PROGRAM BOOK

Joint Conference

2019 International Seminar on Intelligent Technology and Its Application (ISITIA 2019)

&

12th AUN/SEED-Net Regional Conference in Electrical and Electronics Engineering

(RC EEE)

Organized by:

Department of Electrical Engineering
Institut Teknologi Sepuluh Nopember, Indonesia

August 28 – 29, 2019

JW Marriott, Surabaya, Indonesia

MESSAGE FROM THE GENERAL CHAIR

 We welcome you all to the joint conference of the 2019 International Seminar on Intelligent Technology and Its Applications, ISITIA, and the 12th AUN/SEED-Net Regional Conference in Electrical and Electronics Engineering, or RCEEE. It is a huge honour for us to be holding the ISITIA and RCEEE joint conference again this year, which would be the second time that the Department of Electrical Engineering, Institut Teknologi Sepuluh Nopember (ITS), organizes these two conferences together.

In our records, the combined total submissions to ISITIA 2019 and RCEEE 2019 is 160 submissions with authors affiliated with institutions from 13 different countries, including from various ASEAN countries. We accepted 84 papers for presentation at ISITIA and 24 at RCEEE. These papers belong to various topics such as power systems, telecommunications, electronics, control systems, biomedical engineering, and intelligent systems.

We thank you for submitting your recent research work to our conference and present your findings in this event. ISITIA 2019 is the fifth ISITIA conference that is annually organized by the Department of Electrical Engineering, ITS, and technically co-sponsored by IEEE Indonesia Section. However, the history of ISITIA goes even further back 20 years ago when the department started its annual national conference called Seminar on Intelligent Technology and Its Applications, or SITIA for short. It is our hope that researchers from different backgrounds and fields can share their findings and latest development in the broad area of electrical and electronics engineering. It is also our hope that through this forum, we can all give contributions that brings positive impact to all of us. Hence, the theme for this year's joint conference, "Creating impact through intelligent devices and systems", was chosen.

This joint conference has received tremendous help and support, therefore we would like to thank all reviewers from various universities in different countries, as well as the honourable keynote speakers in this event. Our gratitude goes to AUN/SEED-Net and JICA for sponsoring the joint conference of RCEEE 2019 and ISITIA. We would also like to thank Institut Teknologi Sepuluh Nopember, Surabaya, for the support and help for the conference, as well as IEEE Indonesia Section and IEEE ITS Student Branch for also co-sponsoring this event.

Lastly, please have a great time at the conference, and we wish you a very pleasant stay in Surabaya, Indonesia.

Dr. Astria Nur Irfansyah

ISITIA 2019 General Chair

MESSAGE FROM THE DEAN OF
THE FACULTY OF ELECTRICAL TECHNOLOGY
INSTITUT TEKNOLOGI SEPULUH NOPEMBER

Dear ladies and gentlemen,

It is my pleasure to welcome you to the International Seminar on Intelligent Systems and its Applications ISITIA 2019 in Surabaya, Indonesia.

Institut Teknologi Sepuluh Nopember Surabaya has commitment to achieve our vision and mission, to actively participate in the development of science and technology. In line with this, the Faculty of Electrical Technology ITS aims to contribute towards the development in the area of electrical technology and its related fields, and also bringing impact to the society and community. Through the theme of this conference, "Creating impact through intelligent devices and systems," I wish academics, researchers, and industry can meet and share our work and findings to bring impact for a better future.

This is now an era of rapid change and development. The next industrial revolution, or popularly known as industrial revolution 4.0, certainly has tremendous opportunities in improving the quality of life of us. These big opportunities also come with huge challenges and threats. It is very important to highlight that this development must be made for humanity and our well-being. Therefore, the Faculty of Electrical Technology ITS has the goal to establish Humanised Intelligent System Center of Excellence.

Finally, I would like to thank all of you who contributed in this event. I also would like to give appreciation to the keynote speakers, reviewers, committee, and technical program committee for their work to realise this event. For all presenters and visitors, I hope you can enjoy the conference and have a pleasant time in Surabaya.

Thank you.

Dr. Tri Arief Sardjono, S.T., M.T.

Dean

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Institut Teknologi Sepuluh Nopember

Surabaya

Indonesia

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KEYNOTE LECTURE

Prof. Ryohei Kanzaki

Director, Research Center for Advanced Science and Technology,
The University of Tokyo, Japan
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Learning from Senses and Intelligence of Insects: Convergent Future Technology for Sustainable Society

To elucidate the dynamic information processing in a brain underlying adaptive behavior (or biological intelligence), it is necessary to understand the behavior and corresponding neural activities. This requires animals which have clear relationships between behavior and corresponding neural activities. Insects are precisely such animals and one of the adaptive behaviors of insects is high-accuracy odor source orientation. Insects are valuable model systems in neuroscience due to the balance between the moderate complexity of their nervous systems, a rich behavioral repertoire, and the cost of maintenance as experimental animals. Insect brains contain on the order of 10^5 to 10^6 neurons. The concept of individually identifiable neurons and small networks composing functional units have been vital for understanding insect brains. Moreover, insects are uniquely suited for multidisciplinary studies in brain research involving a combined approach at various levels, from molecules over single neurons to neural networks, behavior, modeling, and robotics, owing to their seamless accessibility to a wide variety of methodological approaches, in particular genetic engineering, neuroanatomy, electrophysiology, and functional imaging.

To examine the neural basis of the odor-source orientation behavior, we implemented a model of the neural circuit reconstructed from single neurons, and integrated it with a mobile robot. Moreover, in order to understand the dynamics of the neural circuitry, we have developed an "insect-robot hybrid system" in which the insect or an insect brain controls a robot.

Our interdisciplinary research will enable us to use the full potential of the features of insect sensors and brains as model systems for understanding the dynamical sensory and neural substrates of adaptive behaviors (or bilogical intelligece) for the first time. Our interdisciplinary research is predestined to contribute to develop new avenues for applications affecting safety, security, and everyday life.

Ryohei Kanzaki received his B.S., M.S. and D.Sc. degree in Neurobiology from the Institute of Biological Sciences, University of Tsukuba in 1980, 1983 and 1986, respectively. From 1987 to 1990 he was a postdoctoral research fellow at the Arizona Research Laboratories, University of Arizona. From 1991 to 2003 he was a at the Institute of Biological Sciences, University of Tsukuba. From 2004 to 2006 he was a full professor at Department of Mechano-Informatics, Graduate School of Information Science and Technology, the University of Tokyo. Since 2006 he is a full professor at the Research Center for Advanced Science and Technology (RCAST), the University of Tokyo. Since 2016 he has been a director of RCAST. He was a president of the Japanese Society for Comparative Physiology and Biochemistry (JSCPB) from 2012 to 2015. Ryohei Kanzaki is also contributing greatly to science education of children through children's science and technology development projects by Japan Science and Technology (JST) as chairs of the projects.

KEYNOTE LECTURE

Assoc. Prof. Dr. Supavadee Aramvith

Department of Electrical Engineering
Chulalongkorn University, Thailand
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Video Analytics for Surveillance IoT Applications

In this talk, we will present and discuss the current trends and researches in video analytics. As surveillance cameras have been widely installed worldwide, although the main purpose of those cameras is for monitoring, but the most important task is to be able to analyze video contents and extract useful information. Several on-going researches such as image super resolution, real-time multiple face recognition system, video anomaly detection and several implementations of embedded video analytic system on FPGA and Single Board Computers will be discussed.

Supavadee Aramvith (IEEE S'95-M'01-SM'06, IEICE M'04) received the B.S. (first class honors) degree in Computer Science from Mahidol University, Bangkok, Thailand, in 1993. She received the M.S. and Ph.D. degrees in Electrical Engineering from the University of Washington, Seattle, USA, in 1996 and 2001, respectively. She joined Chulalongkorn University in June 2001. Currently, she is currently an Associate Professor at Department of Electrical Engineering, Chulalongkorn University, Bangkok, Thailand. Currently, she is an Associate Professor at Department of Electrical Engineering, Chulalongkorn University, Bangkok, Thailand. She was Associate Head in International Affairs (2007-2016), Head, Communication Engineering Division (2013-2016), Head, Digitial Signal Processiong Laboratory (2017-2018).

KEYNOTE LECTURE

Assoc. Prof. Dr. Tara Julia Hamilton

Macquarie University, Australia
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Silicon Intelligence

In this presentation I will introduce you to the wonderful world of neuromorphic engineering. I will discuss some of my past, present, and future projects in neuromorphic engineering including modelling the nervous system, developing bio-neuro-inspired artificial intelligence, and applications of neuromorphics to designing better analog integrated circuits.

Tara Julia Hamilton (S'97–M'00) received the B.E. degree (Hons.) in electrical engineering and the B.Com. degree from The University of Sydney, Australia, in 2001, the M.Sc. degree in biomedical engineering from The University of New South Wales, Australia, in 2003, and the Ph.D. degree from The University of Sydney in 2009. She is currently an Associate Professor with the School of Engineering, Macquarie University, Australia. She has authored over 100 journal papers, conference papers, and book chapters, and holds patents in integrated circuit design, neuromorphic systems, and biomedical engineering. Her current research interests include neuromorphic engineering, mixed-signal integrated circuit design, and biomedical devices.

KEYNOTE LECTURE

Dr. Muhammad Rivai

Department of Electrical Engineering,
Institut Teknologi Sepuluh Nopember, Indonesia
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The artificial olfactory system

We have five senses including physical senses (sight, hearing and touch) and chemical senses (smell and taste). Science and technology have developed rapidly, so we can find the three physical senses in various electronic devices. However, the sense of smell and taste is still not much developed. The researchers tried to make an alternative approach by imitating the working principle of the mammalian olfactory system which is the best chemical detector capable of detecting various volatile chemical compounds or odors. This approach uses a sensor array which each element has a response that partially overlaps with the others. Although the identification process cannot be achieved by a single sensor element, the pattern of the sensor array will produce a unique fingerprint for each odor. An artificial olfactory system or electronic nose composed of sensor array, signal conditioning, and pattern recognition that corresponds to the olfactory receptors, olfactory bulb, and olfactory cortex of the mammalian nose, respectively. Chemical sensors commonly used in this method are semiconductor devices, composite conducting polymers, quartz resonators, surface acoustic wave devices, and optical gas sensors. Preprocessing is signal conditioning of sensor signals, which removes irrelevant information to make it more supportive to the next phase, which can include normalization, noise reduction, compression, baseline manipulation, etc. Feature extraction from sensor response is needed to produce several significant features selected for the classification process. This method includes principal component analysis, Fourier transform, wavelet transformation, linear discriminant analysis, etc. Classification methods can be categorized into supervised and unsupervised methods, which include back propagation neural networks, support vector machines, k-nearest neighbors, k-means clustering, self-organizing maps, etc. An efficient chemical sensing system combined with a robust pattern recognition method to achieve accurate quantitative and qualitative information about chemical compounds is a challenging mission in the future, especially applied in the food, medical and environmental fields.

Muhammad Rivai received BE degree from Institut Teknologi Sepuluh Nopember in 1993, ME degree from University of Indonesia in 1997, PhD degree from University of Airlangga in 2006. He is currently a lecturer at Electrical Engineering Department, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia. His research interests include odor sensors, electronic circuits, and neural network applications.

KEYNOTE LECTURE

Nicolas Husny Tjioe, M.Sc.

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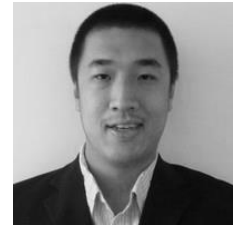
Trusted Security for Smart Home

Internet of Things (IoT) are affecting our daily lives significantly. A smart home is a home that provides increased user convenience and energy efficiency based on smart and secured devices, functionalities and services which can be controlled remotely or interact or provide data automated based on intelligent sensing and situational awareness. The key building blocks to enable smart homes are made up of sensors, controllers, actuators and security. This means they can collect, interpret and process data and then trigger appropriate actions or responses, all within a secure environment. In this presentation, we will go over several use cases such as Home Appliances and Smart Lighting.

Mr. Nicolas Husny is currently with Infineon Technologies as an experienced Business Development Manager with a demonstrated history of working in the semiconductors industry, specializing in embedded security solutions, IoT, and smart card. Mr. Nicolas Husny obtained his Masters degree in Computer Science from Arizona State University (2008 - 2010), and his Bachelor in Computer Engineering from the Arizona State University (2004 - 2007).

PROGRAM SCHEDULE

ISITIA – RCEEE 2019, 28 – 29 August 2019, Surabaya, Indonesia

ISITIA and RCEEE 2019 General Program Schedule

Day 1, 28 August 2019

Time	Event	Venue
7.00 - 8.00	Registration	Ballroom foyer
8.00 - 8.40	Opening ceremony: - Opening remarks from General Chair - Opening remarks from Prof. Ueda Tamon, Chief Advisor and Acting Executive Director, AUN/SEED-Net - Official opening by Dean of Faculty of Electrical Technology, ITS	Ballroom
8.40 - 9.30	Keynote speech 1: Prof. Ryohei Kanzaki (*University of Tokyo*) Title: Learning from Senses and Intelligence of Insects: Convergent Future Technology for Sustainable Society	Ballroom
9.30 - 10.00	Coffee break	
10.00 - 10.50	Keynote speech 2: Assoc. Prof. Dr. Supavadee Aramvith (*Chulalongkorn University*) Title: Video Analytics for Surveillance IoT Applications	Ballroom
10.50 - 11.40	Keynote speech 3: Nicolas Husny Tjioe (*Infineon*) Title: Trusted Security for Smart Home	Ballroom
11.40 - 12.25	Presentation from AUN/SEED-Net, & photo session	Ballroom
12.25 - 13.30	Lunch break	Ballroom foyer
13.30 - 15.00	Technical session 1	Ballroom, Java Flores, Banda Celebes, Oasis
15.00 - 15.30	Coffee break	Foyers
15.30 - 17.00	Technical session 2	Ballroom, Java Flores, Banda Celebes, Oasis
18.30 - 21.00	Gala Dinner	Pool-side

Day 2, 29 August 2019

Time	Event	Venue
7.00 - 8.00	Registration	Ballroom foyer
8.00 - 8.50	Keynote speech 1: Assoc. Prof. Dr. Tara Hamilton (*Macquarie University*) Title: Silicon Intelligence	Ballroom
8.50 - 9.40	Keynote speech 2: Dr. Muhammad Rivai (*Institut Teknologi Sepuluh Nopember*) Title: The artificial olfactory system	Ballroom
9.40 - 10.00	Closing remarks, ISITIA 2020 promotion, photo session	Ballroom
10.00 - 10.30	Coffee break	Ballroom foyer
10.30 - 12.30	Technical session 3	Ballroom, Java Flores, Banda Celebes, Bali C
12.30 - 13.30	Lunch break	Ballroom foyer
13.30 - 15.30	Technical session 4; AUN/SEED-Net delegates visit Surabaya Intelligent Transportation System & ITS	Ballroom, Java Flores, Banda Celebes, Bali C; bus visit to SITS and ITS
15.30 - 16.00	Coffee break	Foyers

For paper presentations, please prepare the presentation file in the location 15 minutes before the scheduled session time.

TECHNICAL PRESENTATION SCHEDULE

Technical Program Schedule
Day 1

Technical Session 1 (28 August 2019, 13.30 - 15.00 WIB)

Time	Rooms & Track			
	Ballroom	Java Flores	Banda Celebes	Oasis
	Power & Energy Systems 1	*Sensors & Instrumentation 1*	*Robotics & Automation*	*Information Tech. 1*
13:30	ISPS1	ISSN1	ISRA1	ISIT1
13:45	ISPS2	ISSN2	ISRA2	ISIT2
14:00	ISPS3	ISSN3	ISRA3	ISIT3
14:15	ISPS4	ISSN4	RCRA2	ISIT4
14:30	RCPS1	RCRA1	RCRA3	ISIT5
14:45	RCPS2	RCSN2	RCRA4	ISIT6

Technical Session 2 (28 August 2019, 15.30 - 17.00)

Time	Rooms & Track			
	Ballroom	Java Flores	Banda Celebes	Oasis
	Power & Energy Systems 2	*Biomedical Engineering 1*	*Telecomm. 1 (Antenna & MIMO)*	*Artificial Int. & Machine Learning 1*
15:30	ISPS5	ISBM1	ISTL1	RCAI1
15:45	ISPS6	ISBM2	ISTL2	RCAI2
16:00	ISPS7	ISBM3	ISTL3	RCAI3
16:15	ISPS13	ISBM4	RCTL1	RCAI4
16:30	RCPS3	ISBM5	RCTL2	RCAI5
16:45	RCPS4	ISBM6	RCTL3	RCCE1

Code:

IS*** : ISITIA   TL : Telecommunications
RC***: RCEEE   IT : Information Technology
PS : Power and Systems   CE : Computer Engineering
HV : High Voltage Engineering   SN: Sensor & Instrumentations
BM: Biomedical Engineering   RA: Robotics & Automation
AI : Artificial Intelligence & Machine Learning   EL : Electronics & VLSI

Technical Program Schedule
Day 2

Technical Session 3 (29 August 2019, 10.30 - 12.30 WIB)

Time	Rooms & Track			
	Ballroom	Java Flores	Banda Celebes	Bali C
	Power & Energy Systems 3	*Biomed. Eng 2 (signal proc. & wearables)*	*Telecomm. 2 and Signal Proc.*	*Artificial Int. & Machine Learning 2*
10:30	ISPS8	ISBM7	ISTL4	ISAI1
10:45	ISPS9	ISBM8	ISTL5	ISAI2
11:00	ISPS10	ISBM9	ISTL6	ISAI3
11:15	ISPS11	ISBM10	ISEL1	ISAI4
11:30	ISPS12	ISBM11	ISIT9	ISAI5
11:45	RCPS5	ISCE2	RCEL1	ISAI6
12:00	RCPS6	ISCE3	RCCO1	ISAI7
12:15		RCSN1	RCC02	ISAI8

Technical Session 4 (29 August 2019, 13.30 - 15.30 WIB)

Time	Rooms & Track			
	Ballroom	Java Flores	Banda Celebes	Bali C
	Power & High Voltage Eng.	*Information Tech. 2*	*Control Systems*	*Artificial Int. & Machine Learning 3*
13:30	ISHV1	ISIT7	ISCO1	ISAI9
13:45	ISHV2	ISIT8	ISCO2	ISAI10
14:00	ISHV3	ISIT10	ISCO3	ISAI11
14:15	ISPS14	ISCE1	ISSN5	ISAI12
14:30	ISPS15	ISAI13	ISSN6	ISAI14
14:45	ISPS16	ISAI17	ISSN7	ISAI15
15:00	ISPS17		ISSN8	ISAI16
15:15				

Code:

IS*** : ISITIA
RC***: RCEEE
PS : Power and Systems
HV : High Voltage Engineering
BM: Biomedical Engineering
AI   : Artificial Intelligence & Machine Learning
TL : Telecommunications
IT : Information Technology
CE : Computer Engineering

SN: Sensor & Instrumentations
RA: Robotics & Automation
EL : Electronics & VLSI

ISITIA – RCEEE 2019, 28 – 29 August 2019, Surabaya, Indonesia

- Technical Session 1 -

Session 1 - Track: Power & Energy Systems 1 - Wednesday 28 August 2019, 13.30 - 15.00, Ballroom

Code	#	Title	Authors
ISPS1	1570555836	Optimizing Tie Switches Allocation and Sizing Distributed Generation (DG) based on Maximize Loadability Simultaneously using HPSO Algorithm	Darma Arif Wicaksono; Ontoseno Penangsang; Rony Seto Wibowo; Dimas Fajar Uman Putra; Ni Aryani
ISPS2	1570556203	MPPT Based on Modified Incremental Conductance Algorithm for Solar Powered UAV	Heri Suryoatmojo
ISPS3	1570556259	A Comparative Study of Maximum Power Point Tracking Algorithms for Wind Energy Systems in Giligenting Island	Soedibyo Soedibyo; Ahmad Firyal Adila; Sjamsjul Anam; Mochamad Ashari
ISPS4	1570556807	Design of Single-Forward Type Charger Using SiC MOSFET for Pulsed Power Generator	Ahmad Firyal Adila; Heri Suryoatmojo; Mochamad Ashari; Takashi Sakugawa
RCPS1	1570565137	Comparative Study of LVAC Distribution Topology for Urban Village in Phnom Penh	Vannak Vai; Long Bun
RCPS2	1570572469	Simulation Study of Different Single Phase Transformer-Less Pv Inverter Topologies for Grid-Tied PV System	Shameem Ahmad; Saad Mekhilef; Leong Wen Chek

Session 1 - Track: Sensors & Instrumentation 1 - Wednesday 28 August 2019, 13.30 - 15.00, Java Flores

Code	#	Title	Authors
ISSN1	1570557616	Horizontal Scanning Method by Drone Mounted Photodiode Array for Runway Edge Light Photometry	Daniel Steven Doxazo Sitompul; Fakhri Surya; Fakhri Suhandi; Hasballah Zakaria
ISSN2	1570557631	Comparative Study of Burst And Beams Types Ultrasonic Sensor For Distance Measurements	Purwadi Agus Darwito; Murry Raditya; Halimatus Sa'diyah; Arviandi Cikadiarta; Aditya Wimansyah
ISSN3	1570561285	QCM Coating With rGO Material as a Platform Developing Piezoelectric Biosensor	Dody Susilo; Totok Mujiono; Darminto Darminto
ISSN4	1570561461	Soft Sensor Design of Solar Irradiance Using Multiple Linear Regression	Muhammad Khamim Asy'ari; Ali Musyafa'; Ronny Noriyati; Katherin Indriawati
RCRA1	1570572473	Autonomous car for scanning and modeling unknown areas developed from open-source platform Arduino	Nam Hoang Nguyen
RCSN2	1570574136	Studying and Realizing the Smart Device for measuring and monitoring Ammonia Concetration, applying for NPK fertilizer industry	Thanh Dang Bui; Quan Giang; Vinh Le; Tan Phan

Session 1 - Track: Robotics & Automation - Wednesday 28 August 2019, 13.30 - 15.00, Banda Celebes

