to energy transported. However, the geometry of the transmission towers creates unbalances because the distances between phases and between the phases to earth not equal, consequently, it can generate unbalance to the power flows.

The geometry of the towers of high voltage transmission lines produces impedance asymmetric, which in turn causes corresponding voltage and current unbalance at the line end. The effect of line asymmetric can be eliminated by the use of phase transposition, dividing the line into three, or multiples of three sections [1]. The phase conductor have their position interchanged at special transposition tower so that the conductor of each phase occupies positions 1, 2 and 3 [2], as shown as Fig. 1.

![Diagram of line scheme transposition with three sections](image)

Fig. 1 Line scheme transposition with three sections

2. Transmission lines Parameter

In this case, three phase transmission lines is assumed as the long transmission lines with lines parameters uniformly distributed along lines [3]. The conductor that used Hawk kind ACSR 26/7 with characteristics GMR = 0.029 ft, diameter = 0.858 in and resists (500) = 0.216 ohm/mile, length conductor 165 miles, conductor configuration horizontal like Fig. 2.

![Conductor configuration horizontal](image)

The value of series impedance and shunt admittance determined by this equations [3][4]:

\[ Z' = \frac{z}{1 + \frac{(\frac{\pi}{2})^2}{6}} \text{ ohm} \quad (1) \]

\[ Y' = \frac{y}{2} \left( 1 - \frac{1}{3} \left( \frac{\pi}{2} \right)^2 \right) = \frac{y}{2} \left( 1 - \frac{(\frac{\pi}{2})^2}{12} \right) \text{ mho} \quad (2) \]

z is lines impedance per unit of length-lines, with matrices element determined by this equations [5]:

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2.1 Classification and specification of buses

In three phase power flow study all the buses in the network are classified as slack bus, PV buses or PQ buses. Slack bus: at the slack bus, both the positive sequence voltage magnitude and the angle are specified.

\[ V_i^{\text{slack bus}} = V_i^{\text{specified}} \angle \theta_i^{\text{specified}} \]  

PV bus (Voltage controlled Bus): The PV bus is a generator bus in which both the positive sequence voltage magnitude and the total generated power are specified.

\[ \begin{align*} 
V_i^{PV \text{ bus}} & = V_i^{\text{specified}} \\
\left( P_i^{PV \text{ bus}}, Q_i^{PV \text{ bus}} \right) & = \left( P_i^{\text{total \ generation}}, Q_i^{\text{total \ generation}} \right) \\
\Sigma & \text{ represents three phase total power.} 
\end{align*} \]  

PQ bus: for balanced loads, the specified power for each phase is calculated from the total power demand at the load bus.

\[ S_i^{\text{specified}} = \frac{P_i^{\text{Total}} + Q_i^{\text{Total}}}{3} \quad m = a \text{ or } b \text{ or } c \]  

2.2 Mathematical models of power flow

Power flow mathematical model newton-raphson three phases asymmetric based on component sequence can be inscribed as sequence positive [6],

\[ \begin{bmatrix} \Delta P_i \\ \Delta Q_i \end{bmatrix} = \begin{bmatrix} H_i & N_i \\ J_i & L_i \end{bmatrix} \begin{bmatrix} \Delta V_i \end{bmatrix} \]  

where \( \begin{bmatrix} H_i & N_i \\ J_i & L_i \end{bmatrix} \) positive sequence Jacobian matrices

\[ \Delta P_i = P_i^{\text{specified}} - P_i^{\text{calculated}} \]
\[ \Delta Q_i = Q_i^{\text{specified}} - Q_i^{\text{calculated}} \]

The calculated positive sequence power for N bus power system given as

\[ P_{i_{\text{calculated}}}^{\text{specified}} = \sum_{j=1}^{N} V_{i,j} V_{j,i} \cos(\delta_{i,j} - \theta_{i,j} + \theta_{j,j}) \]
\[ Q_{i_{\text{calculated}}}^{\text{specified}} = -\sum_{j=1}^{N} V_{i,j} V_{j,i} \sin(\delta_{i,j} - \theta_{i,j} + \theta_{j,j}) \]

where

\[ V_{i,j} = V_{i,j} \angle \theta_{i,j} \]
\[ P_{i_{\text{calculated}}}^{\text{specified}} = P_{i_{\text{calculated}}}^{\text{specified}} + \sum_{j=1}^{N} \Delta P_{i_{\text{calculated}}}^{\text{calculated}} \]
\[ Q_{i_{\text{calculated}}}^{\text{specified}} = Q_{i_{\text{calculated}}}^{\text{specified}} + \sum_{j=1}^{N} \Delta Q_{i_{\text{calculated}}}^{\text{calculated}} \]

where \( M \) refers to the total number of untransposed transmission lines to bus \( i \) [6].

3. Case Study

The test of this case is done with simulating unbalanced power flow that caused by untransposed transmission lines. The simulation uses software EDSA by running phase dependent power flow analysis at IEEE 14 bus system, as shown by Fig. 4.

![IEEE 14 bus system](image-url)
As does current each phase, active power unbalance each phase also happened in all lines and has big relative unbalance percentage, especially between bus 4-7, 6-11 and 7-9. Percentage magnitude each phase between bus 4-7 76.91%, 22.90% and 0.19% alternately in phase a, b and c, like showed Fig. 8.

Reactive power unbalance each phase also happened in all lines and has big relative imbalance percentage. Biggest unbalance percentage happens between bus 4-5 and 14-13, that is as big as 76.88%, 12.04% and 11.07% for phase a, b and c between bus 4-5, while between bus 14-13 84.27%, 8.40% and 7.32% for phase a, b and c, like showed Fig. 8.

4. Conclusion
Untransposed transmission lines can be caused unbalanced each phase of bus and lines, this matter is showed with voltage difference, current, active power and reactive power in each phase.

