ISSN 2338-0128
VOLUME 2

PROCEEDINGS BOOK
THE 7TH ANNUAL BASIC SCIENCE INTERNATIONAL CONFERENCE

7-8 March 2017
Ijen Suites Resort and Convention
Malang, Indonesia

Basic Science for Improving Survival & Quality of Life

Sub Topics:
Material Science and Technology
Mathematics, Statistics, and Modelling

BaSiC 2017 INTERNATIONAL CONFERENCE

Faculty of Science
Brawijaya University

ISSN 2338-0128

Volume 2

BaSIC 2017

The 7th Basic Science International Conference

Basics Science for Improving Survival and Quality of Life

7 – 8 March 2017

Ijen Suites Resorts & Convention

Malang, East Java

Indonesia

Proceedings Books

Sub Topics:

- ✓ Material Science and Technology
- ✓ Mathematics, Statistics and Modelling

BRIEF CONTENTS

BRIEF CONTENTS i

BASIC 2017 COMMITTEE ii

ABOUT BASIC vi

WELCOME MESSAGE vii

CONFERENCE VENUE ix

CONFERENCE PROGRAM x

TABLE OF CONTENTS xi

PLENARY LECTURES 1

SCIENTIFIC PAPERS

A. Invited Papers 12

B. Material Science and Technology 28

C. Mathematics, Statistics and Modelling 112

COMMERCIAL SUPPORT 252

BASIC 2017 COMMITTEE

Steering Committee

Prof. Dr. Ir. Mohammad Bisri, M.S.
Rector, Brawijaya University

Adi Susilo, M.Si., Ph.D
Dean, Faculty of Mathematics and Natural Sciencess
Brawijaya University

Dr. Agung Pramana Warih Marhendra, M.S.
Vice Dean I, Faculty of Mathematics and Natural Sciences
Brawijaya University

Moh. Farid Rahman, S.Si., M.Si.
Vice Dean II, Faculty of Mathematics and Natural Sciences Brawijaya University

Advisor

Johan A. E. Noor, Ph.D
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Achmad Efendi, Ph.D
Department of Mathematics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Dr.Ing Setyawan P. Sakti, M.Eng
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Organizing Committee

Hari Arief Dharmawan, M. Eng., Ph.D
Chairperson
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Chomsin S. Widodo, Ph.D Vice chairperson I
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dian Siswanto, Ph.D Vice chairperson II
Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dr. Eng. Masruroh, M.Si Secretary
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dr. Istiroyah, M.Si Treasury
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Surakhaman, S.AP., MM Treasury
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Lisfadiana Ekakurniawati, S.E. Treasury
Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Sunarti Treasury
Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Rustika Adiningrum, SE. Treasury
Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Muhammad Ghufron, M.Si Secretariat Coordinator
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Cholisina Anik Perwira, S.Si, M.Si Secretariat
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Susilo Purwanto Secretariat
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Sahri Secretariat
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Ir. Tjujuk Usmanhadi Secretariat
Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Trivira Meirany Secretariat
Faculty of Mathematics and Natural Sciences,
Brawijaya University
Indonesia

Dr. Eng. Agus Naba, MT
Web and IT Division Coordinator
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Fransiscus Adi Purwanto Web and IT Division
Faculty of Mathematics and Natural Sciences,
Brawijaya University
Indonesia

Dr. Alamsyah M. juwono, M.Sc.
Program Division Coordinator
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Sukir Maryanto, S.Si.,M.Si.,Ph.D
Program Division
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Zulfaida P. G., Ph.D. Program Division
Department of Biology, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Dra. Lailatin Nuriyah, M.Si
Banquet Division Coordinator
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Firdy Yuana, S.Si., M.Si. Banquet Division
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Achmad Hidayat, S.Si., M.Si
Equipment Division Coordinator
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Dr. Sunaryo, S.Si.,M.Si Equipment Division
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Purnomo Equipment Division
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Karyadi Eka Putra, A.Md. Equipment Division
Faculty of Mathematics and Natural Sciencess
Brawijaya University
Indonesia

Agung Kurniawan Equipment Division
Faculty of Mathematics and Natural Sciences
Brawijaya University
Indonesia

Hasan Muhajir Equipment Division
Faculty of Mathematics and Natural Sciences,
Brawijaya University
Indonesia

Suliono Equipment Division
Faculty of Mathematics and Natural Sciences
Brawijaya University
Indonesia

Deny Equipment Division
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Drs. Wasis, MAB
Accomodation Division Coordinator
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Drs. Arinto Yudi Ponco Wardoyo, M.Sc., Ph.D
Accomodation Division
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Dr. Heru Harsono, M.Si.
Funding Division Coordinator
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Ir. Mochammad Djamil, MT Funding Division
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Gancang Saroja, S. Si., MT
Proceeding Division Coordinator
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Mauludi Ariesto Pamungkas, S.Si., M.Si, Ph.D.
Proceeding Division
Department of Physics, Faculty of Mathematics and
Natural Sciences, Brawijaya University
Indonesia

