Proceedings of The 2nd International Conference on Instrumentation, Communications, Information Technology, and Biomedical Engineering 2011

Science and technology for health

Organized by:

ISASS
Indonesian Sensor & Actuator System Society

Indonesian Biomedical Engineering Society
# Table of Contents

## Keynote Address

Development of lead free radiation shielding glass: experimental and theoretical approach  
*J. Kaewkhoa*  
1

Proposal of a Touch Panel Switch with the Function of Bending and Addition - One of a New User Interface  
*Seichi Serikawa and Lifeng Zhang*  
8

Instrument for Measuring Astronaut Body Mass  
*Yusaku Fujii, Akihiro Tsukita, Koichi Wakahara, William Thornton and Kazuhiro Shimada*  
14

Discussion on Business of Free Software Products - through E-Jikei Network Project  
*Noritsuki Yoshiura*  
19

Tele-Medicine Techniques for Remote Support of Patients in Dialysis and COPD  
*Klaus Schilling*  
23

Novel Measurement Method for Physical Activity Based on Electrostatic Induction Technique  
*Koichi Kurita*  
29

## Robotics, Automated Test & Measurement

GPS Water Vapor Monitoring and TroWav Updated for ENSO Studies  
35

A Preliminary Investigation Towards Test Suite Optimization Approach for Enhanced State-Sensitivity Partitioning  
*Mizatul Akmar Sapaat and Salmi Baharom*  
40

Integration of GPS-INS with Kalman Filter For Rocket Navigation  
*Roni Wiyasudana, Thomas S. Widada, Wahyu Widada, Sunarto, Sri Kliwati*  
46

Consensus-Based Controllers for Spacecraft Attitude Alignment: Simulation Results  
*Harry Septianto, Bambang Riyanto-Triaksono, Arief Syaichu-Rahman and Ridunarti Eko-Poetra*  
52

Acoustic Analysis of High Care Unit (HCU) at Hospital "X" in Bandung, Indonesia  
*Febi Rhiana, John Sarwono, Fx Nugroho Soelawi*  
58

Simplified Q-Learning for Holonomic Mobile Robot Navigation  
*Widyawardana Adiprawito, Adang Suwardi Ahmad, Jaka Sembiring, Bambang R. Triaksono*  
64

A Camera-Based Autonomous Mobile Robot on A Simple Simulated Highway  
*Brendan Adrian Marcellino, Endrowinfen Kuantama and Sefyan*  
69

## Communication & Security

Entropy Simulation of Digital Information Sources and the Effect on Information Source Rates  
*Edmond Fefrinicko Amay and Ilham Wahid*  
74

Security Metrics: A Brief Survey  
*Tito Wuluyo Purboyo, Budi Rahardjo and Kuspriyanto*  
79
BIOMEDICAL ENGINEERING

A portable screening system for onboard entry screening at international airports using a microwave radar, reflective photo sensor and thermography
Guanghao San, Shigeto Abe, Osamu Takei and Takemi Matsui

Coronary Angiogram Stabilization for QUBE Values Calculation Using SIFT Method
A. Kusamowardhani, TLR. Mengko, I. Fahri, S. Soenendarata, D. Firman, and H. Zakaria

Automated Microaneurysm Detection Using Mathematical Morphology
Andinanto Andi Purwito, Kresna Aulyawibowo, Ashihil Dameitry, Made Widhi Suya Atman

Low-Cost Automation of Gram’s Microbiology Staining Method
Gerardo Kenny Puminjo, Manli Panjaitan, Arko Djajadi

Preliminary Study of Antivirus for Human Immunodeficiency Virus (HIV) using Combined Protease Enzyma (Bromelain) And Lipozyme
Yonathan Audhitya Sutihono, Manli Panjaitan and Tutun Nugraha

Study of Efficaciousness of Bromelain on Mammalian Cell Culture
Monica Lestari Manli Panjaitan and Joko Pambakus

Direct Reading Flame Photometer Using Digital Photography and Image Processing
Aangga M. Panditrao

CT Lung Image Filtering Based on Max-Tree Method
Aranda, I Ketut Eddy Pumama and Maudhi Hery Purnomo

Detection Method of Cerebral Aneurysm Based on Curvature Analysis from 3D Medical Images
H. Prasetya, T. L. R. Mengko, O. S. Santon and H. Zakaria

The Effect of Sericin Application Over Hydroxyapatite Surface on Osteoblast Cells Proliferation
Siti Sunaretyas and Widowati Siuwomuhardjo

Abnormal Condition Detection of Pancreatic Beta-Cells as the Cause of Diabetes Mellitus Based on Iris Image
I Putu Dody Lesmana, I Ketut Eddy Pumama, Maudhi Hery Purnomo

