



"A brighter future with tropical innovation In the application of industry 4.0"

International Conference on Mathematics and Science (ICMSc) 2021 Faculty of Mathematics and Natural Science Mulawarman University

Abstract Book

The 3rd International Conference on Mathematics and Sciences ICMSc 2021

"A Brighter Future with Tropical Innovation in the Application of Industry 4.0"

Faculty of Mathematics and Natural Sciences, Mulawarman University Jl. Barong Tongkok No. 4, Gunung Kelua, Samarinda, East Borneo, Indonesia, 75123

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Chairman: Yanti Puspitasari



Contents



Foreword from the Dean of Faculty of Mathematics and Natural Sciences, Mulawarman University



Assalamu'alaikum wr. wb.

First of all, let us praise and thank the Almighty God, because his blessings and helpings, we are able to gather here to attend this conference.

It is a great pleasure to welcome you all to the 3rd International Conference on Mathematics and Sciences (ICMSc 2021) with a theme "A Brighter Future with Tropical Innovation in the Application of Industry 4.0". I am delighted to see that the Faculty of Mathematics and Natural Sciences Mulawarman University has again organized the third international conference that capitalize on our strength and built on our commitment to promoting the researches on mathematics, statistics, physics, geophysics, chemistry, and biology, as well as their applications.

Unlike the previous two seminars, ICMSc 2021 is conducted using a hybrid method, by combining online and offline seminars. This is due to the COVID-19 pandemic which has impacted our lives, including in education and research. As researchers, lecturers and students, we do face many challenges in this pandemic condition and we find it difficult to carry out research in the laboratory due to limited access and the application of very strict health protocols.

I am very happy and proud of all the keynote speakers, invited speakers and oral presenters who remain enthusiastic in carrying out research in the midst of this pandemic and presenting their research results in this seminar.

The conference proudly invites five keynote speakers coming from several countries. Therefore, on behalf of the committee, I would like to express my sincere thanks to them, specifically: Prof. Rizalman Mamat from University Malaysia Pahang; Prof. Bao Weizhu from National University of Singapore; Prof. Thomas Pohlmann from Universität Hamburg, Germany; Assoc. Prof. Dr. Eng. Muhammad Azis, University of Tokyo, and Worata Klinsawat, PhD from KMUTT, Thailand who have high reputation and commitment in their field.

I would also like to thank all invited speakers from different universities in Indonesia, Prof. Dr. Nurdin, S.Si., M.Si, Bagus Sartono, M.Si, PhD, Dr. Handika Dany Rahmayanti, M.Si, Aswi, M.Si., Ph.D, Dr. Muh. Alimuddin Hamzah Assagaf, M. Eng, Dr. Noor Hindryawati, M.Si, Dr. Soerja Koesnarpadi, M.Si, Rudy Agung Nugroho, M.Si, Ph.D, and Dr. RR Dirgarini J N Subagyono, MSc.

Furthermore, I would like to take this opportunity to thank the conference organizing committee who have shown great hard work and determination for this conference. They have all worked since the beginning of 2020 from the planning stage to the implementation stage in the middle of their busy lives as lecturers, laboratory assistants and administrative staff.

I would also like to thank participants, especially those of you coming from abroad, for joining us and sharing your valuable experiences. I do hope that this conference would bring a great



opportunity for all of us to share research experience and knowledge and this conference will give significant contribution to the advancement of our nation.

On this occasion, I would like to apologize to all of you when there are some inconveniences during the conference.

Finally, for all the speakers and participants listed in the 3rd ICMSC 2021, have a nice conference and I do hope we can all meet again in the 4th ICMSc in 2022.

Wassalamu'alaikum wr. wb.

Best Regards,

Dr. Eng. Idris Mandang, M.Si Dean of Faculty of Mathematics and Natural Sciences Mulawarman University



Foreword from the Chairman of Organizing Committee

Assalamu'alaikum wr. wb.



Dear participants,

The 3rd International Conference on Mathematics and Sciences (ICMSc 2021) is an international hybrid conference organized by Faculty of Mathematics and Natural Sciences, Mulawarman University (UNMUL), Samarinda, East Kalimantan, Indonesia. ICMSC 2021 with a theme "A Brighter Future with Tropical Innovation in the Application of Industry 4.0" will cover all key areas in mathematics, statistics, physics, geophysics, chemistry, and biology and the applications.

Previously, two ICMSC series were conducted offline where we could meet face-to-face and exchange information and experiences. In this third ICMSc, the conference is held with a hybrid method due to COVID-19 pandemic where most of us can only meet online. However, I believe that these limitations do not prevent us from sharing experiences, research results and information.

I am very pleased that we have renowned keynote speakers, Prof. Rizalman Mamat from University Malaysia Pahang; Prof. Bao Weizhu from National University of Singapore; Prof. Thomas Pohlmann from Universität Hamburg, Germany; Assoc. Prof. Dr. Eng. Muhammad Azis, University of Tokyo, and Worata Klinsawat, PhD from KMUTT. In this year conference, we also invite Prof. Dr. Nurdin, S.Si., M.Si, Bagus Sartono, M.Si, PhD, Dr. Handika Dany Rahmayanti, M.Si, Aswi, M.Si., Ph.D, Dr. Muh. Alimuddin Hamzah Assagaf, M. Eng, Dr. Noor Hindryawati, M.Si, Dr. Soerja Koesnarpadi, M.Si, Rudy Agung Nugroho, M.Si, Ph.D, and Dr. RR Dirgarini J N Subagyono, MSc from different universities in Indonesia. It is an honor and privilege to have them as speakers as I strongly believe that their contribution would be beneficial to the people working in this field.

For ICMSc 2021, we received 88 abstracts and there are 73 accepted abstract for 71 oral presentations and 2 poster presentations. All accepted articles will be published in a proceeding published by The American Institute of Physics (AIP) Publishing.

I would like to thank all the committee and students involved in this seminar. Thank you for the great teamwork and your time. I would also like to greatly thank PT Badak NGL for financial supports.

On behalf of the organizing committee, I would like to welcome all of speakers and participants. Please enjoy the conference.

Best regards,

Dr. Yanti Puspitasari Chair of Organizing Committee



Committee

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Mirna, SE. Iin Yunarti, S.Pd

Gatot Afriyanto, S.Sos Muhammad Nurul Huda, S.Si., M.Si Rudianto, S.Si Erlinda Ratnasari Putri, S.Si., M.Si Fedy Harlanto, S.Si Ruli Yuniarto, S.Si M. Rasyid Rahman, S.Stat Arif Sopian Wasdub Dr. Hetty Manurung, M.Si Eko Kusumawati, S.Si., M.P Qonita Qurrota A'yun, S.Si., M.Sc Mukhlis, S.Pd., M.Sc La Jahaja, SE Triyono Widadi, A.Md Ahmad Zarkasi, S.Si., M.Si Dr. Rahmat Gunawan, M.Si Dijan Sunar Rukmi, S.Si., M.Si Riski Indah Wiyani, S.Si



Venue



Science Learning Center Faculty of Mathematics and Natural Sciences, Mulawarman University

Jl. Barong Tongkok No. 04 Mulawarman University Campus, Mount Kelua Samarinda East Kalimantan, Indonesia 75123



Conference Schedule

Day 1: 12 October 2021

Time – Central Indonesia Time (WITA)	Agenda	Room/Zoom details
08.00 - 09.00	Registration	
	Conference regulation (MC)	Theater Room SIC (Offline)
09.00-09.45	Opening Ceremony:	Theater Room, She (online)
	1. Greeting by Master of Ceremony	Zoom virtual room (Online)
	(Robiansyah & Qonita Qurrota A'yun, S.Si., M.Sc.)	Topic: First session of The 3rd ICMSc, 12 Oct 2021
	 Indonesian National Anthem: Indonesia Raya Traditional dancing by Art Student Creativity Unit, Faculty of Mathematics and Natural Science, Mulawarman University Opening remarks: Chairman (Dr. Yanti Puspitasari, M.Si) Dean of Faculty of Mathematics and Natural Sciences (Dr.Eng. Idris Mandang, M.Si) Rector of Mulawarman University (Prof. Dr. H. Masjaya, M.Si) Chanting prayers (Irfan Ashari Hiyahara, M.Si) 	Join Zoom Meeting https://bit.ly/ICMSc2021-Day1-Session1 Meeting ID: 931 9785 2746 Passcode: ICMSc01
09.45 - 10.00	Break – Interactive Quiz	www.menti.com
10.00-11.00	Plenary Session 1	Theater Room, SLC (Offline)
(10.00-11.00 MYT)	Keynote Speaker 1:	
	Prof. Rizalman Mamat, University Malaysia Pahang	Zoom virtual room (Online)
	Mederator	Topic: First session of The 3rd ICMSc, 12 Oct 2021
	Dr. Noor Hindryawati, M.Si	Join Zoom Meeting https://bit.ly/ICMSc2021-Day1-Session1
	nanuover of certificates to keyhote speakers	



Time – Central Indonesia Time (WITA)	Agenda			Room/Zoor	n details
11.00-12.00	Plenary Session 1			Meeting ID: 932	l 9785 2746
(11.00-12.00 SGT)	Keynote Speaker 2:			Passcode: I	CMSc01
	Prof. Bao Weizhu, Nation	al University of Singapore			
	Modorator:				
	Prof Dr Nurdin S Si M S	Si			
	Handover of certificates t	o keynote speakers			
12.00 - 12.05	Plenary and parallel sess	ion sharing information by	v MC		
12.00 - 13.30	BREAK			SLC (Off	line)
13.30 - 14.30	Plenary Session 1			Theatre Room,	SLC (Offline)
(07.30-08.30 CEST)	Keynote Speaker 3:				
	Prof. Thomas Pohlmann, Universität Hamburg, Germany			Zoom virtual room (Online)	
	Mederator			Topic: Second session of The	e 3rd ICMSC, 12 Oct 2021
	Dr Mustaid M Si			Ioin Zoom	Meeting
				https://bit.ly/ICMSc20	<u>)21-Dav1-Session2</u>
	Handover of certificates t	o keynote speakers			
				Meeting ID: 980	0072 8064
				Passcode: ICMSC02	
14.30-16.30			Parallel Session		
	Room 1 Mathematics	Room 2	Room 3	Room 4	Room 5
	SIC (Offling) Zoom	Statistics	SIC (Offling) 700	SLC (Offling) Zoom	SIC (Offling) Zoom
	virtual room (Online)	virtual room (Online)		yirtual room (Online)	virtual room (Online)
	virtual room (onnie)	virtuar room (omme) virtuar room (omme			virtuar room (omne)
	Moderator:	Moderator:	Moderator:	Moderator:	Moderator:
	Fidia Deny Tisna, M.Si	Meiliyani Siringoringo, M.Si	Irfan Ashari Hiyahara, M	Si Dr. Rahmawati, M.Si	Dr. Dijan Sunar Rukmi, M.Si
			_		
	Invited Speaker:	Invited Speaker:	Invited Speaker:	Invited Speaker:	Invited Speaker:
	Prof. Dr. Nurdin, S.Si., M.Si	Bagus Sartono, M.Si, PhD	Dr. Noor Hindryawati, M	Si Dr. Muh. Alimuddin Hamzah	Rudy Agung Nugroho,
	(14.30-14.50)	(14.30-14.50)	(14.30-14.50)	Assagat, M. Eng	M.SI, Ph.D



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Time – Central Indonesia Time (WITA)	Agenda			Room/Zoon	n details
				(14.30-14.50)	(14.30-14.50)
	Operator: Fedy Harlanto, S.Si	Operator: Ruli Yuniarto, S.Si	Operator: M. Fakhrurrozy, S.Ko	Operator: om M. Rasyid Rahman, S.Si	Operator: Rudianto, S.Si
19.00 - 21.00	Gala dinner			Midtown Hotel,	Samarinda



Day 2: 13 October 2021

Time – Central Indonesia Time (WITA)	Agenda	Room/Zoom details
08.00 - 08.55	Registration	
	Conference regulation (MC)	
08.55-09.00	Opening by MC	
09.00-10.00	Plenary Session 2	
(10.00-11.00 JST)	Keynote Speaker 1:	Theatre Room, SLC (Offline)
	Assoc. Prof. Dr. Eng. Muhammad Azis, University of Tokyo	
		Zoom virtual room (Online)
	Moderator:	Topic: First session of The 3rd ICMSc
	Dr. RR Dirgarini Julia Nurlianti S., MSc	13 Oct 2021
	Handover of certificates to keynote speakers	Join Zoom Meeting
10.00-11.00	Plenary Session 2	https://bit.ly/ICMSc2021-Day2-Session1
(09.00-10.00 ICT)	Keynote Speaker 2:	
	Worata Klinsawat, PhD, KMUTT, Thailand	Meeting ID: 949 0912 6864
		Passcode: ICMSC03
	Moderator:	
	Rudy Agung Nugroho, PhD	Interactive Quiz
		www.menti.com (the code will be informed
	Handover of certificates to keynote speakers	prior to the Quiz)
11.00 - 11.15	Break – Interactive Quiz	-
11.15 - 11.45	Information session	
	Publication in AIP Publishing	
	(Dr. Rudy Agung Nugroho, M.Si)	4
11.45 - 12.00	Parallel session sharing information by MC	
	(Information on the best presenters)	
12.00 - 13.30	BREAK	SLC (Offline)



Time – Central Indonesia Time (WITA)		Agenda	Room	/Zoom details			
13.30-15.15	Parallel Session						
		,	Theatre Room, SLC (Offline)			
	Zoom virtual room (Online) Topic: Second session of The 3rd ICMSc, Oct 13th 2021						
			Ioin Zoom Meeting				
		<u>https:/</u>	/bit.ly/ICMSc2021-Day2-S	ession2			
			Meeting ID: 916 4639 1087	7			
	Deem 1	Deem 2	Passcode: ICMSC04	Deem 4	Deem F		
	K00M 1 Mathematics/	KOOM Z	ROOM 3 Chomistry	K00m 4 Dhysics and	K00M 5 Statistics 2		
	Statistics	SI C (Offline)	SI C (Offline)	Ceonhysics	Statistics 2		
	SLC (Offline)	Zoom virtual room	Zoom virtual room	SLC (Offline)	Zoom virtual room		
	Zoom virtual room	(Online)	(Online)	Zoom virtual room	(Online)		
	(Online)			(Online)			
		Moderator:	Moderator:		Moderator:		
	Moderator:	Meiliyani Siringoringo,	Dr. Noor Hindryawati, M.Si	Moderator:	Qonita Qurrota A'yun,		
	Fidia Deny Tisna, M.Si	M.Si		Dr. Rahmawati, M.Si	S.Si., M.Sc		
			Invited Speaker:				
		Invited Speaker:	Dr. RR Dirgarini J N	Invited Speaker:			
		ASWI, M.SI., PILD (12 20-12 50)	(12 20-12 50)	Dr. Hallulka Dally Pahmayanti M Si			
		(13.30-13.30)	(13.30-13.30)	(13 30-13 50)			
			Dr. Soeria Koesnarpadi, M.Si	(10.00 10.00)			
			(13.50-14.10)				
	Oronatory	Oronatan	Operatory	Oneratory	Onorotory		
	Uperator: Fody Harlanto S Si	Operator: Duli Vuniarto S Si	Operator: Muhammad	Operator: M Paswid Pahman S Si	Operator: Pudianto S Si		
	reuy marianto, 3.51		Fakhrurrozy, S.Kom	M. Rasylu Railliall, 3.31	Ruulanto, 5.51		



Time – Central Indonesia Time (WITA)	Agenda	Room/Zoom details
15.15 - 16.00	Closing Ceremony	Theatre Room, SLC (Offline)
	1. Greeting by Master of Ceremony	
	(Muhammad Robiansyah & Qonita Qurrota A'yun, S.Si., M.Sc.)	Zoom virtual room (Online)
	2. Traditional dancing by Art Student Creativity Unit, Faculty of Mathematics	Topic: Second session of The 3rd ICMSc,
	and Natural Science, Mulawarman University	Oct 13th 2021
	3. Announcement of the best speakers	
	4. Closing remarks:	Join Zoom Meeting
	Dean of Faculty of Mathematics and Natural Sciences (Dr.Eng. Idris Mandang,	https://bit.ly/ICMSc2021-Day2-Session2
	M.Si)	
	5. Photo Session	Meeting ID: 916 4639 1087
	6. Evaluation	Passcode: ICMSC04



Parallel Session Schedule

Date : October 12, 2021 (Day 1)

Room : Science Learning Center, Floor 3, Classroom 1 (Mathematics)

Moderator : Fidia Deny Tisna, M.Si

Operator : Fedi Harlanto, S.Si

No	Code	Authors	Title	Time
1	IVT1	Prof. Dr. Nurdin, S.Si., M.Si	Total Vertex Irregularity Strength Of Dodecahedral Graph	14.30 - 14.50
2	410	Mila Kurniawaty	Actuarial Approach Of Covid-19 Epidemic In China	14.50 - 15.00
3	341	Syaiful Anam, Indah Yanti, Zuraidah Fitriah	Detecting The Tomato Leaf Disease Using Clustering Algorithm Based On Fuzzy Adaptive Turbulence Particle Swarm Optimization	15.00 - 15.10
4	374	Baso Indar, Seruni Apriyuni, Muhammad Renaldi Saputra, Moh. Nurul Huda	Discrete Dynamical Analysis On A Predator-Prey Model For Controlling The Extinction Of The Pesut Mahakam (<i>Orcaella Brevirostris</i>) At Mahakam River	15.10 - 15.20
5	378	Risky Yoga Suratman, Christiana Rini Indrati	Regularized Quasi-Semigroups	15.20 - 15.30
6	419	Wasono Wasono	Analysis Of Service Provider Marketing Strategy In Achieving Customer Loyalty Using Game Theory For Senior High School Students In Samarinda City	15.30 - 15.40
7	388	Kwassi Anani	Series Solutions For The Spherically Symmetric Droplet Transient Heating Problem	15.40 - 15.50
8	371	Galuh Oktavia Siswono	Mathematics Model in Determining the Portion of Tabarru' Fund for Sharia Life Insurance with Wakalah Scheme	15.50 - 16.00