Ahmad Nadhir, S.Si., MT., Ph.D.
Proceeding Division
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dr. Drs. Sugeng Rianto, M.Sc
Proceeding Division
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

DR.rer.nat Abdurrouf, S.Si., M.Si
Proceeding Division
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

International Scientific Committee

Prof. Dr. Wolfgang Nellen
Institut fur biology, Germany

Prof. Tatsuhiko Aizawa
Shibaura Institute of Technology (SIT), Japan

Dr. Guillaume Mauri
Neuchatel University, Switzerland

Dr. Ing. Setyawan P. Sakti, M.Eng
Department of Physics, Brawijaya University
Indonesia

Prof. Peter Andrew Lay
Sydney University, Australia

Prof. Dr. Agus Suryanto, M.Sc.
Department of Mathematics, Brawijaya University
Indonesia

Local Scientific Committee

Prof. Dr. M. Nurhuda
Scientific Division Coordinator
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Ir. Retno Mastuti, M.Ag.Sc., D.Agr.Sc
Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Drs. Unggul Pundjung Juswono, M.Sc.
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dr. Suharjono, MS
Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dr. Eng. Didik Rahadi Santoso, M.Si.
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dr. Dra. Catur Retnaningdyah, M.Si
Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Ir. D. J. Djoko H. Santjojo, M.Phill., Ph.D
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Widodo,S.Si., M.Si., Ph.D.Med.Sc
Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Prof. Muhaimin Rifa'I, S.Si., Ph.D..Med.Sc
Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Masruri, S.Si., M.Si., Ph.D.
Department of Chemistry, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Drs. Adi Susilo, M.Si., Ph.D.
Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Akhmad Sabarudin, S.Si., M.Sc., Dr.Sc
Department of Chemistry, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Lukman Hakim, S.Si., M.Sc., Dr. Sc
Department of Chemistry, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dr. rer. nat. Rachmat Triandi Tjahjanto, M.Si
Department of Chemistry, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Drs. Abdul Rouf Alghofari, S.Si., M.Si., Ph.D
Department of Mathematics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Achmad Efendi, S.Si., M.Sc., Ph.D
Department of Mathematics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Rahma Fitriani, S.Si., M.Sc., Ph.D
Department of Mathematics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dr. Adji Achmad Rinaldo Fernandes, S.Si., M.Sc
Department of Mathematics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Dr. Suci Astutik, S.Si., M.Si.
Department of Mathematics, Faculty of Mathematics and Natural Sciences, Brawijaya University
Indonesia

Student Committee

Bagas Adi Saputra
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Adwi Arifin
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Muhamad Abdullah Faqih, S.Si,
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Ully Mamba'atul Mukarromah, S.Si,
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Mira Setiana S.Si,
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Muhammad Warits Ishari
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Lalu Muhammad Shirr Wujudulhaaq
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Arin Siska Indarwatin
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Ragil Danang Kusuma
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Citra Anggun Noorjannah
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Pramita Dhealia Larasati
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Dimmy Kurniawan Irwanto
Department of Physics, Faculty of Matematics and Natural Sciences, Brawijaya University
Indonesia

Conference Secretariat

Departement of Physics,
Faculty of Mathematics and Natural Sciencess
Brawijaya University
Jl. Veteran, Malang, East Java, Indonesia 65145
Phone: +62 0341 575833
Fax: +62 0341 575834
E-mail: basicsciences2017@gmail.com
Website: http://basic.ub.ac.id

ABOUT BASIC

The Annual Basic Science International Conference is a scientific meeting aimed to promote mutual exchange between scientists and also experts, to discuss innovative ideas in scientific research, and to tackle contemporary problems through the application of knowledge that rise from sciences. The scope of this conference is fundamental and applied research in chemistry, biology, physics, and mathematics. The origin of this conference was initiated in year 2000, by the Faculty of Mathematics and Natural Sciences of Brawijaya University, under the name of Seminar Nasional Kemipaan (National Sciences Conference). Since then, the conference has been organized regularly on annual basis. In 2004, the conference changed its name to Basic Sciences Seminar (BSS) and started to invite international speakers and participants. The conference then expands its scope to international in 2011 and formally adopting the current name. The previous Basic Sciences International Conference was held at Atria Hotel Malang in 2016 with participants from many countries including Australia, Malaysia, Thailand, Japan, UK and Germany.

WELCOME MESSAGE

On behalf of the organizing committee, I would like to welcome you to the 7th Annual Basic Science International Conference.

