

# Proceeding of 2<sup>nd</sup> International Conference on Science, Technology and Interdisciplinary Research 2016

Publisher :

Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM)  
Universitas Lampung

# Proceeding of 2<sup>nd</sup> International Conference on Science, Technology and Interdisciplinary Research 2016

ISBN :

978-602-70050-3-7

Editor :

Prof. Muhamad Basyuni (Universitas Sumatera Utara)

Dr. Irza Sukmana (Universitas Lampung)

Dr. Ing. Ardian Ulvan (Universitas Lampung)

Dr. Denni Kurniawan (Universiti Teknologi Malaysia)

Cover and Layout :

IC-STAR Team

Publisher :

Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM) Universitas Lampung

# PREFACE

*Dear colleagues and friends,*

*Greetings from Bandar Lampung!*

Following the successful of our inaugural series in 2015, we cordially present The 2<sup>nd</sup> International Conference on Science, Technology, and Interdisciplinary Research (IC-STAR) 2016 took place in Bandar Lampung, the capital city of Lampung Province, Indonesia, on August 22 till 25, 2016. IC-STAR is an interdisciplinary international conference covering research and technological development in the field of engineering, life and applied sciences, medical and biomedical engineering, and agriculture engineering and food sciences.

This year we received 181 submissions from authors that submitted their work in the conference. The submission was divided into regular full papers, short papers (work in progress), extended abstracts, and posters. After the double blinded peer-review process, the scientific committee of IC-STAR 2016 accepted and hosted 112 original research papers for oral presentation, and 8 posters. Due to inattentive reason, conclusively, the official IC-STAR abstract proceeding included 81 papers and 8 posters.

During the conference, 5 distinguish keynote speakers gave their speech and presentation of their state-of-the art works in the 2 keynote sessions. In addition, 14 parallel sessions were held in order to advance and contribute to specific research areas in the field of arranged sections. The parallel sessions composed into 44 paper contributions and 5 posters in Engineering section, 7 contributions in Agriculture and Food Sciences, 12 contributions in Medical and Biomedical Engineering, 18 contributions in Life and Applied Sciences.

IC-STAR 2016, in its inaugural arrangement, aims at creating a forum for further discussion on interdisciplinary fields of interest between academia, researchers, and their counterparts in government and industrial sectors. The objectives were to disseminate and discuss the advancements in understanding of Science, Technology and Interdisciplinary Research and their innovations. Also to gather stakeholders from academia, research institutes and industries for sharing their innovative and sustainable ideas, collaboration and networking opportunities. Therefore, the call for paper was addressed to scholars and/or professionals in the relevant fields. Furthermore, papers focused on issues of education were also welcomed along with papers regarding the science and engineering as long as the disciplines were intersected each other.

We would like to thanks the Faculty of Engineering, University of Lampung, who hosted the conference, also all members of committees, institutional partners, affiliated journals, sponsors, and ladies and gentlemen of authors and participants who have been contributed in the IC-STAR 2016.

*See you again in IC-STAR 2017*

**Dr. Ing. Ardian Ulvan**  
**IC-STAR 2016 Conference Chair**

# PROGRAM COMMITTEE

## Advisory Board

Prof. Dr. Ir. Hasriadi Mat Akin – *Rector of University of Lampung*  
M. Ridho Ficardo, S.Pi, M.Si – *Governor of Lampung Province*  
Prof. Hadi Nur – *Universiti Teknologi Malaysia, Malaysia*  
Prof. Ing. Boris Simak – *Czech Technical University in Prague, Czech Republic*  
Prof. Toshiro Ohashi – *Hokkaido University, Japan*

## Steering Committee

Prof. Bujang Rahman – *Vice Rector, University of Lampung, Indonesia*  
Prof. Dr. Suharno – *Dean of Faculty of Engineering, University of Lampung, Indonesia*  
Dr. Warsono – *Director of Research Center, University of Lampung, Indonesia*  
Prof. Akio Tomiyama – *Dean of Graduate School of Engineering, Kobe University, Japan*  
Dr. Jiri Krejci – *Vodafone, Czech Republic*  
Mr. M. Ikhsan – *PT. Telkom, Indonesia*  
Mr. Terklin Sinulingga – *Alstom Grid, United Kingdom*

