



# CONFERENCE PROGRAMS AND ABSTRACT

**The 3<sup>rd</sup> FIRST 2019 INTERNATIONAL CONFERENCE  
FORUM IN RESEARCH, SCIENCE, AND TECHNOLOGY  
OCTOBER 09-10, 2019  
*Palembang, Province of South Sumatera  
Indonesia***

**Organized by :**



**Collaborate With :**





## FOREWORD FROM GENERAL CHAIR 3<sup>rd</sup> FIRST 2019 INTERNATIONAL CONFERENCE

Welcome to 3<sup>rd</sup> FIRST 2019, it is with a great pleasure that we extend our warm welcome to all the participants of the 3<sup>rd</sup> FIRST 2019 International Conference, Forum in Research, Science, and Technology. This conference is held for third times and organized by State Polytechnic of Sriwijaya. The first conference in the series was held in State Polytechnic of Sriwijaya, Palembang, South Sumatera, Indonesia, on October 18-19, 2016, while the second conference was held on October 30-31, 2019 at Horison Ultima Hotel Palembang.

It is a good collaboration of State Polytechnic of Sriwijaya, Management and Science University (MSU), and National Chin-Yi University of Technology (NCUT). **To facilitate the researchers and the community server, the 3<sup>rd</sup> FIRST 2019 is conjugated with Seminar Nasional Aplikasi Teknologi untuk Masyarakat 2019 (SNAPTEKMAS), “Penerapan Perkembangan Teknologi untuk Meningkatkan Nilai Ekonomi Masyarakat”.**

The 3<sup>rd</sup> FIRST 2019 International Conference has attracted 109 participants from 6 countries, Malaysia, Japan, Taiwan, and Brunei Darussalam. The 3<sup>rd</sup> FIRST 2019 particularly encouraged research students and developing academics to present and to discuss new and current work in the field of 3 Tracks, including Engineering and Science (Track 1), Computer Science and ICT (Track 2), and Social Science (Track 3). For the 3<sup>rd</sup> FIRST 2019, 232 peer reviewed paper by reviewers drawn from the scientific committee, external reviewers and editorial board, however only 192 papers were selected. For SNAPTEMAS 2019, there are only 59 papers that are accepted.

Finally, as the General Chair of the Conference, I would like to express my deep appreciation to all members of the Steering Committee, Technical Program Committee, Organizing Committee and Reviewers who have devoted their time and energy for the success of the event.

At the end, I hope you enjoy the conference and the beauty of Palembang.

Assoc. Prof. Dr. Rita Martini, SE., M.Si., Ak., CA  
General Chair of 3<sup>rd</sup> FIRST 2019



## **FOREWORD FROM DIRECTOR OF STATE POLYTECHNIC OF SRIWIJAYA**

Dear all participants, welcome to Palembang, South Sumatera, Indonesia. It is my great pleasure to have all of you who have come from many parts of the world, to join the 3<sup>rd</sup> FIRST 2019 International Conference, Forum in Research, Science, and Technology. This conference is initiated and organized by State Polytechnic of Sriwijaya in collaboration with Management and Science University (MSU), and National Chin-Yi University of Technology (NCUT).

It is also my great pleasure to see that this conference is an effective media to link the researchers from many parts of the world. The theme for the 3<sup>rd</sup> FIRST 2019 International Conference, Forum in Research, Science, and Technology is “Applied Technology for Sustainable Development in Supporting Prosperous Human Existence”. It is expected it will be worthwhile platform for researchers to present their finding in the areas on multidisciplinary of Engineering and Science (Track 1), Computer Science and ICT (Track 2), and Social Science (Track 3). It has also provided an opportunity for the professionals and researchers to learn and share about the latest development and research in those 3 tracks.

Finally, on behalf of the conference committee, I would like to express my gratitude and great appreciation towards all of the authors, reviewers, and participants for the great contribution to ensure the success of this event.

Dr. Ing. Ahmad Taqwa, M.T.  
Director of State Polytechnic of Sriwijaya

# Organizing Committee

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Leni Novianti, M.Kom., Politeknik Negeri Sriwijaya, Indonesia  
Firdaus, S.T., M.Kom., Universitas Sriwijaya, Indonesia  
Syarifah Putri Rafflessia. S.Kom. M.T., Universitas Sriwijaya, Indonesia  
Ervi Cofriyanti, S.Si, M.T.I, Politeknik Negeri Sriwijaya, Indonesia

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Hairul, S.T., M.T.,Politeknik Negeri Sriwijaya, Indonesia  
Eka Susanti, S.T., M.Kom., Politeknik Negeri Sriwijaya, Indonesia



## **Yasushi Kiyoki, Professor, Ph.D**

Professor of Faculty of Environment and Information Studies and Graduate School of Media and Governance, KEIO University,

Program Chair of “Global Environmental System Leader Program (KEIO GESL): PhD Leading Program in Ministry of Education, Japan,

Former Dean of Graduate School of Media and Governance, KEIO University, 2015 to 2017,

Former President of Database Society of Japan (DBSJ), 2016-2018,

IPSJ(Information Society of Japan) Fellow, 2004,

5D-World Map System Creator : Global Environmental Database System, currently utilized in SDG-14, United Nations-ESCAP:

[https://sdghelpdesk.unescap.org/toolboxes?title=&field\\_sdgs\\_target\\_id=All&page=3](https://sdghelpdesk.unescap.org/toolboxes?title=&field_sdgs_target_id=All&page=3)

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<http://www.mdbl.sfc.keio.ac.jp>



## **Prof. Nurul Taufiqu Rochman, M. Eng, Ph. D**

### Work Experience

1. Chariman of Nano Center Indonesia (2012-Now)
2. Head of Material and Metallurgical Research Center LIPI (2019-Now)
3. Research Proffesor, Physics Research Center LIPI (2017-Now)
4. The National Research Council (2016-Now)
5. DKI Jakarta Regional Research Council (2018-Now)
6. IABIE Expert Board (2016-Now)
7. Nano Society Board of Trustees of Indonesia
8. Founder and Chairman of Nanotech lobal Innovation Pte. Ltd. (Singapore)

### School Attended

KAGOSHIMA UNIVERSITY, JAPAN

Bachelor of Engineering in Material Science, 1995

Master of Engineering in Material Science, 1997

Doctor of Engineering in Material Science and Nanotechnology, 2000

BOGOR AGRICULTURAL UNIVERSITY, INDONESIA

Doctorate in Business and Management, 2011

### Intellectual Property

Rochman N.T, K.Yamada, K. Hamaishi, H. Sueyoshi, Metoda Eliminasi Pb dari Paduan Tembaga, Japanese Patent, No Granted 2005-8970 (P2005-8970A); 2005 January.

Rochman N.T, Agus Sukarto Wismogroho. Learning Method of Atomic Motion Phenomena and Crystal Structure Formation of a Material. Patent No. P00200600346; 2006 June 15.

Rochman N.T, Agus Sukarto Wismogroho, Wahyu Bambang Widayatno, Andi Wahyu Indrayana, Nur Hendrasto. Methods and Tools for Producing Zinc Oxide Nanoparticles (ZnO) with Electric Plasma Arc Technology. Patent No. P00201000638; 2010 October 12.



## **Prof. Tjiptohadi Sawarjuwono, M.Ec., Ph. D., Ak.**

Name : Tjiptohadi Sawarjuwono, Prof, M.Ec, Ph.D, CPA, CA Occupation : Lecturer at Airlangga University since 1981, rank : IV e Date and Place of Birth : Bandung, 7 September 1953.

Main Activities:

### 1. Teaching:

- a. Behavioural Accounting for Bachelor and Master Programmes.
- b. Philosophy of Accounting for Bachelor dan Doctorate programmes.
- c. Qualitative Research Methodology for Bachelor and Master Programmes (Accounting and Islamic Study).
- d. Professional Ethics for Bachelor and Master Programmes.

### 2. Supervising Students at all level of programmes

Other activities

1. Vice Rector for Academic and Student Affairs, Universitas Internasional Semen Indonesia (UISI) since 2015.
2. Accounting supervisor at Mosque Al Falah, the biggest mosque in Surabaya, since 2014.
3. Partner of Accounting Firm Chatim, Atjeng, and Sugeng (CAS), Surabaya, since 2005.

Other experiences

1. Indonesia Accounting Association (IAI), member since 1981. Became the Leader of IAI for 3 periods from 2005 till 2017.
2. Becomes the speaker on various seminars and workshops with topic on a qualitative research method and an Islamic Accounting.
3. Became a leader of Islamic Accounting Forum, Academic Accounting Association. □
4. Editor for several Accounting Journals in Indonesia.





### **Prof. Win-Jet Luo**

Prof. Win-Jet Luo received his master degree in Engineering in 1994 and got his ph.d degree in Engineering in 2000 from National Chen Kung University (NCKU), Taiwan. After getting his ph.d degree, prof. Luo had been teaching in the program of Refrigeration, Air-conditioning and Energy Engineering and program of Electrical Engineering. He was promoted to professor position in 2008. At present, prof. Luo is teaching in Graduate Institute of Precision Manufacturing of National Chin Yi University of Technology (NCUT). Research interests of prof. Luo focus on the computational fluid dynamics, micro electromechanical Systems, ventilation, energy saving, fuel cells and micro-sensors. Prof. Luo has more than 70 journal papers published in the famous international journals and serves the reviewers of the journals. In 2012, 2014 and 2018, he got the engineering paper awards from Taiwan Society of Refrigerating and Air-Conditioning Engineers (TSHRAE). From 2013 to 2019, prof. Luo was nominated as dean of engineering college of NCUT. From 2014 to 2017, he was nominated as the president of TSHRAE and the consultant of council of heat pump engineering in Taiwan as well. He is also a member of Higher Education Evaluation and Accreditation Council of Taiwan. From 2014 to 2019, he has being gotten the honors of distinguished professor of NCUT as well.



## **Dr. med. vet. Wisnu Nurcahyo, DVM**

### Professional background:

1. Lecturer at Department of Parasitology, Faculty of Veterinary Medicine, Universitas Gadjah Mada since 1990
2. Director of Graduate Program of Veterinary Science UGM 2012-2016.
3. Chairman of Indonesian Society of Veterinary Parasitology since 2014
4. National Coordinator of Community Service in Directorate of Research and Community Services, Indonesian Ministry of Research, Technology and Higher Education since 2012.

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### Educational background:

1. Training on Tropical Veterinary Parasitology, Institut fuer Parasitologie und Tropische Krankheit, Veterinarmedizinische Fakultae der Freien Universitaet (FU) Standort Mitte, Berlin, Germany. 1993
2. PhD in Molecular Parasitology (Isolation and characterization of recombinant Variance Surface Glycoprotein Trypanosoma congolence in Escherichia coli), Freie Universitaet (FU) Berlin, Germany(DAAD Scholarship), 1993-1998
3. Postdoctoral Research Fellowship, Institut fuer Molekularparasitologie der Humboldt Universitaet zu Berlin (HU) Berlin, Germany. 2004

### Research interest

Parasitology and Wildlife Conservation



## **Associate Professor Dr Intan Z. Mat Darus**

Associate Professor Dr Intan Z. Mat Darus is an Associate Professor of School of Mechanical Engineering and Associate Chair of Academic Development in the Office of Undergraduate Studies, Universiti Teknologi Malaysia.