Room : Science Learning Center, Floor 3, Classroom 2 (Statistics)

Moderator : Meiliyani Siringoringo, M.Si

Operator : Ruli Yuniarto, S.Si

No	Code	Authors	Title	Time
1	IVT2	Bagus Sartono, M.Si, PhD	A Simulation Study On The Performance Of Robust Lasso	14.30 - 14.50
2	327	Nur Rochmah Kurniasari, Wahyu Wibowo	Sentiment Analysis Of IPOT Application Reviews Using Naive Bayes Classifier Method	14.50 - 15.00
3	328	Rega Andika Rahmawati, Wahyu Wibowo	Sentiment Analysis Of Soco By Sociolla E- Commerce Application Review On Google Playstore Site Using Naïve Bayes Classifier Method	15.00 - 15.10
4	329	fauzillah - indriani, Wahyu Wibowo	Sentiment Analysis Data By Shopeepaylater Twitter's Opinion Using Naïve Bayes Classifier	15.10 - 15.20
5	393	Sifriyani Sifriyani, Idris Mandang, Fidia Deny Tisna Amijaya	Geographically Temporally Weighted Regression Model For GIS Mapping Of Influence COVID-19 In East Kalimantan	15.20 - 15.30
6	335	Wayan Somayasa	Assessing The Optimum Condition Of Multivariate Second Order Response Surface Model Through The Asymptotic Inference Of The Eigenvalues	15.30 - 15.40
7	342	Ardityan Purbo Adhitama, Heri Kuswanto, Irhamah Irhamah	Forecasting Gold Based On Ensemble Empirical Mode Decomposition And Elman Recurrent Neural Network	15.40 - 15.50
8	355	Annisa B Tribhuwaneswari	Spatial Autoregressive Quantile Regression As A Tool For Modelling Human Development Index Factors In 2020 East Java	15.50 - 16.00
9	448	Darnah Andi Nohe	Attitudes Towards COVID-19 Vaccines To Support The Achievement Of Government Targets: A Case Study Of Bontang City	16.00 - 16.10
10	330	Adi Prayogo Muhammad, Wahyu Wibowo, Mike Prastuti	Forecasting Of Analytic Residential Price Index Using Arima Box-Jenkins	16.10 - 16.20



Room : Science Learning Center, Floor 4, Classroom 1 (Chemistry)

Moderator : Irfan Ashari Hiyahara, M.Si

Operator : Muhammad Fakhrurozy, S.Si

No	Code	Authors	Title	Time
1	406/IVT3	Noor Hindryawati	Degradation Of Methylene Blue Using Fe ₃ 0 ₄ - ZnO/WO ₃ Catalyst	14.30 - 14.50
2	334	Jerry Darmawan, Soerja Koesnarpadi	Magnetite Nanoparticles Coated Fulvic Acids For Methylene Blue Adsorption	14.50 - 15.00
3	346	Daffa Anugerah, Rudi Kartika, Rahmat Gunawan	Absorption Of Cr ⁶⁺ Ion By The Bacterium Pseudomonas Sp	15.00 - 15.10
4	350	Achmad Dwi Setiawan, Dr. Rudi Kartika, M.S.i, Dr. Rahmat Gunawan, M.Si	Validation And Absorption Of Cu(II) By Pseudomonas Sp Bacteria	15.10 - 15.20
5	352	Riki Riki, Rudi Kartika, Rahmat Gunawan	Biosorption Of Pb ²⁺ Ion By Bacterium Pseudomonas Sp	15.20 - 15.30
6	357	Erika Risdayana, Aman Sentosa Panggabean, Moh Syaiful Arif, Ika Yekti Liana Sari	Biosynthesis Of Silver Nanoparticles (Agnps) Using Aggregate Mangrove Leaf Extract (<i>Sonneratia Alba</i>) For Colorimetric Analysis Of Chloramphenicol (Cap)	15.30 - 15.40
7	358	Moh Syaiful Arif, Selvi Yanti, Bohari Yusuf	Colorimetric Detection Of Histamine Using Unmodified Silver Nanoparticles On The Real Samples	15.40 - 15.50
8	438	Veliyana Londong Allo, Gabby Encha Farhanah, Rahmat Gunawan	In Silico Analysis Of Flavonol Compound Against Mpro Covid-19	15.50 - 16.00
9	432	Daniel Daniel, Muhammad Rifky Rizquillah, Eva -	Synthesis Of Maleyl Oleate Through An Esterification Reaction Of Malic Acid Followed By An Interesterification Reaction With Methyl Oleate	16.00 - 16.10



No	Code	Authors	Title	Time
		Marliana, Agustina		
		Rahayu Magdaleni		
10	450	Waluyo Eko Cahyono	Measuring and Comparing In-situ CO ₂ Concentrations with Satellite	16.10-16.20



Room : Science Learning Center, Floor 1, Theater Room (Physics and Geophysics)

Moderator : Dr. Rahmawati, M.Si

Operator : M. Rasyid Rahman, S.Si

No	Code	Authors	Title	Time
1	IVT4	Dr. Muh. Alimuddin Hamzah Assagaf, M. Eng	Extracting Information from Ocean Waves Statistics	14.30 - 14.50
2	343	Rahmawati - Munir, Nadya - Amalia, Rahmiati - Munir	Physics Laboratory by Video Tracker and Visual Basic for Application at Home During Covid-19 Pandemic: Material Elasticity Measurement	14.50 - 15.00
3	368	Diena Noviarini	The Future of Palm Tree Plantation Using Power Self Generation on Wiring Telecommunication As Outcome of Plant Output	15.00 - 15.10
4	369	Diena Noviarini, Eko Arif Syaefuddin	SNI Standard Freight Software Design With Social Platform Media For Cost Efficiency And Effectiveness For Product Advantages For Cooperative Found MSME Products	15.10 - 15.20
5	390	Diena Noviarini	Integration Of Indonesian Regional Head Election General Election Information System Using Online Real Time Basis Ssytem With Touchscreen Fingerprint	15.20 - 15.30
6	408	Irvin Dayadi	The Effect Of Wood Width, Thickness, And Length On Static Bending Of Red Meranti (Shorea Sp.)	15.30 - 15.40
7	430	Mislan Mislan, Devina Rayzy Perwitasari Sutaji Putri, Piter Lepong, Djayus Djayus, Asmaidi Asmaidi	Utilization of 3-Dimensional Watershed Model to Support Disaster Mitigation Learning System	15.40 - 15.50
8	423	Rahmawati - Munir, Ahmad - Zarkasi, Erlinda Ratnasari Puteri, Wahidah - Wahidah, Idris - Mandang	Improvement Physical Science Interest for Elementary Students in SDN 22 Samarinda by Basic Measurement Learning	15.50 - 16.00



No	Code	Authors	Title	Time
9	427	Rani Chahyani, Abdul Manan	The effect of truncating the Taylor series terms toward derivative results of the Complex Conjugate Approach and its applications in Geophysics and Statistics	16.00 - 16.10
10	442	Roniyus Marjunus	Synthesis and characterization of TiO ₂ from Lampung's iron sand using acid leaching method with variation of HCl concentration	16.10 – 16.20



Date: October 12, 2021 (Day 1)Room: Science Learning Center, Floor 4, Discussion Room (Biology)Moderator: Dr. Dijan Sunar Rukmi, M.SiOperator: Rudianto, S.Si

No	Code	Authors Title		Time
1	IVT5	Rudy Agung Nugroho, M.Si, Ph.D	Potential use of black soldier fly larva oil	14.30 - 14.50
2	320	Feiky Aprilasari, Nova Hariani, Sus Trimurti	Insects That Found on Wistar Rat (<i>Rattus norvrgicus</i>) Carrions in Samarinda, East Kalimantan	14.50 - 15.00
3	365	Jusmaldi Jusmaldi, Nova Hariani, Febriana Ninchy	Fecundity And Spawning Patterns Of Three Spot Gourami <i>Trichopodus Trichopterus</i> (Pallas, 1770) In Lempake Reservoir, East Kalimantan	15.00 - 15.10
4	377	Lani Nurfakhira, Rudy Agung Nugroho, Retno Aryani, Yanti Puspita Sari, Hetty Manurung, Rudianto Rudianto	The Effects of Dietary Myrmecodia pendens on The Growth and Digestive Enzyme Activity of Catfish Clarias gariepinus	15.10 - 15.20
5	379	Zulfika Rahmawati, Hetty Manurung, Dwi Susanto, Riska Desthy Sari	Phytochemical Screening and Antioxidant Activities of the Methanol Leaf Extracts of <i>Durio</i> <i>kutejensis</i> (Hassk.) Becc.)	15.20 - 15.30
6	380	Hetty - Manurung, Hetty - Manurung, Dwi - Susanto, Zulfika - Rahmawati, Eko - Kusumawati	GC-MS Analysis, Phytochemical Screening and Antioxidant Activity of Lai (<i>Durio kutenjensis</i> Hass. Beck) The Endemic Plant In Kalimantan, Indonesia	15.30 - 15.40
7	385	Retno Aryani, Rudy Agung Nugroho, Hetty Manurung, Nur Ainun Oktavia Pusparini, Widha Prahastika, Rudianto	Subchronic Toxicity Study of the Ethanol Extracts from <i>Ficus deltoidea</i> Leaves on histology of ventriculus and intestinum tenue Male Mice	15.40 - 15.50



No	Code	Authors	Title	Time
8	386	Riska Desthy Sari, Hetty Manurung, Dwi Susanto, Zulfika Rahmawati	Antioxidant Activity Test and Secondary Metabolite Content of Hot Water Extract Leaves of Lai (<i>Durio kutejensis</i> (Hassk) Becc.)	15.50 - 16.00
9	397	Nurlaila Ismah Sardi, Retno Aryani, Rudy Agung Nugroho, Yanti Puspita Sari, Hetty Manurung, Rudianto Rudianto	Effects of Ant-Nest Plant (<i>Myrmecodia pendens</i>) Bulb Extract on Histology of Intestinal, Liver And Proximate Fillet of Sangkuriang Catfish (<i>Clarias</i> <i>gariepinus</i> Var)	16.00 - 16.10
10	RudiantoRetno Aryani,Rudy AgungNugroho,Mukhlis449FIladelfiaWulandary,HettyManurung,RudiantoRudianto		Effects of mekkai (<i>Albertisia papuana</i> Becc.) on the spermatozoa blood profiles, and reproductive status of Mus musculus	16.10 - 16.20



Room : Science Learning Center, Floor 3, Classroom 1 (Mathematics/Statistics)

Moderator : Fidia Deny Tisna, M.Si

Operator : Fedi Harlanto, S.Si

No	Code	Authors	Title	Time
1	412	Iis Dewi Ratih	Mapping The Health Quality In Sumenep Using K- Medoids Algorithm	13.30 - 13.40
2	426	Suaidah Suaidah, Purwanto Purwanto	Continuous Monotonic Decomposition Of Corona Product	13.40 - 13.50
3	437	Adi Setiawan	Calculation Of Region In More Than Two Different UTM Zone Using Shoelace Formula Based On The GADM Database	13.50 - 14.00
4	411	Iis Dewi Ratih	Synthetic Minority Over-Sampling Technique Nominal Continuous (SMOTE-NC) Logistic Regression For Imbalanced Data	14.00 - 14.10
5	434	Mohamad Handri Tuloli, Syaiful Anam, Nur Shofianah	Predicting The Number Of Covid-19 Cases In Surabaya Using Hybrid Extreme Learning Machine And Particle Swarm Optimization	14.10 - 14.20
6	435	Fidia Deny Tisna Amijaya, Syaripuddin Syaripuddin, Qonita Qurrota A'yun	Hill Cipher Algorithm Using Two Keywords And 94 Ascii Code Characters	14.20 - 14.30



Room : Science Learning Center, Floor 3, Classroom 2 (Statistics 1)

Moderator : Meiliyani Siringoringo, M.Si

Operator : Ruli Yuniarto, S.Si

No	Code	Authors	Title	Time
1	IVT6	Aswi, M.Si., Ph.D		13.30 - 13.50
2	359	Dwi Endah Kusrini, Zakiyatul Wildani, Nur Azizah	Asean Foreign Trade Analysis Using Dynamic Panel Data Simultaneous Regression Modeling	13.50 - 14.00
3	364	Rehana Parvin	Does a nonlinear nexus exist between crude oil prices, inflation, exchange rates, and Bangladesh's export earnings? A NARDL model approach	14.00 - 14.10
4	366	Marisa Rifada, Nur Chamidah, Ratih Ardiati Ningrum	Estimation of Nonparametric Ordinal Logistic Regression Model using Generalized Additive Models (GAM) Method based on Local Scoring Algorithm	14.10 - 14.20
5	373	M. Fathurahman, Ika Purnamasari, Surya Prangga	Modeling Negative Binomial Regression and Its Application to the Number of Dengue Hemorraghic Fever Cases in East Kalimantan	14.20 - 14.30
6	381	Endang Yuliani, Bagus Sartono, Hari Wijayanto, Alfian Futuhul Hadi, Evi Ramadhani	Study of Features Importance Level Identification of Machine Learning Classification Model in Sub-Populations for Food Insecurity	14.30 - 14.40
7	382	Nur Anisa Damayanti, Irhamah Irhamah	Clustering on "Z" E-Learning Application's Reviews Using Self Organizing Maps (SOM) and K-Means Methods	14.40 - 14.50
8	383	Meiliyani Siringoringo, Ika Purnamasari, Sri Wahyuningsih, Rito Goejantoro, Surya Prangga	Time Series Analysis on Amount Palm Oil Production Data in East Kalimantan Province	14.50 - 15.00



Room : Science Learning Center, Floor 4, Classroom 1 (Chemistry)

Moderator : Dr. Noor Hindryawati, M.Si

Operator : Muhammad Fakhrurozy, S.Si

No	Code	Authors	Title	Time
1	IVT7	Dr. R.R. Dirgarini Julia Nurlianti S., MSc	A Kinetic Study of Co-Pyrolysis of <i>Botryococcus</i> <i>braunii</i> and Victorian Brown Coal	13.30 - 13.50
2	IVT8	Soerja Koesnarpadi, Teguh Wirawan, Eva Marliana	Comparative study of Physical and Chemical Properties of Magnetite Synthesis Using Coprecipitation Method	13.50 - 14.10
3	407	Irfan AshariUrang-aring (<i>Eclipta prostrata</i> L.) Leaf as NaturalHiyahara, NoorPigments from Plants Used as Sensitizers for TiO2HindryawatiBased Dye-Sensitized Solar Cells		14.10 - 14.20
4	375	Supiyani Supiyani, Harry Agusnar, Harry Agusnar, Purwantiningsih Sugita, Purwantiningsih Sugita, Irwana Nainggolan, Irwana Nainggolan	Synthesis Silica from Rice Husk by Sol-Gel Method	14.20 - 14.30
5	387	Helda Niawanti, Fitri Yani, Mu'min Herman, Husnul RafliansyahEffect of Extraction Time and Solid-Liquid Ratio on Tannin Extraction from Guava (<i>Psidium</i> guajava) Leaves		14.30 - 14.40
6	396	Polonius Dosi Miten, RR Dirgarini Julia Nurlianti Subagyono, Rahmat Gunawan, Alan Chaffee, Marc Marshall	A Kinetic Study of Pyrolysis of Marine Microalgae <i>Chlorococcum</i> sp. by Thermogravimetric Analysis	14.40 - 14.50



No	Code	Authors	Title	Time
7	455	Suwandi, Rahmat Gunawan, R.R. Dirgarini J.N.S	Energy Harvesting on Dye Sensitized Solar Cells (DSSC) as an alternative to Renewable Energy. A Study of Computational Molecular Electron Structure	14.50 – 15.00



Room : Science Learning Center, Floor 4, Classroom 2 (Physics and Geophysics)

Moderator : Dr. Rahmawati, M.Si

Operator : M. Rasyid Rahman, S.Si

No	Code	Authors	Title	Time
1	IVT9	Dr. Handika Dany Rahmayanti, S.Si., M.Si	Investigation of Fiber in the Phenomena Around us and Its Application Potential in the Future	13.30 - 13.50
2	440	Mutiara Rachmat Putri, Najwan Alghifari, Lamona Irmudyawati Bernawis, Agus Setiawan, Idris Mandang	Numerical assessment of flushing time in Balikpapan Bay	13.50 - 14.00
3	445	Nilam Anggun Cahyani	Mechanical Properties of Natural Fiber Biocomposite : Bamboo Apus (<i>Gigantochloa</i> <i>Apus</i>)	14.00 - 14.10
4	362	Idris Mandang, Rahmiati Munir	Extreme Rainfall And Relationship With El Nino Southern Oscilation (Enso) In East Kalimantan	14.10 - 14.20
5	376	Rachvika Cindy Gayatri, Heru Maulana, Muhammad Rizqy Septyandy	Geology Of Campaka District, Cianjur Regency, West Java Province	14.20 - 14.30
6	428	Djayus Djayus, Supriyanto Supriyanto	Resistivity Value Of Oil Contaminated Soil Based On Geoelectric Resistivity Interpretation And Soil Coring	14.30 - 14.40
7	431	Fajar Alam, Faried Rahmany	Environmental Review For Ecotourism Potential Of Batu Putih Area, Samarinda, East Kalimantan	14.40 - 14.50



Room : Science Learning Center, Floor 4, Discussion Room (Statistics 2)

Moderator : Qonita Qurrota A'yun, S.Si., M.Sc

Operator : Rudianto, S.Si

No	Code	Authors	Title	Time
1	403	Dyah Setyo Rini, Sigit Nugroho, Dian Agustina, Tommy Jomecho	Spatial Panel Data Model of Poverty in Bengkulu Province with Fixed Effect and Spatial Error Autocorrelation	13.30 - 13.40
2	424	Destri Susilaningrum Susilaningrum	The Analysis of Factors Affecting Stage Level of Breast Cancer Patients at RSUD DR. SOETOMO Surabaya	13.40 - 13.50
3	425	Zakiatul Wildani	Measuring Efficiency of Economic Growth in East Java using Data Envelopment Analysis	13.50 - 14.00
4	446	Siti Maghfirotul Ulyah, Marisa Rifada, Elly Ana, Christopher Andreas, Ilma Amira Rahmayanti, Salsabylla Nada Apsariny	Forecasting Premium Adequacy to Claim Paid Ratio with COVID-19 Effect using Multilayer Perceptron Neural Network	14.00 - 14.10
5	384	Maria Novita, Irhamah Irhamah	The Impact of the Covid-19 Pandemic and Joe Biden's Winning Speech to IDX Composite Using Multi Input Intervention Analysis	14.10 - 14.20
6	401	Maimun Maimun, Bambang Widjanarko Otok, Santi Wulan Purnami	The Multivariate Adaptive Regression Spline (MARS), And Mixed Discriminant Analysis Approach For Classification Of Poor Households In Papua Barat Province	14.20 - 14.30



The List of Keynote Speakers





Biofuel from The Tropical Rainforest

Rizalman Mamat College of Engineering, Universiti Malaysia Pahang



Abstract

The transportation sector is a major source of greenhouse gas emissions and air pollution, both of which contribute to global warming. Gaseous pollutants such as NOx, CO₂, CO, and fine particulate matter are produced when fuel is burned. It causes some health issues and is also harmful to the environment as a whole. One of the finest alternative fuels for internal combustion engines is biofuel. Biofuel, which is mostly sourced from plants, is widely utilised to minimise reliance on petroleum-based fuel. The fuel also has a lower overall carbon footprint. The biofuel combustion in the engine produces comparable engine performance while lowering exhaust emissions. The tropical rainforests of Indonesia and Malaysia, in particular, provide a wealth of resources that can be exploited to make biofuel.