Signal Enhancement in Post-Processing of Multiple-Voxel Magnetic Resonance Spectroscopy
Yarurita Dwihapraj, J.P. Mosten, and I. M. Hoogduin

Comparison Studies of 2D and 3D Ultrasound Biparietal Diameter for Gestational Age Estimation
Lai Khin Wai, Lee Mee Yee, Tan Lee See and Eko Supriyanto

Ultrasound Time Mapping based Human Face Identification System
N. M. A. Sumarang, M Hakol Satria and Eko Supriyanto
Adhi Anindyajati, Alva Edy Tontowi and Punta Dewi

Sensitivity Analysis of Silicon MEMS Thermal Flow Sensor for Spirometer Application
Ihsan Hariadi

Using Pulse Oximetry Method As A Non Invasive Indicator of Blood Perfusion In Neonates
Naszariah Mohd Noor, Mohd Nasir Taib and Rosmina Jaafar

Development of ECG Signal Interpretation Software on Android 2.2
Kristoferus Hermawan, Auka Arif Iskandar and Reggio N. Hartono

Noninvasive Blood Pressure (NBP) Measurement by Oscillometric Principle
Rosmina Jaafar, Hisham Mohamad Dasa, Zulkifli Mahmoodin, Muhammad Rosli Abdullah, Zarimin Zahanudin

Computational Hybrid Level-Set and Region Growing Techniques: A Strategy for 3D Fast Segmentation of Medical Images
Abdulfattah A. Abooba, Shihab A. Hameed, Othman O. Khalifa, Aisha H. Abdalla

Image Guided Surgery (IGS) Model for Emergency Surgical Intervention (ESI)
Abdulfattah A. Abooba, Shihab A. Hameed, Othman O. Khalifa, Aisha H. Abdalla, Rahmat H. Harun, Nurzaini Rose Mohd Zain

Vessel Enhancement Algorithm in Digital Retinal Fundus Microaneurysms Filter for Nonproliferative Diabetic Retinopathy Classification
R. Vidyasiri, I. Sohani, and T.L.R. Mengko, H. Zakaria

Design and Construction of Thermally Combined Microcurrent Electrical Therapy Device for Rheumatoid Arthritis Treatment
Yuda G. Hadiunrojo, Aulia A. Iskandar, and Tatun Nugroho

Bicep Brachii's Force Estimation using MAV Method on Assistive Technology Application
Reza Darmakusuma, Ary S Prihatmanto, Adi Indrayanto and Tati L. Mengko

Study and Design Framework for e-Dengue Teleconsultation System
Andik Setyono, Md. Jawhangir Alam and Beatrice Ann Maria Soosai

Design of a Decision Support System using Open Source Software for a Home Telehealth Application
Mas S. Mohktar, Kezhang Lin, Stephen J. Redmond, Jim Basilakis and Nigel H. Lovell

Effective Bandwidth Allocation Algorithm for Medical Device Wireless Network
Indra H Mulyadi, N. M. A. Surnarang, Norlaili M Safri, and Eko Supriyanto

Role of Pressure and Wall Shear Stress in Initiation and Development of Cerebral Aneurysms
Nedy Utami, Hasbullah Zakanu, Tati L. R. Mengko, and Oerip S. Santoso

Development of Automatic Continuous Passive Motion Therapeutic System
Michael Khairi Saputra and Aulia Arif Iskandar

Comparison of Shear and Microtensile Failure Stresses in the Repair of Dental Composite Restorations
Margareta Rinastuti, Widowati Siswomihardjo and Mutlu Özcan

3D Kinematics of Human Walking Based on Segment Orientation
S. Mihradi, A. I. Henda, T. Dirgantara, A. I. Mahyuddin

Development of an Optical Motion-Capture System for 3D Gait Analysis
S. Mihradi, Ferryanto, T. Dirgantara, A.I. Mahyuddin

Wearable Gait Measurement System Based on Accelerometer and Pressure Sensor
E. Penkesit, T. L. R. Mengko, H. Zakaria
CONTROL, MODELING & SIMULATION

Sliding Mode Power Control of PMSG Based Variable Speed Wind Energy Conversion System
Y. Errami, M. Ouassaid, M. Maaroufi, M. Benchagra and M. Hillal

Application of Backstepping Controller for Maximum Power Extraction of Wind Turbine
Mohamed Benchagra, Mohamed Maaroufi, Mohamed Ouassaid

Simulating The Movement Of The Crowd In An Environment Using Flocking
Meilasy Dewi, Mech. Hariadi and Maulidi Heri Purnomo