## Conference Committee

Ardian Ulvan – *Conference Chair*  
Dewi A. Iryani – *Secretary, Public Relation, and Sponsorship*  
Melvi - *Treasurer*  
Gigih Forda Nama – *Information and Conference Management System*  
Hery Dian Septama – *Publication and Circulation*  
A. Yudi Eka Risano – *Sponsorship*  
Donni Lesmana – *Social event and Excursion*  
Novri Tanti – *Logistics and Appurtenances*

## Scientific Committee

Irza Sukmana – *University of Lampung, Indonesia – Chair*  
Basem Abu Izneid – *Effate University, Saudi Arabia – co-Chair*

# TABLE OF CONTENTS

<b>PREFACE</b> .....	<b>i</b>
<b>PROGRAM COMMITTEE</b> .....	<b>ii</b>
<b>TABLE OF CONTENTS</b> .....	<b>iii</b>
<b>TENTATIVE SCHEDULE OF IC-STAR 2016</b> .....	<b>x</b>
<b>SECTION 1 : ENGINEERING</b> .....	<b>1</b>
WATER-OIL-AIR THREE-PHASE FLOW IN POROUS MEDIA: LAND CONTAMINATION BY OIL .....	2
INTEGRATION OF A BIG DATA EMERGING ON NANOTECHNOLOGY THEORY, MODEL, SIMULATION AND ITS APPLICATION USING GREEN COMPUTING PLATFORM .....	3
INTEGRATED ANALYSIS OF RADON AND MAGNETOTELLURIC METHOD FOR DETERMINING LOCATION OF RESERVOIR IN THE WAY RATAI GEOTHERMAL FIELD LAMPUNG INDONESIA .....	4
PROCESS OF DISPUTE RESOLUTION IN CONSTRUCTION PROJECTS THROUGH ARBITRATION : LITERATURE STUDY .....	5
FUZZY KALMAN FILTER IN AUTONOMOUS UNDERWATER VEHICLE NAVIGATION .....	6
DESIGN OF TEM CELL TO TEST THE ELECTROMAGNETIC SENSOR .....	7
ELECTRICAL PROPERTIES TEST OF DIELECTRIC AND IMPEDANCE LITAO <sub>3</sub> THIN FILM DOPED WITH GA <sub>2</sub> O <sub>3</sub> (0% AND 10%) .....	8
SUSTAINABLE MATERIAL: USED WOOD AS BUILDING MATERIAL .....	9
EFFECTS OF BIOPHILIC-DESIGN ON RESIDENTIALS STUDY IN JAKARTA .....	10
THE CONSERVATION OF KALI PASIR JAMI' MOSQUE IN TANGERANG, BANTEN.....	11
STRENGTHENING OF NURUL ILMI MOSQUE WITH CONCRETE JACKETING .....	12
DEVELOPMENT OF A LOW-POWER STEP-DOWN DC/DC CONVERTER MODULE FOR ELECTRIC CARS .....	13
OVERHEAD MEDIUM VOLTAGE TWISTED INSULATED CABLE (MVTIC) MODELS FOR THREE-PHASE POWER FLOW ANALYSIS .....	14
PHASOR MEASUREMENT TECHNOLOGY BASED POWER SYSTEM MONITORING AND CONTROL .....	15
INTERACTIVE CAR DISPLAY USING AUGMENTED REALITY ON SMARTPHONE ANDROID .....	16
SUPPORT VECTOR MACHINE (SVM) FOR TODDLER'S NUTRITIONAL CLASSIFICATION IN PALU CITY .....	17
FLOOD EARLY WARNING SYSTEM WITH INFORMATIONAL TECHNOLOGY FOR REDUCING RISK OF LOSS IN SUSTAINABILITY OF CITY .....	18
SYSTEM DESIGN OF IRIS RING DETECTION USING CIRCULAR HOUGH ALGORITHM FOR EYESTRAIN APPLICATION .....	19