Keyword: Biofuel, internal combustion engine, emission



Multiscale Methods and Analysis for The Highly Oscillatory Nonlinear Klein-Gordon Equation

Professor Weizhu Bao Department of Mathematics National University of Singapore



Abstract

In this talk, I begin with the nonlinear Klein-Gordon equation (NKGE) under two important parameter regimes, i.e. one is nonrelativisitic regime and the other is long-time dynamics with weak nonlinearity or small initial data, while the NKGE is highly oscillatory. I first review our recent works on numerical methods and analysis for solving the NKGE in the nonrelativistic regime, involving a small dimensionless parameter which is inversely proportional to the speed of light. In this regime, the solution is highly oscillating in time and the energy becomes unbounded, which bring significant difficulty in analysis and heavy burden in numerical computation. We begin with four frequently used finite difference time domain (FDTD) methods and obtain their rigorous error estimates in the nonrelativistic regime by paying particularly attention to how error bounds depend explicitly on mesh size and time step as well as the small parameter. Then we consider a numerical method by using spectral method for spatial derivatives combined with an exponential wave integrator (EWI) in the Gautschi-type for temporal derivatives to discretize the NKGE. Rigorous error estimates show that the EWI spectral method show much better temporal resolution than the FDTD methods for the NKGE in the nonrelativistic regime. In order to design a multiscale method for the NKGE, we establish error estimates of FDTD and EWI spectral methods for the nonlinear Schrodinger equation perturbed with a wave operator. Based on a large-small amplitude wave decomposition to the solution of the NKGE, a multiscale method is presented for discretizing the NKGE in the nonrelativistic regime. Rigorous error estimates show that this multiscale method converges uniformly in spatial/temporal discretization with respect to the small parameter for the NKGE in the nonrelativistic regime. Finally, I discuss issues related error bounds of different numerical methods for the long-time dynamics of NKGE with weak nonlinearity and applications to several highly oscillatory dispersive partial differential equations.



Achieving Green and Sustainable Energy Systems: Techno-Economic Perspectives

Muhammad Aziz Institute of Industrial Science, The University of Tokyo 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan



Abstract

Green and sustainable energy system becomes very crucial issue in our future, especially in new paradigm of Industry 4.0 or Society 5.0. Energy sustainability covers three main pillars of energy security, energy equity, and environmental sustainability. Energy security does not only deals with the quantitative ability to supply the energy demand, but also qualitative capacity to balance the energy in real time manner. Energy equity facilitates inclusive and mutual involvement of all the stakeholders in order to optimize the utilization of available green resources, as well as creates new circular economy in the community. Finally, the environmental sustainability refers to possible decarbonization technology, carbon capture, storage, and utilization. Furthermore, decarbonization becomes an essential strategy to realize zero-carbon society. Among the them, hydrogen is considered playing a pivotal role in the future as secondary energy source, together with electricity. Therefore, effective hydrogen production, storage/transportation, and utilization technologies are urgently demanded. In addition, in the electricity sector, battery and vehicle-to-grid technologies are believed to be dominant in the future to responsively balance the fluctuation in both supply and demand sides, as well as facilitate optimization of renewable energy adoption and new circular economy.



Experiences from regional climate forecasts for the 21st century for the North Sea and its application to Asian waters

Thomas Pohlmann



Abstract

A mesoscale resolution version of the Hamburg Shelf Ocean Model (HAMSOM) was developed at the Institute of Oceanography, University of Hamburg for the North Sea region. Based on the IPCC scenario A1B (IPCC 2000, IPCC 2007), a projected forecast of hydrodynamic conditions in the North Sea region will be simulated by the shelf ocean model HAMSOM for the 21st century. To drive the HAMSOM model, oceanic forcing variables (MPI-OM data from the global coupled atmosphere-ocean model MPI-OM/ECHAM5) as well as atmospheric forcing variables (data from the regional atmospheric model REMO) are prescribed at the open lateral boundaries of the North Sea domain and at the air-sea interface, respectively.

Since the atmospheric variables show a large temporal variability, influenced by the North Atlantic Oscillation (NAO), and since the North Sea reacts sensitively on changes in the atmospheric forcing, a validation of the atmospheric forcing variables was carried out. All forcing variables are created by a free model run (MPI-OM and REMO) without any data assimilation incorporated and hence, a direct comparison of single data sets with any hindcast data is not applicable. Thus, for the validation monthly climatological means of the REMO data were compared with monthly climatological means of reanalysis data (NCEP and ERA40) for the period 1958-2000.

It is obvious that the experiences obtained for the North Sea can be transferred to the Indonesian Waters, which are strongly influenced not by the NAO but by El Nino. Since many future climate projections show the tendency that more El Nino events will occur in the next 100 years, obviously, it is very important to investigate the local response of the expected climate change also for the Indonesian waters. Due to its great global importance the Indonesian Through flow area should be one of the major foci of these local response studies.



Application of molecular techniques to combat wildlife trade and population management of otters and hornbills in Thailand

Worata Klinsawat¹, Wanlop Chutipong², Naruemon Tantipisanuh², Supaphen Sripiboon³, Manakorn Sukmak³, Somying Thunhikorn⁴, Pimpisa Jansamut¹, Thanapa Boonpim², Wasawat Krissirisawad², Boonchu Joseph surivong², George A. Gale¹

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- ² Conservation Ecology Program, Pilot Plant Development and Training Institute, King Mongkut's University of Technology Thonburi, Bangkok, Thailand
- ³ Faculty of veterinary Medicine, Kasetsart University, Kampheng Saen Campus, Nakorn Pathom, Thailand
- ⁴ Wildlife Research Division, Department of National Parks, Wildlife and Plant Conservation, Bangkok, Thailand

Abstract

Dispersal and gene flow are crucial to the persistence of fragmented wildlife populations. However, habitat modification potentially disrupts these ecological and microevolutionary processes. Small and isolated populations are vulnerable to genetic stochasticity, reduction in effective population sizes, genetic diversity, and adaptive potential. In addition to habitat fragmentation, illegal pet trade in Southeast Asia has emerged as a threat to population viability and regional biodiversity. Targeted law enforcement and restoration of population connectivity are among the primary goals of conservation management to combat wildlife crime and reduce the risks of local extinction. Population genetics and advances in molecular techniques to amplify fecal and feather DNA enable us to quantify the extent to which landscape facilitates gene flow and trace geographic origin of traded animals. In Thailand, genetic monitoring is increasingly integrated to guide reintroduction planning and develop spatial genetic reference to assign unknown seizures of birds and carnivores to their potential source populations. In this study, we provide an overview of molecular applications to inform population management of Smoothcoated Otter, Asian Small-clawed Otter and Great Hornbill. Our genetic database assists law enforcement tackle wildlife crime by inferring source populations of traded otters in southern Thailand by comparing their genetic profiles to geo-located wild counterparts. Systematic genetic management of captive hornbills also ensures the translocation of genetically diverse founders and establishment of self-sustaining populations in their former range. The integrated genetic and ecological monitoring could be applicable to improve management of habitat networks and restore population connectivity in other threatened species.





The List of Invited Speakers





Total Vertex Irregularity Strength of Dodecahedral Graph

Nurdin

Hasanuddin University, Indonesia



Abstract

Let G = (V, E) be a simple graph. A total labeling $f: V \cup E \rightarrow \{1, 2, 3, ..., k\}$ is called a vertex irregular total k-labeling of G if for every two different vertices, x and y in V, their weights are distinct, that is $wt(x) \neq wt(y)$. The weight of vertex x is the sum of its label and labels of all edge incident to x, that is $wt(x) = f(x) + \sum_{u \in V(G)} f(xu)$. The total vertex irregularity strength of G, denoted by tvs(G), is the smallest positive integer k such that G has a vertex irregular total k-labeling.

In this paper, we determined the total vertex irregularity strength of modified dodecahedral graph $G \mathfrak{D}n$ for $n \ge 6$ where n is even number. The result of this study, we obtained that:

$$tvs(G\mathfrak{D}_n) = \left[\frac{2n+3}{6}\right].$$

This result is important because there many classes of graph have the same structure with modified dodecahedral graphs.

Keywords: Modified Dodecahedral Graph, Total Vertex Irregular Labeling, Total Vertex, Irregularity Strength.


A Simulation Study on the Performance of Robust Lasso

Bagus Sartono¹, Rochyati¹, Evita Purnaningrum², Septa Dwi Cahya¹

¹IPB University – Bogor, Indonesia ²University of PGRI Adibuana – Surabaya, Indonesia

Abstract

In the circumstance of handling a regression model with a considerable number of variables, the analysts might implement a series of variable selection procedures to identify a small subset of active variables. The lasso has become a vastly used methodology to run the selection. However, as revealed by several authors, the performance of lasso is sensitive to the existence of outlying observations in the dataset. Those authors then introduced Robust Lasso approach for this class of problem by applying some weighting scheme to every sample in the data. We will present a part of our study about the performance of three weighting schemes of Robust Lasso. The simulation study generated a rich set of scenarios which includes combinations of several covariance structures of variables, types of outliers, number of outlying observations, and number of variables. Our study found that the Tukey Lasso outperforms Huber- and Welsch Lasso in identifying significant variables correctly and the accuracy of the response predictions. In general, the performance of robust lasso decreases when the covariances among X's are higher and the dimension of the data increases.

Keywords: high dimensional regression, Huber, Tukey, variable selection, Welsch



Investigation of Fiber in the Phenomena Around Us and Its Application Potential in the Future



Handika Dany Rahmayanti

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There are also many daily phenomena related to fiber that can bring out to interested research topics. This paper reviewed some studies related to specific fibers especially to statistical properties, absorption and filtering. First, if we observe the shape of the wet yarn, it tends to shrink. This scheme is very similar to the conformation of a long chain polymer. Furthermore, an explanation of the nature of fiber absorption has been successfully identified through a fabric wringing experiment. In the experiment also carried out variations in direction of fabric fiber orientation. The results show it looks like a crystal atom. These results can be used for the basis development of fiber application research which was also carried out in this study by utilizing nata de coco as a fiber filter and moisture absorber. Nata de coco fiber has been successfully made into a transparent air mask material by the Hot Press method and Naphthalene insertion. In addition, nata de coco fiber also has the potential to be a moisture absorber so that I can potentially be a preservative of dry food in packaging as a substitute for silica gel. It is proven from the results of the study that nata de coco can absorb water vapor in packaged foods and even exceeds silica gel.

Keywords: Fiber Conformation, Wringing Fabric, Nata de coco and Hot Press



Bayesian Spatial and Spatio-Temporal Models on a Small Number of Areas

Aswi

Statistics Study Program, Universitas Negeri Makassar

Abstract

A range of Bayesian models have been used to describe the spatial and spatio-temporal pattern of disease in areal data. This talk will present the different Bayesian spatial models as well as Bayesian spatio-temporal models. A case study considered count data aggregated to a small number of areas using Bayesian Poisson models involving dengue fever cases in Makassar Indonesia. A case study of Covid-19 cases in Makassar as well as in South Sulawesi Province were also considered. Several methods were used to check the goodness of fit such as Watanabe Akaike Information Criterion (WAIC), Deviance information Criterion (DIC), and Modified Moran's I (MMI).





Extracting Information from Ocean Waves Statistics

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Abstract

Knowledge of random ocean waves becomes important along with the increasingly widespread development in the marine sector in Indonesia. The need for wave information in the deep sea and in coastal waters is important for coastal and offshore construction activities. This paper describes several techniques to extract information from ocean wave data. The discussion will focus on short term wave statistics and assuming waves as Gaussian processes. Statistical analysis based on time and frequency domains is useful for identifying the characteristics of the waveform being exhibited. The analysis is presented on the data in the frequency space which is presented with a probability density spectrum. Several applications of the standard spectrum commonly used in the marine industry are presented.

Keywords: random wave, wave statistics, probability density spectrum



Potential Use of Black Soldier Fly Larvae Oil

Rudy Agung Nugroho

Department of Biology Faculty of Mathematics and Natural Sciences Mulawarman University Samarinda, East Kalimantan, Indonesia



Abstract

Black solider fly (*Hermetia illucens*) or known as "Maggot" is gaining in popular due to their properties as recycler or decomposer for organic substrate. The black soldier fly (BSF) is able to reproduce at higher rates and easy to farm, has a short life span and high feed conversion efficiency. Currently, BSF larvae (BSFL) has been implemented as alternative protein source for animal. Beside their high protein, BSFL contains oil which potential to be used for various purposes. The oil from BSFL can be obtained by pressurized extrusion and extraction from BSF prepupae, followed by transesterification for biodiesel. For future prospect, BSFL oil has been projected for fish oil substitution, biodiesel, pharmaceuticals, and entomobeauty (Essential oil).

Keywords: Black soldier fly larvae, oil, future prospects



Degradation of Methylene Blue Using Fe_3O_4 -ZnO/WO₃ Catalyst

Noor Hindryawati

Department of Chemistry Faculty of Mathematics and Natural Science, Mulawarman University

Abstract

The degradation of dyestuffs by AOPs method is a fascinating subject to study since the method is straightforward and lowers the amount of new waste generated during the degradation process. The goal of this research is to utilize $\text{Zn-Fe}_3O_4/WO_3$ composite to degrade methylene blue as a model of organic pollutant by photocatalysis process. The Characteristic of catalyst was analyzed using X-ray Diffraction (XRD) and scanning electron microscope (SEM). The results of the XRD analysis revealed the presence of a $\text{Zn-Fe}_3O_4/WO_3$ composite structure. In the SEM examination, it can be shown that the morphology particle of $\text{Zn-Fe}_3O_4/WO_3$ are non-uniform and tend to cluster together and agglomerated to each other. The optimal conditions of photocatalytic process were 50 mL methylene blue (10 ppm), 0.2 g weight of $\text{Zn-Fe}_3O_4/WO_3$ catalyst and a contact time of 30 min, which resulted in an 81.38 % degradation.





Comparative Study of Physical and Chemical Properties of Magnetite Synthesized Using Co-Precipitation Method



Soerja Koesnarpadi, Teguh Wirawan, Eva Marliana

Department of Chemistry Faculty of Mathematics and Natural Sciences, Mulawarman University Jalan Barong Tongkok 4 Gunung Kelua, Indonesia

Abstract

Comparative study of the physical and chemical properties of magnetite synthesized by coprecipitation method has been carried out. This research aims to synthesize and characterizise of magnetite using coprecipitation method with a mole ratio of Fe(II) and Fe(III) = 1:4; 2:4 and 4:1 under alkaline conditions by the addition of NH_4OH 15%, heating temperature of 90°C for 30 minutes. The physical properties of crystal structure and particle size were measured using an X-Ray difractometer (XRD) and magnetization value was determined using a vibrating sample magnetometer (VSM). The chemical properties were characterized by using a Fourier transform infrared (FTIR) spectrometer. While the experiment result showed excess Fe(II) will increase formation of magnetite phase and its magnetization value. However, lower Fe(II) will increase formation of the goethite phase and decrease the value of magnetization. FTIR spectra of all magnetites showed Fe-O vibration characteristics at 594 and 401 cm⁻¹, but there was a bending vibration of Fe-O-OH at α -FeOOH if mole ratio of Fe(II)/Fe(III) was very low. The presence of bending and stretching vibrations of the -OH group indicates that the magnetite crystallization process is not yet complete. The physical and chemical properties of magnetite synthesized by coprecipitation method depend on the mole composition of Fe(II) and Fe(III).