Firstly, I would like to thank all participants who have spent their time to come and join us for the conference. I believe that we will not be able to hold this conference successfully without participation from all of you. Secondly, I would like to thank the dean of faculty of Mathematics and Natural Sciences, Brawijaya University, because the faculty has provided us supports and facilities. I am thankful to our great keynote and invited speakers for their willingness to join the conference and share their scientific knowledge to all of us. Thanks to our reviewers who have made assessments and suggestions related to the abstracts. I also want to thank the sponsors which have made their contributions to this conference. Finally, I want to thank all members of the committee for their hard work to make this conference successful.

The Basic Science International Conference is held every year since 2010, and always organized by the Faculty of Mathematics and Natural Sciences, Brawijaya University. This conference is a forum that enables us to share our ideas among us. The participants are expected also to take their time and opportunities to know each other during the conference, in order to strengthen their networks and collaborations. In this conference, we have more than 300 participants from counties such as Indonesia, Japan, Australia, Germany, Switzerland, and Thailand. In the conference, we have plenary lectures and sessions for parallel oral presentations as well as poster presentations.

We hope that all participants enjoy all activities during the conference and this proceedings book will be useful for all of us.

Thank you very much.

Best regards,

Hari Arief Dharmawan, Ph.D.

Chairman of BaSIC 2017

TABLE OF CONTENTS

Plenary Lectures

CRISPR/Cas9: The new gene surgery.....1
Wolfgang Nellen

Use of Wavelet Analyses with Potential Field Data in Exploration and Monitoring Studies.....3
Guillaume Mauri, Ginette Saracco

Mathematics for Solving 5G Massive Wireless IoT Networks Problems.....5
Khoirul Anwar

The Roles of Metal Ions in Diabetes – Metal Drugs and Supplements.....7
Peter A. Lay, Anna Safitri, Aviva Levina

Functionalization of Stainless Steels Via Low Temperature Plasma Nitriding.....8
Tatsuhiko Aizawa

Scientific Papers

A. Invited Papers

Complexity and Nano Sciences Approach in Life Sciencess: The way to overcome our partial understanding on living system.....12
Sutiman B. Sumitro

Surface Modification for Quartz Crystal Microbalance using Polystyrene as a Basis for Biosensor.....13
Setyawan P. Sakti, Akhmad Sabarudin, Masruroh, Dionysius J.D.H. Santjojo

Structure and Dynamics of Water: An Insight from Molecular Simulation.....17
Lukman Hakim, Irsandi Dwi Oka Kurniawan, Irwansyah Putra Pradana, Masakazu Matsumoto, Hideki Tanaka

Electrochemical Sensor for Industry and Medical.....18
Fredy Kurniawan, Liana Ari Widyanti, Kartika A. Madurani

Polyaniline-Modified Zeolite NaY: A New Sorbent for Dispersive Solid Phase Extraction of Multiclass Pesticides.....24
Rodjana Burakham, Prapha Arnnok, Nopbhasinthu Patdhanagul

Mathematical Model of a Growing Tumor and Its Interaction with Immune System: The role of dendritic cell in controlling the immune system.....25
Trisilowati and D.G. Mallet

Spatial Panel Dynamic Econometrics Model of Land Value, Land Use Externalities and Their Dynamic: Case Study of the Jakarta's Fringe.....26
Rahma Fitriani, Eni Sumarminingsih, Suci Astutik

How Data Sciences Shapes Personalized Medicine Revolution.....27
Setia Pramana

B. Material Science and Technology

Synthesis of Textile Natural Colorants from Cassava Peel Waste Fermented by Monascus Purpureus.28
Ikhwanul Muslim, Ika Natalia Mauliz, Mohamad Widodo

An Analysis of Temperature Substrate Effect and Nitrogen Gas Pressure on Aluminum Nitride Crystal Growth Using Reactive Sputtering Method.....32
Dianita Wardani, Diah Susanti, Agung Purniawan, Trimadji Atmono

Nanosilica (SiO_2) From Phyropilite Ores Make Banknote Superhydrophobic.....35
Fithrotun Nisa, Abdulloh Fuad, Subakti

Solar Cells Characterization Polycrystalline with Sun Simulator System Using Light Bulb Halogen 39
Soni Prayogi, Yoyok Cahyono, Ahmad Sholih, Fitria Silviana, Darminto

The Effectiveness Sap of Avicennia Alba as antimicrobial That inhibit Bacteria Growth in Streptococcus Mutans 43
Okta Efriyadi, Devi Ayu Novita

Making Ecofriendly Fiber Made from Recycled Polyethylene Plastic Bag Waste 47
Asril Senoaji Soekoco, Noerati, Maya Komalasari, Kurniawan, Agus Hananto