Code	#	Title	Authors
ISRA1	1570555903	Development of Unmanned Aerial Vehicle (UAV) for Dropping Object Accurately Based on Global Positioning System	Ronny Mardiyanto
ISRA2	1570557051	Ladder Diagram Design Based On Change Signal Method For Crude Palm Oil Process	Eka Iskandar; Mochammad Rameli; Andhiko Palito F
ISRA3	1570561450	Leader Follower Navigation System based on Pedestrian Dead Reckoning for Mobile Robot Navigation	Muhammad Farih; Mochammad Sahal; Rusdhianto Effendi Abdul Kadir
RCRA2	1570572461	Simulating Meerkat Foraging Behavior using Agent Based Modeling Approach on NetLogo	Wan Othman
RCRA3	1570573252	Implementation Of Ground Mobile Robot Navigation Using Stereo Vision Based Visual Odometry	Ilham Wicaksono; Mochammad Sahal; Rusdhianto Effendie A. K.
RCRA4	1570574459	Precision Landing for Drone based on Computer Vision	Petra Situmorang; Astria Nur Irfansyah; Muhammad Attamimi

Session 1 - Track: Information Technology 1 - Wednesday 28 August 2019, 13.30 - 15.00, Oasis

Code	#	Title	Authors
ISIT1	1570551905	Next Generation Firewall for Improving Security in Companies and IOT Network	Benfano Soewito
ISIT2	1570557466	Clustering on Multidimensional Poverty Data using PAM and K-prototypes Algorithm (Case Study: Jambi Province 2017)	Aris Wijayanto; Yoyon Suprapto; Diah Wulandari
ISIT3	1570557470	Analysis of E-Procurement Service Satisfaction Level Using Service Quality Model	Tri Hasti Wulandari; Yoyon Suprapto; Achmad Affandi
ISIT4	1570557479	Implementation of Cryptography Module Security Certification Based on SNI ISO/IEC 19790:2012 - Security Requirements For Cryptography Module	Yasril Andriawan; Ival Tirta
ISIT5	1570557636	Maturity Level Analysis of Governance and Integration IT of Simkeuda in Pamekasan Regency Using COBIT 4.1	Novis Prasetyawan; E Endroyono; Supeno Susiki
ISIT6	1570558921	Authentication of Printed Document Using Quick Response (QR) Code	Ahmad Tasyrif Arief; Iwan Wirawan; Yoyon Suprapto

- Technical Session 2 -

Session 2 - Track: Power & Energy Systems 2 - Wednesday 28 August 2019, 15.30 - 17.00, Ballroom

Code	#	Title	Authors
ISPS5	1570556890	Optimal Placement and Sizing Distributed Generation (DG) Considering Energy Storage Using ABC-QP Algorithm	Luthfia Fajariyanti; Rony Seto Wibowo; Ontoseno Penangsang; Dimas Fajar Uman Putra; Ni Aryani
ISPS6	1570557360	Security Constrained Unit Commitment Considering Ramp Rate and Transmission Line Losses Using Binary Particle Swarm Optimization Based on IEEE 30 Bus System	Ni Aryani; Dimas Fajar Uman Putra; Elpha Aulia Arifin; A. Saad Daroini
ISPS7	1570557446	Design and Implementation of Three-Phase Grid-Connected Inverter for PV System	Nur Rohmat Hadianto; Mustaghfiri Mustaghfiri; Fifi Hesty; Joke Pratilastiarso; Erik Tridianto
ISPS13	1570561349	Optimal Planning of Solar PV Using Simple Model for New Feed-in Tariff in Indonesia	Kharisma Bani Adam; Hajime Miyauchi
RCPS3	1570572618	Coils design and parallel resonant H-bridge inverter for inductive power transfer to recharge low-power portable devices	Leong Wen Chek
RCPS4	1570574905	Detail Design of Interior Permanent Magnet Synchronous Motor for Ebike	Bui Minh Dinh

Session 2 - Track: Biomedical Engineering 1 - Wednesday 28 August 2019, 15.30 - 17.00, Java Flores

Code	#	Title	Authors
ISBM1	1570552368	Estimation of Nigrescens Palm Oil Ripeness using Contrast and Skewness from 680 nm Image	Agung W. Setiawan; Donny Danudirdjo; Alfie Rizky Ananda
ISBM2	1570552445	Panoramic of Image Reconstruction Based on Geospatial Data Using SIFT (Scale Invariant Feature Transform)	Adi Hermansyah; Eko Mulyanto Yuniarno; Supeno Mardi Susiki Nugroho; Arif Nugroho; Arief Kurniawan
ISBM3	1570557575	Seizure Type Detection in Epileptic EEG Signal using Empirical Mode Decomposition and Support Vector Machine	Inung Wijayanto; Rudy Hartanto; Hanung Adi Nugroho; Bondhan Winduratna
ISBM4	1570557611	Automatic Detection of Fetal Head using Haar Cascade and Fit Ellipse	Putri Nadiyah; Riyanto Sigit; Heny Yuniarti; Noor Rofiqah; Qurina Firdaus
ISBM5	1570558156	Deep Learning and Late Fusion Technique in Medical Image Classification	David Alebiosu; Muhammad Fermi Pasha; Anuja Thimali Dharmaratne; Sayyida Masoom Gilani
ISBM6	1570558409	EEG Visualization for Cybersickness Detection During Playing 3D Video Games	Khaitami Khaitami; Adhi D Wibawa; Supeno Susiki; Alfi Khoirunnisaa

Session 2 - Track: Telecommunications 1 (Antenna & MIMO) – Wed.28 Aug 2019, 15.30 - 17.00, Banda Celebes

Code	#	Title	Authors
ISTL1	1570556717	Circular Polarization 5.5 GHz Double Square Margin Antenna in the Metal Framed Smartphone for SIL Wireless Sensor	Irfan Mujahidin; Aries Boedi Setiawan
ISTL2	1570556902	Capacity Improvement Factor of HF Multi-Mode Skywave MIMO Channels	Teguh Imam Suharto; Gamantyo Hendrantoro; Achmad Mauludiyanto; Umai Saroh; Roberto Corputty; Muriani Muriani
ISTL3	1570557438	Parameter study of coplanar vivaldi antenna feeding structure	Efrilia Marifatul Khusna; Eko Setijadi; Gamantyo Hendrantoro
RCTL1	1570569937	Modified Double Hexagonal Loop for Bandwidth Enhancement of Frequency Selective Surface	Mohamad Kamal A. Rahim; Nur Biha Mohamed; Osman Bin Ayop
RCTL2	1570571950	Access Points Positioning and Link Allocation in Cell-Free Massive MIMO system	Wan Amirul Wan Mohd Mahyiddin; Fuad Erman; Effariza Hanafi; Kaharudin Dimyati; Noraisyah Mohd Shah
RCTL3	1570574089	Wideband Short-Ended Frequency Reconfigurable Metamaterial Antenna Design	Mohamad Rijal Hamid; Mohamad Kamal A. Rahim; Murtala Aminu-Baba; Mohd Fairus Mohd Yusoff; Adamu Y Iliyasu

Session 2 - Track: AI & Machine Learning 1 - Wednesday 28 August 2019, 15.30 - 17.00, Oasis

Code	#	Title	Authors
RCAI1	1570570799	Comparative Study: Text Classification Method to detect hate speech in Indonesian Language	Ali Yunda Noverma Hakim, Ay; Widy Widyawan; Teguh Bharata Adji
RCAI2	1570572332	Cluster Analysis on Student Data for Selection of Major at University	Ainur Rahmawati; Eko Mulyanto Yuniarno; Supeno Susiki
RCAI3	1570572509	Road Pavement Model using Regression Data Mining For Road Maintenance Decision Making	Dessy Isyana Sunaryati
RCAI4	1570573957	Data-driven Water Potability Classification using Ensemble Learning for Philippine Rural Areas	Melchizedek I Alipio
RCAI5	1570574366	Advanced Deep Learning Technique For Application in Remote Sensing Smart Irrigation System	Mohd Hider Kamarudin; Zool H Ismail
RCCE1	1570571084	Software Project Effort Estimation In Startup Software Development	Axel Manuella Kefas; Ridi Ferdiana; Rudy Hartanto

- Technical Session 3 -

Session 3 - Track: Power & Energy Systems 3 - Thursday 29 August 2019, 10.30 - 12.30, Ballroom

Code	#	Title	Authors
ISPS8	1570557498	Application of High Gain Zeta Converter For Photovoltaic System	Heri Suryoatmojo
ISPS9	1570557653	Determining Critical Clearing Time Based on Critical Trajectory Method using Unbalance Fault	Ardyono Priyadi; Talitha Puspita Sari; Wahyu Dwi Saputro; Naoto Yorino; Mauridhi Hery Purnomo
ISPS10	1570561219	Modelling of Distribution Compensator for Inrush Current of Medium Voltage Induction Motor in an Air Separation Plant Power Systems	Indra Hermawan; Mochamad Ashari
ISPS11	1570561332	The Design of RBMP Technique to Limit The Fault Current and Voltage Dip in Medium Voltage Electrical System Application	Margo Pujiantara; Vincentius Raki Mahindara; Bintha Fachrurriza; Ardyono Priyadi; Mauridhi Hery Purnomo
ISPS12	1570561346	Harmonic Effect For Voltage Stability Condition In Radial Distribution System	Novian Patria Uman putra; Adi Soeprijanto; Ni Aryani; Dimas Fajar Uman Putra
RCPS5	1570576496	Electromagnetic Design of an Exterior Rotor EBike	Bui Minh Dinh
RCPS6	1570583441	Business Model of Resident Participation Based Waste to Energy (WTE) Project	F Farizal; Rahmat Nurcahyo; James Marisi

Session 3 - Track: Biomedical Engineering 2 (Signal Proc. & Wearables) - Thursday 29 August 2019, 10.30 - 12.30, Java Flores

Code	#	Title	Authors
ISBM7	1570558923	EEG-based motion task for healthy subjects using time domain feature extraction: A preliminary study for finding parameter for stroke rehabilitation monitoring	Dwi Rahmat Mulyanto; Evi Pane; Wardah Rahmatul Islamiyah; Mauridhi Hery Purnomo; Adhi D Wibawa
ISBM8	1570559750	Identifying EEG Parameters to Monitor Stroke Rehabilitation using Individual Analysis	Hendra Setiawan; Wardah Rahmatul Islamiyah; Mauridhi Hery Purnomo; Adhi D Wibawa
ISBM9	1570561371	The Effect of Sampling Rate on the Extraction of VEP Features Using Wavelet Transform	Hasballah Zakaria; Maula Ahmad
ISBM10	1570561373	Stress Diagnostic System and Digital Medical Record Based Internet of Things	Rachmad Setiawan; Fajar Budiman; Wahyu Basori
ISBM11	1570561455	Wavelet-Based Respiratory Rate Estimation Using Electrocardiogram	Anita Miftahul Maghfiroh; Achmad Arifin; Tri Sardjono

Code	#	Title	Authors
ISCE2	1570550111	The IMU and Bend Sensor as a Pointing Device and Click Method	Romy Budhi Widodo; Agustinus Haryasena; Hendry Setiawan; Mochamad Subianto; Paulus Irawan; Didik Suharso; Iskandar Iskandar; Ardiansyah Ardiansyah; Ari Lusiandri
ISCE3	1570561472	Blind People Guidance System using Stereo Camera	Ichsan Pratama Adi; Hendra Kusuma; Muhammad Attamimi
RCSN1	1570568028	Development of Flex Force Smart Glove	Mohamad Khairi Ishak

Session 3 - Track: Telecommunications 2 & Signal Processing - Thursday 29 August 2019, 10.30 - 12.30, Banda Celebes

Code	#	Title	Authors
ISTL4	1570557496	A Modified Genetic Algorithm for Resource Allocation in Cognitive Radio Networks in the Presence of Primary Users	Niki Robbi; I Wayan Mustika; Widy Widyawan
ISTL5	1570557545	IBR-DTN To Solve Communication Problem On Post-Disaster Rescue Mission	Muhammad Fauzan; Tito Waluyo Purboyo; Casi Setianingsih
ISTL6	1570561177	Performance Analysis of Ad-Hoc On-Demand Distance Vector (AODV) and Dynamic Source Routing (DSR) Routing Protocols During Data Broadcast Storm Problem in Wireless Ad Hoc Network	Ida Nurcahyani; Faritz Laksono
ISEL1	1570561471	Implementation of cross correlation with stochastic computation in FPGA	Rifqi Yunus Pratama; Thibault Pichel; Astria Nur Irfansyah; Fajar Budiman
ISIT9	1570561449	Analysis of Secure Bit Rate for Quantum Key Distribution based on EDU-QCRY1	Dedy Septono Putranto; Damayani Suyitno; Haykal Octa Asmar; Rini Wardhani; Mohamad Syahral; Dion Ogi
RCEL1	1570573323	FPGA Implementation for Real-time File Transfer using Visible Light Communications	Trio Adiono; Rosmianto Saputro; Muhamad Luthfi; Syifaul Fuada
RCCO1	1570572447	Extending Flight Time for Multi-copters Through Optimization of Power and Thrust Delivery	Ahmad Faizul Hawary
RCCO2	1570565638	Implementation of Quaternion Based Proportional-Derivative Controller for UAV Quadrotor Attitude Tracking with Madgwick Filter	Adha Cahyadi; Rofiq Muhana; Andreas Sandiwan

Session 3 - Track: AI & Machine Learning 2 - Thursday 29 August 2019, 10.30 - 12.30, Bali C

Code	#	Title	Authors
ISAI1	1570536203	Wood Strength Classification Based on RGB Color and Image Texture Using KNN Method	Okta Dhirga Sukrisdyanto; I Ketut Pumama; Supeno Nugroho
ISAI2	1570548238	Clustering of female avatar Face features consumers choice using KMeans and SOM algorithm	Citra Dewi Megawati, CM; Eko Mulyanto Yuniarno; Supeno Susiki
ISAI3	1570553695	Pre-Collision Warning and Recommendation System for Assistant Driver using Least Square Support Vector Machine and Fuzzy Logic	Alifia Puspaningrum; Adi Suheryadi; A Sumarudin
ISAI4	1570555453	Preliminary Study of Multi Convolution Neural Network-Based Model To Identify Pills Image Using Classification Rules	Windra Swastika; Kestrilia Prilianti; Andrian Stefanus; Hendry Setiawan; Afif Zuhri Arfianto; Ari Wibawa; Mohammad Basuki Rahmat; Edy Setiawan
ISAI5	1570557126	Combining SentiStrength and Multilayer Perceptron in Twitter Sentiment Classification	Eko Yudhi Prastowo; E Endroyono; Eko Mulyanto Yuniarno
ISAI6	1570557189	Forecasting Sunspot Numbers Using Fuzzy Time Series Markov Chain Model As Flare Identification	Dian Candra Rini Novitasari; Nurul Ardhiyah; Nanang Widodo
ISAI7	1570557279	Water Pipe Leak Detection using the k-Nearest Neighbor Method	Abdul Rojik; Astria Nur Irfansyah; E Endroyono
ISAI8	1570558211	Village Classification based on Geographic Difficulties using Backpropagation Neural Network Algorithm (Case Study: Village Potential of Sumenep Regency)	Heru Setiono

- Technical Session 4 –

Code	#	Title	Authors
ISHV1	1570557459	Wavelet Transformation Selection for Detection of Ferroresonance Behaviour	I Made Yulistya Negara; Dimas Anton Asfani; I Gusti Satriyadi; Daniar Fahmi; Bagas Kuntala Aji; Verdiansyah Verdiansyah
ISHV2	1570557644	Floating Metal Particle Motion Characteristics with Shape and Size Variation in the Oil Insulation Under DC Voltage	Daniar Fahmi; I Made Yulistya Negara; Dimas Anton Asfani; I Gusti Satriyadi; Tasha Deliana; Juan Christian Soebagio
ISHV3	1570559769	Low-Voltage Arcing Detection on Non-Linear Load with Total Harmonic Distortion and Power Factor Variations	Dimas Anton Asfani; Daniar Fahmi; I Made Yulistya Negara; I Gusti Satriyadi; Jefri Setyadi; Made Yudha Pranadiksa Giri
ISPS14	1570561436	Controlling Line Power Flow in JAMALI (Jawa-Madura-Bali) System Using STATCOM	Anugerah Akbar Setiyawan; Ontoseno Penangsang; Ni Aryani
ISPS15	1570561438	Design and Implementation of DC-DC Bidirectional Cuk Converter with Average Current Mode Control for Lead Acid Battery Testing	Irham Izzatur Rahman; Dedet Riawan; Mochamad Ashari
ISPS16	1570561451	Power Swing Phenomenon on Jawa Bali 500 kV Backbone and Its Mitigation	Ontoseno Penangsang; Ni Aryani; Restu Maulana Azmi; Gracia Manuella
ISPS17	1570561476	Security Constrained Unit Commitment Considering Transmission Capacity and Loss With Non-Smooth Generation Cost Function Using Binary Particle Swarm Optimization (BPSO) Algorithm	Ni Aryani; Rony Seto Wibowo; Dimas Fajar Uman Putra; A. Saad Daroini; Elpha Aulia Arifin

Session 4 - Track: Information Technology 2 - Thursday 29 August 2019, 13.30 - 15.30, Java Flores

Code	#	Title	Authors
ISIT7	1570561304	Classification of Aircraft Inspection Result Using K-Nearest Neighbors	Nurhadiyanto Nurhadiyanto; Supeno Susiki; Eko Setijadi
ISIT8	1570561400	Vehicle Distance Measurement Tuning using Haversine and Micro-Segmentation	Aghus Sofwan; Yosua Alvin Adi Soetrisno; Eko Handoyo; M Arfan; Natalia Ramadhani; Amiko Rahmayani
ISIT10	1570561456	Clinical decision support system for typhoid fever disease using classification techniques	Boby Andrianto; Yoyon Suprapto; Istas Pratomo; Ika Irawati
ISCE1	1570549898	SIFT and ICP in Multi-View based Point Clouds Registration for Indoor and Outdoor Scene Reconstruction	Muhammad Imanullah; Eko Mulyanto Yuniarno; Surya Sumpeno
ISAI13	1570560727	Community Feedback Analysis Using Latent Semantic Analysis (LSA) To Support Smart Government	Zakky Sanjifa; Surya Sumpeno; Yoyon Suprapto
ISAI17	1570557285	Asphalt Pavement Pothole Detection using Deep learning method based on YOLO Neural Network	Ernin Ukhwah; Yoyon Suprapto; Eko Mulyanto Yuniarno

Session 4 - Track: Control Systems - Thursday 29 August 2019, 13.30 - 15.30, Banda Celebes

Code	#	Title	Authors
ISCO1	1570551573	Modeling and Simulation of Independent Speed Steering Control for Front In-wheel in EV Using BLDC Motor in MATLAB GUI	Chhith Chhlonh; Dedet Riawan; Heri Suryoatmojo
ISCO2	1570554073	Transition Control on Hybrid Unmanned Aerial Vehicles (UAV) using Altitude Change	Imroatul Hudati; Achmad Jazidie; Rusdhianto Efendi Abdul Kadir
ISCO3	1570557169	Path Planning for Differential Drive Mobile Robot to Avoid Static Obstacles Collision using Modified Crossover Genetic Algorithm	Nia Saputri Utami; Achmad Jazidie; Rusdhianto Efendi Abdul Kadir
ISSN5	1570561473	Classification of the Quality of Milk Using Spectrophotometer System Based on Raspberry Pi	Fajar Budiman; Muhammad Rivai; Muhammad Gemintang; Suwito Suwito; Harris Pirngadi
ISSN6	1570561475	Monitoring and Control System for Ammonia and pH Levels for Fish Cultivation Implemented on Raspberry Pi 3B	Fajar Budiman; Muhammad Rivai; Muhammad Nugroho
ISSN7	1570561482	Fuzzy Logic-Based Wet Scrubber to Control Air Pollutant	Bima Romadhon Parada Dian Palevi; Muhammad Rivai; Djoko Purwanto
ISSN8	1570561483	Implementation of Gas and Sound Sensors on Temperature Control of Coffee Roaster Using Fuzzy Logic Method	Agus Hayatal Falah; Muhammad Rivai; Djoko Purwanto

Session 4 - Track: AI & Machine Learning 3 - Thursday 29 August 2019, 13.30 - 15.30, Bali C

Code	#	Title	Authors
ISAI9	1570559115	Personality Classification from Online Handwritten Signature using k-Nearest Neighbor	Harris Teguh Laga; Evi Pane; Adhi D Wibawa; Mauridhi Hery Purnomo
ISAI10	1570559746	Analysis of Students Ability Assessment Based on Bloom's Taxonomy Using Fuzzy Signatures	Eryca Dwi Huzaini R; Umi Laili Yuhana; Eko Setijadi; Mauridhi Hery Purnomo
ISAI11	1570559781	Instance-Aware Semantic Segmentation for Food Calorie Estimation using Mask R-CNN	Reza Dea Yogaswara; Eko Mulyanto Yuniarno; Adhi Dharma Wibawa
ISAI12	1570560224	Vehicle Brands and Types Detection Using Mask R-CNN	Mohammad Wahyudi Nafi'i; Eko Mulyanto Yuniarno; Achmad Affandi
ISAI14	1570561208	Development of Indonesian Speech Recognition with Deep Neural Network for Robotic Command	Citta Anindya; Djoko Purwanto; Desy Iba Ricoida
ISAI15	1570561457	Regulation Document Search Based on Themes using Cosine Similarity and Naive Bayes	Gayuh Suwiatmaja; Surya Sumpeno; I Ketut Eddy Purnama
ISAI16	1570561465	Implementation of Voice Recognition in Disaster Victim Detection System Using Hidden Markov Model (HMM) Method	Ferry Alifani; Tito Waluyo Purboyo; Casi Setianingsih

Session 1 - Track: Power & Energy Systems 1
Wednesday 28 August 2019, 13.30 - 15.00, Ballroom

ISPS1

Optimizing Tie Switches Allocation and Sizing Distributed Generation (DG) based on Maximize Loadability Simultaneously using HPSO Algorithm

Paper ID: 1570555836

Darma Arif Wicaksono, Ontoseno Penangsang and Rony Seto; Dimas Fajar Uman Putra; Ni Aryani (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Load demand has been increased in every year. In power system installation, we need to know when will the system get instable condition to cover power load in the system. To get maximum power load that can be connected to the system, loadability is loading factor which will be considered. In this research, network reconfiguration and Placement DG is used to optimize simultaneously based on maximum loadability. The DG that placed must be in constraint range of voltage stability, which means minimum and maximum voltage requirement. In this paper. IEEE 33 bus system is tested to identify the effect of Network Reconfiguration and Placement DG to optimize based on loadability. Hybrid Particle Swarm Optimization (HPSO) algorithm conducted to be optimization algorithm

ISPS2

MPPT Based on Modified Incremental Conductance Algorithm for Solar Powered UAV

Paper ID: 1570556203

Heri Suryoatmojo (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Photovoltaics (PV) technology today becomes popular source of energy because the benefit of low-cost maintenance and emission free. One of the many applications of PV technology is electric vehicle. Development of the PV technology in electric vehicle such as Unmanned Aerial Vehicle (UAV) and electric cars. PV operations also have its own characteristics, therefore optimal method is required to maximize the PV power output. This method called MPPT (Maximum Power Point Tracking). MPPT is a series of DC-DC converters that can set the operating voltage of the PV to reach the maximum power output. In the application of UAV, the PV will get highly volatile and intermittent irradiance because of the mobility of the UAV. Because this problem, it needs implementation of MPPT method that has fast response time of convergence, so it always produce the maximum power for each conditions. In this paper, the MPPT was designed by incremental conductance that already modified using correction factor from PV conductance value. Experimental results also showed that with the changing in irradiance and load values, Mod-Inc algorithm has better efficiency than hill climbing method.