Associate Professor Dr Intan Z. Mat Darus was born in Malaysia, in September 16th, 1976. She received her First Class B.Eng. (Hons.) degree in Mechanical Engineering from the University of Wales College Cardiff, Wales, United Kingdom in 1998 and later her Ph.D. in Automatic Control and Systems Engineering from the University of Sheffield, United Kingdom in 2004. Her current research interests are instrumentation measurement and control, modelling and simulation of dynamical system, modelling and control of thermal energy, systems and application, soft computing techniques, evolutionary algorithms, artificial intelligent, robotic and automation system. She is currently the International editorial board member of the Journal of Low Frequency Noise, Vibration and Active Control, Journal of Artificial Intelligence Research (AIR), Jurnal Mekanikal and Journal of Institute Engineer Malaysia (IEM). Associate Professor Dr Intan Z. Mat Darus has published over 140 journal and conference papers and funded over 30 research and industrial collaboration and consultancy projects in the area of robotic and automation, thermal energy, artificial intelligent, evolutionary algorithm, instrumentation, measurement and control. She gained several research and service awards including from the Ministry of Science and Technology and Innovation Malaysia and several research awards from Seoul International Invention Fair. She has supervised over 60 postgraduate research students since 2004. Associate Professor Dr Intan Z. Mat Darus had 20 years of program development and teaching experience in the undergraduate and postgraduate studies at the Universiti Teknologi Malaysia since 1999.



## RUNDOWN

### 3<sup>rd</sup> FIRST 2019 INTERNATIONAL CONFERENCE (FORUM IN RESEARCH SCIENCE AND TECHNOLOGY) SNAPTEKMAS (Seminar Nasional Aplikasi Teknologi pada Masyarakat) 2019

**The Excelton Hotel Palembang, South Sumatera, Indonesia  
Wednesday-Thursday, October 9-10, 2019**

<b>Wednesday, October 9, 2019</b>					
<b>The Excelton Hotel Palembang, Diamante Room (M Floor)</b>					
No.	Session	Person in Charge	Time Allotment	Liaison Officer	
1.	<b>Registration</b>	Event Section Committee	07.00 – 08.00	M.Miftakhul Amin, S.Kom., M.Eng	
2.	<b>The Opening Ceremony</b>		08.00 – 08.35		
3.	Do'a				
4.	Tari Tanggai				
5.	Indonesian National Anthem				
6.	Chair Report Speech				
7.	Speech and Opening Remarks by Director of State Polytechnic of Sriwijaya				
8.	Souvenirs Gift, Group Photos				
9.	<b>Coffee Break</b>				
<b>PLENARY SESSION</b>					
No.	Keynote Speaker	Affiliation	Time Allotment	Moderator	Liaison Officer
1.	Prof. Yasushi Kiyoki, Ph.D	KEIO University, Japan	09.00 – 09.30	Tiur Simanjuntak, M.Pd./ Tommy E Sutarto, Ph.D	Dr. Eng. Herlambang, M.Kom
2.	Prof. Win-Jet Luo	National Chin Yi University of Technology (NCUT), Taiwan	09.30 – 10.00		
3.	Assoc. Prof. Ts. Dr. Intan Zaurah Mat Darus	Universiti Teknologi Malaysia	10.00 – 10.30		
4.	Prof. Dr. Nurul Taufiqu Rochman, M.Eng, Ph.D	LIPI	10.30 – 11.00	Dr. Markoni Badri, S.E., M.B.A.	M.Miftakhul Amin, S.Kom., M.Eng
5.	Prof. Drs. Tjiptohadi Sawarjuwono M.Ec., Ph.D., Ak.	Universitas Airlangga, Indonesia	11.00 – 11.30		
6.	Dr. R. Wisnu Nurcahyo, DVM	Universitas Gadjah Mada, Indonesia	11.30 – 12.00		

Break, Sholat Dzuhur, Lunch		12.00 – 13.00			
<b>PARALEL SESSION</b>					
No.	Theme	Room	Time	Moderator	Articles
1.	TRACK 1 (Engineering and Science)	ROOM 1 Electra 3 (2nd Floor)	13.00 – 16.12	Nyayu Latifah Husni, S.T., M.T./ A. M. Shiddiq Yunus, S.T., M. Eng., Ph.d	23
2.	TRACK 1 (Engineering and Science)	ROOM 2 Electra 4 (2nd Floor)	13.00 – 16.12	Dr. Eng. Tresna Dewi, M.Eng/Fatahul Arifin, Ph.D.	23
3.	TRACK 1 (Engineering and Science)	ROOM 3 Electra 5 (2nd Floor)	13.00 – 16.12	Ir. Jaksen, M.Si /Dr. Beni Hidayat	23
4.	TRACK 1 (Engineering and Science)	ROOM 4 Electra 6 (2nd Floor) /SESSION 1	13.00 – 14.36	M.Miftakhul Amin, S.Kom., M.Eng/Agus Subrianto,M.Eng.	12
		ROOM 4 Electra 6 (2nd Floor) /SESSION 2	14.44 – 16.20	M.Miftakhul Amin, S.Kom., M.Eng/Agus Subrianto,M.Eng.	11
5.	TRACK 2 (Computer Science, Computer Engineering, Information System, Informatics Management)	ROOM 5 Electra 1 (2nd Floor)	13.00 – 16.12	Herlambang, M. Kom, Ph.d./R Passarella, M.Eng	23
6.	TRACK 2 (Computer Science, Computer Engineering, Information System, Informatics Management)	ROOM 6 Electra 2 (2nd Floor)	13.00 – 16.12	Ervi Cofriyanti, M.TI / Ozkar Firdausi Hamzah, S.T., M.T., M. Sc	23
7.	TRACK 3 (Social Science)	ROOM 7 Diamante 1 (M Floor)	13.08 – 15.48	Doeslohal Djumrianti, S.E.MIS., Ph.D/Dr. Sari Lestari ZR	20
8.	TRACK 3 (Social Science)	ROOM 8 Diamante 2 (M Floor)	13.00 – 15.56	Dr. Welly/ Heri Setiawan, MM	21
9.	SNAPTEKMAS 1	ROOM 9 Diamante 3 (M Floor)	13.00 – 15.40	Pridson Mandiangan, S.E., M.M M.Si./ Marieska Verawaty, Ph.D.	19

10	SNAPTEKMAS 2	ROOM 10 Diamante 4 (M Floor)	13.00 – 15.48	Dr. Rusdianasari/ Dr. Febrianty	20
11	SNAPTEKMAS 2	ROOM 11 Diamante 5 (M Floor)	13.00 – 15.48	Dr. Indri Ariyanti/ Ade Silvia H, ST, MT	20
12	TRACK 1, TRACK 2 (Engineering and Computer Science)	ROOM 12 Diamante 6 (M Floor)	13.00 – 14.36	HettyMeileni, S.Kom, M.TI/ Alan Novi Tompunu, S.T., M.T.	12
<b>CLOSSING SESSION</b>					
Event			Time	Room	
<ul style="list-style-type: none"> <li>- Closing Ceremony</li> <li>- Announcement of: <ul style="list-style-type: none"> <li>1. Best Paper FIRST IC 2019</li> <li>2. Best Paper SNAPTEKMAS 2019</li> <li>3. Best Presenter FIRST IC 2019</li> <li>4. Best Presenter SNAPTEKMAS 2019</li> </ul> </li> <li>- Door Prices</li> </ul>			16.30– 17.30	Diamante Ball Room	

**Thursday, October 10, 2019**  
**MUSI AND CITY TOUR**



**The 3<sup>rd</sup> FIRST 2019**  
**(FORUM IN RESEARCH, SCIENCE, AND TECHNOLOGY)**  
**International Conference**



Jl. Srijaya Negara Bukit Besar Palembang 30139 South Sumatera – Indonesia  
phone +62711 353414 Fax: +62711 355918

Theme : TRACK 1 (Electrical Engineering)  
Room : ROOM 1 (Electra 3, 2<sup>nd</sup> Floor)  
Moderator : Nyayu Latifah Husni, S.T., M.T./A. M. Shiddiq Yunus, S.T., M. Eng., Ph.D  
Time : 13.00-16.12 WIB  
Articles : 23

ID	Time	Authors	Title	Affiliation
1585	KEYNOTE SPEAKER	Yasushi Kiyoki	A Global Knowledge Sharing and Semantic Computing System with 5-Dimensional World-Map for Natural and Social Environment-Analysis and Visualization	Keio University
1329	13.00 – 13.08	B Alfaresi, Z Nawawi, R F Malik, K Anwar	5G Channel Model for 28 GHz frequency in Palembang	Universitas Sriwijaya
1344	13.08 – 13.16	Suzan Zefi, Eka Susanti, R.A Halimahtussa'diyah, Sholihin	Wireless Sensor Network Data Communication and Information system to Regulate Water Volume and Turbine Rotation	Polsri
1504	13.16 – 13.24	Yurni Oktarina, Tresna Dewi, Pola Risma, Muhammad Nawawi	Tomato Harvesting Arm Robot Manipulator; a Pilot Project	Polsri
1461	13.24 – 13.32	Armin Sofijan, Zainuddin Nawawi, Bakhti Yudho, Rimant Sipahutar, Irwin Bizzy	Performance Evaluation Solar Charge Controller on Solar Power System Home-Based SPV Amorphous 80 Watt-peak	Universitas Sriwijaya
1463	13.32 – 13.40	Sopian Soim, Suroso, Ade Silvia Handayani, Ahmad Taqwa, Nur Shadrina	The Implementation Of YATEBTS Based GSM Using Raspberry Pi	Polsri
1453	13.40 – 13.48	Brendy Chandra Supian Atmodjo and Rinaldy Dalimi	Optimization of Own Electricity Usage with Electricity Supply from Solar Cells at Darajat Geothermal Power Plant	Universitas Indonesia
1588	13.48 – 13.56	Yeni Irdyanti, Rd. Kusumanto, Masayu Anisah, Niksen Alfarizal, Zarmariesyah Erman	Ultrasonic Sensor Application As A Performance Enhancement Of Robot Two Wheels	Polsri
1535	13.56 – 14.04	Nofiansah, M. Noer, Nurhaida, M. Hafidz Aulia	Operation 3 Phase Induction Motor 1 Kw Star Delta System Using Hp (Smart Phone)	Polsri
1487	14.04 – 14.12	Lin Prasetyani, Bayu Ramadhan, Tresna Dewi, William Sarfat	PLC Omron CJ1M CPU-21 Control Modification for Drill Oil Hole Machine in an Automotive Company	Politeknik Manufaktur Astra
1546	14.12 – 14.20	Yessi Marniati, Andri Suyadi, Herman Yani, Sutan Marsus	Characteristics Of Battery Use In Electric Car	Polsri
1570	14.20 – 14.28	Sabilal Rasyad, Evelina Evelina, Amperawan Amperawan, Dewi Permata Sari, Nyayu Latifah Husni	Learning Module Of Analog Electronics Practice	Polsri