Characterization Argon Plasma on DC Bias Discharge by Using Comsol Multyphysics Simulation and The Effect of Voltage Variation 51
Muhammad Ghufron, E.E Yunata, T. Aizawa2

The Characteristics of Optical and Magnetic Properties of $Zn_{0.75}Mn_{0.25}O$ Nanoparticles 55
Heru Harsono, Zahratul Jannah AR

Austempering Process at Low Temperatures in Produce of Wear Resistant Steel with Structured Carbide Free Bainite 58
Faisal Manta, Suwarno

The Effect of Cr2O3 Addition on The Phase Stability of Tl_2-$XCr_xBa_2CaCu_2O_8$ Superconductor 62
Syahrul Humaidi, Marhaposan S, Eddy Marlianto and Roslan Abd-Shukor

The Influence of KOH Concentration of The Chemical Activation on The Production of Active Carbon Made of Agave Fiber 66
Gancang Saroja, Lailatin Nuriyah, Yogi Fernandus

The Effect of Various Amount of Sucrose of Zeolite-X Templated Carbon on The Properties and CO_2 Adsorption Capacity 69
Ibnu Muhariawan Restuaji, Nurul Widiastuti

Study on Physical Properties and Mineralogy of Pumice and Scoria from Mount Kelud Blitar To Evaluate Their Potential as Geotechnical Material 73
Andre Primantyo Hendrawan, Heri Suprijanto, Emma Yuliani, Muhammad Nurjati Hidayat

Metal Coat Spray Distance analysis of AISI Steel 1045 To Corrosion Ressistance and Lamination Strength with Stainless Steel as Lamination 77
Ipick Setiawan, Sunardi, Budiman

Magnetic Susceptibility and Mineralogy of Deposited Sediment in Eastern Part of Sentani Lake.....81
Dian Sisinggih, Zem Dhani, Sri Wahyuni, Siti Zulaikah and Yusuf Bungkang

Effect of Addition of Malic Acid and Sodium Alginate Biopolymer to The Poly(Vinyl) Alcohol Membrane on the TG-DTA Thermogram 85
Ulfa Andayani, Diah Mardiana

Nitrided Austenitic AISI 316L by RF-DC Plasma Nitriding 89
Istiroyah, D.J. Santjojo

Effect of Horizontal Peg Distance to The Shear Strength of Beams Bamboo Lamination 93
Zulmahdi Darwis, Soelarso, Slamet Widodo

Synthesis and Characterization of Alginate Bioplastic Based on *Sargassum Sp*. 97
Lailatin Nuriyah, Muhammad Ghufron, Agesta D. Widyanugraha

The Effect of Addition of Activated Carbon Made from Palm Empty Fruit Bunch and Iron Powder on Ceramic Membrane Characteristics.....101
Sisnayati, Muhammad Said, Subriyer Nasir, and Dwi Putro Priadi

Study on Contamination Detection of Rhodamine B in Capsicum Annum L Based on The Electrical Properties of Materials 105
Chomsin S Widodo, Unggul P.J., Bambang

The Role of Boltzmann Temperature on Short Pulse Molecular Alignment 108
Abdurrouf

C. Mathematics, Statistics and Modelling

Forecasting Analysis Using Poverty Level Multiple Regression analysis **112**
Warnia Nengsih, Juni Nurma Sari

Solving a System of Nonhomogeneous Fourth Order Ordinary Differential Equtions by Using Diagonalization Matrix **116**
Tjang Daniel Chandra

The Properties Pringsheim and Regular Convergence of Double Series and its Application **120**
Moch. Aruman Imron

SFH (Smart Floating Harbour): Smart Harbour with Harbour-Tourism Concept Based on Graph Analysis of Simpang 5 Semarang **124**
Rezki S.

Segmentation of Leaf Spot Disease on Apples Plants by Using Fuzzy C-Means Algorithm **128**
Syaiful Anam

Developing Programming of a Quantum Walks Algorithm Using MATLAB **132**
Lila Yuwana and Agus Purwanto

Spatio Temporal Dynamic Modeling of Dengue Fever Infectious Disease in Bandung **136**
I Gede Nyoman Mindra Jaya, Bud Nurani Ruchjana

A Comparison of MCMC and DMC Approach for Seeemingly Unrelated Regression Models with Application Gross Regional Domestic Product **140**
A.B. Santosa, N. Iriawan, Setiawan and M. Dokhi

An Explicit Formula for angle Between Subspaces of an N-inner Product Space **144**
M. Nur, H. Gunawan, O. Neswan

Risk Identification on Food Safety for Fish Supply Chain with Pareto Diagram **148**
Hana Catur Wahyuni, Wiwik Sumarmi

Power Quality Improvement Caused by Electric Arc Furnace Using Unified Power Quality Conditioner **151**
Wahyuni Martiningsih, Rizky, Rocky Alfanz