OPTIMIZATION MODEL OF FUZZY RULE BASED EXPERT SYSTEM USING MAX-MIN COMPOSITION AND SCHEMA MAPPING TRANSLATION..... 20

PRODUCTION PROCESS TIME IMPROVEMENT OF RADIATOR CN-A-121 WITH VALUE STREAM MAPPING METHOD..... 21

PROPOSAL OF MATERIAL ISSUING ACTIVITY IN RADIATOR COMPANY WITH VALUE STREAM MAPPING METHOD..... 22

EFFECT OF HEAT TREATMENT AND ALLOYING ELEMENTS ON PRECIPITATION AND SURFACE BEHAVIOR OF BIOMEDICAL CO-CR-MO ALLOYS ..... 23

SURFACE ROUGHNESS VALUES OF MAGNESIUM ALLOY AZ31 WHEN TURNING BY USING ROTARY CUTTING TOOL ..... 24

PREPARATION, CHARACTERIZATION AND PERFORMANCE OF CELLULOSE ACETATE PERVAPORATION MEMBRANES MODIFIED BY USING LAMPUNG NATURAL ZEOLITE ..... 25

INTERACTION BETWEEN BETAINE MONOHYDRATE AND POLYOL ON DEEP EUTECTIC MIXTURES FORMATION ..... 26

DEVELOPMENT OF GARBAGE BANK AND 3R WASTE TREATMENT FACILITY FOR MITIGATING GREENHOUSE GAS EMISSIONS FROM WASTE SECTOR: A CASE STUDY OF PADANG CITY, INDONESIA..... 27

A NEW PROPAGATION MODEL FOR THE CALCULATING OF THE PATH LOSSES FROM OUTDOOR TO INDOOR ..... 28

PERFORMANCE OF CLOUD BASED IMS CORE NETWORK ..... 29

INOVATIVE DESIGN OF MATTRESS BY USING TRIZ AND QFD ..... 30

THE IMPLEMENTATION OF JACKSON NETWORK QUEUE ON A PROTOTYPE HOSPITAL QUEUE ..... 31

COUNTING THE NUMBER OF DISCONNECTED LABELED GRAPHS OF ORDER FIVE WITHOUT PARALEL EDGES..... 32

HYDROLYSIS OF STARCH ENZYMATICALY: IMMOBILISED AMYLASES ON MCF SILICA..... 33

LIBRARY AUTOMATION SYSTEMS INTEGRATION (CASE: ELIB AND SLIMS) ..... 34

LEAVES CURL IDENTIFICATION USING NIR POLARIMETRIC SIGNATURES ..... 35

THE UNIVERSITY OF LAMPUNG INTERNET TRAFFIC MEASUREMENT: TRENDS AND IMPACT IN CAMPUS NETWORK..... 36

OBSERVED INTRASEASONAL ZONAL CURRENTS IN THE EQUATORIAL INDIAN OCEAN..... 37

BEST PRACTICES OF CONTRACT MANAGEMENT APPROACH TOWARDS EXCELLENT SERVICE CULTURE IN CONSTRUCTION PROJECT ..... 38

TORREFACTION OF OIL PALM TRUNK : THE EFFECT OF PROCESS CONDITION ANALYSIS USING RESPONSE SURFACE METHODOLOGY..... 39

POWER CONSTRAINED DISTRIBUTED ESTIMATION FOR WIRELESS SENSOR NETWORKS ..... 40

SPATIAL MAPPING OF ARI (ACUTE RESPIRATORY INFECTION) CASE ON HAZE DISASTER AREA AS IMPROVEMENT EFFORT OF VIGILANCE ON GLOBAL CLIMATE CHANGE ..... 41

MAINTENANCE PROPOSAL OF PRESS PARTS PRODUCTION FOR MINIMIZE WASTE BY LEAN MANUFACTURING METHOD – VALUE MAPPING STREAM (VSM) ..... 42