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1450	14.28 – 14.36	Resti, Nasution, Burlian, Yani	Different metric distances on the k-means method in building a cans waste classification system using the CMYK color model	Universitas Sriwijaya
1447	14.36 – 14.44	Zarkasi	Implementation of Facial Feature Extraction Using Viola-Jones Method for Mobile Robot System	Universitas Sriwijaya
1705	14.44 – 14.52	Rumiasih, Carlos R. Sitompul, Anton Firmansyah, Indah Susanti	Effect Of Load On BLCD Motor	Polsri
1468	14.52– 15.00	D A Pratama, N L Husni, E Prihatini, S Muslimin	Implementation of DSK TMS320C6416T Module in Designed of Sound Detection	Polsri
1606	15.00 – 15.08	Ahmad Taqwa, Tresna Dewi, RD Kusumanto, Carlos R Sitompul, Rusdianasari	Automatic Cooling of a PV System to Overcome Overheated PV Surface in Palembang	Polsri
	15.08 – 15.16	<b>BREAK</b>		
1710	15.16 – 15.24	Hairul, Markori, Indrawasih dan Sudirman Yahya	Analysis Of Performance Test And Consumption Of BLDC 350 W Motor Power To Mechanical Vibration With Variation Of Speed And Load Variation	Polsri
1610	15.24 – 15.32	Zainuddin Idris, M. Yunus, Siswandi, Bambang Guntoro	The Influence Of Change Of An Angle Of Illuminance On Solar Power Generating Capacity 30 Watts In Laboratory Of Electrical Engineering Polytechnic Of Sriwijaya	Polsri
1629	15.32 – 15.40	Yohandri Bow, Adi Syakdani, Muhammad Taufik, Rusdianasari	The Effect of Drying Airflow Rate on H2O Mass Evaporated of Banana Chips Drying using Photovoltaic Solar Panels	Polsri
1711	15.40– 15.48	Benny Junianto, Tresna Dewi, Carlos Sitompul	Development and Feasibility Analysis of Floating Solar Panel Application in Palembang, South Sumatra	Polsri
1533	15.48 – 15.56	A. M. Shiddiq Yunus, Makmur Saini, Sri Suwasti, dan Purwito	Effects of Grid Frequency Drop on the Dynamic Performance of Full Converter Wind Turbine Generator	Politeknik Ujung Pandang
1767	15.56 – 16.04	Nyayu Latifah Husni, Dampito, Abdurrahman, Evelina, Ade Silvia Handayani, Sabilal Rasyad, Adella Rialita	Modified Design for Water Metering System	Polsri
1349	16.04– 16.12	Ade Silvia Handayani, jefri alkausar, Sarjana Sarjana, Nyayu Latifah Husni, Siti Nurmaini, Irsyadi Yani	Implementation Of Fuzzy Logic Type-2 On Mobile Robot Navigation System	Polsri



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Theme : TRACK 1 (Mechanical and Energy Engineering)  
 Room : ROOM 2 (Electra 4, 2<sup>nd</sup> Floor)  
 Moderator : Dr. Eng. Tresna Dewi, M.Eng/Fatahul Arifin, Ph.D  
 Time : 13.00 - 16.12 WIB  
 Articles : 23

ID	Time	Authors	Title	Affiliation
1637	INVITED SPEAKER	Intan Z. Mat Darus	Intelligent Controller for Flexible Robot Arm	Universiti Teknologi Malaysia
1335	13.00 – 13.08	Hasan Basri, A. Syahrom, Amir Putra Md Saad, A. T. Prakoso, D. Wicaksono, M. I. Amarullah, Tri Satya Ramadhoni	The Analysis of Wear on Artificial Hip Joint with Dimple on Femoral Surface	Universitas Sriwijaya
1350	13.08 – 13.16	Fatahul Arifin, Min-Wen Wang, Guo Wei	Optimal Design of Plasticizing Screw Using Artificial Intelligent Approach	University of Science and Technology, Kaohsiung Taiwan
1336	13.16 – 13.24	Akbar Teguh Prakoso, Ardiyansyah Syahrom, Amir Putra Md Saad, Abdul Hadi Abdul Wahab, Achmad Rendiko Ichsan, Hasan Basri	Mechanical Degredation Model of Porous Fe Scaffolds: Simulation Approach	Universitas Sriwijaya
1437	13.24 – 13.32	Darmawi, Riman Sipahutar, Qomarul Hadi	Scoopy Blade For Low Current River Waterwheel Supporting The Energy Procurement In The Countryside Of Indonesia (Part II)”	Universitas Sriwijaya
1443	13.32 – 13.40	Indra Maulana, Dicky Seprianto, Yossy Yudhianto, Muhammad Najib, Muhamad Azwar	SELT Design as a source of renewable electricity using the Flywheel Generator and Photodiode Sensor	Polsri
1460	13.40 – 13.48	Riman Sipahutar, Diah Kusuma Pratiwi, Darmawi Bayin, Irwin Bizzy, Baiti Hidayati	Analysis of Upgrading Process of South Sumatera Low Rank Coal	Universitas Sriwijaya
1664	13.48 – 13.56	Romli, D Seprianto, DP Putra, and M Rasid	The Effect of Parameters on the Process of Making Objects with Rapid Digital Prototyping Light Processing Technology on the Bending Stress	Polsri
1665	13.56 – 14.04	D Seprianto I, R Sugiantoro, Sproni, and Yahya	The Effect of Rectangular Parallel Key Manufacturing Process Parameters Made with Stereolithography DLP 3D Printer Technology Against Impact Strength	Polsri
1469	14.04 – 14.12	Ismail T, Zainal A, Fusito HY, Rahmad H, Ahmad K, Geby P	Simulation of the Effect of Cutting Angle in Lathe Process on Distribution of Cutting Temperature	Universitas Sriwijaya
1470	14.12 – 14.20	Ismail T, Amrifan S M, Riman S, Irsyadi Y, Sandro O, Fatiandari A	Conduction Heat Rate Analysis of Tool in Titanium Turning Process	Universitas Sriwijaya
1503	14.20 – 14.28	Kun-Ying Li, Win-Jet Luo, Shih-Jie Wei , and Yan-sin Liao	Cooling Channel Design for a Built-in Spindle of a Machine Tool	National Chin-Yi University of Technology,



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				Taiwan
1521	14.28 – 14.36	Syahril Ardi and Rahardian Faizal Zuhdi	Design of Automatic Control Systems at Loader Output of Snap Gauge Machine in Manufacturing Industry	Politeknik Manufaktur Astra
1522	14.36 – 14.44	Syahril Ardi and Juliantito Ardianto	Design Control Systems of Marking Machine and Total Length Check Damper Assembly Based on Programmable Logic Controller	Politeknik Manufaktur Astra
1531	14.44 – 14.52	Muhammad Yanis, Amrifan Saladin Mohruni, Safian Sharif, Irsyadi Yani, muhammad Zahir	Experimental Vibration Study in Milling Thin- Walled Ti6Al4V under MQL using Coconut Oil as Cutting Fluid	Universitas Sriwijaya
1622	14.52– 15.00	Carolus Bintoro, Vicky Wuwung, Fathurrohman Nurdin	Determination Overlap Ratio On Savonius Twisted Water Turbine Using Numeca Software	Bandung Polytechnic State
1594	15.00 – 15.08	Dharma Manurung, Rinaldy Dalimi	Optimization Electricity Supply for Thousand Island Jakarta Province by Using Hybrid Photovoltaic-Wind Turbine-Diesel Generator- Crude Palm Oil (CPO) Power Plant-Battery System	Universitas Indonesia
	15.08 – 15.16	<b>BREAK</b>		
1607	15.16 – 15.24	Irawan Malik	Study on using Casting Simulation Software for Design and Analysis Gate and Riser in Foundry Industries	Polsri
1624	15.24 – 15.32	Tri Widagdo, Ella Sundari, Eka Satria Martomi	Application Of Vacuum Valve Technology As Afr Settings In 3500 Watt Operated By Methane Gas	Polsri
1654	15.32 – 15.40	Muhammad Rasid, S.T., MT.	Innovation Utilization Of Nitridation Method In Improving Hardness And Corrosion Resistance Of Blacksmiths Crafts	Polsri
1662	15.40– 15.48 (INVITED SPEAKER)	Win-Jet Luo, Nai-Feng Wu, Cheng-Yn Lin, Deri Suhaeji,	Performance Analysis of a Sludge Drying	National Chin-Yi University of Technology, Taichung, Taiwan
1534	15.48 – 15.56	Yan-Lin Wu, Yu-Lieh Wu, Azka Hasya Hanifan	Study on Ventilation Performance in Operating Room with Variation Ventilation Design	National Chin-Yi University of Technology, Taiwan
1761	15.56 – 16.04	Dyos Santoso, Joni Yanto, Zainal Abidin, Muhammad Irfan Dzaky	Effect of the Utilizing Savonius Machine as Auxiliary Starting Device on the Performance of Darrieus Machine	Universitas Sriwijaya
1766	16.04– 16.12	Bunyamin, Kaprawi, Dewi Puspitasari, Sugianto, Nyayu Latifah Husni	Analysis Model for Orifice Flow Meter Correction Factor in Measuring in-Pipe Natural Gas Flow based on Numerical Simulation	Universitas Sriwijaya



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Theme : TRACK 1 (Chemical and Energy Engineering)  
Room : ROOM 3 (Electra 5, 2<sup>nd</sup> Floor)  
Moderator : Ir. Jaksen, M.Si/Dr. Beni Hidayat  
Time : 13.00-16.12 WIB  
Articles : 23