Keywords: physical and chemical properties, magnetite, mole ratio Fe(II)/Fe(III)



A Kinetic Study of Co-Pyrolysis of *Botryococcus braunii* and Victorian Brown Coal

RR Dirgarini J N Subagyono

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Abstract

The co-pyrolysis of the green microalgae *Botryococcus braunii* and Victorian brown coal was studied by thermogravimetric analysis using the Kissinger–Akahira–Sunose (KAS), Flynn–Wall–Ozawa (FWO), and Friedman methods. This research aims to study the synergistic effect of mixing *Botryococcus braunii* and Victorian brown coal in pyrolysis reactions on the kinetics parameter using thermogravimetric analysis. Co-pyrolysis was carried out at four heating rates, 10, 15, 20, and 25 °C/minute. The co-pyrolysis reaction of *Botryococcus braunii* and Victorian brown coal occurred from 155.79 °C to 545.27 °C; this temperature range was lower than that for pyrolysis of only *Botryococcus braunii* under the same conditions. Mixing the two samples increased the thermal decomposition temperature for each conversion value (α), as well as the average activation energy, due to the presence of compounds that require high temperatures to undergo pyrolysis in the Victorian brown coal. The average activation energies of the co-pyrolysis reaction of *Botryococcus braunii* and Victorian brown coal determined using the KAS, FWO, and Friedman methods were 195.20 ± 17.40, 195.60 ± 17.70 and 225.93 ± 32.39 kJ/mol, respectively.

Keywords: *Botryococcus braunii*, Victorian brown coal, Kissinger–Akahira–Sunose, Flynn–Wall– Ozawa, Friedman, co-pyrolysis.









Abstracts: Oral Presentations



Insects That Found on Wistar Rat (*Rattus norvegicus*) Carrions in Samarinda, East Kalimantan

Feiky Aprilasari*, Nova Hariani, Sus Trimurti

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Abstract

The insects have important roles in this life, such as to determine the time of death or it's usually called Post Mortem Interval (PMI). The study about this topic has not been reporting yet in Samarinda and it is a background to conduct this research, that aim to find out the kind of insects on wistar rat (*Rattus norvegicus*) carrions in Samarinda, East Kalimantan as a basic data for forensic entomology study. This study conducted using the observational method at 16 male wistar rats and 16 female wistar rats. All of the wistar rats were dislocated and wounded on the right abdomen 1 cm long. The observation was conducted 24 hours once. There were 4 wistar rat carrions (2 males and 2 females) observed every day to determine the decomposition stages and to collect the evidence (insect, eggs, larvae, and pupae). Every entomology evidence will be identified later. The result showed there were 4 decomposition stages, the fresh stage, the decay stage, the post decay stage, and the skeletonization stage. Based on that decomposition stages, there were 25 insects categorized by 15 families and 4 orders. The insect order that affected the decomposition stages most were Diptera and Coleoptera. Some of them were *Chrysomya megacephala*, *C. albiceps*, *C. rufifacies*, *Staphylinus* sp. and *Platysomalocenti* sp.



Fecundity and Spawning Patterns of Three Spot Gourami *Trichopodus trichopterus* (Pallas, 1770) In Lempake Reservoir, East Kalimantan

Jusmaldi Jusmaldi*, Nova Hariani, Febriana Ninchy

Departement of Biology, Faculty of Mathematics and Natural Sciences, Mulawarman University

*Corresponding Author: aldi_jus@yahoo.co.id

Abstract

The study of fecundity and spawning patterns of three spot gourami (*Trichopodus trichopterus* Pallas, 1770) in Lempake Reservoir, East Kalimantan has never been reported. The purpose of this study was to analyze the fecundity of three spot gourami related to total length and body weight and its spawning patterns. A total of 30 samples of female fishes in gonad maturity conditions were collected from the Lempake reservoir from March to April 2021. To analyze its fecundity and spawning patterns were used gravimetric and measurement of egg diameter methods. The results of this research showed that the fecundity of three spot gourami from Lempake Reservoir ranged from 448-1.257 eggs/individual, with a total length of fish ranged from 82.13-112.46 mm and weights ranged from 9.1-22.5 g. The relation between fecundity with length and body weight of three spot gourami based on regression equation were F=0.0003 L3.231 (r=0.89) and F=58.76W1.033 (r=0.88). The diameter of the eggs in three spot gourami on gonad maturity was ranged from 0.41-0.98 mm. Based on the frequency distribution of egg diameter, it is suggested that the spawning patterns of three spot gourami were a synchronous group or total spawner. Thus, conclusion fecundity and eggs diameter of three spot gourami in the Lempake Reservoir are affected by the size of fishes and water quality.



The Effects of Dietary Myrmecodia pendens on The Growth and Digestive Enzyme Activity of Catfish *Clarias gariepinus*

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Abstract

This study was conducted to examine the effects of dietary Myrmecodia pendens extract (MPE) on the growth and digestive enzyme activity of the catfish *Clarias gariepinus*. A group of fish with four replicates were fed 1 g kg-1 of MPE in basal diet and then compared to control group (without MPE). All fish was fed at a rate 3% of body weight for 8 weeks. At the end of the trial, average weekly gain (AWG), specific growth rate (SGR) and feed efficiency (FE) were evaluated and digestive enzyme (amylase, lipase, and protease) activity was determined. The results showed that after 8 weeks of feeding, FE, amylase, lipase and protease of MPE fed fish were significantly higher than the control group, whereas AWG and SGR were not affected by dietary MPE. These findings suggest that the inclusion of MPE in the diet is beneficial in improving feed efficiency, amylase, lipase and protease activity of fish.



Phytochemical Screening and Antioxidant Activities of the Methanol Leaf Extracts of Durio kutejensis (Hassk.) Becc.)

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Abstract

Abstrak. Lai (Durio kutejensis (Hassk.) Becc.) is a fruit plant that can be used as traditional medicine, a plant that belongs to the genus durio is spread in Indonesia, especially that in Borneo, this plant has leaves with a size of most long-term than other types of durio other with a length of +30 cm and a width of +17 cm, the leaves of the lai utilized by the community in Borneo as fresh vegetables and raw material medicine and cosmetic, then the other parts such as flower, fruit, and roots can be used as a medicine and for consumption. This research aimed to determine phytochemical compound, total phenolic content (TPC), total flavonoid content (TFC), and antioxidant activity of lai leaf methanol extract using the DPPH (2,2-diphenyl-1-pikrilhidrazil) method. The experiment was conducted in the Plant Physiology and Development Laboratory, Faculty of Mathematics and Natural Sciences, Mulawarman University using research series consists of phytochemical screening, total phenolic content, total flavonoid content, and antioxidant activity by using DPPH method lai leaf methanol extract. Based on the phytochemical screening, leaf extract of D.kutejensis contained alkaloids, flavonoids, phenolics, saponins, and steroids. The total phenolic content of leaf extract of *D.kutejensis* is 104,55 µg gallic acid equivalent (GAE)/g extract and total flavonoid content is $281,41 \mu g$ quercetin equivalent (QE)/g extract. The DPPH method methanol extract of lai leaf exhibited a weak antioxidant activity.



GC-MS Analysis, Phytochemical Screening and Antioxidant Activity of Lai (*Durio kutenjensis* Hass. Beck) The Endemic Plant In Kalimantan, Indonesia

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Abstract

Lai (Durio kutejensis) is one of the most types of fruit plants that grows endemic in Kalimantan Indonesia, and traditionally its leaves are used to treat several diseases in humans. But today, there has been no research on phytochemical compounds and biological activities of leaf extracts of this plant. So, the study aimed to determine the phytochemical content, antioxidant activity, and bioactive compounds in leaf methanol extract of D. kutejensis. Gas chromatography-mass spectrometry (GCMS) analysis was performed to determine the bioactive compounds of lai leaf methanol extract. DPPH (2,2-diphenyl-1-picrylhydrazyl) was used to evaluate antioxidant activity. Phytochemical test results showed that the methanol extract of lai leaves contains alkaloids, flavonoids, phenolics, saponins, and steroids. Quantitative analysis also proved that the methanol extract of lai leaves contains some phenolic and flavonoid compounds. The results of GCMS analysis of lai leaf methanol extract proved to contain some active compounds including 2-(1,1-dimethyl ethyl)-Phenol; 4-(3-hydroxy-1-propenyl)-2-methoxy-Phenol (Coniferyl alcohol); E7-Decenylacetate; Octadecanoic acid (Stearic acid); 1,3,6-Octatriene, 3,7-dimethyl-, (Z)-; Palmitaldehyde, diisopentyl acetal; Ledol; Estran-3-one, 17-(acetyloxy)-2-methyl-, (2.alpha.,5.alpha.,17.beta.)-. The results of this study prove that the methanol extract of lai leaves can be used as a source of active medicinal ingredients and has the potential to treat several diseases in humans.



Subchronic Toxicity Study of the Ethanol Extracts from *Ficus deltoidea* Leaves on histology of ventriculus and intestinum tenue Male Mice

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Abstract

Leaves of Ficus deltoidea Jack. contains flavonoids, steroids, alkaloids, triterpenoids, saponins, tannins, and phenolics so that they have great potential as traditional medicines. However, at this time there is still no known level of safety for its use. This study aims to determine the effect of sub-chronic toxicity on the histology of the stomach and small intestine of male mice. Methods: 25 mice were divided into 5 treatment groups with ethanol extract of *Ficus deltoidea Jack*. leaves with doses of 0, 125, 250, 500, and 1000 mg/kgBW for 28 days. At the end of the study, the mice were dissected, then the stomach and intestinal organs were taken and weighed. The organs of the stomach and small intestine were made histological preparations and analyzed descriptively and the thickness of the stomach wall and the height of the intestinal villi were measured. Results: The results showed that the ethanol extract of *Ficus deltoidea Jack*. leaves caused the histological structure of the stomach and small intestine at doses of 125 and 500 mg/kgbb did not change significantly compared to control. Whereas at doses of 500 and 1000 mg/kgbb there was a slight change which was indicated by the thickness of the stomach wall thinner and the height of intestinal villi shorter compared to control in male mice. Conclusion: At doses above 250 mg/kgBW affects the thickness of the stomach wall and the height of the intestinal villi of male mice.



Antioxidant Activity Test and Secondary Metabolite Content of Hot Water Extract Leaves of Lai (*Durio kutejensis* (Hassk) Becc.)

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Abstract

Lai plant leaves contain secondary metabolites compounds which are potentially used as a source of natural materials that have bioactivity. The purpose of doing this research is to find out secondary metabolites compounds that are contained in hot water extract lai (*Durio kutejensis*) leaves as well as antioxidant activities. Phytochemicals qualitative covers alkaloid test, terpenoid, steroid, phenolic, flavonoid, tannin, saponin, coumarin, carotenoid. Test phytochemicals quantitatively consist of test total phenolic content, test total flavonoid content, and antioxidant activities test with DPPH method and FRAP method. Results show that secondary metabolites compounds contained in hot water extract leave lai is a group of alkaloid, flavonoid, phenolic and saponin. Antioxidant activities extract hot water leave on DPPH method is a category being with Lai IC50 value of 139.862 ppm. Antioxidant activities on the methods of FRAP show the percentage of the lowest inhibition on the concentration of 6.25 ppm and the highest on the concentration of 100 ppm. The content of the total phenolic extract hot water leaves lai of 43,939 μ g GAE/gr extract and the contents of the total flavonoid of 237,281 μ g QE/gr extract. Results show that hot water extract is potentially used in some bioactivities of which as lai antibacterial, a bitter taste, biopesticides, bioherbicides, and others.



Effects of Ant-Nest Plant (*Myrmecodia pendens*) Bulb Extract on Histology of Intestinal, Liver and Proximate Fillet of Sangkuriang Catfish (*Clarias gariepinus Var*)

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Abstract

Myrmecodia pendens bulb extract (MPBE) contains phytochemical compounds such as flavonoids, phenols, alkaloids, tannins and saponins that potential can be used as an additional fish feed. The purpose of this study was to determine the effects of MBPE to fish feed on the growth performance, intestine and liver histology, and proximate content of catfish (*Clarias gariepinus* Var) fillets. Fishes (initial weight 15 g) were randomly divided into several groups of triplicates, containing 20 fishes per group. The group one (K) is a control, while groups P1, P2, P3, dan P4 with the addition of 0.5; 1; 2; and 3 g/kg M. pendens bulb extract. Fishes were fed MPBE in the diet for 90 days and at the end of treatment fish growth was measured. Meanwhile, intestine and liver were taken out for histological analysis. The results showed, fish fed 3 g/kg MPBE had higher growth performance (p<0,05) than other groups. However, villi and depth of crypt intestine the fish fed MPBE was shorter than control group. The liver of the fish fed MPBE also showed a better result of fillet proximate analysis compared to control.



Effects of mekkai (*Albertisia papuana* Becc.) on the spermatozoa blood profiles, and reproductive status of Mus musculus

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Abstract

Mekkai (Albertisia papuana Becc.) is a plant that generally is used for food seasoning which consumes by the Dayak. This plant contains biocompund that can be used as a medicine which may affect reproductive system. The purpose of this study was to examine the effect of water extract of Mekkai leaves (ML) on the blood profile, number of spermatozoa and the weight of reproductive organ of mice (Mus musculus) such as testis, seminal vesicle, epididymis, and vas deferens. The ML was given to mice with several doses (groups): 125, 250, 500 and 1000 mg/KgBW, three times per day for 28 days. All mice were weighed every week and at the end of the study, were fasted for 24 hours before the blood was taken. Mice was then sacrificed by neck dislocation. The sperm and reproductive organs of mice were taken out. The results showed that, the weight of the mice, the weight of reproductive organ and the blood profiles such as leukocyte, lymphocyte, mixed cell, neutrophile, erythrocyte, hematocrit, and platelet of all mice groups including control was not significantly different. Meanwhile, the number of spermatozoa of mice treated with ML was revealed significantly differences. In addition, mice treated with 500 mg/Kg BW ML showed a decrease of the number of sperm. In summary, the treatment of ML above 250 mg/KgBW affected the number of sperm but not involve in the weight body and reproductive organ of mice.



Magnetite Nanoparticles Coated Fulvic Acids For Methylene Blue Adsorption

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Abstract

Preparation and characterization of magnetite nanoparticles coated with fulvic acid (MnP-FA) from Samboja's peat soils and its application for methylene blue (MB) adsorption has been carried out. This research has been done experimentally using FA extract from Samboja's peat soils, East Kalimantan and then the coating FA on MnP using coprecipitation method. This research aims to determine the characterization of MnP-FA and also to determine the optimum condition for MB adsorption. The characterization results showed that MnP-FA, confirmed by the Fourier Transform Infrared Spectroscopy (FT-IR) spectra that shows typical Fe-O group, the aliphatic C-H group and the shift in wavenumber of C-H group on the carboxylate. X-Ray Diffractometer (XRD) diffractogram showed no change in crystal structure of MnP-FA compared to MnP. Scanning Electron Microscope (SEM) result showed surface morphology of MnP-FA is in the form of FA inhomogeneous size attached to the surface of sphere particles of MnP. The magnetic moment of MnP have decreased after the addition of FA. The optimum condition for MB adsorption using MnP-FA is at pH 7, contact time 30 minutes and adsorption capacity (Qa) is 2.1995 mg/g with adsorption percent 56.09%.



Absorption of Cr (VI) Ion by The Bacterium Pseudomonas sp

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Abstract

Absorption of Cr^{6+} metal by *Pseudomonas* sp bacteria has been carried out. This study aims to determine the ability of Pseudomonas sp bacteria to absorb Cr^{6+} metal based on variations in the concentration of Cr^{6+} metal exposure, namely (0, 5, 10, 15, 20, and 25) ppm with respect to time (days) and to determine the concentration and the optimum time required for bacteria in the Cr^{6+} metal Absorption process. The method used in testing the sample is SNI 6989.71:2009, this method has met the criteria for method verification with linearity, accuracy and precision test parameters. The results of the linearity test with a value of r = 0.9978, accuracy with the results of % recovery between (99.528 - 101.371) % and precision with a % RSD value of 0.574%. Based on the test results, *Pseudomonas* sp was able to absorb metal Cr^{6+} at exposure concentrations (5, 10, 15, 20, and 25) ppm with the percent absorption respectively 96.192%; 92.902%; 89.082%; 79.475%; and 75.485%. The optimum concentration and time required for Pseudomonas sp to absorb metal Cr^{6+} metal exposure concentration.



Validation and absorption of Cu(II) by Pseudomonas sp Bacteria

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Abstract

Cu(II) waste pollution in the environment is commonly found in the electroplating industry. Cu(II) waste in the electroplating process has a high concentration of potential to pollute the environment, therefore it is necessary to use a method to overcome environmental pollution with an easy process. This study used the metal ion absorption process by *Pseudomonas* sp bacteria which aims to determine the ability of *Pseudomonas* sp bacteria to absorb Cu(II). The study used a visible spectrophotometer with a maximum wavelength of Cu(II) standard solution of 660 nm. The results of the test, *Pseudomonas* sp bacteria were able to absorb Cu(II) at concentrations (3; 5; 7; 9; and 11) ppm with a percentage (%) of (84,447; 72,023; 66,614; 62,052 and 50,761), respectively. the concentration of Cu(II) is quite significant. The optimum concentration and time of *Pseudomonas* sp in absorbing Cu(II) occurred on day 4 with a concentration of 3 ppm with an absorption percentage of 51.837%.



Biosorption of Pb (II) Ion by Bacerium Pseudomonas sp

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Abstract

Pb²⁺ ion biosorption by *Pseudomonas* sp bacteria has been carried out. This study aims to determine the ability of *Pseudomonas* sp bacteria to absorb Pb²⁺ ions based on variations in the concentration of Pb²⁺ ion exposure to time (days) and to determine the optimum concentration and time required for bacteria in the Pb²⁺ ion biosorption process. The maximum wavelength of the Pb²⁺ ion standard solution is 510 nm. Based on the test results, *Pseudomonas* sp bacteria were able to absorb Pb²⁺ ions at exposure concentrations (4, 8, 12, 16, and 20) ppm with the percentage (%) of biosorption respectively 36,874; 30,548; 20,236; 13,178; and 10,020. The optimum concentration and time required for Pseudomonas sp bacteria to absorb Pb²⁺ ions occurred on the 14th day with an exposure concentration of 4 ppm with a biosorption efficiency of 36,388% %.