Furthermore research can be done with make lines configuration vertically and trilateral.
References

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PREFACE

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The purpose of this conference is to provide an international forum for discussion and exchange of the latest advances in science and technology of electrical engineering and informatics.

Many papers have been submitted and about 290 papers from 12 countries have been accepted for presentation. These papers will be presented in 22 Sessions including 2 Plenary Sessions, 20 Oral Sessions and 9 Poster Sessions. The Samaun Samadikun Memorial Lecture will be given by Prof. Shunri Oda from Tokyo Institute of Technology, Japan with title of State of the Art and the Future of Nanoelectronics.

Invited lectures will be given by Prof. J.J. Smit (TU Delft, The Netherland), Prof. Aziz Deraman (FTSM-UKM, Malaysia), Prof. Rainer Patsch (University of Siegen, Germany), Prof. Soegijardjo Soegijoko and Dr. Yudi S. Gondokaryono (STEI-ITB, Indonesia).

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I hope that all of you will have a fruitful and enjoyable time here in Bandung, Indonesia.

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H-83 Performance Study of Power Factor Correction Circuits

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C-16 Two Fast Computation Algorithms for Luc Cryptosystems

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Rabiah A.K (1)*, T.M.T. Sembok(1), Halimah B. Z.(1) (Department of Information Sciences, Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, Malaysia)
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E-13 Modeling of Human Anatomy in 3-D from Dicom Medical Images Into Computer Aided Design Riza Sulaiman(1)*, Leong Wai Kit(1), Abdul Yazid Mohd Kassim(2) and Hamzaini Abdul Hamid(3) (1)Industrial Computing Department, Faculty of Information Science Technology, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia (2)Orthopedic Department, Hospital Universiti Kebangsaan Malaysia, Selangor, Malaysia. (3)Radiology Department, Hospital Universiti Kebangsaan Malaysia, Selangor, Malaysia

E-16 Adaptive Non-Stationary Cardiac Signals Identification using an Augmented MLP Network Vijanth S. Asirvadam(1)*, Sean F. McLoone(2) (1)Universiti Technologi Petronas, Perak D. Ridzuan, Malaysia, (2)National University of Ireland, Maynooth, Co. Kildare, Republic of Ireland

E-18 Microwave Hyperthermia System Development Based on Non Invasive Temperature Monitoring Thomas Sri Widodo (Electrical Dept. Engineering Fac. Gadjah Mada University, Yogyakarta)
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A-11  Analysts and Design of Fishing Ground Marking and Fisherman Guidance System Suryadiputra Liawatimena, Antoni Susanto, Andi Yunus (Computer Engineering Major, Computer Science Faculty, Bina Nusantara University, Jakarta)

A-14  The Implementation of Microcontroller As Automatic Electrical/Electronic Devices Through Wireless Technology in Making Electrical Power Saving Gatot Santoso*, Narita Purwawan** (Institut Sains & Teknologi AKPRIND Yogyakarta)


A-20  Design, Simulation and Synthesis of 2-D Discrete Cosine transform Vlsi Chip for Image Compression Md. Shabirul Islam(1), M.S. Bhuyan(2), Masuri Othman(3) (1)Lecturer, Faculty of Engineering Multimedia University, Selangor, Malaysia (2)Research Student, Faculty of Engineering Multimedia University, Selangor, Malaysia, (3)Professor, Dept. of Electrical Engineering, University Kebangsaan Malaysia, Malaysia)

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B-03  Learning Activities Management System (SPAP) Nor Azan M. Z.(1)* and Wong S.Y.(1) (Department of Information Science, Faculty of Technology and Information Science, National University of Malaysia, Selangor, Malaysia)

B-100  Small Device Implementation of Dewa Algorithm Setiawan Hadi(1), Adang Suwandi Ahmad(2), Ipings Supriana Suwardi(2), Farid Wazdi(2) (1)Padjadjaran University, Indonesia)

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B-104  A New Framework in Interpreting Two-Dimensional Line Drawing Muhammad Zaini Matondang(1)*, Habibollah Haron(1), Mohamad Shukor Talib(2) (Department of Modeling and Industrial Computing, Faculty of Computer Science and Information System, UniversitiTeknologi Malaysia, Johor, Malaysia)

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B-16  Developing Lossy-to-Lossless X-Ray Image Compression Using ROI Based Fuzzy C-means Vector Quantization A. D. Setiawan(1)*, A. B. Suksmono(2), B. Dabarsyah(3) (Bandung Institute of Technology, Indonesia)

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MARA, Malaysia}

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{(1)ISRG, Elektronika, Sekolah Teknik Elektro dan Informatika ITB, Bandung,
(2)ISRG, Elektronika, Sekolah Teknik Elektro dan Informatika ITB, Bandung)

B-23 Design of Context Sensitive Dictionary As part of Computer Based Language Translator Arry Akhmad Arman

(1)*{(1)Bandung Institute of Technology, Indonesia}

B-25 An Adaptive Multiresolution Digital Watermarking Wan Azizun Wan Adnan

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{(1)Department of Mathematics, ITS Surabaya, Surabaya (2)School of Electrical Engineering and Informatics, ITB Bandung)

B-28 Data Mining Discretization Methods and Performances Z. Marzuki

(1), F. Ahmad(2)
{(1)*Faculty of Information Technology, Universiti Utara Malaysia, Kedah, Malaysia
(2)Faculty of Information Technology, Universiti Utara Malaysia, Sintok, Kedah)

B-31 Authentication Watermarking With Tamper Detection and Recovery (AW-TDR) Jasni Mohamad Zain and Afifah Nailah Muhamad (Faculty of Computer Systems and Software Engineering, University Malaysia Pahang, Kuantan, Pahang, Malaysia)