ID	Time	Authors	Title	Affiliation
1367	13.00 – 13.08	Sajaruddin, Leila Kalsum, Zainuddin Muchtar	The Analysis Of Biogas Fermentation Time From Cow Manure On Biodigester Fixed Dome Batch Systems	Polsri
1397	13.08 – 13.16	Hong-Yi Lin, Yu-Lieh Wu, Kai-Siang Yang, Chih-Yung Tseng, Shih-kuo Wu	The Effect of Surface Modification on Heat Transfer of Heat Exchanger	Taiwan (R.O.C.)
1449	13.16 – 13.24	Ida Febriana, Aneasari M, KA Ridwan, Taufik Jauhari	Prototype of Biodiesel Processors Using Waste Oil (Study of The Effect of The Number of CaO Catalyst (Blood Shell Shells) and Reaction Time of The Biodiesel Rendemen))	Polsri
1451	13.24 – 13.32	Moeksin, Ali, Arita	Production Of Ethyl Ester With The Influence Of Electrode Type, Reaction Time And Electric Voltage From Waste Cooking Oil	Universitas Sriwijaya
1452	13.32 – 13.40	Hilwatullisan, M. Zaman, A.Husaini and Siti Chodijah	Biscuit Product Development using Moringa Oleifera Flour as an additional source of nutrition	Polsri
1465	13.40 – 13.48	Selpiana, Prahady Susmanto, Lia Cundari, Dedek Oktari, Omar Ibrahim	The Physical Characteristics of Cracked Plastic Waste	Universitas Sriwijaya
1472	13.48 – 13.56	Sahrul Effendy, Tahdid, Lety Trisnaliani, Sandy A Putra, dan Alifah R Hefyani	The Analysis of The Use Calcium Oxide from Waste Cockle Shells (Anadara Granosa) and Sodium Hydroxide Catalyst on Prototype Biodiesel Processors Using Waste Cooking Oil Reviewed on Yield of Biodiesel	Polsri
1494	13.56 – 14.04	Muhammad Yerizam, Suri Andayana, Utari Oktavia	Effect of Temperature and Starter Concentration on the Fermentation Process in Making MOCAF	Polsri
1524	14.04 – 14.12	L Cundari, M N Fakhri, M Z Rizki	Adsorption of Synthetic Dye by Betel Nuts Activated Carbon in a Fixed-bed Column, Experiments and Prediction of Breakthrough Curves	Univesitas Sriwijaya
1528	14.12 – 14.20	Rusdianasari Rusdianasari, Aida Syarif, Muhammad Yerizam, M. Syahrman Yusi, Leila Kalsum, Yohandri Bow	Effect of Catalysts on the Quality of Biodiesel from Waste Cooking Oil by Induction Heating	Polsri



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1539	14.20 – 14.28	Meilianti, Marta Aznury, Yuniar, Sofia, Ismy Farhan, Lidia Agustina	Characterization Of Red Beetroot Soft Jelly Candy With Guava Extract And Gel Colloid Added	Polsri
1540	14.28 – 14.36	Lety Trisnaliani, Dina Eka Pranata, Fatria, Tahdid, KA Ridwan, M. Nurizzman Alfarizi, Mangihut Pandapotan Lumbantoruan	Flow rate effect and NaOH Concentration to CO2 Reduction in Biogas Products Using Absorber	Polsri
1568	14.36 – 14.44	Selastia Yuliati, Fadarina, Mustain Zamhari, and Ibnu Hajar	Prototype Of Tray Dryer Unit For Silica Gel Drying Based On Bagasse	Polsri
1572	14.44 – 14.52	Yuniar, Martha Aznury, Sofiah, Meilianti	Modification of Starch from Yam Taro with Hydrolysis Acid As the Adhesive	Polsri
1576	14.52– 15.00	Robert Junaidi, Abu Hasan, Muhammad Yerizam, Indah Purnamasarii	The Performance of Riverse Osmosis (RO) Membrane in Producing Pure Water	Polsri
1623	15.00 – 15.08	Erwana Dewi, Aisyah Suci N, Elina M	The Concentrations of Dissolved Oxygen in Drinking Water	Polsri
	15.08 – 15.16	<b>BREAK</b>		
1309	15.16 – 15.24	Beni Hidayat, Udin Hasanudin, Muhamad Muslihudin, Syamsu Akmal, Siti Nurdjanah, Neti Yuliana	Growth Kinetics of Saccharomyces cerevisiae and Tape Yeast on The Cassava Pulp Fermentation	Politeknik Negeri Lampung
1318	15.24 – 15.32	Mahlinda and M. Dani Supardan	Distillation of Patchouli Oil Using Firewood and Liquefied Petroleum Gas as Fuel : Effects of Yield, Quality and Cost Analyses	Syiah Kuala University
1713	15.32 – 15.40	Leila Kalsum, Abu Hasan, Rusdianasari, A.Husaini Yohandri Bow	Evaluation of Main Parameter Process of Anaerobic Digestion of Cow Dung in Fixed Dome Biodigester on Methane Gas Quality	Polsri
1716	15.40– 15.48	Arizal Aswan, IrawanRusnadi, Fatria, Zurohaina, Rima Daniar	Re-design pyrolysis reactor prototype for the conversion of plastic waste into liquid fuel	Polsri
1313	15.48 – 15.56	Sri handayani, chandra utami wirawati, saronosaron, dwi eva nirmagustina	Value Added Analysis Of Beef Floss With Fillers Of Papaya Fruits And Banana Blossom's	Politeknik Negeri Lampung
1319	15.56 – 16.04	Sri Handayani, Dwi Eva Nirmagustina, Muhammad Irfan Affandi <sup>3</sup>	Marketing Efficiency Of Organic Rice In Lampung Province	Politeknik Negeri Lampung
1746	16.04– 16.12	Farida Ali, Roval Al Fiqri	Simple Design For Pyrolysis Tools For Making Liquid Smoke And Its Aplication From Rubber Shells And Seeds As Food Preserves	Universitas Sriwijaya



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Theme : TRACK 1 (Civil, Architecture and Geology Engineering Engineering) / SESSION 1  
Room : ROOM 4 (Electra 6, 2<sup>nd</sup> Floor)  
Moderator : M.Miftakhul Amin, S.Kom., M.Eng/Agus Subrianto,M.Eng.  
Time : **13.00-14.36 WIB**  
Articles : 12

ID	Time	Authors	Title	Affiliation
1433	13.00 – 13.08	M A Berawi, P Miraj, H Sidqi, G R Gaffara and Gunawan	Industrial Mapping In Java-Kalimantan-Nusa Tenggara Corridor	Universitas Indonesia
1434	13.08 – 13.16	Mohammed Ali Berawi, Perdana Miraj, Ega R Islamiah, Gefra R Gaffara, Gunawan	Revenue Analysis Of Port-City Conceptual Design	Universitas Indonesia
1456	13.16 – 13.24	Adhitya B B, Pataras M., and Kadarsa E	The Utilization of Plastics Waste in Flexible Pavement Hot Rolled Sheet and Asphalt Concrete Wearing Course with Marshall Immersion and Cantabro Test	Universitas Sriwijaya
1459	13.24 – 13.32	Kurnia A Y, Dewi R, Permata D Y, and Pataras M	Characteristics Comparison of Refinery Asphalt, Rubberized Asphalt, and Buton Asphalt in Stone Matrix Asphalt Pavement with Marshall and Cantabro Method	Universitas Sriwijaya
1514	13.32 – 13.40	Sumiati, Mahmuda, Andi Herius, Agus Subrianto	The Effect Of Polycarboxylate Addition Towards The Workability And High Strength Concrete	Polsri
1525	13.40 – 13.48	Ibrahim,, Andi Herius, Julian Fikri, M. Shaid Ramadhinata, Maryani	Stabilization Of Peat Soils Using Petrasoil With Cement Viewed From Cbr Value And Free Compressive Strength Value Of Soils	Polsri
1578	13.48 – 13.56	Sumiati, Mahmuda, Sukarman, Siswa Indra, and Darma prabudi	The Utilization Of Crushed Clay Brick As Coarse Aggregate On Eco-Green Lightweight Foamed Concrete	Polsri
1580	13.56 – 14.04	Arfan Hasan, Indrayani, Ridho Adrian, Dwiki Syamanda, Darma Budi, and Akhmad Mirza	Performance Analysis Of Patal - Pusri Intersections After Underpass Operated	Polsri
1591	14.04 – 14.12	Raja Marpaung, Kosim, Zainuddin, Darma Prabudi	Utilization Of Coconut Shells As A Of Some Coral Stone In Concrete Making Replacement	Polsri
1708	14.12 – 14.20	A. Latif, Yusri, Moch.Absor, A. Fuad Z.	Public Transportation Service Bus Rapid Transit (BRT) Trans Musi Sustainable in Palembang City	Polsri
1709	14.20 – 14.28	Herlinawati, Puryanto, Sudarmadji, Sazili	Transportation Needed of Bus Rapid Transit (BRT) Corridor in Palembang	Polsri
1656	14.28 – 14.36	R Ahmad, A B Mardhanie, P Suroso, T E Sutarto and R Alfajri	Effect of groundwater table on slope stability and design of retaining wall	Politeknik Negeri Samarinda



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Theme : TRACK 1 (Civil, Architecture and Geology Engineering Engineering) / SESSION 2  
 Room : ROOM 4 (Electra 6, 2<sup>nd</sup> Floor)  
 Moderator : M.Miftakhul Amin, S.Kom., M.Eng/ Agus Subrianto, M.Eng.  
 Time : **14.44 - 16.20 WIB**  
 Articles : 11

1345	14.44 – 14.52	Normaliaty Fithri, Endah Fitriani	Plastic To Fuel Technology As Alternative Operation Of Gas Engine Sukawinatan Waste To Energy In Palembang	Bina Darma University
1663	14.52– 15.00	Tahdid, Aida Syarif, Lety Trisnaliani, Syahrul Effendy	Performance Of 1300 Watt Generator Set Fuelled By A Mixture Of Gasoline And Oil From The Conversion Of Plastic Waste Type Polypropylene (PP) And Low Density Polyethylene (LDPE)	Polsri
1454	15.00 – 15.08	Pamilia Coniwanti, Fitri Hadiyah, Roosdiana Muin, Indira Nur Sakinah, FarraUnzilahKendari Putri, Robinsyah	The Effect Of Cracking Temperature From A Mixture Of Hdpe...	Universitas Sriwijaya
	15.08 – 15.16	<b>BREAK</b>		
1734	15.16 – 15.24	Mahmud Basuki, Selvia Aprilyanti, Azhari, Madagaskar	Design Of Corn Thresher	UTP
1777	15.24 – 15.32	Adi Setiawan, Alex Gusti Randa, Faisal Faisal, Taufiq Bin Nur	Thermal Decomposition Of Gayo Arabica Coffee-Pulp In A Segmented Chamber	Universitas Malikussaleh
1794	15.32 – 15.40	Eka Sri Kandi Putri1, Else Febriana1, Rasyid Ridhol and Marieska Verawaty	Microbial Community In Constructed Wetland During The Treatment Of Domestic Wastewater	Universitas Sriwijaya
1661	15.40– 15.48	Andriani, M.Shubhi Nurul Hadie and Fuji Asema	The Effect Of Geotechnical Characteristics Toward Road Damage At Lowland Area	Andalas University, Padang
1395	15.48 – 15.56	Falisa Falisa, Hendri Chandra, Harnani Harnani	Geochemical Studies Of Claystone Based On Analysis Of Scanning Electron Microscope (SEM), Talangsawah, Merapi District And Surroundings Of Lahat Regency, South Sumatra	Universitas Sriwijaya
1724	15.56 – 16.04	Fitra Ramdhani	The Evaluation Of Mechanical Rheology On Modification Rubber Asphalt	Abdurrahman University
1593	16.04– 16.12	Agus Subrianto, Amiruddin Amiruddin, Ibrahim Ibrahim, Ika Sulianti, Nudia Nudia, Salsabila Beladin	Influence Of Water To Foam Ratio On Compressive Strength Of Foamed Mortar As The Road Construction Material	Polsri
1674	16.12 – 16.20	Tommy Ekamitra Sutarto	Effect of bulk density, age, and water content on the erosional strength of streambank soils	Politeknik Negeri Samarinda



