The 4th ICMSc
2022

INTERNATIONAL CONFERENCE
ON MATHEMATICS AND SCIENCES

"THE ROLES of TROPICAL SCIENCE in NEW CAPITAL NATION PLANNING"

10th-11th OCTOBER 2022

BOOK of ABSTRACTS

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

Assalamualaykum 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 4th The International Conference on Mathematics and Sciences (ICMSc 2022) with a theme "The Roles of Tropical Science in New Capital Nation Planning". I am delighted to see that the Faculty of Mathematics and Natural Sciences Mulawarman University has again organized The Fourth International Conference that capitalize on our strength and built on our commitment to promoting the research in Mathematics, Statistics, Physics, Geophysics, Chemistry, and Biology, as well as their applications.

ICMSc 2022 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 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 six keynote speakers coming from several countries. Therefore, on behalf of the committee, I would like to express my sincere thanks to them, specifically: Hafidz Prihtiadi, Ph.D from Institute for Basic Science, Korea; Prof. Agus Hasan, Ph.D from Norwegian University of Science and Technology, Norwegia; Assoc Prof. Shery Chang from University of New South Wales, Australia; Distinguished Prof. Kerrie Mengersen from Queensland University of Technology, Australia; Yanuar Alan Sulistio, Ph.D, Hanyang University, Korea; and Dr. Sc. Ide Yoshihiko, Coastal and Ocean Eng. Ftrom Kyushu University, Japan who have high reputation and commitment in their field.

I would also like to thank all invited speakers from different universities in Indonesia, Prof. Darmawati D., M.Si., Ph.D,, Dr. Eng. Suripto Dwi Y., S.Si., M.T., Dr. Achmad Choiruddin, S.Si., M.Sc., Dr. Junios, M.Si., Ki Ageng S., M.Sc., M.IL., Ph.D., Jordi Mahardika P., S.Si., M.Sc., Prof. Dr. rer. nat. Abdul Haris, Dr. dr. Karina, Sp.BP-RE, Dr. Edriani, M.Si, Syaiful Anam, S.Si., M.T, Ph.D, Ahmad Hafizullah R., S.Si., M.Si., and Dr. Fatia Fatimah, S.Si., M.Pd.

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 2022 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 an excellent opportunity for all of us to share research experience and knowledge, and this conference will significantly contribute to our nation's advancement.

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 4th ICMSc in 2022, have a nice conference and I do hope we can all meet again in the next ICMSc.

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 The 4th International Conference on Mathematics and Sciences

Assalamualaykum Wr. Wb

First of all, let us praise and thank the Almighty God because his blessings and helpings; we are able Dear participants, The 4th International Conference on Mathematics and Sciences (ICMSc 2022) is an international hybrid conference organized by Faculty of Mathematics and Natural Sciences, Mulawarman University (UNMUL), Samarinda, East Kalimantan, Indonesia. ICMSC 2022 with a theme "The Roles of Tropical Science in New Capital Nation Planning" 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 third and fourth 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, Hafidz Prihtiadi, Ph.D from Institute for Basic Science, Korea; Prof. Agus Hasan, Ph.D from Norwegian University of Science and Technology, Norwegia; Assoc Prof. Shery Chang from University of New South Wales, Australia; Distinguished Prof. Kerrie Mengersen from Queensland University of Technology, Australia; Yanuar Alan Sulistio, Ph.D, Hanyang University, Korea; and Dr. Sc. Ide Yoshihiko, Coastal and Ocean Eng. from Kyushu University, Japan. In this year conference, we also invite Prof. Darmawati D., M.Si., Ph.D,, Dr. Eng. Suripto Dwi Y., S.Si., M.T., Dr. Achmad Choiruddin, S.Si., M.Sc., Dr. Junios, M.Si., Ki Ageng S., M.Sc., M.IL., Ph.D., Jordi Mahardika P., S.Si., M.Sc., Prof. Dr. rer. nat. Abdul Haris, Dr. dr. Karina, Sp.BP-RE, Dr. Edriani, M.Si, Syaiful Anam, S.Si., M.T, Ph.D, Ahmad Hafizullah R., S.Si., M.Si., and Dr. Fatia Fatimah, S.Si., M.Pd 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 2022, we received 152 accepted abstract for 147 oral presentations and 5 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 Bank Syariah Indonesia for financial supports. On behalf of the organizing committee, I would like to welcome all of speakers and participants. Please enjoy the conference.

Wassalamu'alaikum wr. wb.