ISPS3

A Comparative Study of Maximum Power Point Tracking Algorithms for Wind Energy Systems in Giligenting Island

Paper ID: 1570556259

Soedibyo Soedibyo; Ahmad Firyal Adila and Sjamsjul Anam; Mochamad Ashari (Institute Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Wind energy systems have become a major commodity in the use of renewable energy resources, but its implementation requires great technical challenges in power extraction. Giligenting Island, Madura, East Java, is a prospective for wind energy development. An algorithm applied to obtain optimal power from wind power generation. This paper presents a performance evaluation of the methods that can be applied as the MPPT (Maximum Power Point Tracking) algorithms. P&O (Perturbation and Observation), IC (Incremental Conductance), and PSO (Particle Swarm Optimization) are studied and discussed as the MPPT techniques in this research. All three methods are implemented on systems that have the same characteristics, they are compared to the simulation results. At the base wind turbine speed of 12 m/s, the P&O method obtained MPPT power of 295.82 W with settling time at 1.02 s. The IC method obtained MPPT power of 297.08 W with settling time at 1 s. Then,

The PSO method achieved an MPPT power of 297.45 W with time settling at 0.88 s. According to the simulation results, the PSO is the algorithm that provided the best performance among all MPPT algorithms studied. Beside good response to wind speed variations, PSO also has a simple structure and easy to implement.

ISPS4
Design of Single-Forward Type Charger Using SiC MOSFET for Pulsed Power Generator
Paper ID: 1570556807
Ahmad Firyal Adila; Heri Suryoatmojo; Mochamad Ashari (Institut Teknologi Sepuluh Nopemberya, Indonesia); Takashi Sakugawa (Kumamoto University, Japan)
Abstract:
This paper presented a single-forward type converter for command charger application. The converter topology is applied in command charger using SiC MOSFET (Silicone Carbide - Metal Oxide Semiconductor Field Effect Transistor) for PPG (Pulsed Power Generator) application. Pulsed power is a huge power obtained by instantaneously releasing energy. PPG is composed of a charging circuit, control circuit, and PPM (Pulsed Power Modulator). A single-forward type is used because it is simple and has a small number of parts. SiC MOSFET is a new device that can operate at high frequency. By using SiC MOSFET, it is possible to aim for miniaturization of the device while maintaining the power capacity. As a result, we have developed a sufficient command charger that can be installed in a limited space near the microscope using a single-forward circuit topology. The developed command charger achieved the target with a charger size of 75 mm (H) x 140 mm (W) x 200 mm (D). The capacitor output is 1.25 ?F. The charging time achieved 600 ?s at 1000 V. Also, the voltage output could be varied from 0 until 1000 V. The output of charging energy is 0.625 J. The experimental result shows that the command charger can work effectively.

RCPS1
Comparative Study of LVAC Distribution Topology for Urban Village in Phnom Penh
Paper ID: 1570565137
Vannak Vai and Long Bun (Institute of Technology of Cambodia, Cambodia)
Abstract:
This paper studies a comparative study of designing LVAC topology in urban area considering the shortest line and load balancing improvement. This work aims at developing and comparing the radial topology with different developed algorithms. Firstly, the shortest path (SP) algorithm is developed in order to search for minimization of conductor used. Secondly, two different algorithms, repeated phase sequence (RPS-ABC), first-fit bin-packing (FFBP) and mixed Integer quadratically constrained programming (MIQCP) as third algorithm are established to search for the load balancing as well as shortest conductor use with MIQCP in three phase LV distribution network. Then, the comparative analysis of three different methods is considered to make a decision of proposed algorithm. With the simulation result, the first algorithm has been selected as the optimal solution with the lowest indicators (i.e. power losses and energy used).

RCPS2
Simulation Study of Different Single Phase Transformer-Less Pv Inverter Topologies for Grid-Tied PV System
Paper ID: 1570572469
Shameem Ahmad (University of Malaya & Power Electronics and Renewable Energy Research Laboratory, Malaysia); Saad Mekhilef and Leong Wen Chek (University of Malaya, Malaysia)
Abstract:
Interest is developing significantly on transformerless photovoltaic (PV) inverter for its small size, low cost and high efficiency compared to the inverter, which has transformer. Different topologies of transformerless inverters are stated in the literature based on the leakage current characteristics. In this paper five different topologies of transformerless inverters (H5, H6, HERIC, and OH5) have been selected for analysis. For controlling the grid current and voltage of the DC link a common controller for all the topologies has been designed based on PI controller and SPWM technique. These two techniques have been used to generate the switching pulses for the inverter switches. The simulation of all the five topologies are conducted in MATLAB/SIMULINK environment

and analysis has been done. Finally, based on that a comparative study has been obtained based on the component ratings, leakage current, maximum efficiency and components number to determine a better topology for real world operation.

Session 1 - Track: Sensors & Instrumentation 1
Wednesday 28 August 2019, 13.30 - 15.00, Java Flores

ISSN1
Horizontal Scanning Method by Drone Mounted Photodiode Array for Runway Edge Light Photometry
Paper ID: 1570557616

Daniel Steven Doxazo Sitompul, Fakhri Surya and Fakhri Suhandi (Institut Teknologi Bandung, Indonesia); Hasballah Zakaria (ITB, Indonesia)

Abstract:

Runway edge light is very important to guide pilots on nightfall or bad weather to land safely, thereby ensuring the light utilization in airport based on aviation regulation is needed by doing regular intensity measurement. Now days, to perform measurement, photometry instrument is mounted to ground vehicles which makes it has high dependency with airport infrastructures condition. This paper proposes a new method on performing runway edge light photometry utilizing drone to carry the instrument thus lowering its dependency on airport infrastructures conditions. The instrument has a photodiode array consisting of a black aluminum bar with several photodiode module sensors separated apart with certain distances. This paper specifically discuss the horizontal scanning method and also compare it with the vertical scanning method. The horizontal scanning method was used to run photometry towards a Thorn EL-EAH runway edge light Balai Teknik Penerbangan Indonesia (Indonesia Aviation Engineering Center) Laboratory. The result of the photometry is an isocandela diagram through the Kriging interpolation based on the data taken in the experiment. Results of the experiment was adequate to aviation regulation.

ISSN2
Comparative Study of Burst And Beams Types Ultrasonic Sensor For Distance Measurements
Paper ID: 1570557631

Purwadi Agus Darwito; Murry Raditya and Halimatus Sa'diyah; Arviandi Cikadiarta; Aditya Wimansyah (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia)

Abstract:

Ultrasonic sensor is one of most popular sensor type to be used in distance measurement. This sensor generates sound waves to measure the distance between itself and the measurement object by using the calculated time of the waves when the waves are reflected back to the sensor. This research is conducted to do a comparative study between 2 types of ultrasonic sensor based on their generated soundwaves. The first sensor is Devantech SRF235 which uses a beam type of signal for measurement, and the second is Parallax PING))) which uses burst type of signal. The results show that SRF235 is capable of distance measurement for small object while the burst type Parallax PING))) has an error approximately of 0.02%.

ISSN3
QCM Coating With rGO Material as a Platform Developing Piezoelectric Biosensor
Paper ID: 1570561285

Dody Susilo (Institut Teknologi Sepuluh Nopember, Indonesia); Totok Mujiono (Institute Technology Sepuluh Nopember, Indonesia); Darminto Darminto (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Quartz Crystal Microbalance (QCM) is one of the piezoelectric material common for sensor application in either gas or liquid phase. By immobilizing a thin layer of bio-element on QCM surfaces, it is possible to develop a biosensor suitable for many applications. Interaction between bio-element and its associate materials of the material deposit into the QCM surfaces and change the QCM frequency. To improve the quality of the biosensor, a bio-compatible material such as Reduced Graphene Oxide (rGO) need to be deposit first. This paper develops a simple technique that immobilize rGO material on the surface of QCM. An rGO solution was prepared and then

sprayed to the QCM surfaces. After drying process, frequency characteristics of the QCM was measured. For the measurement process, 24-bit FPGA-based frequency-counter with 1 Hz resolution has been designed. Measurement results shows that proposed coating method suitable for biological element immobilization.

ISSN4
Soft Sensor Design of Solar Irradiance Using Multiple Linear Regression
Paper ID: 1570561461

Muhammad Khamim Asy'ari (Institut Teknologi Sepuluh Nopember, Indonesia); Ali Musyafa' (ITS, Indonesia); Ronny Noriyati (Institut Teknologi Sepulh Nopember Surabaya (ITS), Indonesia); Katherin Indriawati (Institut Teknologi Sepuluh Nopember Surabaya & Faculty of Industrial Technology, Indonesia)

Abstract:
Solar irradiance is power per area received from the sun. Solar irradiance is an important variable that affects the solar panel output. Monitoring solar irradiance can use a pyranometer sensor, but the sensor is expensive and less efficient if applied to solar power generation systems because it requires a lot of sensors. The problem can be solved by soft sensors. Soft sensors of solar irradiance can be designed using multiple linear regression models. The model is developed using training data from solar cell output. The variations given is type of input to build the model. The model input are solar cell output voltage, solar cell output current, and a combination of both. Data testing is done by using multiple correlation tests, multiple linear regression significance tests, and multiple linear regression coefficient significance tests. The best design soft sensor are a combination of current and voltage as input models. It has the smallest mean square error value of 7.887×10^{-24} for training data and 3.876 for test data.

RCRA1
Autonomous car for scanning and modeling unknown areas developed from open-source platform Arduino
Paper ID: 1570572473

Nam Hoang Nguyen (Hanoi University of Science and Technology, Vietnam)

Abstract:
This article will give you an overview of how to build an autonomous car system with a built-in LIDAR system to perform the task of auto-operate, penetrating and surveying an unknown area. Combined with the creation of computer application that collects and supervises vehicle working process as well as modeling of collected data, it provides us a visual insight of the surveying area. These areas where people haven't or couldn't reach out and exploit, so autonomous car can help us to do that. This work shows you the simplest way to build an LIDAR autonomous car with transmitting - receiving data system. From those raw data, we will explain all methods and algorithms be used to process and perform them on screen by using C# and Windows Forms.

RCSN2
Studying and Realizing the Smart Device for measuring and monitoring Ammonia Concetration, applying for NPK fertilizer industry
Paper ID: 1570574136

Thanh Dang Bui, Quan Giang, Vinh Le and Tan Phan (Hanoi University of Science and Technology, Vietnam)

Abstract:
The paper presents an approach for design and realization of the smart device for measuring and monitoring ammonia concentration, this can be applied to NPK fertilizer production plant. A hardware has been developed based on the ATMEGA328P microcontroller in order to perform data collection function from the ammonia sensor MQ135. We are also built algorithms for signal processing and warning according to different thresholds in this microcontroller (MCU). The collected data will be transmitted to the computer via wireless communication. In addition, an interface software is designed on computers to collect and monitor data from sensors. Our device allows to measure ammonia concentration up to 100ppm. Tests are implemented at the laboratory and the NPK factory of Lamthao fertilizers and chemicals joint stock company (Lafchemco) that demonstrate positive results.

Session 1 - Track: Robotics & Automation
Wednesday 28 August 2019, 13.30 - 15.00, Banda Celebes

ISRA1

Development of Unmanned Aerial Vehicle (UAV) for Dropping Object Accurately Based on Global Positioning System

Paper ID: 1570555903

Ronny Mardiyanto (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

The paper presents design of Unmanned Aerial Vehicle (UAV) for dropping object accurately based on Global Positioning System (GPS). It can be used for many applications such as dropping life jacket for victim of ship accident, dropping food for victim of flood as well as any other disasters that difficult to be reached by ground vehicle, and also can be used for dropping water on forest fire. The key issue here is how the UAV can drop object precisely on determined position. The proposed UAV is designed for dropping object up to four. The electronic sub systems of UAV consist of Radio Remote Controller Transmitter Receiver, Pixhawk Flight Controller, electronic speed controller, twin of brushless motor, GPS, and servo motors. We design the drop object mechanism using four servo motors as actuator for close and release the gates. The drop object mechanism is installed around the Center of Gravity (COG) of the UAV to minimize the COG changing effect. The position of drop object can be selected by utilizing mission planner software. We add formulas to adjust the position by considering the UAV speed, altitude, mass of the object and wind speed. The designed UAV has been successfully realized, tested, and joined the Tubitak International UAV Competition in Turkey on September 2018. It has dropped object accuracy of 4 meter when the altitude is 40m and UAV speed is 12 m/s.

ISRA2

Ladder Diagram Design Based On Change Signal Method For Crude Palm Oil Process

Paper ID: 1570557051

Eka Iskandar and Mochammad Rameli (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia); Andhiko Palito F (Institut Teknologi Sepuluh Nopember Surabaya & Automation Laboratory, Indonesia)

Abstract:

In the process of processing palm fruit into crude palm oil there are five general processes. The first process is the sterilization process, which is the process of boiling the palm fruit, the second process is the process of separating the fruit from the bunch, the third process is the process of separating the fruit from the seeds, the fourth process is pressing the process of separating the oil from the fruit , the fifth process is the process of clarification, namely the process of separating oil, water and dirt. On this basis, the right action is needed for each stage of the process so that the final results can be maximized. Another factor that determines the quality of results and efficiency of the plant is equipment that must be in standard conditions, both the quality and quantity of each tool. The capacity of a process with the others must be synchronous and the operation of each process is also a factor that determines the performance of a palm oil mill. The processes that occur in palm oil processing can be controlled by the PLC as the controller. PLC programming can use the change signal method in the form of a ladder diagram design. With the ladder diagram, the process carried out will run sequentially. Because in the process there are parts which are backward processes and onward processes, this method is right used here. By using the change signal method, the results of the ladder diagram construction are 96 units, 916 relay contacts, and the resulting program capacity is 18 KB.

ISRA3

Leader Follower Navigation System based on Pedestrian Dead Reckoning for Mobile Robot Navigation

Paper ID: 1570561450

Muhammad Farih, Mochammad Sahal and Rusdhianto Effendi Abdul Kadir (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Navigation systems are the first things to have for all types of unmanned vehicles whether it is land, water, or air vehicles. Navigation systems are divided into independent and leader-follower. Today, Global Positioning System (GPS) plays an important role for vehicle positioning. Nevertheless, GPS has a weakness that the signals will be

distorted when the GPS receivers are placed in indoor environments. In this research, leader-follower navigation systems based on pedestrian dead reckoning are designed with wheeled mobile robot as the follower. Artificial Neural Network (ANN) is used as stride length model and the leader heading is obtained from magnetometer. Both data are sent to the follower through Wi-Fi. For follower system, linear model is used as robot distance model and follower heading is obtained from its magnetometer. The test shows that the best model for stride length prediction is ANN model with one hidden layer and four neuron units which has 4.65 cm training error and 5.04 cm testing error using 614 stride examples. As for robot distance model shows that the error is 2.0956 cm using 25 data samples. Finally, the heading error is 39.262° which is tested from two magnetometers with 28 testing points

RCRA2
Simulating Meerkat Foraging Behavior using Agent Based Modeling Approach on NetLogo
Paper ID: 1570572461

Wan Othman (Universiti Sains Malaysia, Malaysia)

Abstract:
In this work, Meerkat behaviors are observed and their foraging behavior is chosen and simulated in an agent-based modeling platform. Before the modeling could be done, the foraging behavior of the Meerkat is studied to fully understand their behavior. The modeling designed included the number of groups form, dividing the task among the members of the group, and the procedure of each task that needed to be done. In conclusion, the model will simulate the behavior of the Meerkat foraging for food to survive in its habitat. The simulations were run in 2 cases where these cases are further divided into 3 cases each which in total 6 cases. For each case, the simulation run 10 times. Where the results were analyzed and graphs were plotted using the average of the results.

RCRA3
Implementation Of Ground Mobile Robot Navigation Using Stereo Vision Based Visual Odometry
Paper ID: 1570573252

Ilham Wicaksono; Mochammad Sahal; Rusdhianto Effendie A. K. (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia)

Abstract:
Navigation is the most fundamental part on the mobile robot's system to complete its tasks. One solution to solve navigation problem is to use 3D vision. Active sensor that could produce 3D information, e.g. LiDAR, have a complex system and not affordable. On the other hand, using stereo camera device, 3D vision could also produced with affordable price. In this paper we propose to use a visual odometry process on stereo camera information to produce a position estimation of a robot. This could be reach using feature detection and feature tracking algorithm. From these features motions, the motion and the position of the robot could be estimated. Results of the test conducted shows that stereo vision process based on two webcam, and processed on i5-5200U, 2.20 GHz processor, could be used on real time application with the refresh rate of rectified image and disparity map stable on 29 FPS. Feature detection and feature triangulation also show a good result with average of 61 inlier feature detected and triangulation only has 0.06 meter error. However, the visual odometry tests conducted show error of 1.20 Meter, 2.21 Meter, and 2.04 Meter on each of the tests conducted.

RCRA4
Precision Landing for Drone based on Computer Vision
Paper ID: 1570574459

Petra Situmorang, Astria Nur Irfansyah, Muhammad Attamimi (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:
Unmanned Aerial Vehicle (UAV) or popularly known as drones are already widely used to help human work, for example delivering kits, monitoring and mapping an area (mapping and monitoring) and photography. One ongoing study regarding UAV is the automatic landing of a multi-copter drone. Common navigation methods for this purpose is the GPS navigation system and integrated GPS with visual navigation system. GPS has accuracy limitations, therefore in this work, we apply computer vision to assist quadcopter drone to perform automatic

precision landing. The camera will help the vehicle to find the landing pad. The visual system can get the relative position of the vehicle towards the target, which is required for the control system of the UAV to reach the landing point. Both stability and accuracy of the landing are the focus and challenges of this work. A prototype quadcopter with an on-board Raspberry Pi 3B+ and camera, to implement the computer vision algorithm, and an Omnibus flight controller, was constructed and tested, with a landing platform of a specified pattern. The drone landed with an average error of 45 cm with a 21cm minimum error, better than the average landing error of 2.85 m based on GPS only.

Session 1 - Track: Information Technology 1
Wednesday 28 August 2019, 13.30 - 15.00, Oasis

ISIT1
Next Generation Firewall for Improving Security in Companies and IOT Network
Paper ID: 1570551905
Benfano Soewito (Bina Nusantara University, Indonesia)
Abstract:

The goal of this research is to analyze of effectiveness the Next Generation Firewall that implemented to secure IoT in smart house and company network. The method used in this research is the method of comparison with a test of DDoS attacks, phishing and SQL Injection on both network, smart house network and company network. From the results of experiment, it can be concluded that the Next Generation Firewall has significantly better performance for protecting smart house and company network, it can increase security of data communication networks against threats from the Internet.

ISIT2
Clustering on Multidimensional Poverty Data using PAM and K-prototypes Algorithm (Case Study: Jambi Province 2017)
Paper ID: 1570557466
Aris Wijayanto (Institut Teknologi Sepuluh Nopember (ITS) & Statistics Indonesia, Indonesia); Yoyon Suprapto; Diah Wulandari (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia)
Abstract:

Poverty is still a serious concern of the Indonesian government. Through the Multidimensional Poverty terminology, experts try to understand poverty with a more comprehensive approach. Using data from the 2017 National Socio-Economic Survey (SUSENAS) and Alkire-Foster method, this study measures poverty in terms of the various deprivations experienced by residents in Jambi Province. The dimensions used in this study consist of 3 dimensions, namely: health, education, and living standard. This study investigates the use of PAM (partitioning around medoids) and k-prototype and compares their effectiveness in clustering mixed data types, using poverty data from published governmental data. This study also examines the scalability of the PAM and K-prototypes algorithm against the number of clusters for a given number of observations. The performance evaluation is carried out by comparing the value of the silhouette coefficient (SC) from each clustering method. In this study, clustering with K-prototypes is 59 % better than PAM in term of the SC value. The scalability test has shown that the K-prototypes algorithm is faster than the PAM algorithm. Considering the SC value, we can conclude that the cluster formed is reasonable. The one-way ANOVA and Kruskal-Wallis test result shows that 13 out of 17 variables used are a statistically significant difference between the formed clusters.