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Theme : TRACK 2 (Computer Science, Computer Engineering, Information System)  
 Room : ROOM 5 (Electra 1, 1<sup>st</sup> Floor)  
 Moderator : Herlambang, M. Kom, Ph.d./ R Passarella, M.Eng  
 Time : 13.00 - 16.12 WIB  
 Articles : 23

ID	Time	Authors	Title	Affiliation
1307	13.00 – 13.08	Erwin, A Rohman, L A Nurjanah, Yurika, D Sinta, Q Al'afwa	Technique automatic for detection and segmentation of optic disc area in retinal image	Universitas Sriwijaya
1308	13.08 – 13.16	Erwin, A Rohman, L A Nurjanah, Yurika, D Sinta, Q Al'afwa	New Techniques For Segmentation And Extraction Retinal Blood Vessels	Universitas Sriwijaya
1330	13.16 – 13.24	Fauzi Rakhmad Firdausi, Arif Djunaidy, Ahmad Muklason	Optimization Of City Bus Routes In Surabaya Using Memetic Algorithm As A Solution To Solve Orienteering Problem	ITS
1346	13.24 – 13.32	Dodo Zaenal Abidin, Siti Nurmaini, Reza Firsandaya Malik, Jasmir Jasmir	A Form Of Preprocessing For Social Media Data Extraction	Universitas Sriwijaya
1347	13.32 – 13.40	Nining Ariati, Dana Indra Sensuse, Putu Wuri Handayani	Factors Affecting Knowledge Sharing Capability Of Doctors In Palembang	UIGM
1348	13.40 – 13.48	Saiful Bukhori	Serious Game Supply Chain Management Agribusiness As A Production Planning Using Cournot Model	University of Jember
1366	15.48 – 13.56	Teuku Roli Ilhamsyah Putra, Muhammad Kalvin	How Electronic Word Of Mount (E-WOM) Affects Purchase Intention With Brand Image As A Mediation Variable : Case Of Xiaomi Smartphone In Student	Universitas Syiah Kuala
1355	13.56 – 14.04	Aryanti Aryanti, Lin Weicong, Lin chih-yi, Billy Brian Henriquez, Ikthison Mekongga, Aaron Raymond See	Smart Cup For Visual Impaired People Based On Arduino	Southern Taiwan University of science and Technology, Tainan, Taiwan
1351	14.04 – 14.12	M A Ahmad1, A R C Hussin, H M Dahlan1, J Mahmood	Challenges Of Teaching In Massive Open Online Course	Universiti Teknologi Malaysia
1371	14.12 – 14.20	Ahmad Nurul Fajar	Service Oriented Architecture and Enterprise Architecture Alignment for Loan Financing System	BINUS
1368	14.20 – 14.28	Albert, Ahmad Nurul Fajar, Nunung Nurul Qomariyah	Analysis Of SOA Framework For Property Real Estate Industry	BINUS
1370	14.28 – 14.36	Surahmat, Alfred Tenggono	Analysis Of Server Virtualization Service Performance Using Citrix Xenserver”	Palcomtech
1372	14.36 – 14.44	Suparto Darudiato, Eliando Eliando	The Pattern Of The Marketing Ground Coffee Beans Using Decision Support System	Matana University





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1375	14.44 – 14.52	Dewi Wardani, Achmad Khusyaini	The Utilization Of Ontology In Association Rule	Universitas Sebelas Maret
1376	14.52– 15.00	Wardani	The Evaluation Of Semantic Mapping	Universitas Sebelas Maret
1377	15.00 – 15.08	Mardiana and Eka Hartati	Measurement of User Satisfaction Level on Implementation of SISKEUDES Application	Palcomtech
	15.08 – 15.16	BREAK		
1388	15.16 – 15.24	Aditya P. P. Prasetyo, Rendyansyah, Sri Desy Siswanti, Siti Nurmaini, Abdurahman	Garbage Collector Robot (Gacobot) Design For Dry Waste Distribution	Universitas Sriwijaya
1396	15.24 – 15.32	Rezania Agramanisti Azdy, Febriyanti Darnis	Use Of Haversine Formula In Finding Distance Between Temporary Shelter And Waste End Processing Sites	Palcomtech
1676	15.32 – 15.40	Indri Ariyanti, Yusniarti Yusniarti, Sri Wahyuni	Geographic Information Systems Search Test Location For Admission Of New Students In Sriwijaya State Polytechnic Using Location Based Service (LBS) Method	Polsri
1564	15.40– 15.48	Madora, Yusniarti, Wahyuningrum, Noval	Book Catalog Information System In The Reading Room (Library) Web-Based Polytechnic Informatics Management Department Sriwijaya	Polsri
1446	15.48 – 15.56	R Passarella, A S Nugroho, and F N Arsyad	Pull-down Fitness Technique Analysis using Motion Capture	Universitas Sriwijaya
1721	15.56 – 16.04	Meiyi Darlies, Ema Laila, Ali Firdaus, Muhamad Erwin	Analysis of EDFAT Methods in Photography Techniques	Polsri
1358	16.04– 16.12	Heru Fahlevi, Teuku Roli Ilhamsyah Putra and Rina Suryani Oktari	Predicting Cost Recovery Rate of Ischemic Stroke Patients: A Potential Application of Big Data Analysis in Hospital	Universitas Syiah Kuala



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Theme : TRACK 2 (Computer Science, Computer Engineering, Information System)  
Room : ROOM 6 (Electra 2, 2<sup>nd</sup> Floor)  
Moderator : Ervi Cofriyanti, M.TI/Ozkar Firdausi Hamzah, S.T., M.T., M. Sc  
Time : 13.00 - 16.12WIB  
Articles : 23

ID	Time	Authors	Title	Affiliation
1448	13.00 – 13.08	Yesi Sriyeni and Maria Veronica	Development Analysis For Numbers And Colors Learning Media	Palcomtech
1455	13.08 – 13.16	Heki Aprianto and Alan Saputro	Animation Design as an Educational Media of Adolescents' Social Behavior Deviation” has been accepted with major revision	Palcomtech
1458	13.16 – 13.24	Syahrul, Pertiwi	Designing Mobile Based User Interface for Promotion of Lakeur Craft Art Application at Balaputra Dewa State Museum	Palcomtech
1464	13.24 – 13.32	Lindawati, I Salamah, Asriyadi, M Fadhli	Prototype of RFID-Based Parking Slot Availability Detection System	Polsri
1466	13.32 – 13.40	DS Sri, FP Rian, Z Ahmad	Mobile Robot Motion Control Based on Static Hand Gesture	Universitas Sriwijaya
1473	13.40 – 13.48	Adelin Adelin, Febria Sri Handayani	Object-Based Design and Modeling Batik Nusantara Catalog Wibatara.com	Palcomtech
1548	13.48 – 13.56	Al Farissi, Halina Mohamed Dahlan, Samsuryadi	Genetic Algorithm Based Feature Selection With Ensemble Methods For Student Academic Performance Prediction	Universitas Sriwijaya
1673	13.56 – 14.04	Suzan Agustri, Dana Indra Sensuse	Information System Strategy Planning in The Private Universities of South Sumatera	Universitas Indo Global Mandiri
1577	14.04 – 14.12	Kintan Rahayu, Leni Novianti, Meivi Kusnandar	Implementation Data Mining With K-Means Algorithm For Clustering Distribution Rabies Case Area In Palembang City	Polsri
1630	14.12 – 14.20	Farizal F	Engine replacement scheduling optimization using Data Mining	Universitas Indonesia
1646	14.20 – 14.28	D. Tri Octafian, Febrianty, Hendra Hadiwijaya	User Experience Analysis On Class I Lpka Palembang Filial E-School	Palcomtech Palembang
1649	14.28 – 14.36	Rika Sadariawati, A. Ari Gunawan, Meivi Kusnandar	Information System Of Student's Final Report And Final Assignment At State Polytechnic Of Sriwijaya With Android Based	Polsri
1653	14.36 – 14.44	Nita Novita, M. Aris Ganiardi, Indri Ariyanti, Delta Khairunnisa	Design Of Semester Exam Scheduling At The State Polytechnic Of Sriwijaya Application	Polsri
1682	14.44 – 14.52	Rike Sucihati, Ahmad Bahri Joni Malyan, Ervi Cofriyanti	Augmented Reality in the Registration Flow for Enterance Examination at State Polytechnic of Sriwijaya Based on Android	Polsri
1683	14.52– 15.00	Leni Novianti, Devi Sartika, Dewi Irmawati, Ienda Meiriska	Design and Build Application of Campus Parking Area for State Polytechnic of Sriwijaya Based on Smartphone	Polsri
1688	15.00 – 15.08	A.Bahri Joni M, Herlambang Saputra, Ahyar Supani, Indarto	Implementation Of Biometric Fingerprint Barbasis Security Doors With Attendance Database On Sriwijaya State Polytechnic	Polsri



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15.08 – 15.16		BREAK		
1704	15.16 – 15.24	Ahyar Supani, Yuli Adriani	Designing and Applying Flood Early Warning System with Fuzzy Logic Based on Rainfall and Water Level for Special of Palembang City	Polsri
1707	15.24 – 15.32	Huda Ubaya and Ria Siti Juairiah	Performance of RUS and SMOTE Method on Twitter Spam Data Using Random Forest	Universitas Sriwijaya
1432	15.32 – 15.40	Sanjaya, Kurniawan, Saputra, Azhar	Mobile Android Based Geographic Information System (GIS) Software Development for Tourist Destination Seekers in Palembang City	Universitas Sriwijaya
1441	15.40– 15.48	M. Rudi Sanjaya, Dedy Kurniawan, Ariansyah Saputra, Iman Saladin B Azhar	GIS Android mobile based Software Development for Tourism Objects, Public Places list, Transportations list, and Culinary Places list Using Usability Measurement	Universitas Sriwijaya
1727	15.48 – 15.56	Firdaus, Andre Herviant Julianoa, Naufal Rachmatullaha, Sarifah Putri Rafflesiab, Dinna Yunika Hardiyantib, Ahmad Zarkasi, Ferlita Pratiwi Arisantia, Siti Nurmaini	The impact of Negative to Positive Training Dataset Ratio on Atrial Fibrillation Classification Machine Learning Algorithms Performance	Universitas Sriwijaya
1791	15.56 – 16.04	Yordan Hasan, Abdurrahman, Yudi Wijanarko, Selamat Muslimin, Renny Maulidda	Analysis of ID Card Implementation as the Automatic Door Lock Security in Electrical Engineering Department	Polsri
1785	16.04– 16.12	Annisa Darmawahyuni, Siti Nurmaini, M Naufal Rachmatullah	Analysis of Classifier Performance on ECG Interpretation for Precision Medicine: Which performance metrics should we use?	Universitas Sriwijaya