Optimal Control Applied to The Spread of HIV/AIDS **155**
Marsudi

An Example of Terwilliger Algebras of Same Degree with Different Dimension **159**
Nur Hamid

Choice Based Conjoint for Preferences of Statistics Teaching Methods **163**
Utami Syafitri, Farit M Afandi, Septian Putri Palupi

Dynamics analysis of a Rotavirus Infection Model with Saturated Incidence Rate **167**
Anna Silvia Purnomo, Isnani Darti

Homomorphism on Direct Product of Fuzzy Module Over Fuzzy Ring **171**
Vira Hari Krisnawati, Bayu Setyabudi

Homotopy analysis Method to Solve the Generalized Fisher's Equation **175**
Dadang Amir Hamzah, Y. Soeharyadi, J.M. Tuwankotta

Application Correlation Order at Dependency Problem on Joint Life Status **179**
Endang Wahyu Handamari, Fawzan Rinaldy

The Interface-Fluid Coupled Model with Free Boundary at Triple Line **182**
Nur Shofianah

A Convolved Gaussian Process for Multiple Dependent Processes **186**
A'yunin Sofro, Jian Qing Shi

Dealing with Feller Condition Under Heston Model **189**
Abe Vallerian Siswanto, Helena Margaretha, Giovani Gracianti

Properties of Various Smoothing Functions for Smoothed Particle Hydrodynamics **192**
Kenny Wiratama, Helena Margaretha, Pujianto Yugopuspito

Application Ant Colony Optimization on Weight Selection of Optimal Control SEIR Epidemic Model **196**
Dinita Rahmalia, Teguh Herlambang

Structural Modeling of Half-Through Steel Arch Bridge on Buckling Effect **200**
Ussy Andawayanti, Evi Nur Cahya

Analysis of Potential Evaporation Calculation Method at Karangploso, Malang Regency, East Java **204**
Donny Harisuseno, Ery Suhartanto, Ersty Nurul Frida Asmara

Service Satisfaction Level (Study Case in GoJek Versus Go Bike) **208**
Yulinda Rizky Pratiwi, Edy Widodo

Generalized Formulae for Instantaneous Nonlinear Susceptibility in The Presence of Excitation and Ionization **212**
Muhammad Nurhuda

Study of Optimization of Cropping Pattern to Maximize the Profit of Agricultural Production at Jati Ampuh Irrigation Area **216**
Lily Montarcih Limantara, Rini Wahyu Sayekti, Muhammad Amar Sajali, Dipta Pramana S.

Clustering Analysis for incomplete Data (Study Case of Composing Zone of User Rights Radio Frequency Cost) **220**
Erfiani

An L (2, 1)-Labeling of Corona Product of K1 and Cartesian Product of Pn and C4 ..... **223**
Rismawati Ramdani, Resti Anisawati Miyuki

Indonesia Life Table Derivation Based on indirect Estimation Data with Logit Model Life Table System **227**
Stephen, Helena Margaretha, Ferry Vincenttius Ferdinand

Semiparametric Mixed Model for Small Area Estimation Under Informative Sampling **231**
Angela Nina R. C., Sri Haryatmi, Danardono

The Influence of Weber Trench to Tsunami Simulation in Banda Sea **235**
Nisrina Ikbar Rahmawati, Bagus Jaya Santosa, Wiko Setyonegoro

Modeling Catastrophic Deaths in indonesia with Extreme Value Theory **239**
Henry Kurniawan, Helena Margaretha, Ferry Vincenttius Ferdinand

Elliptic Curve Cryptosystem (ECC) USED IN Encryption and Decryption TEXT.TXT with C# PROGRAMMING **244**
Akik Hidayat, Mira Suryani, Intan nurma Yunita

Calculation of Insurance Premium of Rice Plants in Citarum Watersheed **248**
Endang Soeryana Hasbullah, Sukono, Muhammad Faiz Rifqi, Sudradjat Supian

Service Satisfaction Level (Study Case in Gojek and Grab Bike)

Yulinda Rizky Pratiwi[1*], Edy Widodo[2]

[1,2]Department of Statistics, Faculty of Mathematics and Natural Science, Universitas Islam Indonesia, Yogyakarta, Indonesia
*Corresponding authors: [yulindarizkypratiwi@gmail.com]

Abstract-Globalization has become a motor for the current technological developments. The presence of the Virtual Space provides an opportunity for the community to actualization with access to a wider world, quickly and easily. Transport which is part of the existence of life, civilization needs over time that also has been the object vital to technological developments. Some android apps are emerging as Gojek and Grab Bike application that can fulfill the public demand for transportation services more easily. Methods for obtaining the data is done by using secondary data. Secondary data are user comments for Gojek and Grab Bike that obtained through a search on the internet media. The analytical methods are descriptive analysis, Clustering, Association Rules, and Wordcloud. These are performed by software open source R adding packages such as "tm", "twitteR", "wordcloud", and "ggplot". By text mining, can be seen the number of followers of the official account of Gojek and Grab Bike by looking at the spread map of the followers of the account to consider the expansion of sales to be widespread. Moreover, it can be known how any talks that are often associated with Gojek and Grab Bike in twitter account.