Simulation of Spontaneous Emission Power on Silicon Based Quantum Dot with Variation of Light Source and Dot Size
Yudhistira, Filira Rahayu, and Yudi Darma

Contouring Posterior and Lateral Tibia of Javanese People Based on X-Rays Images
Suytino, B. Arifianto, R.R.A. Srimijaya, Y.H. Nugroho, M. Mahardika, P. Dewo

Digital Simulation of the FACTS System with 60-pulse GTO-based Voltage Source Converter
Rakhmad Syafitri Lubis

Modeling and Simulation of Generalized Unified Power Flow Controller (GUPFC)
Rakhmad Syafitri Lubis

Static Output Feedback Control Synthesis for Nonlinear Polynomial Fuzzy Systems Using a Sum of Squares Approach
Bomo Wibowo Sanjaya, Bambang Riyanto Triastono, Arief Syakhu-Rohman

SIGNAL PROCESSING

Wyner-Ziv Video Coding With Improved Motion Field Using Bicubic Interpolation
I Made Oka Widyantara, Wrewan and Gamarjo Hendrantoro

Feature Selection via Dimensionality Reduction for Object Class Recognition
Noridawu Manshor, Alfen Abdul Hadi, Mandava Rajeswori and Dhanesh Ramachandram

Fundamental Frequency Estimation of Pathological Speech using Linear Phase Wavelet
Dhany Arifianto

Type 2 Fuzzy Adaptive Binary Particle Swarm Optimization for Optimal Placement and Sizing of Distributed Generation
Adi Soeprijanto and Muhammad Abdullah

Color Image Processing for Measuring Length Deformation in Compression Test
Riska Ewawita, Eko Widatmoko, Suprijadi, Hasbullah Novir, Endra Susilo, Khairuniraj

Fuzzy Assisted Parameter Selection Rule in Regularized Newton Algorithm of Electrical Impedance Tomography
Dedy Kurniadi, Mohammad Rohmanuddin and Anton Maulana
PHYSICAL & CHEMICAL EFFECT

Hybrid Surface Treatment for Improving Mechanical and Surface Properties of AISI 316L Stainless Steel
B. Ariyanto, Suwitno, M. Mahardika

Thermal Performance of Fuel Pellet Containing Large Grains and CerMet Pellet of UO2-Metal
Suwardi and Jan Setjawan

Quantum Size Effect Simulation and Ge Composition on SiGe Quantum Dot for Intermediate Band Solar Cell Applications
Fitria Rahayu and Yudi Darma

Synthesis and Characterization of Gd and Er Co-Doped Ceria As Solid Electrolyte for IT-SOFC via Solid State Method
Arie Hardian and Ismunandar

Modeling Ionic Conduction in γ-Bi2VO5.5
Akram La Kila, Bambang Priyambodo, Muhammad A. Martoprawiro, and Ismunandar

Conductivity and solid state 29Si NMR studies of apatite-type lanthanum silicate prepared by hydrothermal method
Atiek Rosita Novianti, Bambang Priyambodo, I. Nyoman Marsih, Rino R. Mukti, Ismunandar

Temperature Dependent Study of Bi2V1−xGa2xO5.5 (x = 0.1 and 0.15) Oxides
Ismunandar: Roland Rulli, Hasan Ramdan

Daniel Santoso, Fransiscus Dalu Setiadi, and Deddy Susilo

SENSOR & ACTUATOR DESIGN

Measuring Air Pollutant Standard Index (ISPU) with Photonics Crystal Sensor based on Wireless Sensor Network (WSN)
Muhammad Azis, Erus Rustami, Wenny Maulina, Mamat Rahmat, Husin Alatas, and Kudang Boro Seminar

Fabrication and Characterization of NO2 Gas Sensor Based On One Dimensional Photonic Crystal for Measurement of Air Pollution Index

An Integrated Optical Instrumentation for Measuring NO2 Gas Using One Dimensional Photonic Crystal
Erus Rustami, Muhammad Azis, Wenny Maulina, Mamat Rahmat, Husin Alatas, and Kudang Boro Seminar

Measurements of Bowel Microdialysis Recovery with an Online Biosensor System
Emme P. Corcoles, Samer Deboa, George. B. Hanna, Martyn G. Boutelle, Ara Darzi

Development of New Coated Wire Nitrate Selective Electrode Sensor for Determination of Nitrate Concentration in an Aqueous Sample
Buchari, B., Indra Novianti, Mitra Djamal and Maria Evita

Development of a New Giant Magnetoresistance Material Based on Organic Material
Mitra Djamal, Ramli, Sparisomo Viridi and Khairurrijal