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Theme : TRACK 3 (Management Economics, Business Administration, Accounting)  
Room : ROOM 7 (Diamante 1, Ball Room, M Floor)  
Moderator : Doeslohah Djumrianti, S.E.MIS., Ph.D/Dr. Sari Lestari ZR  
Time : 13.08 -15.48 WIB  
Articles : 20

ID	Time	Authors	Title	Affiliation
1718	13.00 – 13.08	Dewi Fadila, Hendra Satrawinata, Mariskha Z, Riska Maulana	Impact of Learning, Socialization and Financial Lifestyle on Student' Intention to Invest in Capital Market	Polsri
1695	13.08 – 13.16	Sulaiman, Bramantyo Muhamad Pangestu, Bainil Yulina, Siska Aprianti	The Effect Of Capital Readiness And E-Commerce Utilization On The Competitiveness Of Micro Small And Medium Enterprises (MSMEs) Woven Palembang	Polsri
1381	13.16 – 13.24	Zulkifli, Martini, Hartati, Widyastuti	Dimensions Of Village Expenditure In Development Sector	Polsri
1394	13.24 – 13.32	Dwi Eva Nirmagustina, Sri Handayani and Luluk Irawati	Comparison Analysis Of Organic Rice And An Organic Rice Added Value Approach	Politeknik Negeri Lampung
1440	13.32 – 13.40	Amalia	Analysis Of Political Connection, Profitability And Capital Intensity Against Tax Avoidance In Coal Companies On The Indonesia Stock Exchange	Palcomtech
1697	13.40 – 13.48	Sari Lestari, Zainal Ridho, Neneng Miskiyah, Muhammad Anshari, Hadi Jauhari <sup>1</sup>	Human Resource Role and Online Strategy	Polsri
1476	13.48 – 13.56	Munparidi, L.Suhairi Hazizma & A.Jalaludin Sayuti	Relationship Model among Employee Engagement, Organizational Commitment and Employee Performance	Polsri
1488	13.56 – 14.04	Gst Ayu Oka Widarti, Esysa Alhadi, Elvia Zahara, Titi Andriani	The Effect of Customer Orientation and Service Quality on Trust and Customer Loyalty	Polsri
1490	14.04 – 14.12	Fetty maretha, yulia pebrianti, rini rini, lisnini	Model of Empowerment as Strategies for Women SMEs Entrepreneurs Competitiveness in Palembang	Polsri
1532	14.12 – 14.20	Koesharijadi, Hardiyansyah and Muhamad Akbar	E-Government Policy, Leadership Commitment, Apparatus Resources Development, And Their Implications On Public Service Performance	Universitas Bina Darma
1537	14.20 – 14.28	Evada Dewata, Yuli Antina Aryani, Yuliana Sari, Aladin	Industrial Clasterization To Improve The Competitiveness Of Small And Medium Industries In The City Of Palembang	Polsri
1542	14.28 – 14.36	Sopian.A.R, Periansya, Ardiyan Natoen, Indra Satriawan	The Influence Of Competence, Leadership, Motivation Work Impact On The Commitment Of Civil State Apparatus In The Office Of The Governor South Sumatera Province	Polsri



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1549	14.36 – 14.44	Lupikawaty, Alhamdari, Bustan	Analysis Method Economic Value Added (EVA) of Cosmetics Companies Listed on the Stock Exchange Period 2013-2017	Polsri
1620	14.44 – 14.52	Anggeraini Oktarida, Eka Jumarni Fithri, Lambok Vera Riama, Sri Hartati	<b>Determinants The Quality Regional Financial Statement</b>	Polsri
1538	14.52– 15.00	Susi Ardiani, Sarikadarwati, Henny Yulsiati, Sandrayati	The Effect Of Hospital Image And Service Quality On Customer Loyalty Through Customer Satisfaction As Intervening Variables In Siti Khadijah Hospital In Palembang City	Polsri
1561	15.00 – 15.08	Yevi Dwitayanti, Maria Maria, Nurhasanah Nurhasanah, Rosy Armaini	The Impact Of Village Fund Program Implementation Towards Society Welfare In Indonesia	Polsri
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1712	15.24 – 15.32	Elisa, Marieska Lupikawaty, Yusleli Herawati, Purwati	Evaluation of Sales Price within Calculation Cost of Good Production SMEs Pempek Ilir Barat I and Bukit Kecil District Palembang	Polsri
1686	15.32 – 15.40	M. Husni Mubarak, Faridah, Nelly Masnila	The Effect Of Taxpayer Awareness And Tax Sanctions On Compliance In Paying Land And Building Taxes In Bukit Kecil Sub-District Of Palembang	Polsri
1644	15.40– 15.48	M. Yusuf, Yusnizal Firdaus, Markoni Badri, AlHusori	The Environmental Compliance Management Of Palm Oil Plantation In Ogran Komering Ilir Regency, Sumatera Selatan, Indonesia	Polsri



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Theme : TRACK 3 (Management Economics, Business Administration, Accounting)  
Room : ROOM 8 (Diamante 2, Ball Room, M Floor)  
Moderator : **Dr. Welly / Heri Setiawan, MM**  
Time : 13.00 – 15.56 WIB  
Articles : 21

ID	Time	Authors	Title	Affiliation
1436	13.00 – 13.08	Nurul Aryanti, Welly Ardiansyah, Murwani Ujihanti	Attitude, Motivation, and Parental Involvement towards Students' Reading Comprehension Achievement	Polsri
1457	13.08 – 13.16	Irmeilyana Irmeilyana, Ali Amran	Relationship between GPA, Length of Study, and Competence with The Length of Time to Get A Job at Alumni of The Mathematics and Natural Sciences, University of Sriwijaya	Universitas Sriwijaya
1509	13.16 – 13.24	Wustari L. Mangundjaya	Testing the Role of Charismatic Leadership, Psychological Climate, and OCB on Resilience	Universitas Indonesia
1512	13.24 – 13.32	Hermina Agustina Mahendrati, Wustari Mangundjaya	Individual Readiness For Change and Affective Commitment To Change: The Mediation Effect Of Technology Readiness On Public Sector	Universitas Indonesia
1515	13.32 – 13.40	Dwi Andriani Puspitasari, Wustari L Mangundjaya	Leader-Member Exchange and Affective Commitment to Change: Mediating Role of Change Self-Efficacy	Universitas Indonesia
1516	13.40 – 13.48	Susilo, Wustari L. Mangundjaya <sup>2</sup>	Testing Mediation of Psychological Empowerment, Work Engagement to Affective Commitment to Change	Universitas Indonesia
1547	13.48 – 13.56	Suroso, Wasitoh Meirani, Muhammad Erwin, Ayu Puspasari	Aim, Concept, and Objectives of Education in Islam	Polsri
1550	13.56 – 14.04	Yurnalis, Wustari Mangundjaya	Testing the Impacts of Organizational Justice on Affective Commitment to Change with Work Engagement as Mediator	Universitas Indonesia
1559	14.04 – 14.12	Eliyeny, Herman, Sunani, Muhammad Nadjmuddin	The Effect Of Directed Reading - Thinking Activity On Students' Critical Thinking Abilities	Polsri
1563	14.12 – 14.20	Darmaliana, Risnawati, Risa, Sri Endah Kusmartini	The Development Of Teaching Material Speaking 2 Based On Communicative Approach For Students In English Department Of Sriwijaya Palembang State Politechnic	Polsri
1575	14.20 – 14.28	Heri Setiawan, Taufiq Marwa, Zakaria Wahab, Muchsin Sagaf	Exploring Linkage among Experiential Value, Destination Image and Revisit Intention in Natural-based Tourism	Polsri
1589	14.28 – 14.36	Munaja Rahma, Zakaria, Moehammad Ridhwan	Students' Perception of English Blended Learning in State Polytechnic of Sriwijaya	Polsri
1612	14.36 – 14.44	Pridson Mandiangan, Desloehal Djumrianti, Hanifati	Online Transportation Technology and Women's Driver Communication Skills	Polsri



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1618	14.44 – 14.52	Zulkifli zulkifli, nian evawati, koryati koryati	The Importance Of The Language Experience Approach (Lea) In Teaching Reading Comprehension To The Third Semester Of Engineering Students In State Polytechnic Of Sriwijaya	Polsri
1631	14.52– 15.00	Paisal Paisal, Afrizawati Afrizawati, Divianto Divianto, Yahya	The Effect Of Organization Climate On Performance With Job Satisfaction As An Intervening Variable	Polsri
1652	15.00 – 15.08	Suryati, Ahmad Sanmorino	The clustering of paddy fields in the province of South Sumatera as an input for the government in determining policy	UIGM
	15.08 – 15.16	<b>BREAK</b>		
1671	15.16 – 15.24	Deri Darfin, Zulkarnaini, Ridwan Effendi, Robinson,	The Public Service Quality Of The Library Services At The Library Unit Of State Polytechnic Of Sriwijaya	Polsri
1714	15.24 – 15.32	Sri Gustiani, Yusri, Tiur Simanjuntak, Evi Agustinasari	The Effectiveness of Blended Learning Approach on Essay Writing Subject	Polsri
1717	15.32 – 15.40	Hadi Winarko, Zaliah, Aimi	Analysis of Student Services at State Polytechnic of Sriwijaya	Polsri
1467	15.40 – 15.48	Setiawan, Hamid, Bustan, Ummasyroh	The Effect of Culinary Knowledge and Culinary Experience on Local Culinary Attractiveness	Polsri
1693	15.48 – 16.56	Muhamad Erwin, Carlos RS, Irawan Rusnadi, Ahmad Zamheri, Dicky Seprianto, Alan Novi Tompunu, Meiya Darlies	Criminal Law Policy in the Crime of Persecution carried out by People who Come from Outside Orang Rimba Group Against Members of Orang Rimba Tribe Around the Bukit Duabelas National Park, Jambi Province, Indonesia	Polsri



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Theme : TRACK 1 (Engineering and Science)  
Room : ROOM 12 (Diamante 6, Ball Room, M Floor)  
Moderator : HettyMeileni, S.Kom, M.TI/ Alan Novi Tompunu, S.T., M.T.  
Time : 13.00-14.36 WIB  
Articles : 12