Biosynthesis of Silver Nanoparticles (AgNPs) Using Aggregate Mangrove Leaf Extract (Sonneratia alba) for Colorimetric Analysis of Chloramphenicol (CAP)

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Abstract

Biosynthesis of silver nanoparticles (AgNPs) using aggregate mangrove leaf extract (*Sonneratia alba*) for colorimetric chloramphenicol analysis has been conducted. Preparation of AgNPs was done by chemical reduction method using adhesive mangrove leaf extract bioreductor. The obtained AgNPs were characterized with Spectrophotometer UV-Vis, PSA and TEM. Based on characterization using Spectrophotometer UV-Vis, the AgNPs with 2 nM AgNO3 showed optimum temperature at 80°C and stirred duration for 20 minutes. PSA Characterization showed the size of AgNPs was 75.3 nm and TEM Characterization showed AgNPs are round and square in shape attached to each other. The Measurement results of the calibration curve showed the equation of linear line y=0.012x + 0.8581. The reaction between AgNPs with CAP showed a change in color from brownish red to yellow and a shift in the hipsochromic wavelenght from 414-395 nm. Validation method results is good with the detection limit (LoD) value was 0.6415 M and the quantification limit (LoQ) was 2.1383 M; precision with a coefficient of variation of 1.9951% \pm 0.0480 and accuracy with a % recovery value of 103.1%, indicating that AgNPs can be used to detect CAP by colorimetric method.



Colorimetric Detection of Histamine Using Unmodified Silver Nanoparticles on The Real Samples

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Abstract

In this work, a novel method for the colorimetric detection of histamine by using silver nanoparticles (AgNPs) was developed. In the detection system, AgNPs were sythesized with sodium cytrate. AgNPs that have a negatively charged surface due to the presence of adsorbed citrate ions. The presence of histamin caused the aggregation of AgNPs through electrostatic attraction, accompanied by solution color changing from yellow to red brown . Several factors including the ratio of the two modifiers and pH value were optimized. Under optimal conditions, this method showed a good linear with a correlation coefficient (R^2) of 0.9994 and the detection limit (LOD) was as low as 0.3550 μ M. The method has a great potential for the rapid detection of histamine in real samples and successfully applied to the determination of the histamine in shrimp samples.



Synthesis Silica from Rice Husk by Sol-Gel Method

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Abstract

Rice husk (RH), one of the agricultural wastes produced in large quantities, is quite large. However, utilization is considered less than optimal. High silica content in husk This rice can use as raw material for the manufacture of silica. Silica from RH was synthesis by the sol-gel method. The basic principle of the sol-gel method is hydrolysis and condensation molecules from the precursor solution. RH is calcined at 700°C for 3 h using furnace. The result obtained is white silica powder. Results Silica characterization using Fourier Transform Infrared (FT-IR) showed groups silanol (Si-OH) at a wavenumber of 3367.70 cm⁻¹. Silica infrared spectrum analysis results in there is a typical absorption at wavenumber 1056.99 cm⁻¹ and 784.38 cm⁻¹. This spectrum indicates asymmetric and symmetric stretching vibrations of the siloxane (Si-O-Si) group, respectively.



Effect of Extraction Time and Solid-Liquid Ratio on Tannin Extraction from Guava (*Psidium guajava*) Leaves

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Abstract

The study aimed to examine the effect of extraction time and sold-liquid ratio on the tannin contents of *Psidium guajava* leaves. The fresh and dry leaves were extracted by ethanol with the solid-liquid ratios were 1/20, 1/40, and 1/60 (w/v). Extraction was carried out by continuous solid-liquid extraction at 80 °C and the extraction time were 30, 45, 60, 75, and 90 minutes. The highest tannin content was obtained 17.058 ± 0.686 % from dry leaves at 60 minutes and 1/20 (w/v) solid to liquid ratio. It is slightly higher than the fresh leaves, which were obtained 12.080 ± 0.589 % at the same operating condition. In contrast, the addition of solvent ratio was not given any improvement to the tannin content extracted. The mass transfer modeling by analytical method resulted in 0.823 as the highest R² obtained at 1/60 (w/v) for the fresh leave sample. The R2 obtained at fresh leaves indicated that 82.30 % of tannin mass transfer was influenced by extraction time. The value of R² from the analytical calculation is similar to the value obtained graphically. This study demonstrated that increasing extraction time enhanced the tannin mass transfer until the equilibrium stage was reached.



A Kinetic Study of Pyrolysis of Marine Microalgae *Chlorococcum* sp. by Thermogravimetric Analysis

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Abstract

The kinetic of *Chloroccocum* sp's pyrolysis by thermogravimetric analysis has been studied. Pyrolysis of the marine microalgae was carried out at four heating rates (10, 15, 20 and 25 °C/min) and the pyrolysis kinetic was analysed using three model-free methods, namely the Kissinger-Akahira-Sonuse (KAS) method, the Flynn-Wall-Ozawa (FWO) method and the Friedman method. In the pyrolysis process of *Chlorococcum* sp., there were four main stages of decomposition of its constituents. Based on the analysis using the KAS, FWO and Friedman methods, the activation energy values for the pyrolysis of *Chloroccocum* sp were 168.68 kJ/mol, 169.9 kJ/mol and 183.67 kJ/mol, respectively, with a correlation coefficient of 94.5%, 95.0% and 96.0%, which indicated that the method with the greatest accuracy in determining the activation energy was the Friedman method.



Urang-aring (*Eclipta prostrata* L.) Leaf as Natural Pigments from Plants Used as Sensitizers for TiO₂ Based Dye-Sensitized Solar Cells

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Abstract

Extracted from the leaves of Urang-aring (*Eclipta prostrata* L.) were used as sensitizers for TiO₂ based dye-sensitized solar cells (DSSCs). This study is aims to determine the maximum efficiency value produced from DSSC using the dye from Urang-aring leaf extract. The research stages consisted of sample preparation and extraction, material characterization, DSSC assembly and current and voltage testing. The DSSC was made using 3 weight variations of TiO₂ paste, namely 0.0045 g, 0.0085 g and 0.0135 g. TiO₂ paste deposition method on ITO glass used is the doctor blade method. The dyes have shown absorption in broad range of the visible region (400–700 nm) of the solar spectrum and appreciable adsorption onto the semiconductor (TiO₂) surface, with an absorbance value of 0.015 which was thought to be the wavelength of the flavonoid luteolin-7-O-glycoside compound. The results of the Scanning Electron Microscopy test obtained that the surface morphology of TiO₂ was spherical and there was agglomerated. The results of the measurement of the maximum current and voltage using the sun light source at 11.00 am, obtained by 5.45x10-4A and 14.715 V with the maximum efficiency value of DSSC is 1.401x10-4%. DSSC could maintain its efficiency value up to 0.391x10-4% for 6 days of testing.



Synthesis of Maleyl Oleate Through an Esterification Reaction of Malic Acid Followed by an Interesterification Reaction with Methyl Oleate

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Abstract

Research has been carried out on the Synthesis of Maleyl Oleate through the Esterification of Malic Acid Continue with the Interesterification Procces with Methyl oleate. The first process of this research was synthesis of maleyl acetate from malic acid through an esterification reaction using anhydrate acetate with ratio of 1:1 to produce maleyl acetate with yield of 72.08%. Then. synthesis of methyl oleate from oleic acid through an esterification reaction using methanol with ratio of 1:6 to produce methyl oleate with yield of 97.26%. Maleyl oleate are synthesized from maleyl acetate and methyl oleate with mol composition used are 1:1 with benzene and catalyst sodium methoxide are gave yield 60.05%. Then, Maleyl oleate ware characterize using FT-IR and HLB (Hydrophilic Lipophilic Balance). Maleyl oleat has been formed proven by wave number in 1743. 65cm-1 which are showed ester carbonyl group and presumed to exist that carboxy group is overlap with ester carbonyl group. Then it is marked by a physical nature that produce a pale yellow solution, able to combine it with hexane, some of it on aquadest and ethanol. Based on research, HLB value was obtaived of 4.61, which indicates that maleyl oleate included emulsifying agent.



In Silico Analysis of Flavonol Compound Against Mpro COVID-19

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Abstract

Main protease (Mpro) plays a role in mediating the replication and transcription processes in viruses. Flavonols are flavonoid-derived compounds obtained from Indonesian natural ingredients and have high antibacterial, anticancer and antioxidant activities. This study aims to examine flavonols potential as inhibitors of SARS-Cov-2 main protease by molecular docking method. The ligand structure was drawn using Avogadro, and the protein structure was obtained from the RSCB site with the PDB code 6LU7. Molecular docking method validation by re-docking native ligands and calculating RMSD values. The yield of bond energy for re-docking of flavonol is -8.51 ligand was -9.34 kcal/mol, and the value of bond energy for molecular docking of flavonol is -8.51 kcal/mol. Based on bond energy value, compounds with potential as Mpro inhibitors are 4',7-dihydroxy 3-methoxy flavonol compounds.



Measuring and Comparing In-situ CO₂ Concentrations with Satellite

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Abstract

Satellite data play a significant role in monitoring the Earth atmosphere, not only to assess numerical weather prediction, but also to study chemical compounds, like Carbon dioxide (CO_2). In particular, the high spectral resolution of the Atmospheric Infra-Red Sounder (AIRS) flown onboard the National Aeronautics and Space Administration (NASA) Aqua platform provides significant information about the CO_2 concentration in the upper troposphere. Hence, this study seeks to investigate the impact of two fundamentally different CO2 data sources on the calculation of the yearly yield and performance ratio of three locations in different climatic regions of Indonesia, namely: Bandung, Kototabang, and Pontianak. Using AIRS instrument, this study used ground-based and satellite-based as the data sources. It found an over estimation of the yield calculation of up to 9.3% for satellite-based climate CO_2 data compared against one-minute ground-based CO_2 data. Therefore, a linear correction of the yield calculation is proposed, as it allows improving the prediction accuracy based on more broadly available satellite-based CO_2 data.



Impact of The September 2019 Kalimantan Smoke Haze Event on Air Pollution

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Abstract

Forest and land fires in Kalimantan increase along with the rapid deforestation, land clearing, and are induced by dry climate. This study aimed to analyze the impact of the September 2019 smoke haze event on the environment and air quality in Kalimantan . Air quality parameters combine with aerosols from Aerosol Robotic Network(AERONET) data and some environmental parameters, i.e. rainfall, visibility, and hotspot numbers are investigated. There are significant relationships between aerosol and environmental parameters both in Palangkaraya dan Pontianak. Aerosol haracterization through aerosol optical depth (AOD), which is characteristic of biomass burning aerosols. We implemented WRF-Chem to simulate air quality in September 2019 when intensive biomass burning occurred over this area. TERRA/AQUA satellite datasets were supporting data to observe fire hotspots. PM2.5 concentration were higher at the time and the area with the larger number of fires was found. The results are consistent with other previous studies stating that biomass burning is one of contributing sources, besides local sources such as traffic or cooking impacts on air quality over the region in summer. We advocate the integration of diversity data sources, such as satellite remote sensing data and ground-based observation data in conjunction with assimilation approach in online model system for building innovative operational air quality forecasts in the region to address haze impacts and health concerns



Extreme Rainfall And Relationship With El Nino Southern Oscilation (Enso) In East Kalimantan

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Abstract

El Nino Southern Oscillation (ENSO) has been related to global climatic anomalies including East Kalimantan-Indonesia. Extreme rainfall is one of the ENSO related to climate anomalies. Using the Southern Oscillation Index (SOI) as ENSO parameters, this research examined at extreme rainfall and its link with ENSO. The data set starts from 1986 to 2012. The Gumble distribution and correlation analysis are methods that used in this study. The Gumbel is a distribution approach for predicting calamities such as extreme rainfall. The largest rainfall values of two years return period were obtained from sta-24 (535.07 mm), five years from sta-2 (788.84 mm), ten years from sta-7 (986.84 mm), twenty-five years from sta-2 (1321.65 mm), fifty years from sta-2 (1570.00 mm), and one hundred years from sta-2 (1816.51 mm). For the correlation analysis was calculated by dividing into 4 seasons: January to March (JFM), April to June (AMJ), July to September (JAS), and October to December (OND). For all stations, tests were conducted from lag-0 to lag-3. The highest correlation coefficient was discovered in lag 0 of JAS and OND. Mostly all stations are a positive correlation with $r \ge 0.4$. The result shows that the influences began to start from July to December in lag 0. The correlation was declining with an increase in lag that showed by lag 1, lag 2, and lag 3. This result shows that ENSO has a direct influence on rainfall in East Kalimantan.



Geology of Campaka District, Cianjur Regency, West Java Province

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Abstract

Geological mapping is a process that describes the geological conditions of an area. The mapping area is located in Campaka District, Cianjur Regency, West Java Province. The purpose of writing this report is to inform readers about the geomorphology, stratigraphy, structure, history, and geological potential of the mapping area. Mapping activities are carried out in accordance with the mapping method, namely conducting literature studies before going to the field, taking samples in the field, then carrying out post-field laboratory analysis to determine the map of the mapping area. The mapping area has geomorphological units that are arranged based on geomorphological aspects, namely Structural High Very Steep Hills Geomorphological Units, Very Steep Intrusion High Hills, and Structurally Steep High Hills. The rock units in the mapping area consist of Andesite Intrusion Unit (Tpia), Andesite Lava Unit (Tma), Tuff Unit (Tmt), Sandstone and Claystone Interchange Unit (Tmpl) and Limestone Unit (Tmg). The mapping area has an indication of the horizontal sinistral fault structure, upward faults, drag and anticline folds, as well as the positive geological potential of the Terekel waterfall tourist attraction and the negative side of the potential for landslides.



Resistivity Value of Oil Contaminated Soil Based on Geoelectric Resistivity Interpretation and Soil Coring

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Abstract

The resistivity value of oil contaminated soil is important as a basis for determining the distribution of oil contaminants in the soil. The purpose of this study was to determine the resistivity value of oil contaminated soil. This research was conducted by using geoelectric resistivity and coring of soil and rock methods. Geoelectric data is modeled in 3D to obtain a model for the distribution of soil resistivity. Soil coring was identified physically, measured the resistivity value and analyzed for the oil content (Total Petroleoum Hydrocarbons). The value of the distribution of geoelectric resistivity is compared with the resistivity value, oil content and physical properties of the soil coring to determine the type of contaminant and the range of resistivity values. The results showed that the soil contaminated with oil had a resistivity value range of $2\Omega m - 15\Omega m$ at 1 m - 4 m in depth, which corresponded to the coring resistivity value from $2\Omega m$ to $12.5\Omega m$ at 1m - 4m in-depth, the physical identification of coring in the form of wet and soft silty clay, with The value of Petroleum Hydrocarbon Analysis for (C₆-C₉) is from 0.3mg/Kg to 31mg/Kg and for (C₁₀-C₃₆) is from 0.3mg/kg to 33mg/kg.



Environmental Review for Ecotourism Potential of Batu Putih Area, Samarinda, East Kalimantan

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Abstract

Limestone in the Batu Putih area in Samarinda always mined as needed for construction materials. Mining activities might disturb the environmental balance and the area proposed to be conserved with ecotourism approach. This study aims to determine the ability of the Batu Putih and surroundings as a conservation area for ecotourism purposes. The research method used is descriptive qualitative, to determine the geological conditions of the Batu Putih area, potential tourism spots for the communities, and aspects of regional environmental management. Based on the results of the study, the Batu Putih area can be grouped into various tourism potentials in the form of natural tourism (parts of Batu Putih hill, mud volcano Rejang Raya), artificial tourism (Kampung Minyak flower garden, Lake Rejang fish pond, Nusyirwan Ismail road fruit garden) and religious tourism (tombs of Habib Ali bin Abdullah Al Bahasyim and Syech Ahmad Rifai bin Abdullah, Subulussalam Islamic Center Complex). Environmental management proposed as revegetation of open land/ shrubs, optimization of existing roads and alternate new roads, stopping rock excavation activities, securing implementation of conservation zones for the area as declared in Detailed Spatial Plan for Samarinda Ulu District, Samarinda City for 2019 – 2039" and proposed additional conservation zones.


Chem-455

Energy Harvesting on Dye Sensitized Solar Cells (DSSC) as an alternative to renewable energy. A Study of Computational Molecular Electron Structure

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Abstract

One of the renewable energy sources is Dye Sensitized Solar Cells (DSSC). This model harvests energy from sunlight in the presence of dye compounds (Dye) in the solar cell system. Many DSSC studies have been carried out experimentally and are still being developed on a larger scale for the purposes of Power Generation. However, studies of DSSC at the molecular level have not been widely studied. Computational studies of solid materials are one way to study molecular level studies, including to study systems in DSSC. In this study, a review of cyanidin and curcumin dye molecules in the TiO₂-Graphene system as a model of Dye Sensitized Solar Cells (DSSC) was carried out. The electron or energy harvest was studied from the electron structure formed by the Density Functional Theory (DFT) method. Calculations with this method showed that the band gap differences of cyanidin and curcumin molecules were 8.03 eV and 7.65 eV, respectively. The optimum distances between cyanidin and curcumin molecules on the TiO_2 -Graphene surface were 4.4 A and 13.4 A, respectively. The PDOS calculation resulted in a band gap of 2.03 eV for the TiO_2 -Graphene system, while for cyanidin and curcumin against the TiO_2 -Graphene system were 3.51 eV and 3.75 eV, respectively. The electron transfer indicated by the isosurface value showed the electron transfer from the p and d sub-orbitals of TiO_2 -Graphene to the surface of the s and p sub-orbitals in cyanidin and curcumin molecules, which were +0.746 e/A and 0.875 e/A, respectively. This showed that the interaction of curcumin molecules on the graphene-TiO₂ system was stronger than that of cyanidin molecules.