ISIT3
Analysis of E-Procurement Service Satisfaction Level Using Service Quality Model
Paper ID: 1570557470
Tri Hasti Wulandari; Yoyon Suprapto; Achmad Affandi (Institut Teknologi Sepuluh Nopember, Indonesia)
Abstract:

Development of an area will run smoothly if the process of procurement of goods/services is carried out correctly. With good and quality service in serving the supply of goods/services can improve the image of the purchase of goods/services Sidoarjo Regency. To find out whether the services provided so far are by what is expected, we need to measure the level of service satisfaction of users. This study aims to determine the distribution of user

ISITIA – RCEEE 2019, 28 – 29 August 2019, Surabaya, Indonesia

satisfaction based on five dimensions of service quality, namely tangibles, reliability, responsiveness, assurance, and empathy. The variables used are two, namely reality and expectation variables, and know the most significant gap between reality and expectation for future improvement. They are retrieving data with an external questionnaire using the simple random sampling method. The population of respondents was 30 people who were directly involved in procurement consisting of commitment-making officials, procurement officials, and administrative staff. The overall results of the study stated that the users were satisfied with the services provided so far, but the gap must be corrected immediately so that the service would be better. The biggest Gab on the tangibles dimension is the completeness of the electronic pre-tender process of 5.63%, for the reliability dimension is the system notification 4.26%, the responsiveness dimension is the response speed value of 5.07%, then the assurance dimension is employee technical knowledge 4.59 % and finally the empathy dimension is the aspect of prioritizing user interests of 4.34%. By looking at the most significant gap in the tangibles dimension, it is advisable to immediately make a supporting application for a complete and detailed electronic pre-tender process as needed.

ISIT4

Implementation of Cryptography Module Security Certification Based on SNI ISO/IEC 19790:2012 - Security Requirements For Cryptography Module
Paper ID: 1570557479
Yasril Andriawan and Ival Tirta (Badan Siber dan Sandi Negara, Indonesia)
Abstract:
Utilization of cryptography in information and communication technology devices in the form of cryptographic modules can guarantee confidentiality, integrity and anti-denial of the information. In 2015 the National Standardization Agency (BSN) has issued ISO/IEC 19790 Indonesian National Standard (SNI): 2015 - Security Requirements for Cryptographic Modules, which are identical adoptions of ISO/IEC 19790:2012 - Security Requirements for Cryptographic Module. SNI ISO/IEC 19790:2015 is an SNI that can provide a major contribution to state security and digital economic development by providing security guarantees for cryptographic modules to ensure confidentiality and integrity of information. but until now there are still no certification schemes, certification bodies, and testing laboratories that have been formed, so that the implementation of the cryptographic module security certification based on SNI ISO/IEC 19790:2015 cannot yet be held. The cryptographic module security certification scheme that can be implemented in Indonesia is a type 2 scheme with some adjustments, The Certification Body that runs the recommended cryptographic module security certification scheme is BSSN, and The Testing Laboratory that runs the recommended cryptographic module security testing is a BSSN internal testing laboratory

ISIT5

Maturity Level Analysis of Governance and Integration IT of Simkeuda in Pamekasan Regency Using COBIT 4.1
Paper ID: 1570557636
Novis Prasetyawan; Endroyono; Supeno Susiki (Sepuluh Nopember Institute Of Technology, Indonesia)
Abstract:
Pamekasan Government has not analyzed the maturity level of Simkeuda governance so that it is difficult to measure alignment of IT investment with organizational goals. Based on the recommendations of the Audit Board (BPK) of the East Java Province, Pamekasan Government needs to analyze the maturity level of Simkeuda governance, as well as integrate with Salary SIM, Asset SIM (Simasda), and Regional Tax SIM (Simpad). The research methodology began with a survey using the Likert scale questionnaire, Pearson product moment validity test, Cronbach's alpha reliability test, and data analysis to measure the maturity level of the Simkeuda governance. Comparison of the maturity level of simkeuda governance before and after integration becomes novelty in IT governance research. The maturity level of governance before integration was at the level of Repeatable but Intuitive for subdomains PO3, AI2, and AI5. Whereas after integration remained at the Repeatable but Intuitive level but experienced an increase in the maturity index of 3.4% for PO3, 13.21% for AI2, and 8.9% for AI5. The conclusion of this study is integration of Simkeuda with Salary SIM, Asset SIM (Simasda), and Regional Tax SIM, can increase Simkeuda governance maturity index in all subdomains.

ISIT6

Authentication of Printed Document Using Quick Response (QR) Code

Paper ID: 1570558921

Ahmad Tasyrif Arief; Iwan Wirawan; Yoyon Suprapto (Sepuluh Nopember Institute of Technology, Indonesia)

Abstract:

Implementation of information systems in the public service has an impact on increasing the use of digital documents. Digital documents replace function of printed documents because they are legally recognised. In reality, printed documents are still considered relevant because it is still considered necessary as legitimate evidence; one example is the permit document. Permit documents are essential because they are needed as administrative requirements. The importance of permit documents has resulted in many falsifications of these documents. Therefore guaranteeing the authenticity of these documents is needed. The use of Quick Response (QR) Code is present as a guarantor of authenticity document because it is considered capable of being an effortless way to validate the authenticity of printed documents. Authentication of QR codes is difficult to determine by using the human senses because they cannot know the original and fake codes. This inability causes QR Code to be vulnerable to counterfeiting. To guarantee authenticity, a unique QR code that is easily validated is needed. This study creates a unique QR Code by utilising AES and SHA-256 that are difficult to produce by other people so that the authenticity of information about document content can be guaranteed and easily validated.

Session 2 - Track: Power & Energy Systems 2
Wednesday 28 August 2019, 15.30 - 17.00, Ballroom

ISPS5

Optimal Placement and Sizing Distributed Generation (DG) Considering Energy Storage Using ABC-QP Algorithm

Paper ID: 1570556890

Luthfia Fajariyanti and Rony Seto Wibowo; Ontoseno Penangsang; Dimas Fajar Uman Putra; Ni Aryani (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

The optimal location and capacity of distributed generation (DG) is essential for electric power systems especially to satisfy the load demand. This paper proposed the hybrid optimization method to obtain optimal location and capacity of DG considering energy storage in dynamic systems. Artificial bee colony (ABC) algorithm and quadratic programming (QP) is applied. The objective functions of the proposed method minimize the cost of distribution line losses and load shedding. ABC algorithm is used to find the optimal location and capacity of DG. Then, objective functions are calculated using QP with dynamic condition of the load profile for 24 hours. Load shedding is generated based on power generation which can't satisfy the load demand. The proposed method has been implemented in a modified IEEE 30 bus.

ISPS6

Security Constrained Unit Commitment Considering Ramp Rate and Transmission Line Losses Using Binary Particle Swarm Optimization Based on IEEE 30 Bus System

Paper ID: 1570557360

Ni Aryani; Dimas Fajar Uman Putra; Elpha Aulia Arifin; A. Saad Daroini (Institut Teknologi Sepuluh Nopember Surabaya & Power System Simulation Laboratory of Electrical Engineering ITS, Indonesia)

Abstract:

The amount of power generation every time changes according to load demand. In order to get the optimal amount of power generation, a unit commitment study is needed with the aim of obtaining a combination of generation that meets the demand at the cheapest cost. In the calculation of the Unit Commitment, there are constraints that must be considered, Those are the minimum up and downtime, spinning reverse, ramp rate, power balance, start-up cost, and power balance. To get a combination of generators that meet the required limits, there are several artificial intelligence algorithms approach, one of the algorithms is Binary Particle Swarm Optimization (BPSO). In this paper, a unit commitment study will be implemented on IEEE 30 bus system by considering ramp rate and transmission line power losses using the Binary Particle Swarm Optimization (BPSO) algorithm to obtain the most optimal combination of generation with the lowest generation costs.

ISPS7

Design and Implementation of Three-Phase Grid-Connected Inverter for PV System

Paper ID: 1570557446

Nur Rohmat Hadianto and Mustaghfiri Mustaghfiri; Fifi Hesty, Joke Pratilastiarso and Erik Tridianto (Politeknik Elektronika Negeri Surabaya, Indonesia)

Abstract:

Solar energy is one of the renewable energy that has a large potential in Indonesia. Solar energy can be converted into electrical energy using PV. According to the increasing energy demand in Indonesia and the enactment of the feed-in tariff by the government, it will be easier for the sale and purchase of electricity through the on-grid system. This study discusses the design and implementation of a three-phase grid-connected inverter. This three-phase inverter circuit uses sinusoidal pulse width modulation for input signal (SPWM) is used to input the IR2113 circuit a three-phase inverter driver. SPWM used is also a synchronization method to connect the inverter to the grid. Grid synchronization in this study is equating the phase angle and inverter output frequency to the grid. In this design add DC to DC converter type push-pull converter as a three-phase inverter supply and also as a control to adjust the inverter output voltage to fit the grid. The push-pull converter uses an SG3525 PWM IC generator. The circuit can be adjusted according to the voltage you want to produce. The circuit uses a high-frequency transformer as a step up the voltage. The result of the system design is the PV output voltage is increased by the push-pull converter and then to supply three-phase inverter.

ISPS13

Optimal Planning of Solar PV Using Simple Model for New Feed-in Tariff in Indonesia

Paper ID: 1570561349

Kharisma Bani Adam (Kumamoto University & Telkom University, Japan); Hajime Miyauchi (Kumamoto University, Japan)

Abstract:

Indonesia is still struggling to attract the investor to involve in solar photovoltaic (PV) project. There is a rapid transformation in PV regulation by the government. Four regulation related to solar PV is delivered since 2016 until 2018. In 2018, the feed-in tariff regulation was established. The feed-in tariff aims the electricity customer to install the PV system and inject the excess energy to the grid. However, this rapid regulation changing is not yet attracting developer nor customer to invest in the solar PV. This paper proposes a simple model to calculate the optimal size of PV for new feed-in tariff regulation in Indonesia. Feed-in tariff regulation allows the customer to inject the energy produced by PV to the grid. The regulation provides 65% compensation of electricity price from energy sent to the grid with several limitations. There is difficulty to estimate daily energy data. Thus, a technical calculation is proposed by using a simple model so that it can help the customer in sizing the solar PV system. Instead of only proposing a methodology, this research also develops application to help customers in calculating the optimal size of solar PV and its profitability. The new feed-in tariff rule will be an attraction for the customer. However, it needs a comprehensive calculation so that solar PV can be profitable. Oversized PV systems can cause financial losses with the large investment and limitation on the calculation of energy injected into the grid. The result shows the PV simple model is successfully developed to help the consumer obtain the optimal PV size.

RCPS3

Coils design and parallel resonant H-bridge inverter for inductive power transfer to recharge low-power portable devices

Paper ID: 1570572618

Leong Wen Chek (University of Malaya, Malaysia)

Abstract:

The capability of the inductive power transfer (IPT) for wireless charging mainly depends on both coil structure and inverter topology. The paper presents the resonant inverter based on the concept of energy injection and free oscillation which are applied to increase the resonant frequency without raising the switching frequency. The implemented inverter utilizes the variable frequency zero current switching (ZCS) control strategy for parallel configuration that ensure the high operating frequency at multiplies of the inverter switching frequency.

Consequently, it will result in decreasing the inverter switching loss and also reducing the coil size that operates at resonant frequency. The coil design methodology is introduced in details while studying the different factors affecting the coil behavior. The performance of the overall designed system is evaluated via simulation tests carried out using ANSYS Maxwell and MATLAB SIMULINK.

RCPS4
Detail Design of Interior Permanent Magnet Synchronous Motor for Ebike
Paper ID: 1570574905

Bui Minh Dinh (Hanoi University of Science and Technology, Vietnam & HUST, Germany)
Abstract:

Interior permanent magnet synchronous motor can be designed with different rotor configurations based on the arrangement of the permanent magnets. Rotor configurations strongly influence the performance of permanent magnet electrical machines especially efficiency. The aim of this paper is to show the process of a high efficiency Interior permanent manget synchronous motor (IPMSM) design with adequate estimation of temperature rise using thermal resistance circuit model. This paper describes a comprehensive design of a three phase IPMSM motor 2,2 kW for Electric Bike made in M1 Factory in Vietnam. This motor has applied for Vietelpost drive to deliver express boex in city. An optimal design of IPMSM motor have been implemented by analytical and simulation methods such as Matlab and Ansys software.

<div align="center">

Session 2 - Track: Biomedical Engineering 1
Wednesday 28 August 2019, 15.30 - 17.00, Java Flores

</div>

ISBM1
Estimation of Nigrescens Palm Oil Ripeness using Contrast and Skewness from 680 nm Image
Paper ID: 1570552368

Agung W. Setiawan (School of Electrical Engineering and Informatics ITB, Indonesia); Donny Danudirdjo (ITB, Indonesia); Alfie Rizky Ananda (Institut Teknologi Bandung, Indonesia)
Abstract:

This paper aim of this study is to assess the oil palm ripe-ness using a specific wavelength as a light source, 680 nm, and simple image processing technique. This paper proposes a simple and low computation technique to estimate the oil palm FFB maturity using 680 nm LED as the light source and digital camera to capture the image. There are some parameters that can be used to detect oil palm FFB maturities, such as chlorophyll concentration and fruitlet detachment. In this research, the 680 nm image contrast is used to detect the chlorophyll due to it correlated with the chlorophyll absorbance. The accuracy of this approach technique is 64.94 %. The second approach is using texture analysis, skewness, to differentiate the detached and undetached fruitlets in oil palm FFB. The accuracy of this technique is 68.83 %. The last technique is combining image contrast and skewness. The result of this approach gives accuracy by 68.83 %. From the results, skewness and combination of contrast and skewness give the same accuracy, 68.83 %. It can be concluded that the estimation of oil palm FFB maturity can be done by using an only skewness value of the 680 nm image. The result is in-between another research results in oil palm FFB maturity grading. The proposed technique can be implemented using microcomputer. It will reduce the implementation cost and can be used to build portable systems

ISBM2
Panoramic of Image Reconstruction Based on Geospatial Data Using SIFT (Scale Invariant Feature Transform)
Paper ID: 1570552445

Adi Hermansyah and Eko Mulyanto Yuniarno; Supeno Mardi Susiki Nugroho, Arif Nugroho and Arief Kurniawan (Institut Teknologi Sepuluh Nopember, Indonesia)
Abstract:

Reconstruction can mean the return of something in its place of origin, rearrangement of existing material and rearranged as it is or the original event. Where in this study used the SIFT, match and homography method. Based on the results of this experiment, it was able to reconstruct panoramic images. After the stitching process on geospatial data found was a problem where the GPS data is lost and the results are still there overlap. Where the

initial data has GPS data. From the experimental results, we have reconstructed the panoramic data based on geospatial data using SIFT (Scale Invariant Feature Transform) method, in which the key point results obtained by matching the original image and stitched image. It can be seen from key point results from four images namely image A = 7, image B = 16, image C = 27 and image D = 32. By summing the key points from those images, the total number of key points are 82. The average of key points will be 20.5 and the average of the run time of the program is 0.0385 second. By knowing the position of initial image coordinate on the stitched image, we know where the position of longitude and latitude is. The stitched image from an image A located in (7,16',51.2675"S/112,47',32.1102"E), image B located in (7,16',51.4336"S/112,47',32.2728"E), image C located in (7,16',51.6024"S/112,47',32.3975"E) and image D located in (7,16',51,8191"S/112,47',32.5617"E). Meanwhile, GPS coordinates point in image A lies in x, y = (205, 164) and x ', y' = (603.15), in image B lies in x, y = (194, 175) and x ', y' = (598.70), image C located in x, y = (196, 110) and x ', y' = (599.71) and image D located in x, y = (28, 110) and x ', y' = (607,130).

ISBM3

Seizure Type Detection in Epileptic EEG Signal using Empirical Mode Decomposition and Support Vector Machine

Paper ID: 1570557575

Inung Wijayanto (Telkom University & Universitas Gadjah Mada, Indonesia); Rudy Hartanto (Gadjah Mada University & Electrical Engineering and Information Technology Departmen, Faculty of Engineering Gadjah Mada University, Indonesia); Hanung Adi Nugroho and Bondhan Winduratna (Universitas Gadjah Mada, Indonesia)

Abstract:

Epilepsy is a serious neurological disorder that needs more attention by society. The International League Against Epilepsy (ILAE) mentioned that the term epilepsy referred to the number of seizure occurred in patients. Electroencephalogram signal is a common epilepsy diagnostic tools used by the neurologist. Research about the detection and classification of the epileptic signal from the EEG signal has massively conducted. In this research, we detect and classify four types of seizures which are focal non-specific seizure (FNSZ), generalized non-specific seizure (GNSZ), simple partial seizure (SPSZ), and tonic-clonic seizure (TNSZ). The EEG signal used was taken from Temple University Hospital EEG Seizure Corpus (TUSZ) version 1.2.0. The EEG signal decomposed with empirical mode decomposition (EMD) to extract five levels of intrinsic mode functions (IMFs). Feature extraction is done by calculating the mean, variance, skewness, kurtosis, standard deviation, and interquartile range. Support Vector Machine (SVM) used for classification with five-fold cross- validation. The best accuracy obtained is 95% by using quadratic SVM kernel.

ISBM4

Automatic Detection of Fetal Head using Haar Cascade and Fit Ellipse

Paper ID: 1570557611

Putri Nadiyah (Electrinics Engineering Polytechnic Institute of Surabaya & PENS, Indonesia); Riyanto Sigit and Heny Yuniarti (Politeknik Elektronika Negeri Surabaya, Indonesia); Noor Rofiqah and Qurina Firdaus (Electronics Engieering Polytechnic Institute of Surabaya, Indonesia)

Abstract:

USG examination is a routine activity during pregnancy with USG machine. There are several parameters to get information about the fetal. The important parameter is head circumference to get to know abnormality, early detection, and monitoring growth. Accurate result and rapidity are really important during the examination. Low quality of ultrasound image and time-consuming in manual annotation made many variability values depending on the doctor or sonographer, the highest risk of human error, so the result is not accurate enough. From that problem, we need an automatic way to detection of the fetal head to make it faster than the manual way. In this result, we use pattern recognition to give learn the system to recognize the characteristic of the fetal head object. We use Haar Cascade to train the classifier to detect the object in the USG image. We also use Fit Ellipse to get the curve shape of the fetal head. The accuracy rate of HC measurement is 97,23% and just consume 1.9s for fetal head detection.

ISBM5
Deep Learning and Late Fusion Technique in Medical Image Classification
Paper ID: 1570558156

David Alebiosu (Monash University, Malaysia); Muhammad Fermi Pasha, Anuja Thimali Dharmaratne and Sayyida Masoom Gilani (Monash University, Malaysia)

Abstract:

Image Classification is essential in medical image database because of the different image modalities such as X-rays images, Computed Tomography images (CT), Magnetic Resonance imaging (MRI) etc. In addition to the varieties of image modalities present in the database, the images are of different body parts and need to be properly classified to enhance their effective retrieval for purposes such as medical diagnosis, teaching and research. Most of the hand-crafted techniques have various limitations which limit their potentials to accurately classify medical X-ray images. For more than a decade, various researchers have employed the use of different handcrafted techniques for medical image classification. However, the major problem associated with the techniques is their inability to extract discriminative features that are strong enough to accurately classify medical images such as radiographic images. This study focuses on employing deep learning and fusion technique to classify medical X-ray images. The proposed technique uses a single pre-trained neural network and a late fusion technique for the classification of ImageCLEF 2007 dataset. The employment of a single pre-trained neural network both as a feature extractor and as fine-tuned network makes the technique unique especially when considering the nature of the dataset used. The combination of the posterior probabilities generated from SVM and Softmax classifiers using a single deep pre-trained neural network produced an overall classification accuracy of 95.54% in classifying our dataset into 116 categories. This is the highest when compared to the use of AlexNet + SVM and fine-tuned AlexNet alone which produced 84.35 and 86.47% respectively

ISBM6
EEG Visualization for Cybersickness Detection During Playing 3D Video Games
Paper ID: 1570558409

Khaitami Khaitami and Adhi D Wibawa; Supeno Susiki; Alfi Khoirunnisaa (Insitut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

The development of Virtual Reality (VR) technology has provided a new choice for the industry of video game developers to explore VR game content. The use of 3D video games is increasingly popular recently among players. However, playing 3D video game can cause negative effects like nausea, headache, eyestrain, and vomiting. This side effect is called cybersickness. Cybersickness is an unpleasant condition that appears due to VR exposure. Cybersickness actually can be measured by using a subjective measurement called SSQ questionnaire, while for more objective method, electroencephalograph (EEG) is implemented. In this study, we visualized the EEG of 9 subjects who played a 3D video game called "Mirror Edge" to capture and investigate the pattern of Cybersickness. The questionnaire results were used as references for determining the cybersickness condition. The visualization was done by using interactive graphical information techniques and topographic mapping methods of frontal area channels (F3 and F4) and occipital areas channels (O1 and O2) of gamma (?) band. The statistical parameter, such as standard deviation was used to visualize the cybersickness. The results showed an increase of standard deviation value in gamma band when the subject playing video game for a few minutes compared to the baseline condition. This indicates that the cybersickness was initiated. From all of 9 subjects, we found that the average time of cybersickness initiation for channels F3 and F4 are at 97th seconds and at 92nd seconds consecutively, while for channels O1 and O2 are at 21st seconds and at 44th seconds. We conclude that by visualizing the standard deviation value of EEG during playing 3D video games, cybersickness initiation can be determined subjectively.

ISTL1

Circular Polarization 5.5 GHz Double Square Margin Antenna in the Metal Framed Smartphone for SIL Wireless Sensor

Paper ID: 1570556717

Irfan Mujahidin and Aries Boedi Setiawan (University of Merdeka Malang, Indonesia)

Abstract:

The wireless sensor network system requires complex configuration component of the electromagnetic feeding network circuit for SIL (Self Injection Locked) wireless sensor on the smartphone metal-framed, and inexpensive material, especially for the electromagnetic component. 5.5 GHz Double Square Margin Microstrip Antenna with 90-degree hybrid directional coupler for SIL Wireless sensor. it is the novel shaped microstrip Antenna with the free frequency, simpler configuration, and low-cost material at the 5.5 GHz for SIL wireless sensor. This system is an important part component of SIL wireless sensor that is package consists of a 5.5 GHz Microstrip antenna with the Double Square Margin, and 90-degree hybrid directional coupler to produce 90-degree phase difference with two input and two output. The Antenna has single band and narrow bandwidth with the frequency is 4.41 GHz until 5.58 GHz under -10dB S parameter and frequency resonance 5.5 GHz, the radiation pattern is directional and the gain is 6.83 dB and 50 ohm line strip impedance, The 90-degree hybrid coupler has S11 of -31.29 dB, S21 of 31.48 dB, S31 of -3.58 dB, and S41 of -3.81 dB that all is specification has a good operation. And overall size of the proposed antenna system is 100 mm times 55.7 mm with FR4 (Phenolic White Paper) with a dielectric constant is 4.4 that has 50ohm.