1557	13.00 – 13.08	Hetty Meileni, Cindy Indah Pratiwi, Ienda Meiriska, and Desi Apriyanty	Information System Of Small And Medium Business In Palembang City	Polsri
1560	13.08 – 13.16	Hetty Meileni, Diky Juniansyah Putra, Desi Apriyanti, Indra Satriadi	Inventory Of Goods Data Processing Using The Economic Order Quantity (Eoq) Method	Polsri
1362	13.16 – 13.24	Emilia Hesti, Sholihin, Adewasti, Sarjana	Internet Of Thing For The Robot Comando Commandation System	Polsri
1439	13.24 – 13.32	Idha Silviyati, Nyayu Zubaidah, Jaksen M.Amin, Endang Supraptiah, Rizka Dwi Utami, Iqbal Ramadhan	The Effect Of Addition Of High Density Poly Ethylene (HDPE) As Binder On Hebel Light Brick (CELCON)	Polsri
1640	13.32 – 13.40	Ibnu Ziad, Ali Nudin, Jon Endri, Ciksadan	Implementation Of Fingerprint Control In Majors Electrical Engineering Using Arduino	Polsri
1672	13.40 – 13.48	Erlinawati, A. Zikri, Sutini PL., Agus M., Fathona S.	Biodiesel Production from Bintaro (Cerbera Manghas L) Seeds with Potassium Hydroxide as Catalyst	Polsri
1677	13.48 – 13.56	Djaka Suhirkam, B Hodayat Fuady, Lina Flaviana, Suhadi	The Copper Fiber On Compressive Strength And Elastic Modulus On Concrete FC'25	Polsri
1679	13.56 – 14.04	Irawan Hadi, Abdul Rakhman, Nasron, Martinus Mujur Rose	Information System Feature Development of Telecommunications Engineering Study Program to Support the New Accreditation and the New Curriculum System	Polsri
1696	14.04 – 14.12	Didi Suryana, Almadora Anwar Sani, Azharuddin Azharuddin, Safei Safei, Indra HB	Grip Tool Cnc Mill 3A To Get 12 Sides Of The Elbow On Results Induction Electrical Furnance Casting	Polsri
1698	14.12 – 14.20	Slamet Widodo, M.Miftakhul Amin, Adi Sutrisman, Ervi Cofriyanti, Maulani Puji R	Implementation of Parking Portal Door Security System Using RFID and Password Based on Microcontrollers in Sriwijaya State Polytechnic	Polsri
1798	14.20 – 14.28	Sairul Effendi, Firdaus, Karmin, Romli, Ozkar F. Homzah <sup>1</sup>	Effects of Carburizing Processes on Nodular Cast Iron with Variations in Temperature, Time and Cooling System	Polsri
1799	14.28 – 14.36	Alan Novi Tompunu, Yulian Mirza, and Azwardi	Room Door Security System Using Microcontroller-Based E-KTP	Polsri





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PAPER • OPEN ACCESS

## Effect of Drying Airflow Rate on H<sub>2</sub>O Mass Evaporated on Banana Chips Drying using Photovoltaic Solar Panel

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# Effect of Drying Airflow Rate on H<sub>2</sub>O Mass Evaporated on Banana Chips Drying using Photovoltaic Solar Panel

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**Abstract.** Solar energy is one source of heat energy that can be utilized with photovoltaic technology using solar panels. One application process that can be used is drying. The dryer uses a heating air media that is produced through the process of converting solar heat absorbed by solar panels. The process of drying bananas is done using variations in the rate of air flow of the dryer entering through the pipe integrated with the fan so that it is expected to be able to speed up the drying time. In this study, the air velocity varied to get the maximum moisture content, and H<sub>2</sub>O mass evaporated on banana chips. Based on the test results, with a drying time of 3 hours using a maximum airflow rate of 6.090 L/s and a temperature of 39.91 °C, moisture content of 65.30% was obtained with a mass of H<sub>2</sub>O evaporating as much as 208 grams.

**Keyword:** drying, flowrate, photovoltaic, solar cell

## 1. Introduction

Indonesia is a country that is rich in energy resources, both energy that is nonrenewable resources and those that are renewable resources. However, the exploration of energy resources is more focused on fossil energy that is nonrenewable resources, while renewable energy is relatively underutilized [1-3].

One of the uses of energy in South Sumatra, especially for food products, is to use solar heat. Solar heat is usually used in the drying process. According to Rachmawan, the drying process aims to reduce the water content contained in foodstuffs, reduce water activity in the foodstuffs and inhibit microbial activity in them to increase product durability, and for specific economic purposes such as reducing weights, increasing flavor product, as well as others [3,4].

Based on observations in the Mengulak Village of East OKU Regency, South Sumatra, drying of bananas is still using the traditional method of placing bananas on bamboo arranged like curtains and fumigating at the bottom and can also be done by direct drying in the sun. If it uses the sun's heat directly, it will be constrained by the weather, and you need a large place to dry. When it rains, the drying process is hampered which can trigger microbial growth, causing the banana to rot, besides



direct sun drying can cause the resulting product to be less hygienic due to insects alighting, dust and dirt particles carried by air and the need to flip through bananas continuously to dry evenly.

Solar power dryer is one form of solar energy usage. Until now, there are two kinds of technology that have been applied, namely thermal solar energy technology and photovoltaic solar energy technology [5-9].

Furthermore, researchers will develop a dryer using solar heat considering that Indonesia is always exposed to the sun every year so that it can be used as an alternative for employers to facilitate the work in terms of drying and improving the quality of the products produced. From previous studies conducted the utilization of a heat absorbent plate concentrator in drying with a good efficiency level of 70% but this type of collector relies heavily on the intensity of the sun for the drying process [10]. Subsequent research has made a dryer with steel material, but the tool has a substantial heat loss of up to 50% [11]. Subsequent research uses thermal and photovoltaic collectors but also has the disadvantage of a large heat loss from solar collectors so that much energy is not utilized [12]. The renewal made is by using photovoltaic energy, adding a heater to the inside of the drying chamber so that the product dries faster and reducing heat losses that occur, adding a motor to the rack so that the dried product gets heat evenly, and using the Thermal Backup Unit as a source reserve heat to dry the product if the sun is not scorching so that the drying process can run continuously. From the results of the design of the dryer, researchers expect that the solar dryer can dry banana chips products quickly and hygienically [12].

## 2. Methods and Materials

The prototype of this dryer uses 2 photovoltaic solar modules with a capacity of 100 Wp in order to produce enough power for the drying process, and when the solar module is exposed to the sun for more than 4 hours, the remaining power can be stored in batteries.

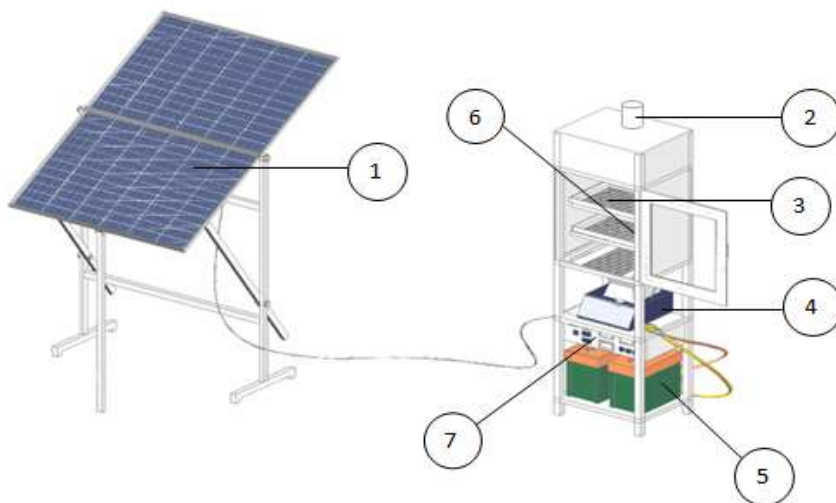
Drying chamber or oven is the place of the drying process. In this study, the drying chamber is made measuring 49.5 cm x 39.5 cm x 70.5 cm from stainless steel with several shelves as much as 2 levels directly connected to the motor, to move the rack with a certain slope so that the drying process on the product is more evenly distributed. The selection of stainless steel is made because stainless steel has resistance to rust and corrosion.

In this study the research variables used consisted of the mass of raw material, temperature and humidity with a fixed variable are the mass of material to be dried, and the variable is not fixed in the form of time. Weight measurements are carried out using a scale, and the air flow rate is measured using an anemometer. Inlet temperature, drying chamber temperature, outlet temperature, and humidity are measured through thermocouples and sensors whose readings can be seen on the control panel.

**Table 1. Specification of Dryers with Photovoltaic Solar Panels**

Material	Specification
Energy Sources	Solar Panels and LPG Gas Stoves
Heat Sources	Blower Heater and Iron Heating Pipes
Solar Panel Dimension	Dimension : 2000 x 1000 mm Capacity : 100 Wp Quantity : 2 pcs
Dryer Rooms	Dimension : 495 x 395 x 705 mm Shape : Rak Bersusun 2

	Capacity : 0.6 kg
Shelf	Dimension : 295 x 360 mm
Electric Motors	Capacity : 5 W
<i>Blower Heater</i>	Quantity : 6 buah
	Capacity : 100 W
Battery	Battery 70 AH
Inverter	Capacity : 1200 Watt
<i>Fan</i>	Capacity : 1,68 Watt Dimension : 2 inchi
Stoves Fuel Sources	LPG 3 kg
Thermocouples	Type "K"
Cable	Ø 0.75 mm



Keterangan:

1. Solar Panel
4. Battery
7. Control Panel

2. Stakes
5. Gas Stoves

3. Drying Racks
6. Rotating Motors

**Figure 1.** Design of photovoltaic solar panel dryers

### 3. Result and Discussion

In this research, a prototype of a tray or rack type banana chips dryer has been made. This tool consists of photovoltaic solar panels that are used to capture solar heat and convert it into electrical energy to be able to supply the needed power to the dryer so that it does not use a power source from PLN but instead uses a source of solar energy stored in batteries.

The heating system in the dryer uses environmental air that enters with a certain flow rate by controlling the speed control integrated with the fan through a 2-inch diameter pipe, then the air enters

the drying chamber and is immediately heated by the heater. The size of the oven used is 49.5 x 39.5 x 70.5 cm with a drying room temperature ranging from 40°C. Drying racks are made in two layers and motors are added so that the drying racks can swing so that it is expected that heat transfer in the air can spread to all parts of the material surface.

The process of drying bananas aims to reduce the water content of bananas to reach a maximum limit of 40% based on SNI standards. The weight of the dried banana dried in this study was 600 grams with the process variable being studied in the form of a variable that changes the speed of the drying air. The results of the research data are used to determine the mechanism of drying air velocity to the amount of H<sub>2</sub>O evaporated on bananas, so an analysis of the decrease in water content in bananas is needed.