Keywords–Gojek, Grab Bike, Logistic Regression, Twitter, Talks

1. INTRODUCTION

One of the communication media is now the fast-growing social media. One part of the social media is a social networking site, which is a web-based service that allows users to create profiles, see the list of available users, as well as invite or accept friends to join the site. Generally, there are two types of textual information on the web, ie facts and opinions. The fact is the objective statement about entities and events in the world, while opinions are subjective statements that reflect the sentiment or perception of people about an entity or world events. Currently, the organization has many uses information from social media to conduct surveys than through conventional survey that will cost quite a lot. Twitter is one of the social networks that are popular today.

Twitter is a website owned and operated by Twitter Inc. which offers a form of micro-blogging social network that allows the users to send and read messages called tweets. In twitter, followers and following are the terms in which it is very important for some twitter users. Due to the popularity of twitter accounts owned by several persons or institutions be seen from the number of followers.

Informatics business is a work by individuals or groups to benefit like a business that utilizes informatics techniques, such as the Internet or applications on the mobile phone. What we know today informatics business rapidly growing, one of the capital city of Indonesia being 'invaded' by green troops who created a stir among the urban community. When down the road, wherever you are, you will see one or two motors that passengers wearing a green jacket with writing Gojek or Grab in tow. Seeing the development of Gojek and Grab Bike are very interesting because Gojek and Grab Bike are startup pioneer in the field of online motorcycle, it is expected that Gojek and Grab Bike development can become a success story that can be taken as lesson learned for other startups.

2. THEORICAL BASIS

2.1 Data Mining

Data mining is the extraction of interesting patterns from large amounts of data. A pattern is said to be interesting if the pattern was "not trivial", implicit, previously unknown, and useful. Patterns presented should be easy to understand, apply to the data to be predicted with a degree of certainty, useful, and new. Data mining is a process that uses statistical techniques, mathematics, artificial intelligence, and machine learning to extract and to identify useful information and related knowledge from a variety of large databases (Turban, et al., 2005). Extracting data required when the available data are too many (for example, data obtained from the company's database system, e-commerce, share data, and bioinformatics data), but do not know what pattern can be obtained. Examples of discovery patterns in data mining is supposed a company that will increase the credit card facility of the customer,

the company will look for patterns of customers to know your potential customers and potential customers who do not. In addition, data mining plays an important role in the fields of industry, finance, weather, climate, science, and technology.

2.2 Text Mining

Doing the work of the prediction of what will happen to a student based on previous historical data relating to the performance index to be reached last semester, and jobs like this in the scientific world is often referred to as pattern recognition. Pattern recognition is part of the data Mining. So pattern recognition is a discipline that studies how we group objects to the various classes and how data mining can be found the inclined. Data mining plays an important role in the fields of industry, finance, weather, science and technology. Data mining with regard to the processing of data on a large scale.

2.3 WordCloud

Word cloud is one of the results of text mining methods that feature popular words associated with internet keywords and text data. Word cloud is often used to highlight popular terms or trend based on the word frequency of users (PBC, 2013). Word cloud is an approach that can explain the research questions very quickly and easily, we can explore word cloud briefly and can perform comprehensive analysis (Graham, I. Milligan, & S. Weingart).

2.4 Association Rules

Association rules analysis is a data mining techniques to discover the rules of associative between a combination of items. Association rules want to provide information in the form of "if-then". Functions association rules are often referred to as market basket analysis which is used to find a relation or correlation between the set of items.

2.5 Text Clustering

Text clustering assists in a decision by making a connection between the same document, which in turn allows the relevant documents be taken after one of the documents has been considered relevant to the request [Martin, 1995]. The main applications of clustering in text mining are as follows:

a. Simple clustering. This refers to the formation of clusters feature text. For example: the grouping of hits generated by search engine.

b. Taxonomy generation. This refers to the generation of a hierarchical group. For example: a cluster that contains the text of the automaker is the parent of the child cluster that contains the text of car models.

c. Topic extraction. This refers to the extraction of the most distinctive features of a group. For example the most distinctive characteristics of the documents in each topic of the document.