Gphy-440

Numerical assessment of flushing time in Balikpapan Bay

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Abstract

Balikpapan Bay is a narrow bay waters and there are estuaries of rivers, as well as part of the Makassar Strait. One important factor in a bay is flushing time, which is the length of time a particle that enters a bay is released back into the open sea. The longer the flushing time in a bay, the more likely the bay will be polluted. If the rinsing time in a bay is fast, particles entering the bay will be quickly removed so the bay will tend to be clean. This study uses a numerical model to perform hydrodynamic and trajectory simulations in Balikpapan Bay, the hydrodynamic model used is the Regional Ocean Modeling System (ROMS) and the trajectory model is Opendrift. The simulation was carried out by releasing a number of particles at the mouth of the bay, and the simulation results showed that within 1 day the particles reached the farthest point, namely in the Kariangau area, then the particles tended to be stranded in Penajam. On the second day, all particles (100%) flowed and spread out to sea, up to the Makassar Strait. Balikpapan Bay flushing time based on numerical assessment is 44 hours or 2 days.



Detecting the Tomato Leaf Disease Using Clustering Algorithm Based on Fuzzy Adaptive Turbulence Particle Swarm Optimization

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Abstract

Early blight is one of diseases that infects tomato leaves. The symptoms of this disease are characterized by the appearance of dark spots on tomato leaves. This disease causes a decrease in the production of tomato plants. The early detection of this diseases is very important to maintain the tomato production. Monitoring tomato leaves health manually in large area is very time-consuming and inefficient. The drones and computer vision technology is an alternative in solving this problem. One of the important steps in detecting the tomato leaf disease based on computer vision is the segmentation area of the tomato leaf into the healthy and diseased tomato leaf. The K-means clustering is an image segmentation method that is simple, fast and works unsupervised. However, the solutions of the K-means clustering algorithm often be trapped into the local optimum. The Particle Swarm Optimization (PSO) offers a solution of this problem. The performance of PSO depends on the particle velocity of the PSO, if the particle velocity is not determined precisely then the PSO will converge prematurely. Fuzzy Adaptive Turbulence Particle Swarm Optimization (FATPSO) offers an adaptive minimum velocity control of the PSO particles to overcome the premature convergence problem in PSO. For this reason, these papers propose the FATPSO to detect the tomato leaf disease. The fitness function of FATPSO uses an objective function of K-means clustering algorithm. The experimental results show that the FATPSO has a better performance than the PSO algorithm in detecting the tomato leaf disease.



Mathematics Model in Determining the Portion of Tabarru' Fund for Sharia Life Insurance with Wakalah Scheme

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Abstract

Sharia companies in the financial industry are currently growing rapidly, so that more sharia products are now starting to be offered to the public. One of them is in insurance industry, sharia life insurance. The main difference between sharia insurance and conventional insurance lies in the aqd contract and the management of premium funds paid by the policyholder to the insurance company. Based on one type of contract in sharia life insurance, namely the Wakalah bin Ujrah contract or Tijarah contract, premium funds are divided into several types of funds, one of which is called Tabarru' funds. In addition, in the Wakalah Contracts, insurance companies have the power to manage the Tabarru' funds and/or participants' investment funds in exchange for ujrah. In this study, the optimal portion of the Tabarru' fund was calculated using the Equivalence Principal (EP). Under the EP principle, the sum of the expected present values of profits and expenses equals the current expected values of premium income. Then, a simulation is carried out to get the optimal portion of Tabarru' funds by using the data in the Indonesia Mortality Table IV which has been released by AAJI in 2019.



Discrete Dynamical Analysis On A Predator-Prey Model For Controlling The Extinction of The Pesut Mahakam (Orcaella Brevirostris) at Mahakam River

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Abstract

Pesut Mahakam (*Orcaella brevirostris*) is an Indonesian animal which is in critical condition towards extinction. The study about discrete dynamic analysis of predator-prey between Pesut Mahakam and its prey has been studied. These were the result of the study. First, the condition in which each predator and prey were headed for extinction, highlighted the instability. Second, the condition in which the predator were almost extinct and the prey were survived, pointed that the excessive levels of poison in the Mahakam river can cause the Pesut Mahakam to become extinct. Third, it were obtained that the predator and prey are able to survive after experiencing a critical period that brought both populations close to extinction. The bifurcation model has been studied to observe the dynamic of Pesut Mahakam. The parameter value of the Pesut Mahakam (predator) growth rate has been obtained by fitting the curve based on data in the field. In addition, the numerical simulations has been conducted to describe the result of analysis.



Regularized Quasi-Semigroups

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Abstract

Regularized quasi-semigroup are generalizations of quasi-semigroup. Generalization is done by changing the identity operator to an injective bounded linear operator. This paper discusses the general properties regularized quasi-semigroup of bounded linear operator.



Series Solutions for The Spherically Symmetric Droplet Transient Heating Problem

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Abstract

The spherically symmetric heat conduction equation is analysed inside an evaporating droplet suspended in a time-evolving hot gas mixture, when assuming the droplet radius to be fixed during a short time step. The volume-average or core temperature of the spherical droplet is considered at the beginning of the time step. From the resulting initial-boundary value problem, Explicit solutions in the Laplace domain are obtained for the droplet internal and volume-averaged temperatures. Then, exact series solutions are derived in the time domain by means of convolution and Heaviside's expansion theorems. A comparative analysis is performed for the droplet internal temperature with a specific series solution often used in the literature. The analysis shows that the two solutions are identical when considering the droplet core temperature at the beginning of each time step. Both solutions can then be used in Computational Fluid Dynamics (CFD) calculations for sprays.



Actuarial Approach of COVID-19 epidemic in China

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Abstract

The risk of the worldwide novel coronavirus-caused pneumonia (COVID-19) pandemic have led to a revived interest in the study of infectious diseases. Mathematical models have become important tools in analyzing the transmission dynamics and in measuring the effectiveness of controlling strategies. Research on infectious diseases in the actuarial literature only goes so far as to set up epidemiological models which better reflect the transmission dynamics. This paper will provide actuarial model expected to be able to help financial arrangements to cover losses due to infectious diseases based on a work by Peng et al on epidemic analysis of COVID-19 in China by dynamical modelling. They proposed a generalized SEIR model to analyze COVID-19 epidemic in China. Based on classical epidemiological compartment models, this paper will formulate financial arrangements, between an insurer and insureds, using actuarial mathematics.



Analysis of Service Provider Marketing Strategy in Achieving Customer Loyalty Using Game Theory for Senior High School Students in Samarinda City

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Abstract

Competition between two or more parties who are interested in facing each other can be modeled using a mathematical model through game theory. Telkomsel and Indosat as telecommunication service providers can be seen as competition between two parties who are interested as telecommunication service providers. Marketing strategies are needed to attract consumers, especially in pandemic era that requires internet services for online learning for elementary, middle, high school, and college students. This study aims to analyze the marketing strategies of service providers in achieving customer loyalty using game theory for senior high school students in Samarinda city. In this study, a sample of senior high school students in Samarinda city was used with research variables on starter pack price, network and signal, social media package promos, conference package promos, internet package price and internet package validity period. Based on the results of game data analysis, the optimal game value is 5.53 with the optimal strategy for Telkomsel card provider superior in network and signal (X2) and conference package promos (X4). Then for Indosat provider card, the internet package price (Y5) and validity period of the internet package (Y6).



Continuous Monotonic Decomposition of Corona Product

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Abstract

Let *G* be a simple graph with an edge set E(G). If $G_1, G_2, G_3, ..., G_r$ are connected edge disjoint subgraphs of *G* with $E(G) = E(G_1) \cup E(G_2) \cup E(G_3) \cup ... \cup E(G_r)$, then $G_1, G_2, G_3, ..., G_r$ is a decomposition of *G*. An (a, d) – Continuous Monotonic Decompositions, or (a, d) - CMD, of *G* is a decomposition of *G* into *r* subgraphs $G_1, G_2, G_3, ..., G_r$ such that each G_i is connected and $|E(G_i)| = a + (i - 1)d$, for each i = 1, 2, 3, ..., r. Many authors have studied decomposition, including (a, d) - CMD, of graphs. In this paper we study (a, d) - CMD of some other class of graphs. Let *n* and *m* be positive integers, $n \ge 3$. The corona product of a cycle C_n and an empty graph $\overline{K_m}$, denoted $C_n \odot \overline{K_m}$, is a graph formed from C_n and *n* copoies of $\overline{K_m}$ by joining each *i*th vertex of C_n , with an edge, to every vertex of the *i*th copy of $\overline{K_m}$. A caterpillar is a tree in which the removal of all its end vertices results a path. In this paper we find an (a, d) - CMD of $C_n \odot \overline{K_m}$ into caterpillars.



Predicting the Number of Covid-19 Cases in Surabaya using Hybrid Extreme Learning Machine and Particle Swarm Optimization

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Abstract

Covid-19 has spread to various countries in the world, including Indonesia. Surabaya becomes one of the big cities in Indonesia where the spread of Covid-19 is very fast, so the number of positive cases of Covid-19 is very large and more than 1000 people die because of this disease until November, 2020. Prediction of the number of positive cases of Covid-19 can be used to regulate the availability of facilities in hospitals and make plans and policies to overcome this disease outbreak. Many prediction methods have been found, one of which is Extreme Learning Machine (ELM). ELM has high training speed and accuracy. However, the performance of ELM depends on the number of neurons. When the number of neurons is not precisely determined, the accuracy of prediction becomes worst. Particle Swarm Optimization (PSO) is used to decide the number of neurons. For this reason, this paper proposes a prediction of the Covid-19 cases in the City of Surabaya using the hybrid of ELM and PSO (ELM-PSO). The experiments show that the performance of the proposed methods is better than the original ELM in the prediction of the Covid-19 cases.



Hill Cipher Algorithm Using Two Keywords and 94 ASCII Code Characters

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Abstract

Hill Cipher algorithm is one of the methods in cryptography. The Hill Cipher algorithm was invented by Lester S. Hill in 1929. The Hill Cipher algorithm uses 1 keyword and 26 characters in the alphabet. The number of keywords and characters affect the strength of the Hill Cipher algorithm. In this study, modifications to the Hill Cipher algorithm were carried out using 2 keywords and 94 ASCII code characters with the aim of increasing the strength of the Hill Cipher algorithm. The modification technique used is to multiply the matrix of 2 keywords, replace 26 characters in the alphabet into 94 ASCII code characters, change the ciphertext equation to C=KP(mod 94) and change the plaintext equation to P=inv(K)C(mod 94). As a result, this modification can be done and the Hill Cipher algorithm can work well in encoding messages.



Calculation of Region in More Than Two Different UTM Zone Using Shoelace Formula Based on the GADM Database

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Abstract

This study is aimed to determine the area of more than 2 UTM zones using the shoelace formula and the Karney polygon method. The results obtained are compared with the reference area obtained from Central Bureau of Statistics. The results of the use of the shoelace formula and the Karney polygon method in determining the area based on provincial boundaries from the GADM database are 153615.8742 km² and 153210.0278 km², respectively, so that the absolute percentage difference with the reference area is 0.03 % and 0.23 %, respectively. Likewise, if the shoelace formula method and the Karney polygon method in determining the area based on district boundaries from the GADM database, respectively, namely 153633.2536 km² and 153694.9630 km², the absolute percentage difference with the reference area is 0.05% and 0.09%, respectively. The results obtained are relatively satisfactory because the difference with the reference area is relatively small, which is even less than 1%. Likewise, similar results can be obtained if the boundaries of the sub-district and village areas.



Physics Laboratory by Video Tracker and Visual Basic for Application at Home During Covid-19 Pandemic: Material Elasticity Measurement

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Abstract

There are many applications that can be used to support physics laboratory today during Covid-19 pandemic. Video tracker and Visual Basic for Application are simplest application nowdays. In this work, we present the implementation of Video Tracker and Visual Basic for Application (VBA) Excel at home to measure elasticity modulus of Sheet-Shaped Material in physics Laboratory. There were two stages performed to obtain elasticity modulus of sheet-shaped material. Firstly, the sample was placed in a curved position (curvature angle variation) then the image was recorded. The results of this photo recording were processed using video tracker software. The data obtained were coordinates point mass of each sheet-shaped material curvature. These coordinate point mass used to calculate elasticity modulus using cantilever beam elasticity equation. Finally, to confirm these results, we also measured directly on the material using a tensile test equipment. The computed results showed that elasticity modulus value closed to value obtained by direct measurement using a tensile strength device. Hence, this method is very potential to develop new ways of practice in physics laboratory.



The Future of Palm Tree Plantation Using Power Self Generation on Wiring Telecommunication As Outcome of Plant Output

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Abstract

Palm tree plantations in tradition are separated from the outside environment because it's situated almost far away from the village or nearby town. This is not the limited from the government of Indonesia also not the public of palm tree owner's in Indonesia and the currently matter is how to use materials from the plantation to generate power to empowered the infrastructure of telecommunication that is needed and keep maintained for the benefit of Indonesia's economy and the prosperity of palm tree plantation's owner and the government's side. Thus this matter could be resolved by pertaining good will and warm hearted from the public of Indonesia to join in such government's plan and action to enhance the innovation and technology that is owned by the government of Indonesia.



SNI Standard Freight Software Design With Social Platform Media For Cost Efficiency And Effectiveness For Product Advantages For Cooperative Found MSME Products

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Abstract

In designing the SNI Standard Freight Software that will be applied, the methods used are library research, analysis method with fishbone diagrams and freight software design method using PHP-based Multi Platform Media. The analytical method in the form of action research is intended to examine the problems faced by the Regional Government Work Units of the cooperative service in Gorontalo Province and entrepreneurs in the e-commerce field with logistics lines as samples. The design method is used to design a new Freight Software based on data taken from the results of a poll with the cooperative service in the form of SNI Standard Freight Software with Intellectual Property Rights that can solve the efficiency and cost effectiveness problems faced for the superiority of MSME products. Designing SNI Standard Freight Software with HAKI Freight software using cloud computing web server hardware with client hardware and freight software Multi Platform programming, interpreter and freight software for clients. The results to be achieved in the first year of research are SNI standard freight software design with Social Media platforms with Intellectual Property Rights and international journal publications.



Integration Of Indonesian Regional Head Election General Election Information System Using Online Real Time Basis Ssytem With Touchscreen Fingerprint

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Abstract

The general elections and regional head elections of the Republic of Indonesia which will be held in 2024 use a decentralized electoral system for each electoral center region using an online life time basis system with a touchscreen fingerprint can be designed using the Android SDK 6.0 Platform and System Images. This information system can be designed to make it easier for voters to vote for candidates for Regional Heads and members of the DPD and DPR as well as candidates for the President of the Republic of Indonesia. The database used is android:installlocation, to avoid system crashes, you can use a secondary memory API and USB Bluetooth with a performance display using 4K. Cameras can be used to monitor and validate voter identification as an alternative to using fingerprints for Biometric Authentication and Recognition as a condition for the validity of voter identity in addition to using NIK (Population Identification Number). This system uses a 4G internet network so that it can be used online Real Time Base and can reach all regions of the Republic of Indonesia to deliver voter votes and integrate directly into the KPU (General Election Commission) database.



The Effect of Wood Width, Thickness, and Length on Static Bending of Red Meranti (Shorea Sp.)

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Abstract

This study aims to determine the dimensions effect of the width, thickness, and length of different wood on the static bending strength of MerantiMerah (*Shorea* sp.). This study was to test the theory of "link weakness theory" of non-timber material which showed weakening with increasing size and volume of the material. The results of the research are expected to be information and evaluation in the application of wood material as a structural material. Specimen testing uses solid wood test standards, DIN 52182 for moisture content test, DIN 52183 for wood density test, and DIN 52186 for static bending strength test including modulus of elasticity (MoE) and modulus of rupture (MoR). Statistical analysis (ANOVA) and LSD (Least Significant Difference) test at 99% confidence level were used to analyze the effect and differences between treatments. The results showed a very significant difference between treatments, where the value of static bending strength decreased with increasing width, and increased with increasing thickness and length.



Experimental-Laboratory Study to reduce iron content in peat groundwater using a layered filtration technique

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Abstract

This research was conducted by experimental-laboratory study to reduce iron content in peat groundwater using a layered filtration technique. This research method is carried out by designing a layered or multilevel filter technique that is designed in such a way as to get the right composition in the filter layer arrangement. The well water samples studied had an iron content of 5.0863 mg/L which did not meet the requirements as clean water (at least 0.5 mg/L) and drinking water (at least 0.3 mg/L). The zeolite filter media was able to reduce the iron content of the sample to 3.0362 mg/L. Activated charcoal filter media was able to reduce the iron content of the sample to 1.4662 mg/L. The zeolite-activated charcoal filter media was effective in reducing the iron content of the sample to 0.0326 mg/L. The last research has been carried out with the composition and arrangement of the filter layers in the container in order from top to bottom is zeolite, charcoal, beach shell sand. The filter is most effective in reducing the iron content of the sample to 0.0106 mg/L. The results of well water filtration using zeolite-activated charcoal filter media are categorized as clean water, while the zeolite-activated charcoal-coast shell sand filter is categorized as clean water and drinking water. However, the filtered water from zeoliteactivated charcoal-sand beach shells must still be cooked for drinking water so that germs and bacteria die in boiling water temperature.