**Tabel 2. Research and Calculation Data**

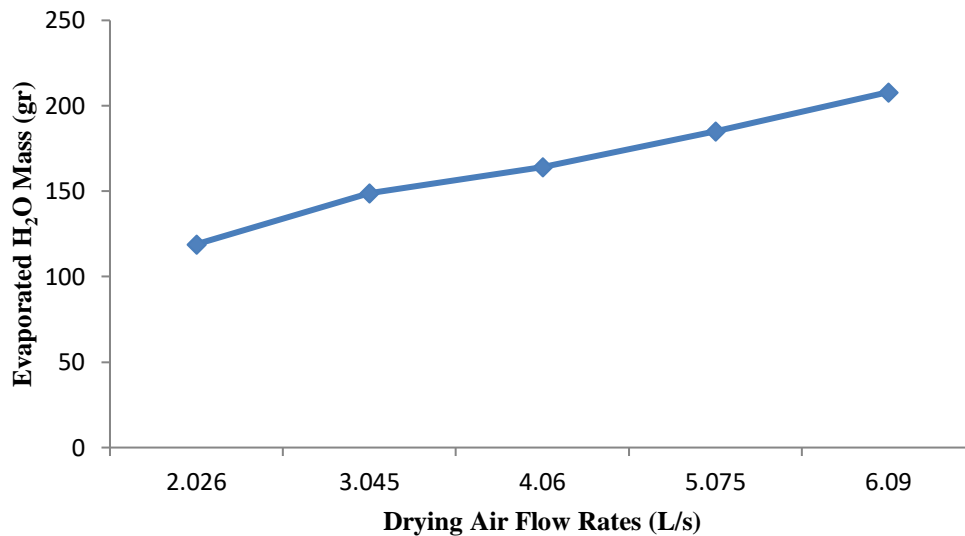
Air Flowrate (L/s)	Air Temperature (°C)		Relative Humidity (%)		Evaporated H <sub>2</sub> O Mass (gr)
	In	Out	In	Out	
2.026	35.7	38.7	46	71	119
3.045	35.6	39.2	41	60	149
4.060	34.2	37.5	52	67	164
5.075	33.8	36.6	58	72	185
6.090	33.6	36.9	55	67	208

### 3.1 Effect of drying air flow rate on the evaporated H<sub>2</sub>O

Drying of a solid is the separation of a small amount of water or a liquid from a solid material, thereby reducing the remaining liquid content in the solid to the lowest acceptable value inhibiting the development of spoilage organisms [13]. If a wet solid substance is contacted with air whose humidity is lower than the moisture content of the solid substance, then the solid substance will release some of its wetness and dry until it is balanced with the air.

In the process of drying, an ingredient, water content is very important because it affects the duration of drying, the course of the drying process and changes that occur in a material.

After conducting research drying banana chips with drying room temperature around 40 ° C and air drying speed of 2.026 L/s; 3.045 L/s; 4.060 L/s; 5.075 L/s; and 6.090 L/s, the pattern of water content reduction can be seen as shown in Figure 2.



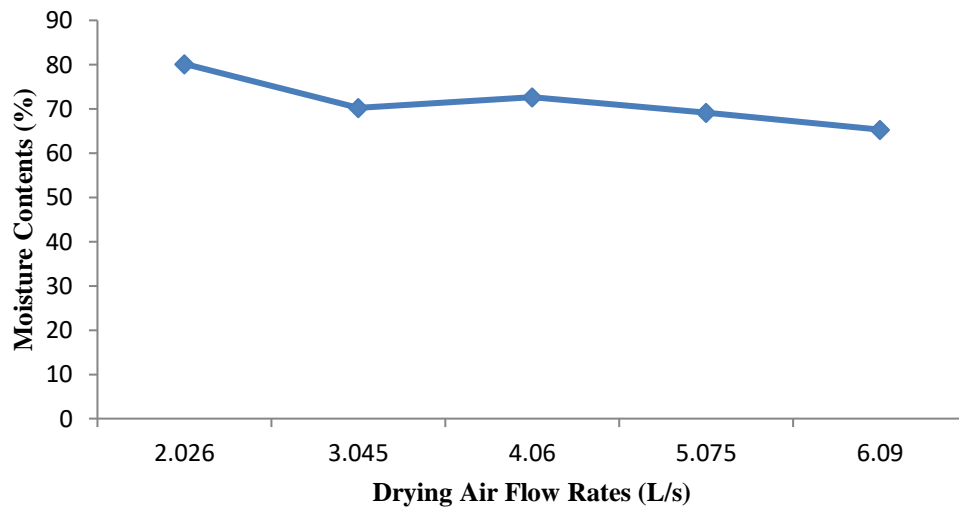
**Figure 2.** Graphs of Drying Air Discharge on Evaporated H<sub>2</sub>O

In Figure 2, a water pattern curve is evaporated from a thin slice of plantain with a thickness of  $\pm 0.5$  cm. From this curve, it appears that the process of releasing water vapor in the material can be influenced by the drying air velocity, which is where the greater the drying air velocity, the greater the mass of water in the material that can be evaporated. This is consistent with the statement who said the higher the drying air flow rate, the drying process will run faster [14]. Similar to the statement which states that the greater the volume of air flow, the greater the ability to carry and hold water from the surface of the material and the drying process will be faster [15].

From the results of this study note that with the same drying time of 3 hours will evaporate more water at a drying air speed of 6.090 L/s which is 208 grams, while for the smallest mass of water that evaporates at 119 grams with a drying air speed of 2.026 L/s.

### 3.2 Effect of Moisture Content on The Drying Air Flow Rate

Water content is one of the physical properties of the material that shows the amount of water contained in a material. Figure 3 shows the effect of drying air velocity on the water content in bananas, which tends to decrease due to the H<sub>2</sub>O levels that are evaporated also increasing with increasing drying air velocity. This indicates that the water content in a material tends to decrease and will experience a constant weight when the drying time increases or reaches a state of equilibrium. However, researchers can only take variations of data for only 3 hours with a drying temperature of around 40°C with different drying airflow rate due to the ability of the tool and a relatively short period.

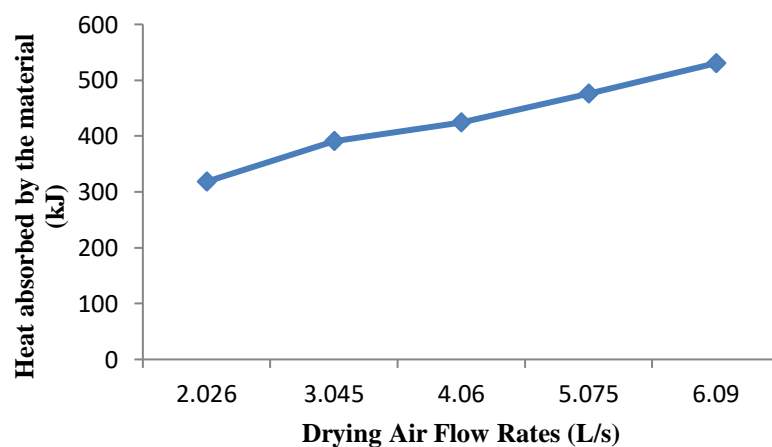


**Figure 3.** Graph of Drying Air Discharge on Moisture Content (%)

Based on observations made, the highest water content of 80.17% occurred at an air velocity of 2.026 L/s while the lowest water content occurred at 65.30% at a speed of 6.090 L/s. However, based on the Indonesian National Standard of banana chips, the maximum water content permitted is 40%. This indicates that the banana products produced have not reached SNI standards. This is influenced by several factors, including drying room temperature and drying time. According to another research, the temperature used for drying is 60-80°C with drying time between 6-16 hours [16]. The use of drying temperature that is too low results in a long drying process time, while if the temperature is too high, the texture of the material will be unfavorable. The use of temperature in the dryer is only around 40-45 °C and drying time is only for 3 hours to make the evaporated mass in bananas only a little which causes the reduced water content only slightly reduced [17].

### 3.3 Effects of Drying Air Flow Rates on $H_2O$ Evaporation Heat

From the data variations in the speed or discharge of drying air obtained heat absorbed by different materials, as shown in Figure 4.



**Figure 4.** Graphic Relationship of Dryer Air Flow Rates to Heat Absorbed by Material



The heat absorbed by the material is obtained from the amount of heat evaporation  $H_2O$  produced and sensible heat in the material. By looking at the graph in Figure 4, it is found that with increasing speed or discharge of drying air, the heat absorbed will be even greater. When the drying air temperature increases, hot air will blow through the entire surface of the material. Due to the temperature difference where the temperature of the drying air is higher than the temperature in the material, so there is a process of heat transfer into the material. This transfer causes a mass transfer of water ( $H_2O$ ) that is in the material to the surface and evaporates into the air. This shows that the greater the speed or discharge of drying air, the ability to evaporate water ( $H_2O$ ) will increase, this is caused by evaporation that occurs due to differences in water vapor pressure in the material and water vapor in the air. When the heat absorbed by the material is getting bigger, then the large energy will make water molecules in the material move faster to the surface of the material. The water contained on the surface of the material is then vaporized into the drying air which has a low moisture value so that the forgotten amount of water will continue to increase and the water content of the material will shrink with increasing drying time.

Based on Figure 4, when banana chips absorb smaller heat which is equal to 318.217 kJ with a velocity or air discharge of 2.026 L/s, the amount of water ( $H_2O$ ) that is evaporated will get smaller at 119 grams. Vice versa, when the banana chips absorb the heat of 530.512 kJ when the maximum air flow rate of 6.090 L/s, the amount of water ( $H_2O$ ) that is evaporated will also be greater, namely 208 grams.

#### 4. Conclusions

Dryers using photovoltaic solar panels are more efficient than manual drying. The rate of the drying air affects the mass of the  $H_2O$  being evaporated. When banana chips absorb smaller heat, amounting to 318.217 kJ with a velocity or air discharge of 2.026 L/s, the amount of water ( $H_2O$ ) that evaporates will get smaller at 119 grams. Vice versa, when the banana chips absorb 530.512 kJ of heat when the maximum air flow rate of 6.090 L/s, the amount of water ( $H_2O$ ) that will also be evaporated will be greater that is 208 grams and the maximum water content of banana chips that evaporates based on the drying process is 65.30%

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# CERTIFICATE OF APPRECIATION

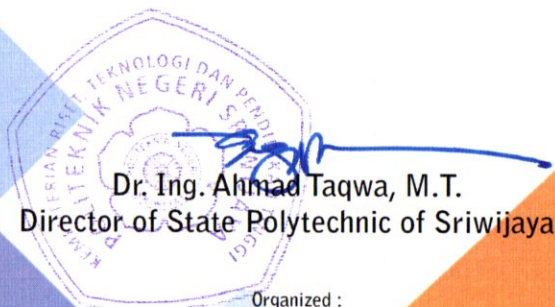
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