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B-38 Terms Visualization for Malay Translated Quran Documents Normal Kamal Ismail, Nurazzah Abd Rahman, Zainab Abu Bakar Tengku Muhammad Tengku Sembok (Faculty of Information Technology and Quantitative Sciences, Universiti Teknologi MARA, Selangor Darul Ehsan, Malaysia, Faculty of Technology and Information Sciences, Universiti Kebangsaan Malaysia, Bangi, Selangor Darul Ehsan, Malaysia)

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(1)Universiti Kebangsaan Malaysia, Selangor, Malaysia)

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A Framework for the Implementation of a Knowledge Management System for a Water Utility Company; Special Focus to Tacit Knowledge. A. NormalMJ(1)* , B. Ishak Ismail(2)* (1)Faculty Science Computer & Information Systems, Universiti Teknologi Malaysia (2)Faculty of Electrical Engineering, Universiti Teknologi Malaysia

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Reducing Delay Time to Commit the Consistent Database By Using Fixed timeout Technique (FTOT) for Mobile Database Over Grid Mosaid Ahmad Khder(1)* , Dr. Abdullah Mohd Zin(2), Dr. Zulaikha Hj. Ali Othman(3) (1)Multimedia university (MMU), Faculty of Information Science and Technology (FIST), Malaysia (2,3)Universiti Kebangsaan Malaysia (UKM) Faculty of Information Science and Technology, Selangor Darul Ehsan 2

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Color Image Processing of Weed Classification: A comparison of two Feature Extraction Technique Kamarul Hawari Ghazali, Mohd. Marzuki Mustafa, Aini Hussain (Department of Electrical, Electronic and Systems Engineering, Faculty of Engineering, Universiti Kebangsaan Malaysia, Malaysia)

Region Selection for Robust Face Verification Using Umace Filters Salina Abdul Samad, Dzati Athiar Ramli, Aini Hussain (Department of Electrical, Electronic and Systems Engineering, Faculty of Engineering, Universiti Kebangsaan Malaysia,
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Reengineering Information Security Culture Formulation Through Management Perspective Omar Zakaria, Abdullah Gani, Mustaffa Mohd Nor and Nor Badril Anuar (Faculty of Computer Science & Information Technology, University of Malaya, Kuala Lumpur, MALAYSIA)

Fuzzy Knowledge Modeling for Image-based Paddy Disease Diagnosis Expert System S. Abdullah(1)*, A. A. Bakar(1), N. Mustafa(2), M. Yusuf(3), S. Abdullah(4) {(1)Faculty of Information Science and Technology, University Kebangsaan Malaysia, Bangi, Selangor Darul Ehsan, Malaysia}

Papaya fruit grading based on size using image analysis S. Riyadi(1,2)*, M. M. Mustafa(2), A. Hussain(2), A. Hamzah(3) {(1)Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia (2)Universiti Kebangsaan Malaysia, Selangor, Malaysia (3)Malaysian Agricultural Research and Development Institute, Selangor, Malaysia}

The development of Critical Undergraduate Program Selection System (CUPSS) for Admission to Malaysian Public Universities. Mustaffa Kamal Mohd Nor, Omar Zakaria, Chang Sok Kin (Faculty of Computer Science & Information Technology, University of Malaya, Malaysia)

New Integration Model of Information System on Higher Education Institution Ipingle Supriana Suwardi(1), Dini S. Permatasari(1) {(1)Informatics Engineering School of Electrics Engineering and Informatics, Institut Teknologi Bandung, INDONESIA Bandung}

License Plate Recognition System for Indonesian Vehicles Felix Arya(1), Ipingle Supriana Suwardi(1) {(1)Informatics Engineering School of Electrical Engineering and Informatics Bandung Institute of Technology, INDONESIA}

Simulation and Visualization of Flood Coverage Area Estimation Andri Mirandi(1), Ipingle Suwarna Suwardi(2) {(1)Informatics Engineering School of Electrical Engineering and Informatics, Bandung Institute of Technology, INDONESIA}

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DE, Malaysia

B-93 Investigating current object oriented programming assessment method in Malaysia's universities: Issues and problems Norazlina Khamis (1), Sufian Idris (2) {(1)Faculty of Computer Science & Information Technology, University of Malaya, Malaysia (2)Faculty of Technology & Information Science, National University of Malaysia, Selangor, Malaysia}

B-94 The Pragmatic Approach to Characterizing Intelligence Safawi Abdul Rahman (1)*, Mohamad Shanudin Zakaria(2) {(1)Department of Information System Management Faculty of Information Management MARA University of Technology, Puncak Perdana Campus, Selangor Darul Ehsan (2)Department of System Science and Management, Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, Selangor, Malaysia}

B-95 Development of Electronic Marketplace for Efficient Bidding in Wood-based Products Industry A. Eka Kurniasary(1)*, B. Norleyza Jailani(1), C. Muriati Mukhtar(1), D. Salha Abdullah(1) {(1,2)Science and System Management Department, Faculty of Technology and Information Science, Universiti Kebangsaan Malaysia, Malaysia}

B-97 Comparative Analysis between Artificial Neural Networks and Statistical Techniques in Bioinformatics Shuzlina Abdul Rahman(1)*, Marina Yusoff(1), Sofia Isma Mutaib(1), Azlinah Mohamed(1) {(1)Faculty of Information Technology and Quantitative Sciences, Universiti Teknologi MARA, Malaysia}

Data and Software Engineering

C-07 An Efficient and Effective Algorithm for Hierarchical Classification of Search Results Masayu Leylia Khodra(1)*, Dwi Hendratmo Widyantoro(1) {(1)School of Electrical Engineering and Informatics – Institut Teknologi Bandung, Bandung}

C-08 Delegating Classifiers For Text Categorization Masayu Leylia Khodra {School of Electrical Engineering and Informatics – Institut Teknologi Bandung}