Improvement Physical Science Interest for Elementary Students in SDN 22 Samarinda by Basic Measurement Learning

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Abstract

Efforts to increase students' interest in physical science must begin in early. The purpose of this community service is to carry out basic measurement learning in SDN 022 North Samarinda. This Service Community targetting for 25 students in grades 4-6 which are randomly selected. In this work, the basic measurement tools are ruler, calipar, screw micrometer, measuring cup and then the materials are papers, stones, eggs, and glasses. The stages of activity implementation are introducing, using procedures, and practicing of basic measurement tools for students. The demostration results show that they only know how to use a ruler from all basic measurement tools, while others only know from figure, and they have never practiced before. In the next, practical activites in SDN 022 North Samarinda will be carried out regulary to improve physical science interest related to daily life. SDN 022 and Physics Department of Mulawarman University should collaborate with each other to support this work by agreement of MoU.



The effect of truncating the Taylor series terms toward derivative results of the Complex Conjugate Approach and its applications in Geophysics and Statistics

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Abstract

The formula for the Truncation Error (ET) was composed of the terms of the Taylor series of complex conjugate argument function that were discarded when formulating the derivative equation. The test results using 3 Test Functions have shown that the truncation of the series terms in the h3-term, the h5-term and the h7-term has no significant effect toward the computational results of the derivative. For Test Functions I and II, the ET was on the order of 10^{-43} and 10^{-30} , and for Test Function III it was on the order of 10^{-44} . This means that the ET is extremely small that it is close to zero or $ET \rightarrow 0$ so that it can be ignored. While the Relative Error (Er), both those cut on the h3-term, the h5-term and on the h7-term, were on the order of 10^{-16} for Test Functions I and II, and on the order of 10^{-17} for Test Function III. This means that the Approach is very accurate because the Er is highly small, close to zero or $ET \rightarrow 0$. For its application in geophysics, the Approach was used to estimate the derivative of the total magnetic field anomaly caused by a 2D finite prism-shaped source under the earth's surface, and the results were in the range of -2.7515×10^7 to 2.1665×10^7 nT/km. For statistics, it was known that the average birth rate and death rate in Konawe Regency for 2020 were 148.90 births/month and 12.38 deaths/month, respectively.



Utilization of 3-Dimensional Watershed Model to Support Disaster Mitigation Learning System

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Abstract

Schools are one of the parties that have potency to embed the paradigm of disaster risk reduction through disaster understanding. The purpose of this community services was to carry out disaster mitigation lessons using the 3-Dimensional Watershed Model. The research location was SMPN 042 Samarinda, with audience target 25 teachers and students. The 3-Dimensional watershed model was using the Karang Mumus sub-watershed prototype, which was made independently with the contents of rainfall, water precipitation areas, border and riverbanks, and residential area. Monitoring and evaluation was carried out through questionnaires and observations regarding: experience of disasters, understanding of floods, understanding of disaster mitigation, ability of the model to explain disaster mitigation improvements. The results showed that the flood disaster was experienced by most respondents, low understanding of watersheds, the models were acceptable under the improvements of: the model size which too small, the extended of simulation time, and must be supported by computer animation program.



$\label{eq:synthesis} Synthesis and characterization of TiO_2 \ from \ Lampung's \ iron \ sand \ using \ acid \ leaching \ method \ with \ variation \ of \ HCl \ concentration$

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Abstract

This research has been done to determine the content of TiO_2 from iron sand of Lampung by the acid leaching method. Previously, iron sand was mixed with sodium hydrogen carbonate (NaHCO₃) and roasted at 700°C for an hour. In this research, five samples were used to determine the TiO2 content of Lampung's iron sand, with variations in HCl concentration of 4, 6, 8, 10 and 12 M in leaching process for 2 hours at 110 °C. Then the water leaching process was carried out using 50 ml distilled water. Then, all samples were characterized using XRD and XRF to determine the content in Lampung's iron sand. The highest TiO₂ content of Lampung's iron sand sand was obtained in samples with 12 M of HCl concentration i.e. 33,737%.



Mechanical Properties of Natural Fiber Biocomposite : Bamboo Apus (Gigantochloa Apus)

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Abstract

Mechanical Properties of Natural Biocomposite Bamboo Apus (*Gigantochloa Apus*). The utilization of bamboo fibers as reinforcement in composite materials has increased extensively and has undergone high-tech revolution in the recent years as a response to the increasing demand for developing biodegradable, sustainable, and recyclable materials. Researchers have expanded their expertise for advanced polymer biocomposite such as thermoplastic. In this work, we fabricated biocomposite based bamboo apus (*Gigantochloa Apus*) as reinforcement and the Yukalac® 157 BQTN-EX for binding. The fibers extraction carried out through mechanical processing. The biocomposite specimen was fabricated using hand lay-up method. Before making the specimen, the fibers were treat used different NaOH concentration of 3% and 5%, respectively. The tensile and flexural properties of the obtain bamboo composite was measured using ASTM D3039 and ISO 178, respectively. Our results shows that the tensile strength is in between 4.05 MPa to 93.18 MPa and the flexural strength is in between 19.37 MPa to 158.86 MPa. The largest tensile strength and flexural strength found here are comparable to the synthetic thermoplastic. This result indicates that biocomposite based bamboo apus are potentially to various design application such as knee decker.



Sentiment Analysis of IPOT Application Reviews Using Naive Bayes Classifier Method

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Abstract

Investment conditions in Indonesia today are very crowded among the public, especially investors as investment actors. One of the investment applications used by the people of Indonesia is IPOT. IPOT is a trading application for stock investments, mutual funds, and Exchanged Traded Funds (ETFs) with more complete features. The availability of IPOT application user reviews on Google Play is very helpful for companies to know the needs and wants of users about the application. These reviews can be analyzed using sentiment analysis to find out how users think about the application they're using. Therefore, the purpose of this study is to conduct sentiment analysis on IPOT application reviews using the Naive Bayes Classifier method. The results of this study were obtained that positive sentiment has a greater value compared to negative sentiment with the accuracy of the classification of test data has an AUC value of 67.80% while the training data has an AUC value of 70.13%.



Sentiment Analysis of Soco By Sociolla E-Commerce Application Review on Google Playstore Site Using Naïve Bayes Classifier Method

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Abstract

Beauty product store SOCO (Sociolla Connect) is a application that sells about beauty products and tools, skin care, body care, hair care and parfume. Beauty products store app available and easy to use on Google Play Store not only there is SOCO by Sociolla or two apps only. the large number of beauty products store apps available causes users to be more selective in determining what apps are better and suitable for use. This can influence users to select an app by looking at the reviews that have been presented on the app's download page. These reviews are often used as a benchmark in an app's assessment. This study aims to find out the sentiment analysis of SOCO by Sociolla app reviews using naïve bayes classifier method. The result from calculation of classification have a accuracy value of 75.41% with a precission value of 72.32% and a recall value of 78.98%. Wordcloud sentiment positive class obtained a word that is often used to give reviews e-commerce application SOCO by Sociolla is a good word, application, product, shopping, Sociolla, and likes, while on negative class sentiment the word that is often used is the word application, update, exit, shopping, and open.



Sentiment Analysis Data By Shopeepaylater Twitter's Opinion Using Naïve Bayes Classifier

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Abstract

The Covid-19 pandemic effect on online shopping transactions rather than offline in order to prevent the spread of the Covid-19 virus. The paylater service help Indonesian become more easier to shop by taking out a loan. Shopee is one of the marketplaces that has a paylater service, namely Shopee PayLater, which is one of the payment methods on the Shopee platform that allows Shopee users to shop and only pay at a later date when it is due. Every new ShopeePayLater user want to know how the previous user responded as a form of testimony after using this feature via Twitter in the form of tweets. So it is necessary to conduct a sentiment analysis to find out public opinion with the existence of ShopeepayLater using the Naïve Bayes Classifier method so that it can provide useful information for Shopee and the public regarding ShopeePayLater services. Calculation of classification accuracy is carried out using G-Mean and AUC, because the sentiment of the tweets data is included in the imbalance data category resulting in a G-Mean value of 64,79% and AUC of 66,12%.



Forecasting of Analytic Residential Price Index Using ARIMA Box-Jenkins

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Abstract

Residential Price Index is one of the economic indicators that provides information on residential property development both in the current quarter and the coming quarter. The precise forecasting of residential property price index figures in each period will be a good reference for Bank Indonesia and other parties in need in order to anticipate in case of unforeseen events affecting real conditions. In this study, Residential price index data modeling was conducted during 2003-2020 using ARIMA Box-Jenkins model. The results showed that the best ARIMA models were ARIMA ([4],2,1) for small houses, ARIMA (0.1,[3]) for medium houses, and ARIMA (1,1,0) for large houses. The forecast results from the best ARIMA model resulted in the fourth quarter of 2021 of 397.62 for small houses, 357.60 for medium houses, and 315.75 for large houses. This indicates that there is an increase in IHPR for the period 2021 in the three categories of houses for the city of Surabaya compared to the base year 2002 and also in 2020, and there is no indication of a bubble property event that is oversupply in 2021.



Assessing the Optimum Condition of Multivariate Second Order Response Surface Model Through the Asymptotic Inference of the Eigenvalues

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Abstract

As documented in the literatures of response surface methodology, the optimality condition of a second order response surface model can be accessed by investigating the magnitude of the eigenvalues of the model matrix. In this paper we establish asymptotic on dence regions for the vector of eigenvalues of matrix models when the observations are obtained from a multivariate second order response surface model. The limiting distribution of the pivotal quantity of the vector of eigenvalues has been derived by applying multidimensional delta method. Under mild condition it has been shown that the sequence of the pivotal quantity of the eigenvalues converges to a centered multivariate normal distribution. By the projection, we immediately obtain the asymptotic marginal condence intervals of the components of each variable. The application of the method to a real data consisting of bivariate observations has been also discussed.



Forecasting Gold Based On Ensemble Empirical Mode Decomposition And Elman Recurrent Neural Network

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Abstract

Gold is a metal that has a variety of different forms and functions. Gold is not only used in jewelry and beauty, but also for investment. Gold investment is a good alternative to maintain financial stability, especially during the global economic turn-down and uncertain. The world gold price fluctuations tend to be nonlinear and uncertain. One method that can accommodate world gold price fluctuations is using Ensemble Empirical Mode Decomposition (EEMD). In this study, a forecasting model based on EEMD and Elman Recurrent Neural Network (ERNN) is proposed to predict world gold price. The data used in this study is daily data of world gold price on the investing.com database. First, the world gold price time series is decomposed into several intrinsic mode functions (IMF) and residual using EEMD. The IMF components and residual are than modeled and forecasted using Elman Recurrent Neural Network (ERNN) and the final forecasting value can be obtained by the sum of these prediction results. The EEMD-ERNN model is chosen to reduce the difficulty in modeling and improve prediction accuracy. Finally, the results show that the EEMD-ERNN hybrid model is better than the ERNN model without EEMD preprocessing.



Spatial Autoregressive Quantile Regression as A Tool for Modelling Human Development Index Factors in 2020 East Java

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Abstract

The Human Development Index (HDI) is a substantial indicator used to assess the effectiveness in efforts to build the quality of human life. The basic components used to measure the achievement of human development were long and healthy life, knowledge, and a decent standard of living. In 2020, East Java is ranked 15th out of 34 provinces in Indonesia with an HDI of 71.71 which makes it into the "high" category. In this study there is a spatial unit, so the data analysis is not accurate when using merely the linear regression analysis, thus the spatial analysis is applied. The most popular model in spatial analysis is Spatial Autoregressive (SAR). The factors that are thought to influence may have different effects at each quantile level and region, hence the analysis which can be used is Spatial Autoregressive Quantile Regression (SARQR). The highest HDI value in East Java is in Surabaya City at 82.23 and the lowest is in Sampang Regency at 62.70. The results of the SARQR model at the 0.50th quantile show that the model can explain the HDI in East Java in 2020 by 94.3% seen from the R² value and the AIC value of 2.141. The results of the analysis using SARQR modeling obtained the best model, namely the 0.50th quantile, indicating that the factors that affect the HDI value in East Java in 2020 are the percentage of the population (X1), the average non-food expenditure (X3), and crime. (X4).



Asean Foreign Trade Analysis Using Dynamic Panel Data Simultaneous Regression Modeling

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Abstract

This study aims to review the simultaneous regression of panel data and dynamic panel data regression and analyze the results of modeling to get an idea of the influence between variables on short term and long term conditions on foreign trade in ASEAN. The study used two modelings: simultaneous regression modeling of panel data for FDI models, and dynamic panel data regression modeling for Export and Import. The results of simultaneous modeling of panel data for FDI show that there is an influence of Growth GDP, Degree of Openness and Labor Force on FDI on GDP with the good of the model of 96.40%, and there is an influence of FDI on GDP, Gross Fixed Capital Formation on GDP and Balance of Trade on GDP Growth with a good model of 88.29%, while the results of dynamic panel data modeling for exports and imports show that variables that have a significant positive effect on the ASEAN export model are Growth GDP, Real Effective Exchange Rate (REER) while gross fixed capital formation (GFCF) variables negatively affect. In addition, variables that have a significant positive effect on the ASEAN import model are Growth GDP and Real Effective Exchange Rate. The variable that provides the highest long-term elasticity to the import model is the Growth GDP variable of 0.2353.



Analyzing the Nonlinear Nexus Between Crude Oil Prices, Inflation, Exchange Rates and Bangladesh's Export Earnings Using the NARDL Model Approach

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Abstract

From 1991 to 2020, this study investigates the asymmetric effects of crude oil prices, inflation, and exchange rates on Bangladesh's export revenues. The non-linear autoregressive distributed lag (NARDL) model was utilized to determine the non-linear effects of our research variables on export earnings. Higher oil prices have a significant and beneficial impact on export earnings in the long run, but a significant and negative impact in the near run, according to the empirical findings of this study. Lower oil prices, on the other hand, have a negligible short-term and long-term influence on export revenue. The adjustment asymmetry in the dynamic multiplier graphs demonstrates that export revenues respond more strongly to a negative change in oil prices than to a positive change. Inflation and exchange rate reductions, on the other hand, have a significant impact on export revenues both in the long and short run. According to the Wald test, there are asymmetries among variables. For Bangladeshi politicians and investors, the implications of this study are critical.



Estimation of Nonparametric Ordinal Logistic Regression Model using Generalized Additive Models (GAM) Method based on Local Scoring Algorithm

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Abstract

One of the statistical methods used to describe the relationship between categorical scale response variable and categorical or continuous variable of predictors is logistic regression analysis. If response variable has ordinal scale, then it is called ordinal logistic regression. Ordinal response variables is common used in scientific research. There are two approaches to the regression model, i.e. parametric and nonparametric approach. The parametric approach assumes that the regression model for each individual observation has the same parameters, while the nonparametric approach assumes that not all individuals have the same parameters. We develop the nonparametric ordinal logistic regression which is an expansion of the ordinal logistic regression model where the regression function is estimated using a nonparametric approach. The aim of this study is determine the regression function estimators of the nonparametric ordinal logistic regression model using Generalized Additive Models (GAM) method based on local scoring algorithm. The GAM method assumes that the regression function is expressed as the sum of the regression functions of each component predictor variables. The local scoring algorithm consists of two loops, namely the scoring step (outer loop) which is iterated until the deviance value converges and the backfitting step (inner loop) is iterated until the Residual Sum of Squares (RSS) value converges.



Modeling Negative Binomial Regression and Its Application to the Number of Dengue Hemorraghic Fever Cases in East Kalimantan

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Abstract

Poisson regression is an effective method in modeling count data. An essential assumption on modeling Poisson regression is that the mean of the response is equal to the variance, namely equidispersion. Many fields of research were the data over dispersed. Therefore, the Poisson regression model is not appropriate. The negative binomial regression model is a solution of the Poisson regression model when the response is an over dispersion count data. This study aims to build a negative binomial regression model and apply it to model the number of cases of dengue hemorrhagic fever in East Kalimantan Province, Indonesia, in 2019. The number of dengue hemorrhagic fever cases indicates the over dispersion count data. Based on the negative binomial regression model result, the factors that affected the number of dengue hemorrhagic fever cases in East Kalimantan are the total area, the area altitude, population density, and the number of health workers.



Study of Features Importance Level Identification of Machine Learning Classification Model in Sub-Populations for Food Insecurity

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Abstract

To explain a complicated machine-learning model, data scientists work a lot with identifying the importance of predictor features of the model. Shapley Additive Explanation (SHAP) and Permutation Feature Importance (PFI) are popular methods useful to measure the feature-importance levels. This research examines the utilization of both techniques to reveal the contribution of predictors in a model to classify the food-insecurity status of Indonesian households. Food insecurity is a condition in which a person does not have protected access to safe and nutritious food in sufficient quantities for normal growth and development and active and healthy life. Instead of identifying significant predictors for a population in general, the study is interested in identifying each sub-population: urban and rural areas in West Java Province. A random forest algorithm was implemented to generate a model using both complete data and sub-population data. A follow-up analysis was then conducted by applying SHAP for both types of data and PFI for sub-population. In general, the two approaches using SHAP resulted in quite similar feature importance levels. Meanwhile, the results of SHAP and PFI are relatively different.


Clustering on "Z" E-Learning Application's Reviews Using Self Organizing Maps (SOM) and K-Means Methods

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Abstract

"Z" is one of the famous online learning applications in Indonesia which has an increasing number of users during the pandemic. Based on these conditions, "Z" is required to improve their services to keep user satisfaction. Reviews are great tool to get information about the user experience. The number of reviews obtained may be very large and contain various information. Reading all the reviews will take a long time and effort, so it needs a method to summarize the information, and one of the methods is to apply clustering analysis. This study groups the reviews taken from Google Play on rating 1 until 5, the aim is to obtain more detailed information about the weaknesses and strengths of the application. This study also compares performance of clustering using Self Organizing Maps (SOM) which is neural network-based algorithm and K-Means which is centered-based algorithm. Clustering is done using the bigram model to get a clearer meaning. Clustering reviews on each rating successfully getting much information regarding the good or bad user experience, and from that information can be given some recommendations for improvement. Based on Silhoutte and Davies Bouldin Index shows that K-Means gives better result than SOM.