ISTL2

Capacity Improvement Factor of HF Multi-Mode Skywave MIMO Channels

Paper ID: 1570556902

Teguh Imam Suharto; Gamantyo Hendrantoro; Achmad Mauludiyanto; Umai Saroh (Institut Teknologi Sepuluh Nopember, Indonesia); Roberto Corputty and Muriani Muriani (Universitas Musamus, Indonesia)

Abstract:

High Frequency (HF) communication systems as an emergency telecommunication technology can reach an isolated disaster region at large distances with the help of ionospheric reflections. In HF communication systems the utilization of multiple-input multiple-output (MIMO) antenna at both transmitter and receiver can increase the availability and channel capacity. This paper reports the 2×2 MIMO channel response measurement on a 3044 km link. The results are used to investigate the channel capacity improvement factor (CIF) over SISO channels when the MIMO configuration is used, which reveals that the CIF is in the range of 0.83-1.87. HF sky wave long-distance communication systems with 2×2 MIMO configuration show an average capacity bigger than the average capacity of each SISO channel.

ISTL3

Parameter study of coplanar vivaldi antenna feeding structure

Paper ID: 1570557438

Efrilia Marifatul Khusna, Eko Setijadi and Gamantyo Hendrantoro (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

An antenna is one of the front-end devices in the telecommunications system. The shape of the antenna can vary depending on frequency usage and purpose. One type of antenna that widely used is the microstrip antenna. Microstrip antenna is an antenna that has a compact and planar shape with a relatively small size, unfortunately, this kind of antenna could work in narrow bandwidth (1-5%) only. A wideband antenna is an antenna that has a bandwidth of more than 20% from all bands. One of the antennae that have the possibility to work in wideband is called Vivaldi antenna. Wide bandwidth antennas can be applied to various fields, such as microwave imaging, wireless communication and GPR (Ground Penetration Radar). Although Vivaldi antennas have been widely implemented, especially in ultra-wideband (UWB) systems, the antenna design process experiences a variety of problems, especially in poor and inconsistent gain, limited bandwidth and large antenna dimensions. Those

problems are characterized as Vivaldi antenna weaknesses. One of the design problems that often occur in Vivaldi antennas, namely Vivaldi antennas has various forms of feeding so that the Vivaldi antenna design process becomes difficult to do. In this research, a simulation of various patterns of Vivaldi antenna feeding forms will be carried out. The results of this research are expected to be able to provide benefits in the form of Vivaldi antenna modeling according to its work frequency. So the Vivaldi antenna design process, especially in the feeding section, will be easier to analyze in the future.

RCTL1
Modified Double Hexagonal Loop for Bandwidth Enhancement of Frequency Selective Surface
Paper ID: 1570569937

Mohamad Kamal A. Rahim, Nur Biha Mohamed and Osman Bin Ayop (Universiti Teknologi Malaysia, Malaysia)
Abstract:

This paper proposes an interconnected of double hexagonal loop of the Frequency Selective Surface (FSS) for broader bandwidth (BW) with angular stability and polarization independent. By increasing the number of sides of the interconnected between the double hexagonal loops, a wider bandwidth with 3.82 GHz can be achieved that suitable for filtering the X-band frequency between 8 to 12 GHz band of frequency.

RCTL2
Access Points Positioning and Link Allocation in Cell-Free Massive MIMO system
Paper ID: 1570571950

Wan Amirul Wan Mohd Mahyiddin and Fuad Erman; Effariza Hanafi; Kaharudin Dimyati (University of Malaya, Malaysia); Noraisyah Mohd Shah (Universiti Malaya, Malaysia)
Abstract:

Cell free massive multiple-input multiple output (MIMO) system is a wireless data transmission method where a large number of access points (APs) cooperatively transmit data to user equipment (UE) within a coverage area. In this paper, we investigate the impact of different APs positioning method in cell free massive MIMO system, namely random positioning and ordered positioning, on the performance of the transmission system. The results shows that the ordered positioning has better downlink rate than that of the random positioning method, especially for the minimum rate UE. However, the performance between the two methods converge as the number of APs becomes very large. We also investigate the optimum number of APs linked to UEs with respect of median downlink rate performance under various number of APs. The simulations show that higher density of APs result to higher optimum number of APs linked to UEs. The analysis from this investigation can enhance our understanding on cell free massive MIMO system, specifically in term of APs positioning and number of APs link allocation.

RCTL3
Wideband Short-Ended Frequency Reconfigurable Metamaterial Antenna Design
Paper ID: 1570574089

Mohamad Rijal Hamid and Mohamad Kamal A. Rahim; Murtala Aminu-Baba; Mohd Fairus Mohd Yusoff (Universiti Teknologi Malaysia, Malaysia); Adamu Y Iliyasu (University Teknolgi Malaysia, Nigeria)
Abstract:

This paper presents the design of wideband shortended metamaterial antenna with frequency reconfiguration capability. The design is based on the method of composite rightleft-handed transmission line (CRLH-TL). The antenna is made of coplanar waveguide CPW-Fed transmission line which simplified the design and enable bandwidth enhancement by merging fundamental modes. Due to short-ended boundary condition, bandwidth enhancement was achieved by controlling series parameters LR in the patch and CL at the shorted strip. Three PIN Diode are employed for frequency reconfiguration. Computer Simulation Technology (CST) Software was used for simulation to determine the accuracy of the technique and operation of the proposed antenna. From the simulation results wideband with bandwidth range (2.3-5.3)GHz and three single band at 2.9GHz, 5.0GHz and 5.8GHz band were obtained. Highest peak gain was realized in E-Plane and H-plane at 2.4GHz as 2.47dBi and 2.69dBi respectively. Based on the results obtained, the antenna can be used for GSM and WLAN applications.

RCAI1
Comparative Study: Text Classification Method to detect hate speech in Indonesian Language
Paper ID: 1570570799
Ali Yunda Noverma Hakim, Ay; Widy Widyawan; Teguh Bharata Adji (Universitas Gadjah Mada, Indonesia)
Abstract:
Hate speech can be distributed not only through utterance or actions, but also texts in social media. Several social media with massive users; such as Twitter is vulnerable against hate speech. Therefore, it challenges us to develop a system detecting hate speech. Previous researchers had classified texts in an unbalanced dataset by two labels, i.e. hate speech and non-hate speech. However, the finding was still inaccurate, as the classification tool tended to abandon the minority class in the dataset. One of the methods to solve the problem was modifying the used dataset, or the oversampling method. Additionally, we also compared some texts extraction and algorithm classification features to obtain the best performance. Our research findings argued that the best performance was obtained by combining the Naïve Bayes algorithm and N-gram (1-2) features. Besides, accuracy also increased when oversampling technique was implemented by 8.34% of the result in original data.

RCAI2
Cluster Analysis on Student Data for Selection of Major at University
Paper ID: 1570572332
Ainur Rahmawati; Eko Mulyanto Yuniarno; Supeno Susiki (Institut Teknologi Sepuluh Nopember, Indonesia)
Abstract:
Choosing a suitable major in university is very important for students. Had a wrong major could decrease student motivation and result in a bad academic performance. While for university, it is essential to provide guideline or information to choose a major in university and maintain student performance. In this study, we propose cluster analysis to provide an information and preliminary guidelines for new student as consideration to choose a major in State Islamic University Maulana Malik Ibrahim Malang. The SOM (Self-Organizing Map) algorithm was applied to do clustering analysis on student's profile data. The data input for this study was undergraduate's student data in State Islamic University Maulana Malik Ibrahim Malang from 2010 to 2012 from SPMB PTAIN admission. The final results showed that female students from the science major during high school who choose Educational Studies had the highest academic achievement compared to the group of female students from science major who choose majors in Language Study, Economics Study, Social Study, Science Study or Psychology Study. Academic achievements in this group have the highest CGPA (0.17 points above the average population) with a study period of 0.51 semesters shorter than the average population.

RCAI3
Road Pavement Model using Regression Data Mining For Road Maintenance Decision Making
Paper ID: 1570572509
Dessy Isyana Sunaryati (Institut Teknologi Sepuluh Nopember, Indonesia)
Abstract:
Road is a vital component that affects the economic and social systems of human life. Good road conditions will facilitate population mobility. When road damage occurs, it can cause accidents, obstacles in economic and social activities. Limited budget is a major problem in the implementation of maintenance national roads. Therefore, national road maintenance using regression model is needed in maintaining the age and road condition to make it easier for people to carry out their daily activities. Maintenance modeling is based on road condition International Roughness Index IRI and annual average daily traffic AADT of 2 axis 4 wheel heavy trucks. The correlation between road pavement conditions and road loads is modeled by regression data mining. The data used is secondary data from BBPJN VIII, Ministry of Public Works and Housing. This study use the Kruskal-Wallis non parametric test and the Median-Based-Linear Model test. The Kruskal-Wallis test output meaning that there is a difference among 2014, 2015, 2016, and 2017. The results showed the IRI road condition values at 1.00, 2.23, 1.09, and 1.64 which means the routine maintenance road . Output in 2015 provides the best Median- Based-

Linear Model result of 2.23. Output in 2015 provides the best Median-Based-Linear Model results of 2.23 indicating that the median condition of road conditions requires routine maintenance. This paper contributes to prediction road condition of international roughness road index for maintenance national roads in the road section of Tuban, East Java as a recommendation for decision-making on road pavement programs especially in Indonesia.

RCAI4
Data-driven Water Potability Classification using Ensemble Learning for Philippine Rural Areas
Paper ID: 1570573957
Melchizedek I Alipio (De La Salle University, Philippines)
Abstract:
In the Philippines, access to safe and sustainable water source is a major problem especially in rural areas. Thus, water monitoring in different water resources has been practiced to ensure safe drinking water. However, manual monitoring of safe drinking water is known to be inconvenient since it requires high operational and transportation costs, and time consuming. This study develop a data-driven water monitoring system that classifies the potability in real-time for rural household areas. Sensor nodes are installed in several water sources in different rural areas to collect water parameters such as pH, turbidity, total dissolved solids, and temperature which are wirelessly transmitted to a base station. In addition, data are sent to a cloud for data storage and remote monitoring. Moreover, the sensor data in the base station is used in building a model to classify water potability using a hard voting method in ensemble learning. The result of the classification is immediately sent to rural households using 2G/3G communication for real- time notification. Results show that the voting classifier model achieves an accuracy of 97% compared with other stand-alone classification algorithms. Furthermore, the model achieves 90% match with conventional industrial laboratory test. Finally, the system is able to communicate to rural households the water potability status with acceptable delay.

RCAI5
Advanced Deep Learning Technique For Application in Remote Sensing Smart Irrigation System
Paper ID: 1570574366
Mohd Hider Kamarudin (Universiti Teknologi Malaysia & Malaysia-Japan International Institute of Technology, Malaysia); Zool H Ismail (Universiti Teknologi Malaysia, Malaysia)
Abstract:
Irrigation system plays a vital role in large scale agriculture production. Today, new technology of Internet of Things has revolutionized conventional irrigation system through broad network communication and intelligent infrastructure. Machine learning algorithm is the main engine that drives the irrigation decision-making system. Recently, a state-of-the-art deep learning technique has started to dominate the agricultural domain with the goal of realizing the concept of smart farming. In this paper, we applied for the first time Long Short-Term Memory (LSTM), a deep learning model of Recurrent Neural Network (RNN) architecture to remote sensing image for soil moisture evaluation. We compared the LSTM model with other deep learning model of Convolutional Neural Network (CNN) in order to observe the performance. The proposed methods were validated on publicly available simulated RGB plant image datasets. Both deep learning techniques gave comparable performance for estimating soil moisture dissipation rates. LSTM has shown a promising result for soil moisture dissipation rate estimation based on the error produced and the model performance.

RCCE1
Software Project Effort Estimation In Startup Software Development
Paper ID: 1570571084
Axel Manuella Kefas and Ridi Ferdiana (Universitas Gadjah Mada, Indonesia); Rudy Hartanto (Gadjah Mada University & Electrical Engineering and Information Technology Departmen, Faculty of Engineering Gadjah Mada University, Indonesia)
Abstract:
Estimation business and time on stage early start-up project is a difficult task and challenge because of volatility and change in requirements of the customer. Method existing estimates and used when this only can do on

company scale big and not yet can use for do estimation on a start-up company. Estimation business and time based on points story (story point) is action subjective and in part big pointing on estimate accurate enough. In an article this researcher proposes to use the inner story point method determines the estimation business start-up company in Indonesia. The result is Effort Estimation using the story points to determine the limits of the module and working time, so that the limit modules and systems for employee payroll can be done well. The results obtained from the story point are in the range of 1-100. This value is used for the employee payroll system.

Session 3 - Track: Power & Energy Systems 3
Thursday 29 August 2019, 10.30 - 12.30, Ballroom

ISPS8

Application of High Gain Zeta Converter For Photovoltaic System

Paper ID: 1570557498

Heri Suryoatmojo (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Photovoltaics are generally used to convert solar energy into electrical energy. If the number of photovoltaic module are limited, then the output voltage will be small. In order to connect the inverter to the grid directly without any transformer devices, it requires extra high gain boost converter. In practice, conventional boost converter only able to increase the input voltage about 4 times. Therefore, this research will implement and analyze the performances of integrated quadratic-boost-zeta high gain DC-DC converter for photovoltaic application. The advantage of this converter is having a high ratio voltage conversion with a small duty cycle and requires few components. From the experiment, this converter can convert input voltage from 18 V to 330 V on duty cycle of 65,92%.

ISPS9

Determining Critical Clearing Time Based on Critical Trajectory Method using Unbalance Fault

Paper ID: 1570557653

Ardyono Priyadi (ITS, Indonesia); Talitha Puspita Sari and Wahyu Dwi Saputro (Institut Teknologi Sepuluh Nopember, Indonesia); Naoto Yorino (Hiroshima University, Japan); Mauridhi Hery Purnomo (Institut of Technology Sepuluh Nopember, Indonesia)

Abstract:

Transient stability has an essential role in the electric power system. When a disturbance occurs, the minimum protection relay will operate in about 0.22 seconds. However, this condition does not guarantee the system will return to steady state condition because of its Critical Clearing Time (CCT). If the fault is isolated before the value of CCT, the generator will return to stable. Otherwise, the generator becomes unstable if the fault is isolated after the value of CCT. This paper proposed the calculation of CCT on generators using an energy function method to determine the control of Unstable Equilibrium Point (CUEP) by considering unbalance fault. The result of this method has an allowable error in 0.0108% for the calculation in critical clearing time. Moreover, this method has faster calculation time than time domain simulation method with the difference in calculation time is 116.243 seconds.

ISPS10

Modelling of Distribution Compensator for Inrush Current of Medium Voltage Induction Motor in an Air Separation Plant Power Systems

Paper ID: 1570561219

Indra Hermawan (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia); Mochamad Ashari (Sepuluh November Institute of Technology, Indonesia)

Abstract:

This paper presents modelling of a Compensator for an Inrush Current in Power system that caused by a Starting of a Medium Voltage Induction motor. Compared to government regulation to limit the Voltage sag caused by a motor starting maximal on 5 percent, in the real plant condition, starting of a 4500 HP motor at 6.6 kV weak grid can causing 47 % voltage sag for 0.6 second duration or more. The Inrush Current Compensator modelling is using a space vector transformation and conventional PI controller to control the inverter bridges in an Matlab

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environment providing an improvement to the power quality in the area compared to the original condition that causing Voltage sag and on some circumstance causing a black out. In this modelling, we will see that the Inrush Current is improved by reducing the magnitude of Voltage sag about 25 % and also improve the Duration of Voltage sag about 0.2 second.

ISPS11

The Design of RBMP Technique to Limit The Fault Current and Voltage Dip in Medium Voltage Electrical System Application

Paper ID: 1570561332

Margo Pujiantara and Vincentius Raki Mahindara (Institut Teknologi Sepuluh Nopember, Indonesia); Bintha Fachrurriza (PT. Kaltim Daya Mandiri, Indonesia); Ardyono Priyadi; Mauridhi Hery Purnomo (Institut of Technology Sepuluh Nopember, Indonesia)

Abstract:

The expansion of the factory's production line might require a new installation of electrical machines. To integrate the new system into the existing network, there are several options that might be chosen such as direct cable connection, through an impedance, or by using a fault current limiter (FCL). This paper discusses the concept of Remote Bus Marching Practice (RBMP) which is a method to integrate a far location substation to the main system. The comparison of integration options by using the direct connection, impedance, and RBMP is performed in a petrochemical company in Indonesia. The factors being compared are the capital investment and the transient condition. The result shows that RBMP could be an adequate solution in a particular circumstance to integrate a new system in medium voltage power system while reducing the impact of voltage dip during a fault condition and in a competitive capital cost.

ISPS12

Harmonic Effect For Voltage Stability Condition In Radial Distribution System

Paper ID: 1570561346

Novian Patria Uman Putra; Adi Soeprijanto; Ni Aryani; Dimas Fajar Uman Putra (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

The distribution system is part of the electrical power transmission system which has different parameters and characteristics with the transmission system. This is because the distribution system is directly connected to the load, the type of load itself there are two kinds of linear electricity load and non-linear electrical load will but the non-linear load is the cause of the current distortion in the electrical system that Power and malfunction of the equipment. Therefore, in this research carried out the calculation of conventional power flow combined with the analysis of distortion to know the large and the spread of distortion seen from the power loss and voltage collapse on the electrical system so it can be known how large the effect of harmonizing on the tension stability of a system in certain conditions by looking at results of P-V curve. The method developed in this study was to combine between the backward-forward sweep power flow analysis with the method of adding Continuous Power Flow (CPF) loads with a secant predictor used to view the voltage stability used in one phase radial distribution system so that obtained the value of THD distortion and LAMDA value (factor system load multiplier) that compared with the voltage on the particular bus and in this research obtained on bus 10 is the bus Have a higher sensitivity with the value of voltage originally before the distortion obtained 0.8911 PU and lamda value of 3.119 to be a voltage value of 0.914 Pu and Lamda reached the maximum point of 2.321. The simulation was done with the help of MatLab software and compared to ETAP software with the validation of THD value with error of 2.86% on bus 10.

RCPS5

Electromagnetic Design of an Exterior Rotor EBike

Paper ID: 1570576496

Bui Minh Dinh (Hanoi University of Science and Technology, Vietnam & HUST, Germany)

Abstract:

In this paper, an exterior rotor e-bike brushless DC motor 1.2 kW is investigated. Geometry and material parameters are varied to elucidate their relative effects on the loss and efficiecncy. Motor power, torque and efficiency performance has been evaluated. This study for applying an auto design program is to find out permanent magnetic parameters and winding size though many calculation loops. This program can estiamte flux density eletromagnetic torque and torque ripple by Finite Element Magnetic Method FEMM. For reducing the cogging torque of BLDC motors. In this paper, Dymanic and static performances of torque, efficiency and current vs speed were validated by SPEED software and experimental test system.

RCPS6

Business Model of Resident Participation Based Waste to Energy (WTE) Project

Paper ID: 1570583441

F Farizal (Universitas Indonesia, Indonesia); Rahmat Nurcahyo (University of Indonesia, Indonesia); James Marisi (Universitas Indonesia, Indonesia)

Abstract:

Municipal solid waste (MSW) is a problem faced in many regions of the world. A better MSW management will provide benefit not only in term of space the waste processed and its environmental impact but also a by product that can be produced from the waste treatment system. Treating MSW through bioreactor systems can turn the waste into energy (waste to energy, WtE) by using the methane gas produced during the decomposition process of the waste organic compounds by bacteria. However, as the addition of the magnitude of the costs involved, how the project run is also crucial issue in carrying out the project. This study used resident based sustainable landfill gas plant project (SLFGP) to establishment a business model of waste management agency/authority. The study was carried out on the basis of regulations and legislation in force so that the implementation of this business model will be able to walk.

Session 3 - Track: Biomedical Engineering 2 (Signal Proc. & Wearables)
Thursday 29 August 2019, 10.30 - 12.30, Java Flores

ISBM7

EEG-based motion task for healthy subjects using time domain feature extraction: A preliminary study for finding parameter for stroke rehabilitation monitoring

Paper ID: 1570558923

Dwi Rahmat Mulyanto; Evi Pane (Institut Teknologi Sepuluh Nopember & Industrial Training Centre of Surabaya, Ministry of Industry, Indonesia); Wardah Rahmatul Islamiyah (Airlangga University, Indonesia); Mauridhi Hery; Adhi D Wibawa (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Nowadays, Stroke has been the second most cause of deaths in the world after Ischemic heart disease. Rehabilitation of stroke patients after the attack is still the most effective way of restoring the patients to normal. However, most of the rehabilitation methods are done manually. In most of stroke rehabilitation programs, the evaluation procedures are still done using visual observation by clinicians. Considering that background, this study is the preliminary stage in preparing stroke rehabilitation monitoring by using EEG. Since EEG has been used widely for studying the human motion and human control especially in the neural system, applying EEG for stroke rehabilitation monitoring and evaluation would be a great solution because the assessment of the rehabilitation progress can be quantified in a better way. Eleven healthy subjects performing specific motion tasks: baseline (no motion), finger motion, grasping and elbow-flexion, the EEG is then recorded and extracted. Statistical parameters were calculated to get the EEG pattern such as mean and mean absolute value (MAV). From the data analysis, we found that during motion, the value of MAV was tended to decrease in low beta bands. We also found that the maximum amplitude of relaxing or no motion (MAR) is higher than the maximum amplitude of the movement (MAM) in the low beta band both C3 and C4 channel.