C-10 Hierarchical Pattern-Based Clustering for Grouping Web Transactions Darenna Syahida Suh, Mustafa Mat Deris {Faculty of Information Technology and Multimedia, Universiti Tun Hussein Onn Malaysia (UTHM), Batu Pahat, Johor, Faculty of Information Technology and Multimedia, Universiti Tun Hussein Onn Malaysia (UTHM), Batu Pahat, Johor}

C-21 Using Semantic Web and Ontology Approach for Knowledge Identification, Organisation and Reuse Azleena Mohd Kassim, Cheah Yu-N {Affiliations: Knowledge Management, Semantic Web, Health Informatics Health Informatics Research Group School of Computer Sciences Universiti Sains Malaysia, Pulau Pinang Malaysia}

C-23 Data creates more data: A study of the Datasets used by Virtual Heart Research Team at University of Malaya Fariza Hanum Md Nasaruddin (1)* {(1)University of Malaya, Lembah Pantai, Malaysia}

C-24 Automatic Generation of Test Cases from Use-Case Diagrams Noraida Ismail (1)*, Roszati Ibrahim(2), Noraini Ibrahim(1) {(1)Research Management and Innovation Centre (RMIC), (2)Faculty of Information Technology and Multimedia, Universiti Tun Hussein Onn Malaysia (UTHM), Batu Pahat, Johor, Malaysia}

C-25 Software Development Approach In Software Engineering Curriculum Development Azna Abdullah and Jasni Mohmad Zain {Fakulti Sistem Komputer & Kejuruteraan Perisian, Universiti Malaysia Pahang, Pahang, Malaysia}

C-26 A Case Study in Applying Software Certification Model by Product Quality Approach J. H. Yahaya(1)*, A. Deraman(2), A.R. Hamdan(2) {(1)Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, Malaysia (1)Faculty of
Information Technology, Universiti Utara Malaysia, Sintok, Kedah, Malaysia (2)Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, Selangor, Malaysia)

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**D-02** A Comparative Study of H Synthesis for Networked Control Systems Imam ARIFIN(1)*, Bambang RYANTO(1) {Electrical Engineering, School of Electrical Engineering and Informatics, Institut Teknologi Bandung}

**D-03** Development of AHRS (Attitude and Heading Reference System) for Autonomous UAV (Unmanned Aerial Vehicle) Widyawardana Adiprawita, Jaka Sembiring (STEI-ITB)

**D-07** Real-time DSP Implementation of Active Noise Control for Broadband Noise Using Adaptive LMS Filter Algorithm Bambang Riyanto {(1)School of Electrical Engineering and Informatics, Institut Teknologi Bandung, Bandung, Indonesia (2)University of Groningen, Groningen, Holland}

**D-10** PSS design based on PD and PI Fuzzy Controller by Particle Swarm Optimization Ermanu A. Hakim(1,2), Adi Suprijanto(1), Maudhiri HP(1) {(1)Teknik – Elektro Institut Teknologi Sepuluh Nopember Surabaya (2)Teknik – Elektro Universitas Muhammadiyah Malang}

**D-11** Optimal Control Design for Dynamic Load Effect Reduction at Building Structure Ferry Hadary(1)*, Zani Fudji Eko Susanto(2) {(1)University of Tanjungpura (UNTAN), Indonesia (2)PT. Aplikanusa Lintasarta, Pontianak, Indonesia}

**D-12** Development of a Real-Time Speed Limit Sign Recognition System Khairul Anuar Ishak, Salina Abdul Samad & Aini Hussain {Dept. of Electrical, Electronic & Systems Engineering, Faculty of Engineering, Universiti Kebangsaan Malaysia, Bangi Selangor, Malaysia}

**D-15** The Investigation of PID Controller for MEMS Gripper M. A. Setiawan {Timah Manufacture Polytechnic and Faculty of Engineering, University of Bangka Belitung, Air Kantung, Sungailiat – Bangka, Indonesia}

**D-16** Feature Extraction Technique Using SIFT Keypoint Descriptors Kamarul Hawari Ghazali (1)*, Mohd. Marzuki Mustafa(2), Aini Hussain(2) {(1)Faculty of Electrical and Electronic Engineering, Universiti Malaysia Pahang, Bandar MEC, Gambang Kuantan, Pahang, Malaysia (2)Department of Electrical, Electronic and Systems Engineering, Faculty of Engineering, Universiti Kebangsaan Malaysia, Malaysia}

**D-17** Jakarta Flood Control System: Modeling M. Iqbal Pakeh(1)*, Petra Gokma Ria(1), Indra H.T.(1), Artiko Wibowo(1) {(1)Bandung Institute of Technology, Indonesia}

**D-19** Jakarta Flood Control Simulation Software R. Braisa Kamagala(1)*, Narpendyah Wisjnu A(2) {Bandung Institute of Technology, Bandung, Indonesia, Student at Electrical Engineering Department – STEI ITB – Bandung, Indonesia}

**D-23** Issues and Open Problems on eControl Implementations D. Mahayana(1), Ary S. Prihatmanto(2), A. Syaichu-Rohman(3) {Computer Engineering Research Div., Control and Intelligent System Research Div., Control and Intelligent System Research Div., Control and Computer System Laboratory, School of Electrical Engineering & Informatics, Indonesia}

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**E-10** Rough Neural Network Model for Tuberculosis Patient Categorization A. A. Bakar,
F. Febriyani {(1)Faculty of Information Science and Technology, University Kebangsaan Malaysia, Selangor Darul Ehsan, Malaysia}

**E-11**

*Question Quantification to Obtain User Certainty Factor in Expert System Application for Disease Diagnosis* Kusrini{(1)STMIK AMIKOM Yogyakarta, Sleman Yogyakarta Indonesia}