2.6 Gojek and Grab Bike

Gojek and Grab Bike are social enterprises that partners with a group of experienced and trustworthy ojek drivers to deliver a one-stop-shop convenience service for Indonesians. GoJek and Grab Bike are a motorcycle taxi that can be reached through phone and mobile application. As another ordinary taxi, the fare is fixed depends on the distance. People love it because GoJek and Grab Bike are cheap and easy to access. They feel delighted with the fair pay-what-you-get service. Moreover, they do not have to walk to find the closest motorcycle taxi since GoJek and Grab Bike driver offers door-to-door service. Generally, there are 3 main services: transport service, instant courier, and shopping & delivery.

3. RESULTS AND DISCUSSION

3.1 Population

The population in this study are active Twitter users are on a tweet with the mentions in account “@GojekIndonesia” and “@GrabID” taken the data as many as 3000 tweets.

3.2 Data analysis method

There are several methods of data analysis used in this study, among other things:

1. Descriptive Analysis is used to describe the condition tweet of the account “@GojekIndonesia” and “@GrabID” .

2. Clustering used to view groups of words have in common.

3. The Association rules used to identify patterns or relationships of words that is often discussed in conjunction with the account “@GojekIndonesia” and “@GrabID”.

4. Wordcloud used to see how the public comments or words that are often associated with account "@GojekIndonesia" and "@GrabID".

5. Logistic regression is used to determine the factors that influence the use of selection between gojek or grab bike.

3.3 WordCloud

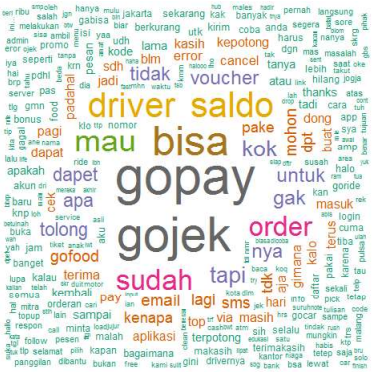

Figure 3.3.1. WordCloud about words that appear most frequently in account Gojek

Fig 3.3.2. WordCloud about words that appear most frequently in account Grab Bike

In the results obtained from the word cloud @GojekIndonesia, the most popular tweet is about "gopay" and "gojek". But in the account @GrabID, the most popular tweet is about "grab" and "driver". It reinforces the analysis that the words that often appear when people talk about @GojekIndonesia and @GrabID through social media twitter is different. Moreover the people are also talking about "driver". Based on these results mean that everybody twitter users associate the @GojekIndonesia with "gopay" and associate the @GrabID with "driver". While the "promo" means that tariffs on Grab Bike also be considered a person in choosing transportation that will be used. Beside that, in account @GojekIndonesia people are also talking about "saldo". It means that the payment also affect the interests of the Gojek users.

3.4 Dendogram Clustering

Words that have been obtained then being clustered in the dendogram below, after eliminating the words that rarely go out. Thus, in this dendrogram raised only words that most often come out.

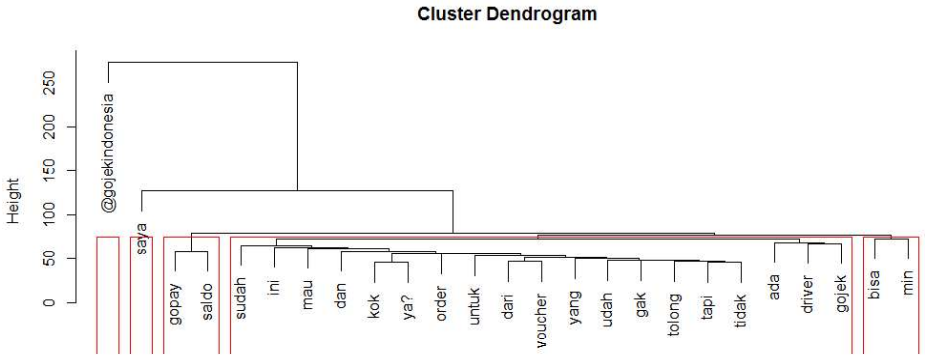

Figure 3.4.1 Dendrogram @GojekIndonesia

Based on the Figure 3.4.1, the result grouped into five clusters. For example, the results shows that the word "gopay" and "saldo" to be one group, so it means that the tweet about gopay will be followed by the word "saldo".