Time Series Analysis on Amount Palm Oil Production Data in East Kalimantan Province

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Abstract

In Indonesia, the one-of-a-kind contributors in Gross Domestic Product are palm plantations from the agricultural sub-sector. Oil palm has a prominent role in economic growth because it is the largest export commodity and the prospect to continue developing mainly in East Kalimantan. The purpose of this article is comparison the forecasting result of the amount of oil palm production using the Singular Spectrum Analysis (SSA) method and the Autoregressive Integrated Moving Average (ARIMA) model. The results showed that the SSA method has MAPE was smaller than the ARIMA model. It means that SSA is better than ARIMA forecasting performance.



The Impact of the Covid-19 Pandemic and Joe Biden's Winning Speech to IDX Composite Using Multi Input Intervention Analysis

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Abstract

The world was shocked by the emergence of a new type of virus, namely Covid-19. 2020 March 2nd, President Joko Widodo announced two positive Covid-19 patients as the first cases of Covid-19 in Indonesia. The Covid-19 pandemic and the Large-Scale Social Restrictions (LSSR) carried out by the government harmed economic growth. The value of the IDX fell from 6000's to 4,000's after the first Covid-19 case in Indonesia. The IDX indicates an increasing trend when Joe Biden made his victory speech on 2020 November 7th. Intervention analysis is used to evaluate the effect of the Covid-19 pandemic, LSSR and Joe Biden's victory speech on the IDX using the daily closing data from April 2019 to December 2020. The results of the intervention analysis obtained are the Covid-19 pandemic raised the IDX value by 233.70 points on the second day and raised 121.47 points on the third day since the announcement of the first Covid-19 patient in Indonesia. The implementation of the LSSR in DKI Jakarta lowered the IDX value by 167.31 points one day after the policy was implemented and Joe Biden's victory speech had no effect on the IDX value.



Geographically Temporally Weighted Regression Model For GIS Mapping of Influence COVID-19 in East Kalimantan

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Abstract

This study has conducted the mapping of Geographic Information System (GIS) based on the Estimation of the Geographically and Temporally Weighted Regression (GTWR) model. The mapping focuses on the factors that affect the increase in COVID-19 on the scale of Regency/City in East Kalimantan Province. The purpose of this research was to find the factors affecting COVID-19 and GIS mapping. The data used are secondary data from the Central Bureau of Statistics and the Department of Manpower, from 2020 to August 2021. This study used the analysis of GTWR Spatio-temporal with the geographic weighting of kernel Gaussian and Bisquare functions. GTWR model is a development of the Geographically Weighted Regression (GWR) model and simultaneously considers the elements of location and time simultaneously. GTWR model can handle non-stationary data, both in spatial and temporal, simultaneously. The advantage of the GTWR model is the generated model is local at each location and time, so that the model is representative. The research results indicated that the factors that affect the increase in cumulative cases of positive COVID-19 in the East Kalimantan Province are the number of tuberculosis cases, population density, GDP, the number of hospitals, and the number of villages that have public health centers. Based on the value of the GTWR model parameter estimator, it was obtained the number of tuberculosis cases, population density, and the limited number of hospitals. They have a great influence on Balikpapan city in comparison with other regions. Based on these values, it gave the information to attend to these factors because of the influence of a considerable increase in COVID-19 cases in East Kalimantan.

Keywords: COVID-19 Outbreak, Spatio-temporal, Geographically Temporally Weighted Regression, GIS Mapping, Geographical Weighted



The Multivariate Adaptive Regression Spline (MARS), And Mixed Discriminant Analysis Approach For Classification Of Poor Households In Papua Barat Province

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Abstract

Poverty is a multidimensional problem that affects many aspects of life, not only economic but also socio-culture and politics. Hence, the government continues to issues various social protection programs to alleviate poverty. Nevertheless, to achieve effective and efficient results from the programs, they have to be supported by provision data and statistical models that can predict the poor accurately. Mixed Discriminant methods can be used as alternative models for the classification of poor households. The data used in this study was taken from the Susenas March 2020 for Papua Barat Province. The predictors are continuous and categorical variables. Mixed Discriminant uses Mixed Principal Component Analysis (PCAmix) for quantification of mixed predictors into predictors of continuous type, prior to Fisher's discriminant analysis. Then compare the performance of the mixed discriminant classification with the established classification method, MARS. The mixed discriminant scores is used to rank poor households. The mixed discriminant has an AUC value of 75.53 which is greater than MARS which has an AUC value of 75.16. The mixed discriminant model is better able to accurately predict poor households in Papua Barat with a percentage of 78.13 percent compared to the MARS model which is only able to accurately predict poor households at 60.59 percent. The MARS model is better able to accurately predict non-poor households in Papua Barat with a percentage of 89.73 percent compared to the discriminant mix which is only able to accurately predict non-poor households at 72.94 percent.



Spatial Panel Data Model of Poverty in Bengkulu Province with Fixed Effect and Spatial Error Autocorrelation

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Abstract

The poverty that occurs in Bengkulu province varies for each district/city, sub-district and village, as poverty data is spatial data that varies by region. The diversity of poverty data in Bengkulu Province is influenced by spatial and temporal effects, and poverty data are cross-sectional and time series data. This study will model the poverty of districts/cities of Bengkulu province using the spatial panel data model. The spatial panel data model is a combined method of spatial regression and panel data regression. This study uses spatial error autocorrelation to detect spatial effects on the panel data model. The results obtained by the panel in the case of poverty in Bengkulu province are the fixed effect of the spatial error model (SEM-FE). Based on this model, the most influential factors on poverty in Bengkulu province are literacy rates, school enrollment rates and the human development index.



Synthetic Minority Over-Sampling Technique Nominal Continuous (SMOTE-NC) Logistic Regression for Imbalanced Data

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Abstract

Evaluation is a method that determines the success of a program or policy that has been carried out by an institution, one of which is an educational institution. Service evaluation is carried out by means of a satisfaction survey of students. The results of the evaluation are one of the efforts to improve the quality of services in educational institutions. In 2021 in one of the educational institutions in the city of Surabaya, 5% of students were dissatisfied with the services provided by educational institutions and 95% of students were satisfied. These data indicate an imbalance in the classification of student satisfaction, where the number of students in the satisfied category dominates more than the number of students who are dissatisfied. The data imbalance has a negative impact on the classification results where the minority class is often misclassified as the majority class. Therefore, this study classifies student satisfaction using the Logistics Regression and the Synthetic Minority Over-Sampling Technique Nominal Continuous (SMOTE-NC) Logistic Regression. The results of the study using the Logistics Regression have an accuracy of 79.41%, a sensitivity of 84%, a precision of 93% and an error rate of 21%. The SMOTE-NC Logistics Regression has 85.29% accuracy, 91% sensitivity, 94% precision and 15% error rate. The results of this study indicate that the SMOTE-NC Logistics Regression method can handle the imbalance in the amount of data and has better accuracy, sensitivity, precision and error rate values than Logistics Regression.



Mapping the Health Quality in Sumenep Using K-Medoids Algorithm

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Abstract

Sumenep Regency is the district with the third highest percentage of poverty in East Java. Health is an investment to support economic development and has an important role in poverty reduction efforts. This study used cluster analysis to map subdistricts in the district based on 3 Health indicators with the k-medoids method. The k-medoids method is a partitioning method of clustering that aims to find a set of k-clusters among the data that best characterize objects in a data set. So in this research, The Sumenep Regency Government can know which subdistricts should be prioritized and can allocate budgets for programs to improve the health quality of poor families. The result of the research are in cluster 1 that health nutrition program, infectious disease control, and environmental health behavior is quite good with a fairly high variation in program implementation and also the availability of clean water facilities is quite good. However, the percentage of contraceptive use is relatively low. Health nutrition program, infectious disease control, and environmental health behavior in cluster 2 is quite good with a fairly high variation in program implementation and also the availability of clean water facilities is quite good.



The Analysis of Factors Affecting Stage Level of Breast Cancer Patients at RSUD DR. SOETOMO Surabaya

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Abstract

Breast cancer is the cancer with the largest number in the world, and ranks as the fifth largest cause of death, which is 6.9% of the total 9,958,133 million cases of cancer deaths. Breast cancer is one of the main killers of women in the world and also in Indonesia. Breast and cervical cancer dominates cancer cases in East Java. Throughout 2019, RSUD Dr. Soetomo Surabaya received 167,000 cancer patients, and the highest case was breast cancer. The high number of breast cancer sufferers makes this disease requires special attention. The cancer staging or staging system is based on whether the cancer has spread from the breast to other parts of the body. Cancer stage is divided into two categories, namely early stage (stages 0 to III A) and late stage (stages III B to IV). This study will examine the factors that affect the level of cancer stage in breast cancer patients at RSUD Dr. Soetomo Surabaya in 2019. Using the binary logistic regression analysis method, it was found that the factors that significantly influence the stage of breast cancer are Grade and Obesity with a classification correctness level of 82.5%.



Measuring Efficiency of Economic Growth in East Java using Data Envelopment Analysis

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Abstract

Measuring organizational performance and monitoring the efficiency of the public sector have been identified as critical tasks. As a result, using data envelopment analysis, this paper attempts to investigate the input usage efficiency for 38 regions in East Java from 2015 to 2019. (DEA). Data envelopment analysis has received lots of attention as a management tool for measuring efficiency. This study includes two input variables namely labor, and regional expenditure variables, and one output variable, regional gross domestic product. Improvements in input use relate to a decrease in the amount of input required for a given output. Therefore they indicate input use efficiency. The result shows that only 3 out of 38 regions in East Java during the period are efficient in using their input, namely Kota Kediri, Kota Surabaya, and Kota Mojokerto, while the other regions are found inefficient.



Forecasting Premium Adequacy to Claim Paid Ratio with COVID-19 Effect using Multilayer Perceptron Neural Network

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Abstract

The Covid-19 pandemic has had a significant impact on the global economic system, including the insurance industry. In Indonesia, the performance of the life insurance industry experienced negative growth during 2020. Moreover, claim payments up to September 2020, particularly for life insurance products, have increased compared to the same period in the previous year. Maintaining the adequacy ratio of premiums to claim payments is very important to do in order to avoid the risk of failure to meet obligations (default) and maintain the sustainability of the insurance industry. Therefore, the aim of this study is to predict the ratio of premium adequacy to payment of claims in the insurance industry in Indonesia with the effect of COVID-19 pandemic. The method used in this study is Artificial Neural Network, which is multilayer perceptron. The fitted model has two hidden layers with lag 1 up to 3 and dummy variable of COVID-19. The results show that the model fits the ratio data with out-of-sample SSE of 0.484.



Attitudes Towards COVID-19 Vaccines to Support the Achievement of Government Targets: A Case Study of Bontang City

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Abstract

The vaccination program launched by the Indonesian government is the fastest and best solution to overcome the pandemic before finding a cure for COVID-19. Unwillingness to receive vaccinations are major barriers for Indonesian government to overcome the COVID-19 pandemic and achieve the target of 70% of the total population in Indonesia received the vaccine. In this study, we estimate predictors of six of domains of negative attitudes towards COVID-19 vaccines in the Bontang city. The Binary logistic regression analysis in this study was used to find the predictors effect of COVID-19 vaccine's attitudes in Bontang city. A total of 500 participants in Bontang city completed the survey. The public unwillingness to receive COVID-19 vaccinations in Bontang city were still high (26,2%). There is effect age (17 - 25 years: p=0.002, OR=1.651; 36 -45 years: p=0.006, OR=1.015; > 55 years: p=0.006, OR=1.016), income (IDR \leq 0.5 million: p=0.019, OR=9.999; IDR 0.6 until ≤ 2 million: p=0.016, OR=8.816; IDR 2.1 until ≤ 3.5 million: p=0.002, OR=6.216), profession (farmer: p=0.015, OR=5.876; fisherman: p=0.007, OR=6.168; employee: p=0.003, OR=3.161; laborer: p=0.045, OR=5.361), marital status (married: p=0.004, OR= 3.936; single: p=0.016, OR=3,973; death disvorce:0.001, p=0.007, OR=5.148), and level of education (elementary school: p=0.032, OR=2.787; junior high school: p=0.007, OR=2.420) to COVID-19 vaccine's attitudes in Bontang city. persuasive approach and public health massaging should be continued and tailored to address these concerns, specially to certain age, certain profession, marital status, and people with lower levels of education and incomes.





Abstracts: Poster Presentations



Exploring Exponential Regression for Bearing Remaining Useful Life Prediction

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Abstract

Induction motors are devices that convert electrical energy to mechanical. The maintenance of an induction motor is essential to ensure its performance. Diagnostic and prognostic are two essenstial aspects of maintenance system. Diagnostic refers to detecting, isolating and identifying failure condition, while prognostic deals with prediction of remaining life. The estimation of remaining life of bearing before failure helps to avoid unnecessary spending time in maintenance. Prognostics become an important issue and an appealing area of research. It is defined as the estimation time to failure. The main prognostic objective is to estimate the remaining time before failure of mechanical system. Reducing maintenance cost is the important advantage of prognostics. Bearing fault defects are outer race, inner race, ball defect. Remaining useful life prediction of bearings is a challenge in maintenance to improve reliability. The remaining life is the residual between predicted end of life EOL and time first prediction EOP. Bearing is one important components in rotating machinery which need to monitored and its remaining life should be predicted. The challenge of bearing degradation modeling is to explore a feature able to evaluate the state of the bearing and to estimate the remaining life by prognostics methods. This paper proposes a method for prediction bearing remaining useful life based on exponential regression. Exponential regression is based on fitted feature. The inversion of exponential regression yields a method to estimate the bearing remaining life. Experimental result shows that the proposed method can reliably predict the remaining life of bearings.



Morphological Deformities of Chironomid Larvae in Karang Mumus River, Samarinda. East Kalimantan

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Abstract

Mouthpart and antenna deformities of Chironomidae Larvae has been known used detecting contaminant pollutant in aquatic ecosystems. The research was to identify a morphological deformities in the Chironomidae Larvae in Karang Mumus River, Samarinda. Sample identification suggest a morphological deformities in some Chironomid Larva are collected from the Karang Mumus Rivers. From the 12 observed individuals there are 5 individuals with a morphological deformities , damage to the lateral teet, median teeth, and severe damage to the mentum. Besides, there was damage to the mandible, where all the right teeth were missing.

Keywords: Chironomids, Morphological Deformities, Karang Mumus



General Information

How to join the online conference?

- 1. View the Conference Schedule and find the Zoom Link to join the meeting. There are two Zoom links per day (prior to and after lunch break).
- 2. Fill in the registration form before joining the online conference.
- 3. If you are joining the Session before the host has started the meeting, please wait until the host starts the Session.

Here are some rules for the conference:

- 1. Presenters and participants must attend all sessions in an orderly manner.
- 2. Our recommendation is to turn on your webcam by default to engage more with other participants and to contribute to a more lively conference experience. When presenting or asking questions, we definitely ask you to turn on your webcam.
- 3. During the conference, we will mute your microphone.
- 4. During the presentations, all participants can submit questions through the chat.
- 5. In the discussion after the presentation, Hosts will have the ability to unmute participants to elaborate on their questions. Please note that due to the limited time for discussion, participants may want to continue the discussion outside the session.
- 6. Besides the questions posed during the presentation in the chat, participants can also use the 'raise hand' option provided in zoom and be unmuted by the Hosts to start the discussion.
- 7. When asking a question, please turn on your webcam. After that, you can disable it.
- 8. For oral presenters, you need to join the break out room 5 minutes before the scheduled start
- 9. Presenters and participants must attend all sessions to get certificates.
- 10. Also, at the end of the conference, presenters and participants must fill out an evaluation form to get certificates.

Information for Keynote Speaker

Plenary Session

The Moderator will introduce the Keynote Speaker, lead the discussions, give turns, keep an eye on the chat and be responsible for timekeeping.

Here are some rules for the plenary session:

- 1. A keynote speaker will have 40 minutes for presentations and 15 minutes for Q&A. The moderator will notify the speaker if you have 5 minute remaining and reserve the right to stop the presentation if it is more than the designated time.
- 2. During the presentations, all participants will be muted but can submit questions through the chat.
- 3. Besides the questions posed during the presentation in the chat, participants can also use the 'raise hand' option provided in zoom and be unmuted by the Host to start the discussion.
- 4. The Host will have the ability to unmute participants to elaborate on their questions. Please note that due to the limited time for discussion, participants may want to continue the discussion outside the session.



Information for Invited Speakers and Oral Presenters

Parallel Session

Next to the presenters, every session has a Moderator and a technical operator (Host). The Moderator will introduce you briefly, lead the discussions, give turns, keep an eye on the chat and be responsible for timekeeping.

Here are some rules for the parallel session:

- 1. Please make sure you enabled your camera upon entry, during your presentation, and when you are answering questions; during the presentations of others, you can disable it.
- 2. An invited speaker will have 10 minutes for presentations and 5 minutes for Q&A. While for oral presenters will have 7 minutes for presentation and 3 minutes for Q&A. The moderator will notify you if you have 1 minute remaining and reserve the right to stop the presentation if it is more than the designated time.
- 3. Presenters are allowed to share the slides or a video from your own laptop or PC. Presenters can also send the slides or a video to the committee if you find it difficult to share the slides or the video from your laptop/PC due to internet connection or other reasons.
- 4. During the presentations, all participants will be muted but can submit questions through the chat.
- 5. Besides the questions posed during the presentation in the chat, participants can also use the 'raise hand' option provided in zoom and be unmuted by the Host to start the discussion.
- 6. The Host will have the ability to unmute participants to elaborate on their questions. Please note that due to the limited time for discussion, participants may want to continue the discussion outside the session.



Sponsor

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