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**F-03**

*UHF Partial Discharge Diagnostics for Condition Assessment of Power Transformers* Sander Meijer, Piotr Cichecki, Pantelis D. Agoris, Johan J. Smit, Huub F. Reijnders{(1)Delft University of Technology, Faculty of Electrical Engineering, Mathematics and Computer Science High voltage technology and management, The Netherlands}

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*The Influence of Ageing Mechanisms on Insulator Quality of the Underground XLPE Cables in Service Based on Tan Delta and Capacitance Parameters* Asmarashid Ponniran{(1)}, Tarmidi Tamsir{(2)}, and Rohaiza Hamdan{(3)}{(1,3)Universiti Tun Hussein Onn Malaysia (UTHM) Faculty of Electrical and Electronic Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, Malaysia{(2)Universiti Teknologi Malaysia (UTM) Faculty of Electrical Engineering, Universiti Teknologi Malaysia, Malaysia}

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**F-20**

*A Comparison Study on Artificial Neural Network for Dynamic Voltage Collapse Prediction* Muhammad Nizam*, Azah Mohamed, Aini Hussain{(Universiti Kebangsaan Malaysia, Malaysia}

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**F-22**

*Error in Lightning Location By TOA-MDF Technique* Syarif Hidayat{(1)}{(1)Bandung Institute of Technology, Indonesia}

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*Environmental Implications of Energy System Development with CO2 Emission Reduction Target in Indonesia* C. O. P. Marpaung{(1)}, R. M. Shrestha{(2)}{(1)Universitas Kristen Indonesia, Jakarta, Indonesia{(2)Asian Institute of Technology, Klong Luang, Thailand}

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**F-24**

*Mapping of Pollution Based on ESDD and NSDD Value At the Minahasa Electric Distribution System* Lily Stiowati Patras{(1)}, Parouli M. Pakpahan{(2)}, Suwarno{(2)}{(1)Doctoral Student, School of Electrical Engineering and Informatics, ITB, Indonesia{(2)Academic Staff, School of Electrical Engineering and Informatics, ITB, Indonesia}

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**F-25**

*Modelling of Extra High Voltage 500 kV Transmission Lines using EMTP Simulator* Eko Pramono, Deny Hamdani, Reynaldo Zoro{(Power Engineering Division, School of Electrical Engineering and Informatics, Bandung Institute of Technology)

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*Evaluation and Risk Assessment of Independent Power Producers in Indonesia* I Made Ro Saka{(1)}, Pieter Schavemaker{(2)}, Lou van der Stuij{(2)}{(1)PT PLN (Persero) CNR Jakarta Selatan - Indonesia{(2)Delft University of Technology}

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*Measuring the Usability of Software Applications – Metrics for Accurateness* A. F. A. Fadzlah{(1)}, A. Deraman{(2)}{(1)Department of Computer Science, Faculty of Technology and Information Science, Universiti Kebangsaan Malaysia, Malaysia{(2)Department of Computer Science, Faculty of Information Technology, Universiti Utara Malaysia, Malaysia}

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**F-30**

*Power Analysis of a Shunt Active Power Filter For Three-Phase Four-Wire System under Unbalanced Main Voltages* S. Riyadi{(1)}, L. H. Pratomo{(1)}, Y. Haroen{(2)}{(1)Soegijapranata Catholic University, Semarang, Indonesia{(2)Bandung Institute of Technology, Indonesia}

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*Comparison of Ceramics and Epoxy Resin Performance as 20 kV Outdoor Insulator in Tropical Environment* Valdi Rizki Yandi*, Suwarno{(Department of Electrical Engineering, Bandung Institute of Technology, Indonesia}
F-32 Analytical Study of Geomagnetically Induced Current=GIC Phenomenon at Power Transformer Mursid Sabdullah*, and T. Haryono (Dept. Of Electrical Eng., Faculty of Eng., Gadjah Mada University, Yogyakarta, Indonesia)

F-34 Differential Power Transformer Protection Technique Using the Wavelet Packet Transform Approach Iswadi HR(1)*, Redy Mardiana(2) ((1)University of Riau, Kampus Binawidya Panam, Indonesia (2)Bandung Institute of Technology, Indonesia)

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F-39 Digitalizing of High Voltage Impulse Analog Signal By PC Displaying Leonardo S lhombing, T. Haryono, Soedjatmiko (Dept. Of Electrical Eng., Faculty of Eng., Gadjah Mada University, Yogyakarta, Indonesia)

F-40 Analytical Study of Geomagnetically Induced Current=GIC Phenomenon at Power Transformer Mursid Sabdullah*, and T. Haryono (Dept. Of Electrical Eng., Faculty of Eng., Gadjah Mada University, Fakultas Teknik UGM, Yogyakarta, Indonesia)

F-41 The Effect Of Harmonic Distortion To Power Factor Tumiran(1), T. Haryono(1) and Dultudes Mangopo(2) (Dept.of electrical Eng., Faculty of Eng., Gadjah Mada University, Dept.of electrical Eng., Faculty of Eng., Cenderawasih University Jayapura, Yogyakarta, Indonesia)

F-45 Reconfiguring Radial-Type Distribution Networks Using Graph-Algorithm Yusra Sabri(1)*, Sutisa(2), Deny Hamdani(1) (Power Engineering Division, School of Electrical Engineering and Informatics Bandung Institute of Technology)

F-46 Application of Adaptive Neuro-Fuzzy Method for Forecasting Short-Term Load Demand Yusra Sabri, Deny Hamdani, M. Bachtiar Nappu (Power Engineering Division, School of Electrical Engineering and Informatics Bandung Institute of Technology)

F-51 The Optimization of Suralaya Steam Power Plant Operation With Equal Incremental Rates and Priority Method Hartono (University of Sultan Ageng Tirtayasa, Indonesia)

F-53 Daily Charge Operating Method of a Stand-Alone Photovoltaic/Diesel/Battery Power System Based on Next Day Weather Forecast Ismail Yusuf *(1,2), J.A. Lesil(2), Yoshitaka Inui(1) ((1)Toyoohashi University of Technology)