ISBM8

Identifying EEG Parameters to Monitor Stroke Rehabilitation using Individual Analysis

Paper ID: 1570559750

Hendra Setiawan (Institut Teknologi Sepuluh Nopember, Indonesia); Wardah Rahmatul Islamiyah (Airlangga University, Indonesia); Mauridhi Hery Purnomo (Institut of Technology Sepuluh Nopember, Indonesia); Adhi D Wibawa (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Monitoring post-stroke patients is significantly important to determine the progress of activity in the brain during the rehabilitation period. The monitoring method using electroencephalograph (EEG) can provide more objective and measurable results. One of the challenges in this field is to determine the right EEG parameters. Most of the previous studies focuses more on test selected parameters with one condition of stroke, hemiparesis, or hemiplegia only, while in this study we focused not only in the test selected parameters, but also choosing the most stable parameters, band frequency, movement, and identify the relation between stroke conditions with parameter values. In this experiment, we compared healthy hand movements (HHM) against affected hand movements (AHM) in individual post-stroke patients using several EEG features at varying frequencies and motion. More details, we measured the brain activity of 10 respondents through 2 EEG electrodes (C3 and C4) when performing 3 active motor task: grasping, elbow flexion-extension, and shoulder flexion-extension. We use the Artifact Subspace Reconstruction (ASR) method to cleaning noise artifact from EEG data. Furthermore, we have separated EEG data into three band frequencies: alpha, beta low, and beta high. The features that apply are standard deviation (STD), mean absolute value (MAV), power spectral density (PSD), and Power Percentage (PP). Then, we use the individual analysis to calculate the difference value between HHM against AHM on each feature, band frequency, and movements. The result showed that among four parameters (STD, MAV, PSD, and PP), PSD reached the highest difference value in the alpha band when comparing between HHM and AHM. When comparing three motions, grasping motion showed the most significant difference between HHM and AHM. We also found that the Hemiplegia patients showed lower value in all parameters in AHM when comparing with Hemiparesis patients. The conclusion is certain task motion, and certain parameter needs to be applied when monitoring the progress of stroke patient rehabilitation.

ISBM9

The Effect of Sampling Rate on the Extraction of VEP Features Using Wavelet Transform

Paper ID: 1570561371

Hasballah Zakaria (ITB, Indonesia); Maula Ahmad (Bandung Institute of Technology, Indonesia)

Abstract:

Eyes are important senses for humans. Despite its vital role, this organ is susceptible to disease. One of the disturbances that can occur is Optic Neuritis, in which the process of demyelination occurs. Visual Evoked Potential (VEP) is a method that can be used to early detect this disease where the eye will be given a visual stimulus, and the response will be recorded through the Oz point in the back of the head. The recorded signal is then processed to obtain the VEP features that are used clinically as a reference for assessing eye conditions, namely the P75, P100 and P145 responses. This study was conducted to increase the accuracy of the VEP signal feature extraction process by using quadratic biorthogonal b-splines wavelet by varying the sampling rate of signal acquisition. To optimize the feature extraction process, 5 different sampling rates were chosen, namely 288, 256, 224, 192, and 160 for the data retrieval process. Result showed that sampling rate of 256 was optimal. Higher sampling rate was found to provide similar accuracy.

ISBM10

Stress Diagnostic System and Digital Medical Record Based Internet of Things

Paper ID: 1570561373

Rachmad Setiawan; Fajar Budiman; Wahyu Basori (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Stress is a common response by the human body when faced with certain conditions such as depression. Stress can occur in all age ranges but in general stress is mostly in adulthood. If a person experiences stress, then the

body will react to respond to the cause of stress. One of the body responses that occurs when a person experiences stress is an increased heart rate and the palm will release a cold sweat. In this final project, a system to diagnose the degree of saturation and strain in humans using fuzzy logic method, using several sensors, temperature sensors to measure body temperature, Galvanic Skin Response (GSR) used to detect the conductivity of the skin of two fingers and heartbeat sensors to find out how many heartbeats occur in a minute or Beat Per Minute (BPM). The three sensor value assignments will be sent over the wireless network to the database and the data processing with the fuzzy method is performed on the webserver. Testing of 15 subjects with each subject 5 times of system sensor data retrieval successfully send and store data in database with percentage 100%. Of the 15 subjects there were 12 subjects with the diagnosis of stress level in stable condition so that it can be concluded the system can work with percentage $(12/15) \times 100\% = 80\%$. Then the results of processing the three sensors displayed on the website and the patient can also see the results through android application.

ISBM11
Wavelet-Based Respiratory Rate Estimation Using Electrocardiogram
Paper ID: 1570561455

Anita Miftahul Maghfiroh (Institut Teknologi Sepuluh Nopember, Indonesia); Achmad Arifin (Sepuluh Nopember Institute of Technology, Indonesia); Tri Sardjono (Institut Teknologi Sepuluh Nopember, Indonesia)
Abstract:

Respiratory rate (RR) is calculated per unit time, the unit of measurement is expressed as breath per minute (BrPM). RR can be used for chronic heart disease (COPD) and congestive heart failure (CHF), although respiratory disorders such as sleep apnea are the main risk factors for a variety of heart diseases that provide an early indication of heart failure. RR is used as one of the important indicators of body system disorders, such as those that occur in alveolar ventilation (respiratory rate products and tidal volume) which are controlled by central action, peripheral chemoreceptor, and pulmonary receptors. The electrocardiograph (ECG) uses a 100 Hz LPF analog filter. This study uses the discrete wavelet transform (DWT) method to determine the respiration signal from the ECG signal. DWT is used with an approximate level of 8 with a divider signal of 250 Hz and a known frequency of 0.1 to 0.3. The results of the study 83% of noise-free DWT processing was achieved. DWT testing in real time has a delay of 3 minutes from reading the respiratory signal.

ISCE2
The IMU and Bend Sensor as a Pointing Device and Click Method
Paper ID: 1570550111

Romy Budhi Widodo, Agustinus Haryasena, Hendry Setiawan, Mochamad Subianto and Paulus Irawan (Universitas Ma Chung, Indonesia); Didik Suharso and Iskandar Iskandar (Politeknik Pelayaran Surabaya, Indonesia); Ardiansyah Ardiansyah (Politeknik Pelayaran Surabaya Gunung Anyar, Indonesia); Ari Lusiandri (Politeknik Pelayaran Surabaya, Indonesia)
Abstract:

A pointing device is one of the important interfaces between human and computer. A mouse is usually used as a pointing device; however, people with physical impairments who can not use a mouse due to its operation should use a table. One candidate for solving this problem is using an upper-arm movement combined with an inertial measurement unit sensor. The upper-arm gestures would be mapped and used to manipulate the mouse cursor on the monitor display. The 'clicking' action will be accomplished using a bending sensor attached on the opposite upper-arm. This study evaluates the combination of the IMU and bend sensor (IMU+Bend) as a substitute for the mouse. The evaluation is based on ISO/TS 9241-411: Ergonomics of human-system standard. The results mentioned that the use of IMU is a promising way to emulate the movement of cursor. However, the usage of bend sensor is uncomfortable when it is used as a clicking method. The throughput of the proposed is 1.75 bps, and qualitative results show that the mean of comfort is 4.85 on a Likert scale ranged from 1 to 7.

ISCE3

Blind People Guidance System using Stereo Camera

Paper ID: 1570561472

Ichsan Pratama Adi, Hendra Kusuma and Muhammad Attamimi (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Blind people need a tool for navigation while walking in an unknown or unfamiliar place. Generally, a stick is one of the solutions to guide them passing the walking path. Their movement is slow because they have to map with a stick, in which the radius of the map is only along to the stick. Another problem comes if there are objects that do not touch the ground, such as railroad crossing gate which cannot be detected by a simple stick. So as to solve this limitation, in this paper, we propose a stereo camera based assistive-system which can detect objects and/or obstacles around the blind people. The ZED Stereo Camera and Computer is used and can detected the distance of obstacles around the system and will be informed to the blind-user via stereo sounds. By this approach, we expected that the blind people can walk faster. From the experimental results, this system works well when used by the blind people. In the end of experiment, the system could achieve 83.16% in accuracy and able to guide blind people to find the walking path confidently.

RCSN1

Development of Flex Force Smart Glove

Paper ID: 1570568028

Mohamad Khairi Ishak (Universiti Sains Malaysia, Malaysia)

Abstract:

This paper presents the development of a flex force smart glove. The flex force smart glove is a smart data glove which is developed for the purpose of measuring the finger flexion of the human hand, the orientation of human hand in space and update them in a smartphone application using Internet of Things (IoT). The flex force smart glove is designed to display numerical values of finger flexion and fingertip force exertion, together keeping the cost low. The major building blocks compromises of flex sensors, flexiforce sensors and an IMU which is powered by Arduino Mega. The experimental results proved the reliability and accuracy of the system with reduced sensor reading fluctuations in the negligible range. The real-time communication is achieved by utilizing Internet of Things (IoT) approach.

Session 3 - Track: Telecommunications 2 & Signal Processing
Thursday 29 August 2019, 10.30 - 12.30, Banda Celebes

ISTL4

A Modified Genetic Algorithm for Resource Allocation in Cognitive Radio Networks in the Presence of Primary Users

Paper ID: 1570557496

Niki Robbi and I Wayan Mustika (Universitas Gadjah Mada, Indonesia); Widy Widyawan (Gadjah Mada University, Indonesia)

Abstract:

Technology of spectrum sensing on Cognitive Radio Network (CRN) has opened an opportunity to meet the increasing demand for spectrum. Users who have no license (SU) can easily use the spectrum in the idle time of Licensed users (PU). The challenge is how SU can use the Spectrum effectively without giving any interference to PU. The latest work has carried out a modified Genetic Algorithm (GA) to generate a resource allocation scheme that can maximize the network throughput of users SU. However, the work still does not consider the presence of PU. In this work, we attempted to generate a new scheme to maximize the network throughput of SU regarding the presence of PU. We also proposed a new scenario where the throughput fairness of each users has been considered. The channel interface was represented as a chromosome in GA; while the fairness of channel and throughput distribution became the constraint to get a fitness value for each chromosome. The simulation results showed that the proposed scheme was capable of improving the fairness of network throughput SU; at the same time, it also considered the presence of PU.

ISTL5

IBR-DTN To Solve Communication Problem On Post-Disaster Rescue Mission

Paper ID: 1570557545

Muhammad Fauzan, Tito Waluyo Purboyo and Casi Setianingsih (Telkom University, Indonesia)

Abstract:

Disasters could occur anywhere and anytime, and there are some disasters that could not be fully predicted. Post-disaster places usually have communication problem. This could potentially slow down the rescue team's effort to save the survivors of the disaster. To prevent communication failure, the writer proposed a system using IBR-DTN, an implementation of the bundle protocol RFC5050 to facilitate communication between rescue teams.

ISTL6

Performance Analysis of Ad-Hoc On-Demand Distance Vector (AODV) and Dynamic Source Routing (DSR) Routing Protocols During Data Broadcast Storm Problem in Wireless Ad Hoc Network

Paper ID: 1570561177

Ida Nurcahyani and Faritz Laksono (Universitas Islam Indonesia, Indonesia)

Abstract:

Ad Hoc networks consist of a group of free nodes that can communicate with each other without the need for a base station or access point to exchange information. In communicating between nodes, Ad Hoc networks require a routing protocol that is tasked with finding routes from the source to the recipient. When active nodes in the network try to communicate simultaneously, for example in the condition of broadcast storm data, the routing protocol finds the address of the receiving node from each sending node simultaneously. In this condition, the network is filled with packets of data sent by active nodes while trying to find the destination node for sending messages. The same thing happens when active nodes try to send repeated messages simultaneously. These nodes can flood the network so that it reduces the network's performance. In this paper, we investigated the performance of AODV and DSR routing protocols when experiencing the data broadcast storm problem. The simulation results indicate that the AODV routing protocol performance was better than DSR in terms of throughput and delay in the process of sending data. Meanwhile, both routing protocols show nearly similar values in each simulation scenario in packet loss analysis.

ISEL1

Implementation of cross correlation with stochastic computation in FPGA

Paper ID: 1570561471

Rifqi Yunus Pratama (Institut Teknologi Sepuluh Nopember, Indonesia); Thibault Pichel (INP-ENSEEIHT, France); Astria Nur Irfansyah and Fajar Budiman (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Stochastic computation is an alternative method for computing where numbers are encoded as probabilistic values. In this paper, we investigate the use of stochastic computation in the general cross correlation operation which finds various applications such as in interaural time difference in sound localization algorithms. In this work, we evaluate the performance of stochastic computation in performing cross correlation between two phase-shifted signals through experimental results on an FPGA. The two analog signals are converted into binary format using an on-board ADC of the Altera DE-10 Nano board, while all conversion into stochastic form and cross-correlation are performed within the FPGA. The system has been implemented in an Altera Cyclone V FPGA and able to distinguish signal phase delays in the audio frequency range.

ISIT9

Analysis of Secure Bit Rate for Quantum Key Distribution based on EDU-QCRY1

Paper ID: 1570561449

Dedy Septono Putranto; Damayani Suyitno and Haykal Octa Asmar; Rini Wardhani (National Crypto Institute, Indonesia); Mohamad Syahral (STSN, Indonesia); Dion Ogi (Sekolah Tinggi Sandi Negara, Indonesia)

Abstract:

Most cryptographic mechanisms, such as symmetric and asymmetric cryptography, often involve the use of cryptographic keys. However, all cryptographic techniques will be ineffective if the key distribution mechanism

is weak. The security of most modern cryptographic systems of key distribution mechanism is based on computational complexity and the extraordinary time needed to break the code. Quantum Key Distribution (QKD) or Quantum Cryptography is attracting much attention as a solution of the problem of key distribution; QKD offers unconditionally secure communication based on quantum mechanics. In this article we analyze of secure bit rate with the most popular QKD protocols. Also, we give a short state of the art of Quantum Cryptography.

RCEL1
FPGA Implementation for Real-time File Transfer using Visible Light Communications
Paper ID: 1570573323

Trio Adiono (STEI ITB, Indonesia); Rosmianto Saputro and Muhamad Luthfi (Pusat Mikroelektronika Institut Teknologi Bandung, Indonesia); Syifaul Fuada (Universitas Pendidikan Indonesia, Indonesia)

Abstract:
The digital image, character/texts, audio (music), and video are the multimedia contents which commonly used as objects to be transmitted on the VLC system. We have performed the real-time file transfer successfully using VLC technology with UART connection. The FPGA was chosen as a DSP due to its capability in clocked-speed. We used Ethernet connection due to easy configuration and able to meet the high-speed communication requirement. It was used for communicating between the host with the client device computer. This work covers the design and implementation of the MAC layer, SoC FPGA for UART connection and analog front-end (AFE) transceiver. According to the functional test, the achieved bandwidth of the Ethernet connection is about 83.6 Mbps. However, the FPGA's clock is set at 100 kHz only due to the transferred file does not require a high speed. Thus, the physical layer baud rate is fixed to 11520 bps; it can be used for real-time transfer a digital image with 512 pixels with no compressed file and error.

RCCO1
Extending Flight Time for Multi-copters Through Optimization of Power and Thrust Delivery
Paper ID: 1570572447

Ahmad Faizul Hawary (Universiti Sains Malaysia, Malaysia)

Abstract:
Applications that use multi-copters platform or popularly known as drones is growing tremendously not only for hobbies but also for professional use such as aerial photography, aerial security and also for agricultural services. The only lift force that keeps the drone airborne relies upon the vertical thrust generated by a set of propellers. Thus, the endurance of it depends very much on the capacity of the battery. Most of the drones in the market today have maximum operating time of less than 60 minutes which is not an issue for general-and-short-period operations. However, for applications that require longer flight time, the shortcoming is crucial. Although adding higher capacity batteries would help, but more energy would be consumed due to the battery weight. So, this paper proposes a method to investigate the area where the energy could be optimized without compromising the flight quality. The parameters considered in this study are propelling thrust, rotor speed and the current consumption. Essentially, the relationship between current consumption, the throttle level and the motor speed are presented. The optimal value of these parameters is used to tune a PID controller to observe the amount of energy saving in terms of the increase of the total flight time as compared to an ordinary controller. Based on flying experiment conducted on a predefine trajectory under no-wind condition, the flight time increases by 25%. Therefore, it is concluded that the value obtained from the optimization would help to keep a drone airborne for a bit longer using the same battery.

RCCO2
Implementation of Quaternion Based Proportional-Derivative Controller for UAV Quadrotor Attitude Tracking with Madgwick Filter
Paper ID: 1570565638

Adha Cahyadi, Rofiq Muhana and Andreas Sandiwan (Universitas Gadjah Mada, Indonesia)

Abstract:
This paper presents an experimental study of quaternion based attitude control for a quadrotor. Quaternion is an expansion of the complex number that can be used as orientation representation. It is a more compact

representation than the rotational matrix. It can avoid singularity that occurs when representing rigid body dynamics with the Euler angle. Both, attitude estimation with Madgwick Filter and attitude control with Proportional-Derivative are represented on quaternion without any transformations in other representations. The mapping of the axis error on the controller is presented. It aims to avoid undesirable rotation that often occurs in quaternion based attitude control. The proposed controller supports the quadrotor to track

Session 3 - Track: AI & Machine Learning 2
Thursday 29 August 2019, 10.30 - 12.30, Bali C

ISAI1

Wood Strength Classification Based on RGB Color and Image Texture Using KNN Method
Paper ID: 1570536203
Okta Dhirga Sukrisdyanto (Institut Teknologi Sepuluh Nopember (ITS), Indonesia); I Ketut Pumama and Supeno Nugroho (Institut Teknologi Sepuluh Nopember, Indonesia)
Abstract:
One of the most important factors for deciding the use of wood products is knowing its strength class. For example, the use of wood in building construction must be strong, hard, big and durable. It will be very dangerous, if the selected wood is not in accordance with the specifications above. So far, the wood strength has been measured using relatively expensive laboratory tests both for purchase and rent. In addition, this test has also damaged the test wood. An alternative method that can be used to determine the strength class of woods is to observe their characteristics using the naked eye. However, this is also a tough challenge because it must be done by wood experts who truly memorize and understand the characteristics of each wood class. Therefore, an image processing method is needed to identify the strength of wood easily, cheaply and not to damage test wood. The object of this study consisted of seven types of wood: akasia (Acacia mangium), jati (Tectona grandis), mahoni (Swietenia mahagoni), sengon laut (Paraserianthes falcataria), sengon tekik (Paraserianthes falcataria), trembesi (Samanea Saman) and waru (Hibiscus tiliaceus). The parameters used by the author to determine the strength of wood based on image processing are the RGB color and texture of the wood image. We use two feature extraction methods, the average RGB histogram value for each color channel and the static characteristics of the Gray-Level Co-Occurrence Matrix (GLCM) method. The methods used for feature selection are Recursive Feature Elimination and Recursive Feature Elimination Cross Validation. While for data classification we use five algorithms: LDA, KNN, CART, RF, and SVM. The results of the qualifications showed that the highest accuracy was obtained by the KNN of 91%. Therefore, this method can be used as an alternative to determine the strength of wood.

ISAI2

Clustering of female avatar Face features consumers choice using KMeans and SOM algorithm
Paper ID: 1570548238
Citra Dewi Megawati, CM (Institut Teknologi Sepuluh November Surabaya, Indonesia); Eko Mulyanto Yuniarno (Institut Teknologi Sepuluh November, Indonesia); Supeno Susiki (Sepuluh Nopember Institute Of Technology, Indonesia)
Abstract:
Games is an interactive activity that is popular with consumers. However, illustrators are unable to determine of characters face many chosen with consumers. The paper proposes a clustering of face features often chosen by consumers for their female avatars. The face features involved in this research are the face shape, eyebrows, eyes, nose, lips, ears and skin color. The paper uses two methods for clustering, KMeans and SOM. These methods used class partitioning based on shape similarities. Using K-means, the results show 11% of correspondents picked triangle face shape, then 61% chose an oval shape, and 28% chose a square shape. Using SOM, the results show 36% chose a triangle shaped face, 45% chose an oval face, and 19% chose a square face. It shows that KMeans has better performance than SOM.

ISAI3

Pre-Collision Warning and Recommendation System for Assistant Driver using Least Square Support Vector Machine and Fuzzy Logic

Paper ID: 1570553695

Alifia Puspaningrum, Adi Suheryadi and A Sumarudin (Politeknik Negeri Indramayu, Indonesia)

Abstract:

1.25 million people lose their lives due to road accidents every year. To deal with this problem, some innovative transportation are proposed to avoid road accidents, one of them is giving alert and recommendation for each vehicle which is well known as Pre-Collision Warning. According to many researches that have been conducted before, the performance of pre-collision warning can be improved by considering not only speed, but also the traffic sign and the distance to other objects. Furthermore, after predicting the danger, the system needs to give the speed recommendation and its action. In this paper, we propose Least Square - Support Vector Machine (LS-SVM) to predict the danger and give the speed recommendation using Fuzzy Logic. The experimental result shows that LS-SVM can give the best performance according to the value of 98.71% for accuracy, 98.60% for precision, and 99.18% for recall.

ISAI4

Preliminary Study of Multi Convolution Neural Network-Based Model To Identify Pills Image Using Classification Rules

Paper ID: 1570555453

Windra Swastika, Kestrilia Prilianti, Andrian Stefanus and Hendry Setiawan (Universitas Ma Chung, Indonesia); Afif Zuhri Arfianto (Politeknik Perkapalan Negeri Surabaya, Indonesia); Ari Wibawa (Universitas Diponegoro, Indonesia); Mohammad Basuki Rahmat; Edy Setiawan (Politeknik Perkapalan Negeri Surabaya, Indonesia)

Abstract:

Personal medicine is very important for those who have special health problems. Having several types of pills can make it hard for people to remember every pill especially aged citizen who easily forget his or her own medication. Another problem often encountered is the difficulty of recognizing the drug pills whose labels or the packaging are damaged and hard to read. This research, we developed a multi convolutional neural network (CNN) model to identify pills using classification rules. The idea of using multi CNN model is that almost all type of pills have three main identifiers, namely color, shape and imprint. Three CNNs model are developed to represent each identifier. The number of data collected is 24.000 images, which 95% of the data is used for training purpose and 5% is used for data test. The results of each CNN model is processed with some predefined rules to generate the classes of pills. From the results of different CNN architectures, number of epochs, optimizers and input size experiments, LeNet architecture with input size 64x64 pixels and Adadelta optimization shows the best accuracy up to 99.16%.