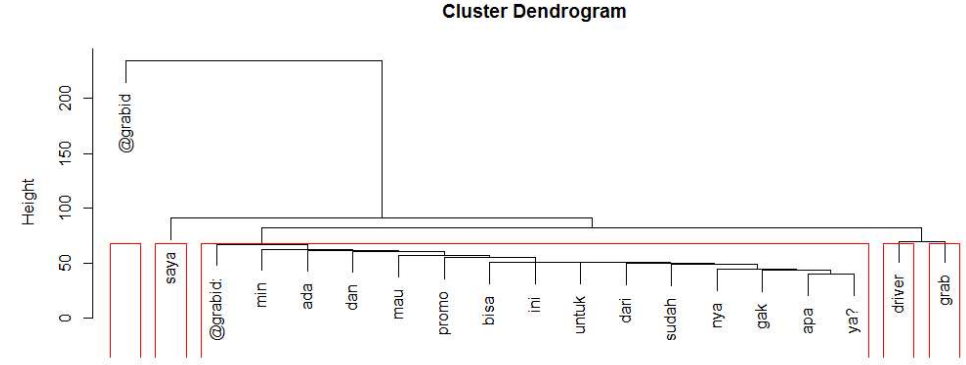

Fig 3.4.2 Dendrogram @GrabID

Based on the Figure 3.4.2, the result grouped into five clusters. For example, the results shows that the word "driver" and "grab" to be one group, so it means that the tweet about grab will be followed by the word "driver".

3.5 Assosiation Rules

To find the word most associated with XYZ word, use the following command:

```
$Assocs(myTdm, 'go-jek', 0.17)
$ek`
$       20%          go-box!       pilihgobox        pindahan?
$      0.38            0.38             0.38             0.38
$      raih    https://t.co…       sekarang!  @familymart_id…
$      0.38            0.35             0.35             0.31
$       cup        kunjungi            nestl          tagihan
$      0.31            0.31             0.31             0.31
$  tukarkan          @sjora       go-points          gratis?
$      0.31            0.28             0.28             0.28
$  download            cek?          kaosnya           ngefan
$      0.27            0.22             0.22             0.22
$ouvenirnya          diskon @gojekindonesia:          gunakan
$      0.22            0.19             0.18             0.18
$      poin
$      0.17
```

Based on the results, the word "go-jek" has the highest association with the word "20%" as much as 0:38 or 38% and the rest follow the number of words that are often associated by someone if writing words on social media twitter @GojekIndonesia.

```
> findAssocs(myTdm, 'bike', 0.15)
$bike
bisa,aplikasi        mutasi   online,saya          grab   pendaftaran
         0.29          0.29          0.29          0.28          0.26
         adik        kabur.   persyaratan      #grabvot        nggak?
         0.20          0.20          0.17          0.16          0.16
         uber
         0.16
```

Based on the results, the word "bike" has the highest association with the word "bisa,aplikasi" as much as 0,29 or 29% and the rest follow the number of words that are often associated by someone if writing words on social media twitter @GrabID.

4. CONCLUSION

Based on the analysis and the twitter account @GojekIndonesia can be concluded that the words were much discussed regarding "go-jek" are "gopay", "gojek", and "saldo". Based on the analysis and the twitter account @GrabID can be concluded that the words were much discussed regarding "bike" are "grab", "driver", and "promo".

In addition to the Gojek and Grab Bike word, the pattern is the word most often occurs with the explanation and said that word is rare. The results obtained in the cluster analysis form of some words that are used by users of Twitter, one of which is a twitter account Gojek and Grab Bike itself.

5. REFERENCES

[1]. Buntoro, Ghulam Asrofi. 2014. Sentiment Analysis Twitter dengan Kombinasi Lexicon Based dan Double Propagation. Pada CITEE 2014 7-8 Oktober 2014. Yogyakarta, Indonesia.

[2]. Elex Media Komputindo. Friendster Tempat Gaul Gaya. IslandScrpt.Net.

[3]. Fairuji, Dede. 2014. Makalah Manajemen Strategik Sejarah, Visi, Misi, dan Strategi yang Digunakan PT XYZ Golden Missisippi. Teknologi Pangan dan Gizi Politeknik Negeri Jember.

[4]. Gopego. Ketahui Lokasi Followers Twitter dengan Aplikasi Tweepsmap. http://gopego.com/news/a/2011/12/ketahui-lokasi-followers-twitter-dengan-aplikasi-tweepsmap [17 Oktober 2015]

[5]. Manalu, Boy Utomo. Analisis Sentimen Pada Twitter Menggunakan Text Maining. http://repository.usu.ac.id/bitstream/123456789/41904/7/Cover.pdf [17 Oktober 2015]

[6]. NN. 2013. Jejaring sosial. https://id.wikipedia.org/wiki/Jejaring_sosial [04 Oktober 2015].

[7]. Prabawati, Ari. 2010. Marketing Gratis dengan Facebook. Yogyakarta: ANDI.

[8]. Santosa, Budi. 2007. Data Mining : Teknik Pemanfaatan Data untuk Keperluan Bisnis. Yogyakarta : GRAHA ILMU.

[9]. Ukhwah, Ernin Niswatul. 2007. Text Mining. http://ernin.wordpress.com/2007/09/21/text-mining/ [04 Oktober 2015].

[10].Waloeyo, Yohan Jati. 2010. Twitter Best Social Networking. Yogyakarta: ANDI.