F-56 Evaluation of Lightning performance of Extra High Voltage 500 kV Transmission Lines by Characterizing of Lightning Strikes Eko Yudo Pramono*(1), Reynaldo Zoro(1), Deny Hamdani(1), Hadi Parmono(2) (Power Engineering Division, School of Electrical Engineering and Informatics, Bandung Institute of Technology)

F-60 The Optimization of Interconnected Electric Power Generating System of South Sulawesi by Merit Loading Method Based on SCADA System Salama Manjang(1), Muh. Thahir(2) ((1)Department of Electrical Engineering, Hasanuddin University, (2)Department of Electrical Engineering, Polytechnic Ujung Pandang, INDONESIA) Power Flow Study of Untransposed Transmission Lines Ali Basrah Pulungan (1), Sasongio Pramono Hadi(2), Soedjatmiko(2) ((1)Dept. of Electrical Eng., Faculty of Eng., Padang University State (2)Dept. of Electrical Eng., Faculty of Eng., Gadjah Mada University)

F-63 The Effectiveness of Shielding Techniques to Reduce High Electromagnetic Waves in Digital Transmission Erwan Sulaiman (Dept. of Power Engineering, Faculty of Electrical and Electronic Engineering, Universiti Tun Hussein Onn Malaysia, Batu Pahat, Johor, Malaysia)

F-64 Development of Web-based Lightning Information from Single Station Redy Mardiana
Contingency Analysis of Power System Electrical Operation Arfita Yuana Dewi(1), Sasono Pramono Hadi(2), Soedjatmiko(2) (1)Dept. of Electrical Eng., Faculty of Eng., Institut Teknologi Padang, (2)Dept. of Electrical Eng., Faculty of Eng., Gadjah Mada University)

Voltage Stability Analysis Of Power System Electrical Apply To Sumbateng System (Sumbur-Riau-Jambi) Asnai Effendi(1), Sasono Pramono Hadi(2), Soedjatmiko(2) (1)Dept. of Electrical Eng., Faculty of Eng., Institut Teknologi Padang, Dept. of Electrical Eng., (2)Faculty of Eng., Gadjah Mada University

Neuro Adaptive Optimal Control for Simple Power System Nasrun Haryanto, Sabat Anwari (National Institute of Technology, Bandung, Indonesia)

Accelerated Aging of the Silicone Rubber in Tropical Climate Nurhening Yuniarti(1)*, Tumiran(2), Hamzah Berahim (2) (1)Dept. of Electrical Eng., Faculty of Eng., Yogyakarta State University (2)Dept. of Electrical Eng., Faculty of Eng., Gadjah Mada University

Hydrodynamic Measurement of RTV Silane Epoxy Resin After Exposed in Tropical Climate Harry Prabowo, Tumiran, and Hamzah Berahim (Dept. of Electrical Eng., Faculty of Eng., Gadjah Mada University, Fakultas Teknik UGM, Yogyakarta, Indonesia)

Effect of Acidic Rain on Hydrophobicity of Silicon Rubber Used as Electrical Insulation Muhammad Ali and Muhammad Zafarullah (UET Taxila, Pakistan)

A Simple Analytical Approach of Estimation of Unaligned Permeance in Multi-Tooth Per Pole Switched Reluctance Motor Mohamad Aris Ramlan(1)*, Mohamad Rom Taimis(2) (1)University of Technology MARA, Malaysia (2)University of Malaya, Kuala Lumpur, Malaysia

A Study of Vegetable Oil Usage as Surface Protection of Polluted Insulator J. A. Lesi, Danial, Y.M. Simanjuntak, U.A. Gani, M. Rajagukguk (High Voltage Laboratory Departemen of Electrical Engineering Tanjungpura University, Tanjungpura University)

Synthesis and characteristics of polyimide composites prepared with four end capping agents Yu-fei Chen, Yong Fan, Yan Ma (The College of Material Science & Engineering, Harbin Univ. Sci. & Tech., Dongli District, Harbin, Heilongjiang, China)

Digitally Controlled Synchronous Buck Converter Taufik(1)*, M. Starman(1), M. Anwari(2) (1)Cal Poly State University, San Luis Obispo, USA (2)Universiti Teknologi Malaysia, Malaysia

Dynamic Behavior of a System Consist of Photovoltaic Generator, DC Motor, and Pumps Using Bond Graph Modeling A. Kartono Wijayanto(1), B. Arif Wibowo(2), C. Yanuar Setiyono(3) (1)Politeknik Negeri Bandung, Jalan Gegerkalong Hilir, Ds. Cikarang, Bandung, Indonesia (2)Master of Engineering, Bandung Institute of Technology, Bandung, Indonesia, (3)Bandung Institute of Technology, Indonesia

Simulation of the Fractal Patterns in Polymer Membranes S. Amir(1), N.S. Mohamed(1) and S. A. Hashim Ali(2) (1)Center for Foundation Studies in Science, University of Malaya, Malaysia (2)Institute of Mathematical Sciences, University of Malaya, Malaysia

Transfer Capability Calculation Using Two-Ports Equivalent Gibson H.M. Sianipar*, Herbert Innah (Power Engineering Research Division, School of Electrical and Information Engineering, Bandung Institute of Technology, Bandung, Indonesia)
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G-03 Two-Level Implementation of the Residue to Binary Converter for the 4-Moduli Set \(2n-1, 2n, 2n+1, 2n+1+1\) A. Sabbagh(1)*, K. Navi(2) (1)Department of Computer Engineering, Science and Research Campus, Islamic Azad University, Tehran, Iran, (2)Faculty of Electrical and Computer Engineering, Shahid Beheshti University, Tehran, Iran