ISAI5

Combining SentiStrength and Multilayer Perceptron in Twitter Sentiment Classification

Paper ID: 1570557126

Eko Yudhi Prastowo (Institut Teknologi Sepuluh Nopember, Indonesia); E Endroyono (ITS & Institut Teknologi Sepuluh Nopember, Indonesia); Eko Mulyanto Yuniarno (Institut Teknologi Sepuluh November, Indonesia)

Abstract:

The advancement of internet technology has caused the use of social media to become the people lifestyle. The company and the government use social media as instant feedback to get user sentiments regarding their comments or reviews. The sentiment is an opinion or view that based on excessive feelings towards something. The method for knowing positive or negative sentiments from someone's comments can be done manually by humans to analyze comments one by one or automatically by machine learning to do classifications. Machine learning requires training data and test data that have positive and negative labels. Generally, data labeling is done manually by humans. In this study, we used machine learning to classify sentiments with data collected from Twitter. Machine learning method used is Multilayer Perceptron and Naive Bayes as a comparison. Labeling dataset using manual method. For addition training data, labeled data was generated using an English lexicon dictionary called SentiStrength. Feature extraction uses vectorization and TF-IDF. This study aims to measure effect of adding

training data generated using SentiStrength from unlabeled data during learning process to accuracy of machine learning model. Classification model testing uses data of 627 tweets. The result is addition of training data to increase average accuracy by 5% of initial accuracy. Multilayer Perceptron is more accurate than Naive Bayes with the highest accuracy ratio of 77.71% and 76.07%.

ISAI6
Forecasting Sunspot Numbers Using Fuzzy Time Series Markov Chain Model As Flare Identification
Paper ID: 1570557189

Dian Candra Rini Novitasari (Universitas Islam Negeri Sunan Ampel, Indonesia); Nurul Ardhiyah (UIN Sunan Ampel Surabaya, Indonesia); Nanang Widodo (Nanang Widodo, Indonesia)

Abstract:
The energy to move the global atmosphere, especially the energy is coming from the sun. Sun has three main activities that can affect the state of the Earth, such as sunspots, the explosion of the sun (flare), and the coronal mass ejection (CME). One of the easiest solar activity on the Earth is observed sunspot and flare. The period for the solar activity cycle takes an average of 11 years. International sunspot number (R) is a key that can indicating the existence of solar activity. In this study, used the method of fuzzy time series Markov Chain models to predict the sunspot number. Fuzzy time series Markov chain model is an combination of fuzzy time series method with Markov chain which aims to have the greatest probability obtained by using Markov transition probability matrix. The Results of a data forecasting of sunspot numbers using fuzzy time series Markov Chain model has an accuracy rate of 6,54% MAPE value which indicates that the forecasting model is categorized as very good, while the value of MAPE on test data of 9,5%. Then the results of sunspot number forecast in April 2019 by 6,4 and in May 2019 was 6,5 which indicated no potential to flare as sunspot numbers generated are less than 20.

ISAI7
Water Pipe Leak Detection using the k-Nearest Neighbor Method
Paper ID: 1570557279

Abdul Rojik; Astria Nur Irfansyah; E Endroyono (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:
Water loss due to pipe leakage is a common phenomenon that occurs and is often overlooked, pipeline leaks that carry water are not too dangerous as in gas or oil pipes, but the losses will be even greater if the leak is neglected, infrastructure around the pipeline leak may suffer damage, impacting water companies and most importantly will affect the availability of clean water. These losses can be minimized if the pipeline leak is immediately known. This paper presents the detection of water pipe leakage by detecting changes in pressure at several points on the water pipe network. A Variable Speed Drive (VSD) is used to control the performance of the water pump, controlled water pump performance by VSD aims to regulate the pressure on the water pipe network, the performance of the 20% strength water pump produces weak water pressure. The water pressure on a weak pipeline network with leakage at 2 points will be analyzed and processed using the k-Nearest Neighbor (k -NN). Data processing was conducted in several experiments, initially pump performance of 40%, 60%, 80% and 100%. Pipeline leak detection did not experience difficulties with 100% accuracy if the pump strength is known and held constant at those specified pump strengths. Then, in the case of combined data from 40%, 60%, 80% and 100% pump strength, with and without leaks, the k-NN method was able to detect leakage with an accuracy of 95.62%. The leak detection accuracy of the method drops to 88.46% when the pump performance was 20 % which produces a weak water pressure in the pipeline

ISAI8
Village Classification based on Geographic Difficulties using Backpropagation Neural Network Algorithm (Case Study: Village Potential of Sumenep Regency)
Paper ID: 1570558211

Heru Setiono, Eko Mulyanto, Supeno Mardi Susiki Nugroho (ITS, Indonesia)

Abstract:
Indonesia has a variety of geographical conditions, from coastal islands, hills, and mountains. For an archipelago consists of 17,504 islands, the diversity of the archipelago affects the equitable development process. Until

recently we have seen a growth center in the region with a flat topography. Developments in hilly, mountainous, and archipelagic regions can be expensive. Sumenep Regency is one of the districts still lagging in East Java Province, and its characteristics are more complex than other districts in East Java. This research was conducted to obtain information about attributes that have an important role as a reference for village development priorities by classifying the level of geographical difficulties based on indicators used as attributes. The initial test with 28 attributes and after features selection using Chi-square and Cramer's V correlation became 25 attributes with better accuracy of 0.95% compared to the initial attributes, with the Backpropagation classification results reaching 92.01%.

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Session 4 - Track: Power & High Voltage Engineering
Thursday 29 August 2019, 13.30 - 15.30, Ballroom

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ISHV1

Wavelet Transformation Selection for Detection of Ferroresonance Behaviour

Paper ID: 1570557459

I Made Yulistya Negara; Dimas Anton Asfani; I Gusti Satriyadi, Daniar Fahmi, Bagas Kuntala Aji and Verdiansyah Verdiansyah (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Ferroresonance is a nonlinear resonance phenomenon that can cause a high increase in current and voltage so that it can cause damage to electrical equipment and can eventually disrupt the electrical system. The main problem in this phenomenon is the complexity of this phenomenon in its detection, prevention, and handling. Wavelet transformation is one of the methods for analyzing ferroresonance detection. The purpose of this study is to be able to find out the suitable wavelet transformation based to detect ferroresonance phenomena. In this study, the detection was carried out by analyzing significant changes in the detailed coefficient value of wavelet (DWT) ferroresonance signal using the MATLAB software. The choice of wavelet is done by two methods. The first method is to analyze the speed of detection and the ratio of the detail coefficient value detected to the threshold value. The second method is to compare the ratio of cumulative energy calculations to normal conditions and ferroresonance conditions. The based wavelet used a 54 based wavelet available on the MATLAB software DWT. Based on studies conducted in the first method, the coif5 mother wavelet shows superior detection performance compared to other mother wavelets by detecting faster consistently in each ferroresonance mode. In the second method, the rbio3.3 mother wavelet consistently produces a cumulative energy ratio greater than the other mother wavelets.

ISHV2

Floating Metal Particle Motion Characteristics with Shape and Size Variation in the Oil Insulation Under DC Voltage

Paper ID: 1570557644

Daniar Fahmi; I Made Yulistya Negara; Dimas Anton Asfani; I Gusti Satriyadi and Tasha Deliana; Juan Christian Soebagio (Sepuluh Nopember Institute of Technology, Indonesia)

Abstract:

Liquid insulation may fail on utilizing its functions due to aging. Aging is caused by the presence of materials such as solid particles, oxygen, water, piles of deposits, dirt, and dust. The solid particles in form of copper, aluminum, stainless steel, and other metal materials may cause impurities and lower the value of breakdown voltage. These particles may float in oil and have different motion and breakdown characteristic. This study was conducted with variable on particles of stainless steel as contaminants. Contaminants vary in shape and size, i.e. spherical and elliptical shape particles with different size. This test was carried out by using DC high voltage generation. Video recording was done to capture the movement pattern of floating metal particles with a high speed camera. Nonetheless, CST simulation was running to determine the field value (E) when the particle moves. The results of the tests showed that the smaller the particle diameter, the greater the breakdown voltage value. Furthermore, particle size has an effect on the pattern of movement of floating metal particles. The larger the particles is, the more cycle generated and the faster floating metal particles move.Liquid insulation may fail on utilizing its functions due to aging. Aging is caused by the presence of materials such as solid particles, oxygen, water, piles of deposits, dirt, and dust. The solid particles in form of copper, aluminum, stainless steel, and other metal materials may cause impurities and lower the value of breakdown voltage. These particles may float in oil

and have different motion and breakdown characteristic. This study was conducted with variable on particles of stainless steel as contaminants. Contaminants vary in shape and size, i.e. spherical and elliptical shape particles with different size. This test was carried out by using DC high voltage generation. Video recording was done to capture the movement pattern of floating metal particles with a high speed camera. Nonetheless, CST simulation was running to determine the field value (E) when the particle moves. The results of the tests showed that the smaller the particle diameter, the greater the breakdown voltage value. Furthermore, particle size has an effect on the pattern of movement of floating metal particles. The larger the particles is, the more cycle generated and the faster floating metal particles move.

ISHV3

Low-Voltage Arcing Detection on Non-Linear Load with Total Harmonic Distortion and Power Factor Variations
Paper ID: 1570559769

Dimas Anton Asfani; Daniar Fahmi; I Made Yulistya Negara (ITS, Indonesia); I Gusti Satriyadi and Jefri Setyadi (Institut Teknologi Sepuluh Nopember, Indonesia); Made Yudha Pranadiksa Giri (ITS, Indonesia)

Abstract:
Fires in residential areas are generally caused by low-voltage arcing. This phenomenon has unique characteristics that is very high current magnitude and very fast period. Therefore low-voltage arcing is not detected by circuit breaker. The study about low-voltage arcing detection on non-linear load with total harmonic distortion (THD) and power factor (cos phi) variations has been conducted. There are two observation conditions, i.e. arcing and normal condition. This study has been able to detect low-voltage arcing or not. Based on wavelet transformation, maximum value of high frequency (HF) current and the number of arc points that exceeds the HF current threshold (2 A) have been used to describe which is arcing or normal conditions. Based on the analysis results, maximum value of HF current and the number of arc points at arcing condition are not affected by THD and power factor variations.

ISPS14

Controlling Line Power Flow in JAMALI (Jawa-Madura-Bali) System Using STATCOM
Paper ID: 1570561436

Anugerah Akbar Setiyawan, Ontoseno Penangsang and Ni Aryani (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:
Several studies on FACTS devices as a solution to various transmission network problems have been carried out. Installation of FACTS devices including Static Synchronous Compensator (STATCOM), on the system has a positive impact on the system. One of the positive effects of installing FACTS is the ability of FACTS to be able to control the power flow channels on the system. STATCOM itself is a set of power electronics equipment based on Voltage Source Converter (VSC). STATCOM will simulate its application to the Java-Madura-Bali (JAMALI) transmission system. The JAMALI system itself is a system that is considered as the backbone of the electricity transmission system in Indonesia. Therefore the simulation is done by looking at the potential of FACTS when it is later applied. In this Final Project the simulation is carried out using PSS / E 33 software, then the results of the simulation will be analyzed. The purpose of this final project is to simulate the possibility of installing FACTS Devices, in this case STATCOM, on the JAMALI system and find out the impact of the installation on the JAMALI system and its analysis

ISPS15

Design and Implementation of DC-DC Bidirectional Cuk Converter with Average Current Mode Control for Lead Acid Battery Testing
Paper ID: 1570561438

Irham Izzatur Rahman; Dedet Riawan; Mochamad Ashari (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:
In this paper, we present a modified battery testing scheme using dc-dc bidirectional cuk converter. This converter is addressed to average current mode control in order to get constant current at input or output side of converter

for battery testing purpose. Battery type used in this experiment is valve regulated lead acid (VRLA) with rating of 12 V and 7.2 Ah. In this experiment with the new proposed battery testing system we will conduct two testing. First, the discharge testing to get battery discharge characteristics. Second, the charge-discharge cycle testing to clarify the ability of state of charge (SoC) estimation method with coulomb counting to predict the SoC of battery with comparison of open circuit voltage method that have good accuracy in predicting the SoC of battery.The result of coulomb counting obtain accuracy of 98,13% in predicting the SoC of battery.

ISPS16
Power Swing Phenomenon on Jawa Bali 500 kV Backbone and Its Mitigation
Paper ID: 1570561451

Ontoseno Penangsang, Ni Aryani, Restu Maulana Azmi and Gracia Manuella (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:
The electricity demand is getting higher along with the change of times. This requires the development of electrical power system which causes bigger and complex system. The network development could lead into greater chance of system faults and increase the possibility of power swing phenomenon. Power swing is a phenomenon of active and reactive power oscillation on the transmission line as a result of major disturbance in the system. This phenomenon can cause error tripping on distance relay and the out of step on generator, thus could cause system blackout occurs. In this thesis, the mitigation of this event will be discussed by adding FACTS Device and circuit addition. This mitigation method uses a simulation in DIgSILENT Power Factory software, while the system modeling used is a 500kV Jawa Bali transmission backbone system, so it is expected to be in accordance with real conditions.

ISPS17
Security Constrained Unit Commitment Considering Transmission Capacity and Loss With Non-Smooth Generation Cost Function Using Binary Particle Swarm Optimization (BPSO) Algorithm
Paper ID: 1570561476

Ni Aryani and Rony Seto Wibowo; Dimas Fajar Uman Putra; A. Saad Daroini; Elpha Aulia Arifin (Sepuluh Nopember Institut of Technology, Indonesia)

Abstract:
Nowadays, the effectiveness and efficiently of human activity depended by the availability of electricity, with this condition the power system must be operated securely and economically optimal. To meet the hourly electrical fluctuate need, unit commitment (UC) could be used for generation scheduling (on/off) by considering generator constrains to get the most economical optimum power system operation. However, unit commitment operation couldn't scheduling generator unit considering the security of the transmission line as the system constrain. This paper discusses Security Constrained Unit Commitment (SCUC) considering transmission capacity and power transmission loss with non-smooth generation cost function on IEEE 30 bus system. Binary Particle Swarm Optimization (BPSO) algorithm will be used to solve SCUC problem to get economically optimum and considering the transmission line security. The test result shows that BPSO method is able to solve and calculate SCUC problem considering transmission capacity and power transmission loss with non-smooth generation cost function with maintaining the constrains such as equality constrain, inequality constrain, minimum up and down time, ramp rate, and transmission line capacity.

Session 4 - Track: Information Technology 2
Thursday 29 August 2019, 13.30 - 15.30, Java Flores

ISIT7
Classification of Aircraft Inspection Result Using K-Nearest Neighbors
Paper ID: 1570561304

Nurhadiyanto Nurhadiyanto; Supeno Susiki; Eko Setijadi (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:
The increased number of people traveling has caused the growth of transportation services enormously. The airplane is the fastest and most efficient transportation between cities, islands, or even continents. Airlines

continue to buy new or used aircraft that are still eligible to meet the increasing demands of passengers each year. Aircraft must have a Certificate of Airworthiness (C of A) to be used for flight. C of A is valid for a year if the airworthiness of the aircraft maintained by routine maintenance and does not experience incidents or accidents. Before C of A expires, an inspection of the aircraft conducted as a condition for extension of the certificate. The aircraft was inspected by a civil aviation inspector from DGCA to determine whether the aircraft was in airworthy condition or not. If it is not feasible, improvements should be carried out to the parts of the examination findings. This research classifies from C of A data inspection using the KNN and Naïve Bayes method to evaluate features that affected the condition of the aircraft. The best accuracy results using KNN method from the selected features obtained 83%. This study has proven to be able to determine the conditions on an aircraft from the feature that already selected.

ISIT8
Vehicle Distance Measurement Tuning using Haversine and Micro-Segmentation
Paper ID: 1570561400
Aghus Sofwan; Yosua Alvin Adi Soetrisno (Diponegoro University & Faculty of Engineering, Indonesia); Eko Handoyo, M Arfan, Natalia Ramadhani and Amiko Rahmayani (Diponegoro University, Indonesia)
Abstract:
In the globalization era, the vehicle tracking system is important and needed in the fleet asset management system. This management system has a significant role in good logistics distribution in order to measure mileage of truck traveling. Therefore, the existence of the global positioning system (GPS), information system, and network technology can help to monitor the fleet system. GPS devices send JSON information by POST method in HTTP to the information system server from anywhere and anytime through internet connection. Furthermore, the stakeholders, the customer and the company of fleet service, can measure the real distance which is gathered from GPS. Contribution of this research is to find the best distance measurement gathered by micro-segmentation technique and summarization of each segment by Haversine formula. Micro-segmentation in this research is performed by modification of how often data sent to the server. Furthermore, we use RMS value that shows correlation, which is obtained by comparing our system result to the real odometer, Google Maps, and GPS data measurement. The obtained RMS of our system exceeds 0.9005 which compared to GPS data. From the result we obtain most optimal repeat duration for sending data by tuning duration with value of every 30 seconds

ISIT10
Clinical decision support system for typhoid fever disease using classification techniques
Paper ID: 1570561456
Boby Andrianto; Yoyon Suprapto; Istas Pratomo; Ika Irawati (ITS, Indonesia)
Abstract:
Antibiotic resistance is one of the biggest threats to global health. According to WHO antibiotic resistance is already at high levels of danger. Causes of antibiotic resistance are errors in diagnosis and treatment. Essential facts of disease diagnosis in primary health care units in Indonesia are conventional methods often used because of a shortage of skilled medical personnel, Conventional diagnosis systems depend on the experience of medical personnel without using complex clinical data. This paper use a clinical decision support system (CDSS) based on medical record data and classification techniques to reduce misdiagnosis. This paper focuses on the diagnosis of typhoid fever disease (TFD) because the amount of antibiotic resistance is very high and is an endemic disease in Indonesia that is difficult to diagnose. This system uses three methods of supervision classification, Naïve Bayes (NB), k- nearest neighbor (kNN), Support Vector Machine (SVM). Then the system was compared and evaluated. The results of the three methods showed that kNN provided 88.7% accuracy, better than other classifications for typhoid fever disease.

ISCE1

SIFT and ICP in Multi-View based Point Clouds Registration for Indoor and Outdoor Scene Reconstruction

Paper ID: 1570549898

Muhammad Imanullah; Eko Mulyanto Yuniarno; Surya Sumpeno (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

3D reconstruction requires many approaches in solving the fundamental problem such as accuracy, wholeness, and acquisition method. To achieve a rigid and wholesome shape, 3D object reconstructed from many different views should be registered. This registration process aims for combining and aligning pieces of the same object by which it was reconstructed from many different orientations, to be a single wholesome shape as possible. The registration process takes some steps started from data acquisition, feature extraction and matching, essential matrix calculation and decomposition, coarse registration, and refinement. We propose the use of SIFT (scale invariant feature transform) algorithm in feature extraction and matching process to find point correspondences on each indoor and outdoor multi-view scene images, along with other followed registration steps. The search of point correspondences is crucial since it appears as basis in essential matrix calculation that let us obtain the initial orientation value between all pieces in coarse registration attempt. The complete registration process ends up with refinement using ICP (Iterative closest point) within the coarse registration results. The whole steps and results of this SIFT and ICP usage in multi-view based point cloud registration will be stated in the end of paper along with performance and recommendation to get optimal registration result.

ISAI13

Community Feedback Analysis Using Latent Semantic Analysis (LSA) To Support Smart Government

Paper ID: 1570560727

Zakky Sanjifa; Surya Sumpeno; Yoyon Suprapto (Sepuluh Nopember Institute of Technology, Indonesia)

Abstract:

Developing and prioritizing development planning is the main task of the government. Development priority programs carried out in government activities can have direct or indirect impacts on the community. Community participation in providing responses or feedback from activity programs can be an important contribution for the government in realizing good governance. In the city of Surabaya there is a website portal called media center that can accommodate community participation. Communities can submit complaints, suggestions, appreciation and information requests through various channels such as government websites, e-mail, telephone and social media, then their complaints are collected and published on the media center portal. This study aims to identify and analyze community feedback from official government portal using the K-means clustering and Latent Semantic Analysis (LSA) methods to produce topics of development problems that are occurring. After getting the topic then interpret it into categories according to the priorities of the development program called RKPD. In clustering using k-means clustering and LSA, the cluster formed is 17 clusters with 6 categories including public service at first position followed by infrastructure, city utilities, living environtment, transportation system and mass transport, and education service

ISAI17

Asphalt Pavement Pothole Detection using Deep learning method based on YOLO Neural Network

Paper ID: 1570557285

Ernin Ukhwah; Yoyon Suprapto; Eko Mulyanto Yuniarno (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

There is an increasing need for assessment of national road condition. Currently, some automatic devices have been extensively applied to collect up-date data about road condition, such as the use of survey vehicle for collecting data-which make it faster and more accessible, and semi-automatically data processing that is useful for policy decision making. Yet, demand for more detail road data is continuously growing; thus, data improvement needs to perform, upgrading the existing solution. To date, stages on identification and classification of road damages are being conducted semi-manually based on images collected by survey vehicle; it is hindered due to the facts that this method is the cost-consuming process and may result in inconsistency. Therefore, this present work used YOLO with three different architecture configuration, i.e., Yolo v3, Yolo v3 Tiny, and Yolo v3 SPP, enabling us to create a more accurate assessment for detecting potholes on the road surface. The results

showed the average mAP values for Yolo v3, Yolo v3 Tiny, and Yolo v3 SPP at 83.43%, 79.33%, and 88.93%. While the area measurement shows the accuracy of 64.45%, 53.26%, and 72.10% respectively. And it needs 0,04 second to detect each image. Conclusively, it shows a satisfying result in pothole detection; thus, this technique has a high opportunity to developed and implemented as a tool for road assessment.

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Session 4 - Track: Control Systems
Thursday 29 August 2019, 13.30 - 15.30, Banda Celebes

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ISCO1

Modeling and Simulation of Independent Speed Steering Control for Front In-wheel in EV Using BLDC Motor in MATLAB GUI

Paper ID: 1570551573

Chhith Chhlonh (Institut Teknologi Sepuluh Nopember (ITS), Indonesia); Dedet Riawan (Sepuluh Nopember Institute of Technology, Indonesia); Heri Suryoatmojo (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Currently, electric vehicles (EV) have become more popular in research because of issues of the environmental pollution and the running out of fossil fuel. This research presents a strategy of independent speed steering control for two front in-wheel BLDC motors while an EV drives on a straight road as well as on a curved road. When the EV runs on a straight road, each front wheel has the same rotating speed. However, on a curved road, the outer wheel has the rotating speed higher than the inner wheel. Ackermann-Jeantand steering model is used to determine the reference speed for each front wheel of the EV during turning motion when a certain steering angle and EV speed are inputted. The fuzzy logic controller (FLC) has been designed to control the speed of each motor to reach the desired speed. Hysteresis current controller is introduced to generate the switching signals for each switch device in the power inverter. A Graphical User Interface (GUI) is created in MATLAB to control the overall system. Three different cases of simulation have been done and the results are satisfying with the response. The results demonstrated that the control system has worked properly.