HIGH SPEED RAIL IN ASIA AND EUROPE: LESSON LEARNED FOR INDONESIA .....	43
QUALITY OF EXPERIENCE ON TOLL ROADS .....	44
A STUDY ON THE SHORELINE RETREAT AND SPATIAL ANALYSIS OVER THE COASTAL WATER OF BELAWAN .....	45
WIRELESS SINGLE LINK PRICING SCHEME UNDER MULTI SERVICE NETWORK WITH BANDWIDTH QOS ATTRIBUTE .....	46
USER ACCEPTANCE OF MOBILE APPLICATIONS .....	47
THE EFFECT OF BAGASSE DELIGNIFICATION AS FILLER TO THE MECHANICAL PROPERTIES OF CONCRETE COMPOSITE .....	48
SLAKING PHENOMENON UNDER 1D COMPRESSION TEST .....	49
ANALYSIS ON IMPEDANCE INFLUENCE ON MULTIFREQUENCY CAPACITIVE SENSOR .....	50
IMPROVEMENT OF VISUAL FIELD USING EYECREAM THERAPY AFTER RIGHT INFERIOR MCA STROKE .....	51
CLASSIFICATION OF UNDOPED AND 10% GA <sub>2</sub> O <sub>3</sub> DOPED LITAO <sub>3</sub> THIN FILM BASED ON ELECTRICAL CONDUCTIVITY AND PHASE CHARACTERISTIC .....	52
ANALYSIS OF PRIORITY CAUSE OF FAILURE AT PRODUCTION PROCESS TUBE 811X USING MULTI ATTRIBUTE FAILURE MODE ANALYSIS (MAFMA) IN BRIDGESTONE TIRE INDONESIA (BSIN) COMPANY .....	53
PET PLASTIC BOTTLE WASTE WITH REUSE APPROACH AS INTERIOR PRE-FABRICATION MODULES FOR INTERIOR WALL .....	54
THE EXISTENCE OF MALAYS HOUSE IN AIR TIRIS KAMPAR RIAU IN HEALTHY HOUSE PERSPECTIVE .....	55
MAGNESIUM AND ITS ALLOYS AS BIODEGRADABLE BONE SCREW APPLICATIONS: CURRENT STATUS AND FUTURE CHALLENGES .....	56
THE INFLUENCE OF CHANGE LOAD AGAINST FUEL COST IN COAL-FIRED POWER TARAHAN LAMPUNG UNIT 3 AND 4 .....	57
DEVELOPMENT OF DYNAMIC EVOLUTION CONTROL FOR PV INVERTER IN SOLAR POWER PLANT APPLICATION .....	58
DESIGNING ERGONOMIC PARTICIPATORY BASED ON CRITICAL SAFETY PERFORMANCE INDEX IN BATIK CREATIVE INDUSTRIES.....	59
OVERTAKING SITUATION IDENTIFICATION IN CONNECTED VEHICLES ENVIRONMENT .....	60
IMPLEMENTATION OF USER ANTHROPOMETRY BALE "SAKENEM" BUILDINGS IN SINGAPADU TENGAH VILLAGE, GIANYAR.....	61
ANALYSIS OF THE COSTS CONSTRUCTION WORK THE WALL ADOBE SHELLS AS MATERIAL ENVIRONMENTALLY FRIENDLY IN ARCHITECTURE GREEN .....	62
ERGONOMIC CHAIR DESIGN USING BAMBOO LAMINATION TECHNIC .....	63
HANDOVER PERFORMANCE IN HETEROGENEOUS NETWORKS: PHY LAYER ANALYSIS .....	64
THE ADVANCED STUDY OF SEARCH ENGINE OPTIMIZATION (SEO) USING WHITE HAT SEO TECHNIQUES TO INCREASE WEBSITE VISIBILITY AND TRAFFIC .....	65
ALTERNATIVE SCHEME TO HANDLE REVERSELY THE WASTE OF MOBILE PHONE IN BANDUNG,	

## DEVELOPMENT OF A LOW-POWER STEP-DOWN DC/DC CONVERTER MODULE FOR ELECTRIC CARS

Mohammad Nasucha<sup>1,a</sup>

<sup>1</sup>Department of Information Technology, Universitas Pembangunan Jaya.

<sup>a</sup>mohammad.nasucha@upj.ac.id

**Abstract.** An electric car uses at least two high power DC/DC converters, one applied as the motor speed controller and one applied for the battery charger. It also usually needs another DC/DC converter, a small one, used to down step the battery voltage to a lower voltage for supplying power to non-machine-related devices such as LED lamps, door openers, GPS device, tablet PC, and mobile phone. For the Rinus C1 electric car we built, we needed a small power DC/DC converter that converts 48V battery voltage to 12V gadget-ready voltage. Having gone through requirement definition, reference study, design, assembling and experimental test, the module has been successfully developed –using MC34063A ASIC of Motorola– and is currently in use.

**Keywords:** DC/DC converter, buck converter, electric car