G-09 ASIC Implementation of MAC with Overflow and Saturation Correction Lakshmanan & Masuri Othman (VLSI Design Research Group Department of Electrical, Electronic and Systems Engineering University Kebangsaan Malaysia)

G-10 The Analysis on the Distance \(d\) of the Magnetic Module with Respect to Pig for Real Time Pipeline Pigging Tracking and Monitoring System Rozaidah Saat(1)* (1)International Islamic University Malaysia, Jalan Gombak, Malaysia

G-11 Implementation of Data Grid using GLOBUS Toolkit to Facilitate Sharing and Integration of Drilling Parameters Miftah Arfan, Fariza Hanum Md Nasaruddin, and Maizatul Akmar Ismail (Faculty of Computer Science & Information Technology, University of Malaya, 50603 Kuala Lumpur, Malaysia)


G-15 Design of a Prototype Automatic Temperature Control circuitry for a Low Power consuming Shower heater Nondumiso Ngid, Taj Mohammad Baloch (Electrical and Electronics Engineering Department, Universiti Teknologi Petronas, Perak Darul Ridzuan, Malaysia)

G-16 Towards Real-Time Processor: Multioperand MSB-First Minimax Addition Yusrila Y Kerlooza(1), Kuspriyanto(2) (Bandung Institute of Technology, Bandung, Indonesia)

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H-08 Measuring Performance of LDPC Codes with Girth Degree Deny Hamdani, Wolfgang Endemann, Ruediger Kays (Communication Technology Institute, University of Dortmund, Dortmund, Germany)

H-09 Enhancing Performance of High-Order Modulation with LDPC Codes using Feedback Mechanism Deny Hamdani, Wolfgang Endemann, Ruediger Kays (Communication Technology Institute, University of Dortmund, Germany)

H-14 Dynamic Beaconing for ad hoc Position-based routing protocol using fuzzy logic R. Saqour(1), M. Shanudin(1), M. Ismail(2) (1)Faculty of Science & Information Technology, Universiti Kebangsaan Malaysia, Bangi, Selangor, (2)Faculty of Engineering, Universiti Kebangsaan Malaysia, Bangi, MALAYSIA

H-16 Design & Evaluation of A Low Noise Frequency Synthesizer for Multi Frequency SFMC-GPR Endon Bharata, Andriyan B. Suksmono (The School of Electrical Engineering and Informatics, Institut Teknologi Bandung)

H-23 Printed square UWB antenna Razali Ngah, Yusnita Rahayu, Teguh Prakoso and Mohd Shukri Othman (Wireless Communication Centre Faculty of Electrical Engineering Universiti Teknologi Malaysia, Malaysia)
H-28 Performance Improvement of Split Compressed Image transmission Using Diversity Selection Combining Technique in Wavelet Domain  Bahaeddin, MT.  {Electrical Engineering Department, faculty of Engineering, Andalus University}

H-29 RPE-LPC Speech Coder at 7.8 kbps  Ikhwana Elfri  {Electrical Engineering Department, Andalus University, Jurusan Teknik Elektro UNAND, Kampus UNAND Limau Manih, Padang}

H-31 Performance evaluation of the combined power control and antenna diversity in CDMA systems  A. Kurniawan*, and B. Maruddani  {Bandung Institute of Technology, Bandung, Indonesia}

H-32 Modified Dipole Antenna For UWB SFCW-GPR  A. Adya Pramudita(1,2)*, Adit Kurniawan(1), Andriyan Bayu Sukmono(1)  {(1)Telecommunication Radio and Microwave Lab, STEI - ITB, Indonesia (2)Unika Atmajaya Jakarta, Jakarta}

H-34 Ray Tracing In Graded Index Rod Lens  Sofian*), Julinda Pangaribuan and John E. Batubara  {Department of Electrical Engineering Universitas Pelita Harapan, Lippo Karawaci, Tangerang, Indonesia}

H-35 Channel Estimation for OFDM-based Wireless Broadband in Highly Mobile Environment  Hassan Migdadi(1), Ahmod Unggul Priantoro(1), Masrul Faizal Mohammad(2)  {Electrical and Computer Engineering Department, Faculty of Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia}

H-36 2D Parallel Solver for Free Space Wave Propagation on Distributed Memory Multi-processor Machine  M.K. Hasain(1) , M. Othman(2), Z. Abbas(3), J. Sulaiman(4) and F. Ahmad(2)  {(1)Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, (2)Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, Selangor, Malaysia. (3)Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia. (4)Science and Technology, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia}

H-38 Acquisition Performance of Modified-Costas Loop QPSK Digital Demodulator in the Absence of Noise  Sugiharto  {School of Electrical Engineering and Informatics Bandung Institute of Technology}

H-40 Analyzing the Effect of HELLO Messages in QoS-AODV  Nur Idawati Md Enzai(1)*, Farhat Anwar(2), Zeldi Suryady(3)  {Electrical and Computer Engineering Department, International Islamic University Malaysia (IIUM) Kuala Lumpur, Malaysia}

H-41 Bi-polar Ionospheric GPS-TEC at Conjugate Stations during 2004 Equinoxes  Sumazly Sulaiman(1)*, Mohd Alauddin Mohd Ali(1), Baharudin Yatim(2)  {(1)Jabatan Kejuruteraan Elektrik, Elektronik dan Sistem, Fakulti Kejuruteraan, Universiti Kebangsaan Malaysia, 43600 Bangi Selangor, Malaysia (2)Institut Sains Angkasa (ANGKASA), Universiti Kebangsaan Malaysia, Selangor, Malaysia}

H-47 A Codebook for Period Information of Speech Signal Quantization based on Sinusoidal Model  Florentinus Budi Setiawan(1,3), Soejigardjo Soegijoko(2) Sugiharto(1) Suharto Tjondronegoro(1)  {(1)Telecommunication, Radio and Microwave Laboratory, SEEI - ITB, Bandung, (2)Biomedical Engineering Laboratory, SEEI - ITB, Bandung, (3)Electrical Engineering Soegijapranata Catholic University, Semarang}