ISCO2

Transition Control on Hybrid Unmanned Aerial Vehicles (UAV) using Altitude Change

Paper ID: 1570554073

Imroatul Hudati; Achmad Jazidie; Rusdhianto Efendi Abdul Kadir (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

The design of a transition state arrangement is needed to make a hybrid UAV that has two engines, tricopter and fixed wing. Those can track vertical take off and landing (VTOL) and cruising with minimum errors. The setting of the transition state is completed by adjusting the height of the UAV. Firmly, it can be achieved by giving a weight values to the each UAV engine. In this study, the transition state is sought by calculating the change of altitude UAV. When the UAV has reached the expected height, the active machine will change. During the take off, the active engine becomes a tricopter and after the UAV reaches the expected height, the active machine will become a fixed wing. Meanwhile on landing, the active engine is a fixed wing which later when the speed of the propulsion engine has dropped, the active engine becomes a tricopter until the UAV reaches the landing pad. From the simulation, it can be known that UAVs can track in accordance with the expected trajectory, starting from take off, then doing cruishing and then landing. On the Y axis tracking, there is a deviation of 0.3 m at 5 m. The UAV takes 9 seconds so that the UAV can reach the expected height.

ISCO3

Path Planning for Differential Drive Mobile Robot to Avoid Static Obstacles Collision using Modified Crossover Genetic Algorithm

Paper ID: 1570557169

Nia Saputri Utami; Achmad Jazidie; Rusdhianto Efendi Abdul Kadir (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Autonomous mobile robots such as differential drive mobile robots really need an intelligent navigation system that is able to avoid collisions with any obstacle from the starting point to the destination point. These collisions

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can be avoided by planning a collision-free path first. This study uses a modified genetic algorithm method to planning collision-free paths with static obstacles. Modification of the genetic algorithm is carried out on the crossover process by making rules that the fitness value of the progeny should be compared with fitness value of the parents. The chromosome with the best fitness value will be taken and use for the mutation process. Meanwhile, the chromosome with poor fitness value will be completely ignored. Several experiments were carried out to achieve the desired criterion such as shortest path and fast execution time. The simulation result shows that the proposed genetic algorithm is able to generate optimal solutions based on the desired criterion

ISSN5

Classification of the Quality of Milk Using Spectrophotometer System Based on Raspberry Pi
Paper ID: 1570561473

Fajar Budiman and Muhammad Rivai; Muhammad Gemintang; Suwito Suwito; Harris Pirngadi (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia)

Abstract:

Dairy cow milk is a beverage that is often consumed by humans. The quality of milk for dairy cows needs to be maintained because milk naturally experiences relatively rapid decay. Protein content can be used as a parameter used to determine the quality of milk. One method used to analyze protein content is by using a spectrophotometer. Technically, a spectrophotometer in a laboratory serves to measure the transmittance or absorbance of a sample expressed in a wavelength function. The wavelength of a sample varies according to the color of the spectrum used. To test protein content, a biuret spectrophotometry method is used which produces purple in the sample, so that the wavelength with the highest absorbance value is found in the range of 525 nm. The absorbance value of the sample of dairy cow milk tested shows the quantity of protein content. The spectrophotometer system is designed using image processing based methods using Raspberry Pi. Tests were carried out by comparing protein content between standard laboratory spectrophotometers and Raspberry Pi based spectrophotometers. The results obtained from Raspberry Pi based spectrophotometer tests have an average error of 2.366%. The classification of the quality of milk for dairy cows produces 3 levels of classification, namely milk for dairy cows with a protein content of 0% - 2.5% indicating low quality, 2.51% - 7.38% indicating medium quality and 7.39% - 9.63% indicating high quality.

ISSN6

Monitoring and Control System for Ammonia and pH Levels for Fish Cultivation Implemented on Raspberry Pi 3B
Paper ID: 1570561475

Fajar Budiman, Muhammad Rivai and Muhammad Nugroho (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Water quality affects the health level of fish, one of parameters that must be maintained is ammonia levels. Ammonia levels which are left high will be harmful to the health of fish. In this study, a control and monitoring system on ammonia level for fish cultivation has been designed that are also useful for measuring the quality of water in an aquarium. Measurements conducted on this study have two main variables, namely pH and ammonia levels. Two sensors namely pH sensor and MQ-135 gas sensor are used equipped with Arduino microcontroller as a controller and data acquisition. Raspberry as Single Board Computer is utilized as processor and serves as Internet of Things (IoT). In the system, the pH is kept neutral (6.5 - 7.5). When the value exceeds the limit, automatic control will channel the liquid acetic acid (CH3COOH) to the aquarium to centralize pH. The results of the tests show that the system can perform controls automatically and manually. The measurement of pH sensor data has an average error of 1.88%. Manual monitoring and control of living and dead conditions of aerators and water filters have a 10-second delay. Manual control and monitoring is carried out through a smartphone application so that it can inform if there is an increase in pH and ammonia levels which can harm the fish.

ISSN7

Fuzzy Logic-Based Wet Scrubber to Control Air Pollutant

Paper ID: 1570561482

Bima Romadhon Parada Dian Palevi, Muhammad Rivai and Djoko Purwanto (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Waste burning is a way that can significantly reduce its volume. This method has a high hygiene level from the presence of bacteria, and reduces odor due to the decay process. However, uncontrolled burning of waste is the main source of air pollutants, including smoke, and harmful gases. In this study, we have designed and realized a wet scrubber-based air pollution control system using fuzzy logic method applied to an Arduino Nano microcontroller. This system uses tin oxide semiconductor gas sensor to measure the concentration of hydrogen sulfide gas, and a water pump equipped with a nozzle to spray water. The experimental result shows that the system can reduce hydrogen sulfide levels with the removal efficiency of more than 99%. This method is expected to be applied to incinerator systems.

ISSN8

Implementation of Gas and Sound Sensors on Temperature Control of Coffee Roaster Using Fuzzy Logic Method

Paper ID: 1570561483

Agus Hayatal Falah, Muhammad Rivai and Djoko Purwanto (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

The flavor quality of a coffee is determined by the roasting process of the coffee beans. In this study, a prototype of a coffee roaster was designed and realized. This system is equipped with temperature control based on fuzzy logic which can be set for several roasting levels, namely light, medium and dark. This control system regulates the gas flow on the stove and the fan motor speed on the drum roaster. The light level is based on responses from the gas sensor, meanwhile, the medium and dark levels are based on the cracking sound of the coffee beans. The Fast Fourier Transform and the Neural Network pattern recognition are used to stop the roasting process for both levels. The experimental results show that there are significant differences in the response of the gas sensor for each roasting level. The Neural Network can distinguish between the cracking sounds of the coffee beans and the background noise based on their frequency spectrum. This system can produce coffee beans according to their roasting levels.

Session 4 - Track: AI & Machine Learning 3
Thursday 29 August 2019, 13.30 - 15.30, Bali C

ISAI9

Personality Classification from Online Handwritten Signature using k-Nearest Neighbor

Paper ID: 1570559115

Harris Teguh Laga (Institut Teknologi Sepuluh Nopember, Indonesia); Evi Pane (Institut Teknologi Sepuluh Nopember & Industrial Training Centre of Surabaya, Ministry of Industry, Indonesia); Adhi D Wibawa; Mauridhi Hery Purnomo (Institut of Technology Sepuluh Nopember, Indonesia)

Abstract:

Signature is the representation of a personal identity that written on a selected medium. Signature can describe people's personality, which includes character, potential, motivation, emotional stability, mental state, intellectual tendencies, and one's work habits. Understanding people's personality is useful to show personality traits in criminology, medical science, and counseling. Previous research has investigated the relationship between online signature and personality by using tablet digitizer. In this paper, we are improving the method by increasing the amount of respondents, using a classification algorithm, and using psychological tests for validation named Big Five Inventory Test (BFI Test). The two best features pressure and speed have been analyzed and classified using k-Nearest Neighbor (kNN). The highest classification accuracy from kNN is 87.5%. From 40 respondents who were involved, 90% were confirmed well with BFI test for the first or second dominant personality. As a conclusion, this research shows that online signature analysis could predict personality with high accuracy.

ISAI10

Analysis of Students Ability Assessment Based on Bloom's Taxonomy Using Fuzzy Signatures

Paper ID: 1570559746

Eryca Dwi Huzaini R, Umi Laili Yuhana;Eko Setijadi; Mauridhi Hery Purnomo (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

One process in the student learning stage is assessment. Formation of cognitive aspects through Bloom Taxonomy will make it easier for assessors to measure student's ability levels. This assessment becomes more complex by describing the problem according to the level of cognitive dimensions in Bloom's Taxonomy. Fuzzy signatures are introduced as methods that can work in multidimensional regions. This study uses Fuzzy Signatures to assess student's abilities from the three lowest levels of cognitive dimensions based on Bloom Taxonomy, namely Remember, Understand and Application. Fuzzy Signatures make it possible to do calculations using different weights at each level and choose the right aggregation method. Assessment of students' abilities in this study used 664 students' responses in answering questions. Students come from 6 different schools with 4-grade levels consisting of 184 third grade students, 225 fourth grade students, 148 fifth grade students, and 107 sixth grade students. The value of students' abilities can be improved by up to 21% approaching the grade level in their school. With question mapping by the cognitive dimension, students with better grades have the opportunity to answer the questions correctly at a higher level than the class level.

ISAI11

Instance-Aware Semantic Segmentation for Food Calorie Estimation using Mask R-CNN

Paper ID: 1570559781

Reza Dea Yogaswara; Eko Mulyanto Yuniarno; Adhi Dharma Wibawa (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Knowing the number of calorie content in the food we consume can help in maintaining body health. By fulfilling the basic calorie need well, it will produce many positive effects to the body, including controlling the ideal body weight and becoming an adequate source of energy for physical activity. Conversely, people who do not care about their calorie needs will face various health problems, including obesity and worsening degenerative diseases such as diabetes or high blood pressure. Calculating the actual number of calories digitally from food requires the parameters of area, volume, and mass of the food. Some previous studies in the field of computer vision have been carried out to get a constant number of calories based on food types and not based on actual food volume measurements. In this research, a system will be developed using a computer vision approach that can be used to calculate the number of food calories automatically based on the size of the food volume using the Deep Learning Mask Region-based Convolutional Neural Network (R-CNN) algorithm. The segmentation technique uses the instance-aware semantic segmentation approach, which is to identify each pixel from instance of objects for each object found in a food image. This work uses the concept of instance-aware data labeling or segmentation detection that distinguishes each instances in a similar class, where this model will be used to recognize each different food object instantaneously in one class so that the number of calories of each food object can be obtained precisely. The expected benefit of the results of this research is to help someone get information about the size of food calories according to the calorie needs of the body with the mean Average Precision (mAP) level obtained at 89.4% and the percentage accuracy in calories calculated at 97.48%.

ISAI12

Vehicle Brands and Types Detection Using Mask R-CNN

Paper ID: 1570560224

Mohammad Wahyudi Nafi'i; Eko Mulyanto Yuniarno; Achmad Affandi (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Detection and classification of vehicles are inseparable parts of Intelligent Transportation Systems (ITS), various kinds of information technology applications are used to be able to detect and classify these vehicles, starting with the use of ultrasonic sensors, laser scanners, induction loops, magnetic sensors, range sensors, pressure sensors

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and CCTV cameras, but the circulation of vehicles with the same design from different manufacturing companies makes the classification of vehicles to determine the vehicle brands and types difficult to do. In this paper, deep learning framework Mask Regional-Convolutional Neural Network (Mask R-CNN) is proposed to solve the problem. Experiments have been conducted twice by using a combination of different datasets and detection algorithms. To be able to distinguish cars with similar shapes from different manufacturers, we use vehicle logos as one of the features that distinguish the manufacturer. The best detection and classification results were obtained in dataset training using 60 epoch, 400 step iterations with an accuracy value of 0.91 and mAP (Mean Average Precision) of 0.89.

ISAI14

Development of Indonesian Speech Recognition with Deep Neural Network for Robotic Command
Paper ID: 1570561208

Citta Anindya and Djoko Purwanto (Institut Teknologi Sepuluh Nopember, Indonesia); Desy Iba Ricoida (STMIK Global Informatika MDP, Indonesia)

Abstract:

Research on speech recognition system for several languages has shown significant improvement because it can make interaction between human and robot become seamless. This study aims to develop an Indonesian speech recognition system for command assistant robot using deep neural network (DNN) architecture. We constructed this system into five main blocks i.e. sound acquisition through a microphone, speech detection to separate actual signal and silent using voice activity detection (VAD), feature extraction to find distinctive speech signal features using Mel-frequency cepstral coefficients (MFCC), DNN to find mathematical model to transform features array speech signal into predicted sound label, and recognition interpretation. We built DNN architecture consisting of convolutional, max pooling, and fully connected layers with training, validation, and testing data in 0.8:0.1:0.1 ratio. The result of the experiments shows that our model achieved 99.43% accuracy on testing data and 89.57% on real-time data.

ISAI15

Regulation Document Search Based on Themes using Cosine Similarity and Naive Bayes
Paper ID: 1570561457

Gayuh Suwiatmaja (Institut Teknologi Sepuluh Nopember, Indonesia); Surya Sumpeno (Institute Teknologi Sepuluh Nopember, Indonesia); I Ketut Eddy Purnama (Institut Teknologi Sepuluh Nopember, Indonesia)

Abstract:

Ministry of Administrative and Bureucratic Reform main task is to make policies. The policies that are produced are Regulations that can be in the form of Undang- Undang, Peraturan Pemerintah, Peraturan Presiden, and Peraturan Menteri. In making these regulations, one of the main concern is to look for regulation that has the same theme as the regulation that is still being drafted, so that the regulation that will be produced later, did not conflict or overlap with existing regulation. So far the search process take a long time because the search process is only based on the title, type and year in which the regulation created. Furthermore, the search process will not produce results if you don't use the right keywords. And after we have succeeded in finding the regulations that we are looking for, in order to facilitate the consultation on these regulations, each regulation document must be classified based on the unit that made it. This paper discusses the search for regulation based on themes using the Cosine Similarity and then classify the regulation document using the Naïve Bayes. The result is that the search process only requires less than 1 second and the classification of the regulations documents has a accuracy of 95%.

ISAI16

Implementation of Voice Recognition in Disaster Victim Detection System Using Hidden Markov Model (HMM) Method
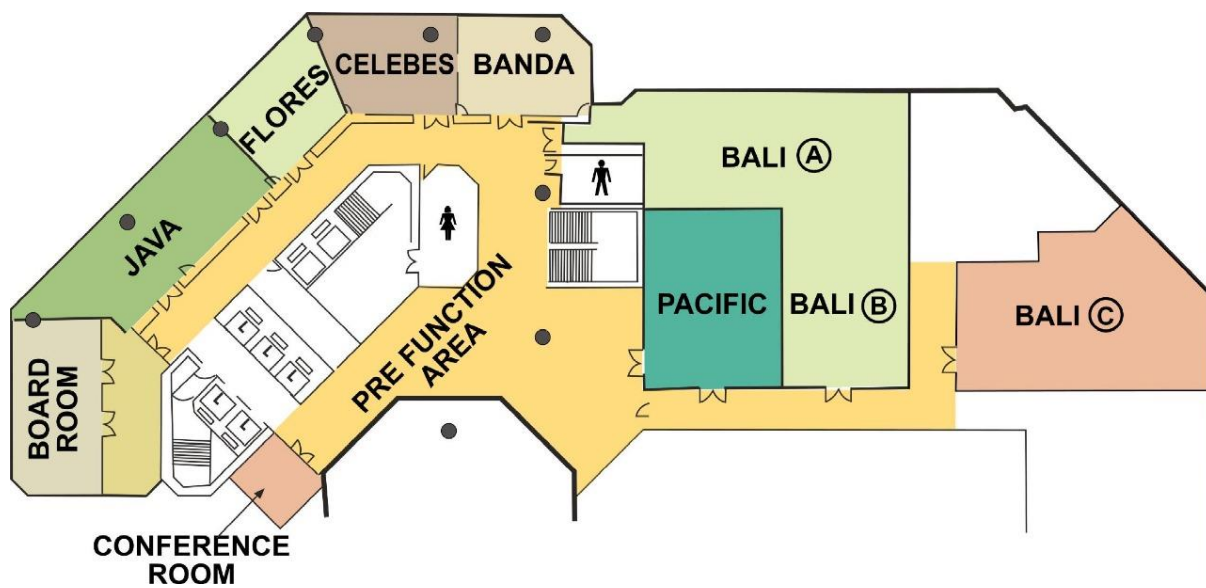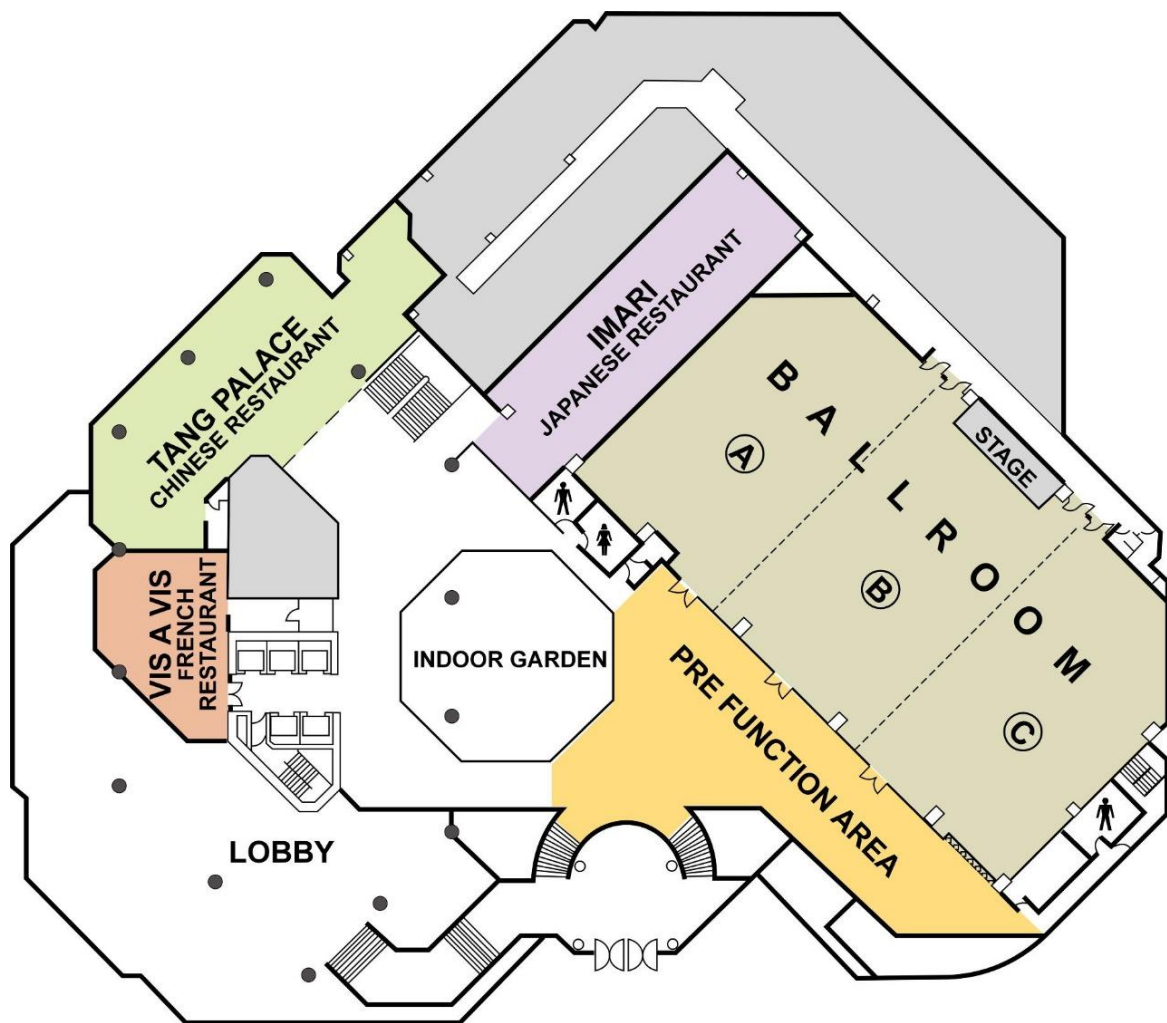Paper ID: 1570561465

Ferry Alifani, Tito Waluyo Purboyo and Casi Setianingsih (Telkom University, Indonesia)

Abstract:

Natural disasters are events that no one can know when they occur, where events really need help immediately. One of the actions that must be taken after a disaster is to immediately evacuate the victims of the disaster.

Therefore, the process of processing the sound of victims of the disaster is to help the evacuation process. Sound processing is done to detect the sound of victims of disasters who are in need of evacuation assistance, sound detection is done using the Hidden Markov Model (HMM) method with the help of the Gaussian Mixture Model (GMM) and Mel-Frequency Cepstral Coefficient (MFCC) for feature extraction. In voting the victims of the disaster will be assisted by using a USB microphone that will be installed on the Raspberry Pi, then if the sound is captured in accordance with the contents in the Library then the voice will send comments and location coordinates of the sound source.

FLOOR PLAN

ISITIA – RCEEE 2019, 28 – 29 August 2019, Surabaya, Indonesia

Floor plan showing Level with TANG PALACE CHINESE RESTAURANT, VIS A VIS FRENCH RESTAURANT, IMARI JAPANESE RESTAURANT, INDOOR GARDEN, LOBBY, PRE FUNCTION AREA, and BALLROOM (A, B, C) with STAGE.

Floor plan showing CELEBES, BANDA, FLORES, JAVA, BOARD ROOM, CONFERENCE ROOM, PRE FUNCTION AREA, PACIFIC, BALI A, BALI B, and BALI C.

*Oasis Room is in Level 4 (poolside)