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Information Technology

I-05 Performance Evaluation on Peer-to-peer (P2P) Distributed Hash Table (DHT) Protocols Wan Fariza binti Wan Abdul Rahman(1) and Farhat Anwar(2) (1)Kulliyyah of Engineering, International Islamic University Malaysia (2)Kulliyyah of Engineering, International Islamic University Malaysia

I-06 iProt – A Data Warehouse for Protein Database M. I. Jaya, Z. Zainol and N.H. Ahamed Hassan Malim (1)School of Computer Sciences, Universiti Sains Malaysia, Malaysia

I-10 Educational Mobile IP Simulator Lee Jen Funn, Sunthari Solaimalai, Abdullah Gani (Dept of System and Computer Technology, Faculty of Computer Science and Information Technology University of Malaya, Malaysia)

I-12 Optimization Model for Achieving Efficient VoIP Networks A. Yoanes Bandung(1)*, B. Carmadi Machhub(1) C. Armein Langi(1) D. Suhoono H. Supangkat(1) (School of Electrical Engineering and Informatics, Institut Teknologi Bandung, Indonesia)

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I-14 Web Server Benchmark Application "WiiBench" for Unix-like OS using Erlang/OTP R11 and Fedora-Core Linux 5.0 A. B. Mutiara(1)* and T.A. Sebastian(1) (1)GunaDarma University, Indonesia

I-15 Preferred Communication Medium For E-Government: A Case Study of Yogyakarta Province, Indonesia Tony Dwi Susanto, Robert Goodwin (Informatics Engineering Department, Universitas Pembangunan Nasional “Veteran” Yogyakarta Indonesia, School of Informatics and Engineering, The Flinders University of South Australia)

I-16 A knowledge Management Readiness Model for the public sector Tan Yit Quin(1)*, Abdul Razak Hamdan(2), Mohammed Yusoff(3) (Faculty of Information Science and Technology, National University of Malaysia, Malaysia)

I-18 Internet Knowledge Sharing: the Malaysian Bankers’ Experience? Hafizi Muhammad Ali and Zawiyah Mohammad Yusof (Department of Information Science Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, Selangor, Malaysia)

I-20 Technological and non Technological Challenges in Complex System Development: The Case of HRMIS, the MSC Electronic Government Proposed Track: Social and Cultural aspect of IT Use (Research in Progress) Marini Othman, Abdullah Md Zin, Abdul Razak Hamdan (1)Department of Informatics, COIT, Universiti Tenaga Nasional, Kajang, Selangor (2)Department of Industrial Computing, Faculty of Information Science and Technology, UKM Bangi (3)Department of Systems Science and Management, Faculty of Information Science and Technology, UKM Bangi

I-22 Measuring the Information Technology Strategic Planning Implementation: A Case Study Yusmadi Yah Jusoh(1)*, Abdul Razak Hamdan(2), Aziz Deraman(3) (Faculty of Information Science and Technology, National University of Malaysia, Malaysia)
Empowering The Knowledge Of University: A Roadmap Toward Smart Campus, Leony Lidya(1), M. Sukrisno M.(2), Iping Supriana S.(3), Iman Sudirman(4) (1)Doctoral Student, School of Electrical Engineering and Informatics, Institut Teknologi Bandung (2,3,5)School of Electrical Engineering and Informatics, Institut Teknologi Bandung (4)Industrial Engineering Department, Institut Teknologi Bandung

Content Presentation and SMS-based e-Government Tony Dwi Susanto(1), Robert Goodwin(2) (1)Informatics Engineering Department, Universitas Pembangunan Nasional "Veteran" Yogyakarta Indonesia (2)School of Informatics and Engineering, The Flinders University of South Australia

Implementing Evaluation of Readiness for ITSP in Malaysian Higher Education Institutions Bakhtiar Md Shaari(1), Mustapa Kamal(2), Abd. Razak Hamdan(3), Aziz Deraman(4) (1)Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, Selangor, Malaysia (2)Faculty of Science Computer and Information Technology, Universiti Malaya, Malaysia (3)Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, Selangor, Malaysia (4)Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, Selangor, Malaysia

The Use of Open Source Software to Build an Effective English Learning System Mohammad Yusuf Hamdan(1) Arya Adrianyah(2) (1)ITB, Bandung (2)STEI – ITB, Bandung West Java, Indonesia

A Review of Peer-to-Peer Systems R. Mohamed(1)*, C. D. Buckingham1, A. Jusoh(2) (1)Aston University, School of Engineering & Applied Science, United Kingdom (2)University of Malaysia Pahang, Faculty of Computer Systems & Software Engineering, Malaysia

Destination-oriented route in Integrated LRT web-based system for Tourism Muhammad Suhaizan Sulong*, Muhammad Haziq Lim Abdullah, Azliarom Abdul Aziz, Massila Kamalrudin (Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka, Melaka, Malaysia)

Formative evaluation of An Instructional System for Computer Training Delivery Rosseni Din, Mohamad Shanudin Zakaria, Khairul Anwar Mastor (Universiti Kebangsaan Malaysia)

Local Content Development using BREW Ecosystem Y. Rosmansyah (Mobile Broadband Technology Centre (MBTC), School of Elec. Eng. and Informatics (STEI) Institute of Technology at Bandung (ITB) Bandung, Indonesia)

Reconstruction of Genetic Regulatory Network Knowledge Base from Metabolic Pathways Data Henny Y. Zubiri*, Chitra H. Ayuningtyas, Adang S. Ahmad1, Achmad S. Noer2 (1)School of Electrical Engineering & Informatics, Bandung Institute of Technology, Indonesia (2)Faculty of Mathematics & Basic Sciences, Bandung Institute of Technology, Indonesia