Best regards,

Dr. Sifriyani, S.Pd., M.Si
Chair of Organizing Committee

Committee

Honorary Board
Prof. Dr. H. Masjaya, M.Si
(Rector of Mulawarman University)
Dr. Eng. Idris Mandang, M.Si
(Dean of Faculty of Mathematics and Natural Sciences, Mulawarman University)
Dr. Sri Wahyuningsih, M.Si
(Vice Dean I of Faculty of Mathematics and Natural Sciences, Mulawarman University)
Dr. Yanti Puspita Sari, M.Si
(Vice Dean II of Faculty of Mathematics and Natural Sciences, Mulawarman University)

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Dr. R.R. Dirgarini Julia Nurlianti S, M.Sc
Dr. Noor Hindryawati,M.Si
Wasono, S.Si., M.Si
Andrea Tri Rian Dani, S.Stat., M.Stat
Erlinda Ratnasari Putri, S.Si., M.Si
Ervinda Yuliatin, S.Si., M.Si

Journal, Poster, and Proceeding
Meiliyani Siringoringo, S.Si., M.Si
Prof. Rudy Agung Nugroho, M.Si., Ph.D
Veliyana Londong Allo, S.Si., M.Si
Nanang Tri Widodo, M.Si
Wahidah, S.Si., M.T
Moh. Nurul Huda, S.Si., M.Si
Muhammad Fauzi Arif, M.Sc
Siti Mahmudah, S.Si., M.Si

Publication, Website, and Documentation
Surya Prangga, S.Si., M.Si
Dr. Nova Hariani, M.Si
Fajar Hadi Ramadana, A.Md
Kusnandar, M.Pd., M.Kom

Equipment
Fidia Deny Tisna Amijaya, S.Si., M.Si
Andi Alamsyah, S.Si, M.S., M.Sc
Jono, S.Sos., M.Si
Iriansyah, S.Kom
Arif Sopian
Wasdub
Muhammad Fakhrurrozi, S.Kom
Rudianto, S.Si
Fedy Harlanto, S.Si
Ruli Yuniarto, S.Si
Ryan Rachmad Ramadhan, S.Si
M. Rasyid Rahman, S.Stat

Accommodation and Consumption
Dr. Hetty Manurung, M.Si
Dr. Retno Aryani, M.Si
Memi Nor Hayati, S.Si., M.Si

Transportation
Mukhlis, S.Pd., M.Sc
La Jahaja, SE
Ahmad Zarkasi, S.Si., M.Si

Public Relations and Cooperation
Moh. Syaiful Arif, S.Pd., M.Si
Dr. Rahmat Gunawan, M.Si
Muhammad Riza, S.Si., M.Si

Venue

Science Learning Center (SLC)
Faculty of Mathematics and Natural Science, Mulawarman University

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

Conference Schedule
The 4th International Conference on Mathematics and Sciences 2022
10-11 October 2022

Day 1:
10 October 2022

Time – Central Indonesia Time (WITA)	Agenda	Room/Zoom details
08.00 – 09.00	Registration Conference regulation (MC)	**Theater Room, SLC (Offline)** UTV is inviting you to a scheduled Zoom meeting. Topic: The Fourth International Conference on Mathematics and Science Time: Oct 9-12, 2022 07:00 WITA Join Zoom Meeting https://unmul.zoom.us/j/93569571652?pwd=YmF5MXpyMGZOZUoxWS9sQTVvWGpTQT09 Meeting ID: 935 6957 1652 Passcode: ICMSc
09.00– 09.45	Opening Ceremony: 1. Greeting by Master of Ceremony (**Aria Dwi Budi Santoso** & **Qonita Qurrota A'yun, M.Sc**) 2. Indonesian National Anthem: Indonesia Raya 3. Traditional dancing by Art Student Creativity Unit, Faculty of Mathematics and Natural Science, Mulawarman University 4. Opening remarks: a. Chairman (**Dr. Sifriyani, M.Si**) b. Dean of Faculty of Mathematics and Natural Sciences (**Dr. Eng. Idris Mandang, M.Si**) c. Rector of Mulawarman University (**Prof. Dr. H. Masjaya, M.Si**) 5. Chanting prayers (**Irfan Ashari Hiyahara, M.Si**) 6. Photo session	
09.45 – 10.00	Coffee Break	**SLC**
10.00 - 11.00	Plenary Session 1 Keynote Speaker 1:	**Theater Room, SLC (Offline)**

Time – Central Indonesia Time (WITA)	Agenda	Room/Zoom details
	Dr. Sc. Ide Yoshihiko, Kyushu University (Offline) Moderator: Dr. Mustaid, M.Si Handover of certificates to keynote speakers	UTV is inviting you to a scheduled Zoom meeting. Topic: The Fourth International Conference on Mathematics and Science Time: Oct 9-11, 2022 07:00 WITA Join Zoom Meeting https://unmul.zoom.us/j/93569571652?pwd=YmF5MXpyMGZOZUoxWS9sQTVvWGpTQT09 Meeting ID: 935 6957 1652 Passcode: ICMSc
11.00-12.00	Plenary Session 1 Keynote Speaker 2: Hafizh Prihtiadi, Ph.D, Institute for Basic Science (Offline) Moderator: Kholis Nurhanafi, S.Si., M.Sc Handover of certificates to keynote speakers	
12.00 - 12.05	Plenary and parallel session sharing information by MC	
12.05 – 13.30	BREAK	SLC (Offline)
13.30 – 14.30 (15.30 – 16.30 AEST Sydney)	Plenary Session 1 Keynote Speaker 3: Associate Professor Shery Chang, University of New South Wales Moderator: Dr. R.R. Dirgarini Julia N.S., M.Sc Handover of certificates to keynote speakers	Theater Room, SLC (Offline) UTV is inviting you to a scheduled Zoom meeting. Topic: The Fourth International Conference on Mathematics and Science Time: Oct 9-11, 2022 07:00 WITA Join Zoom Meeting https://unmul.zoom.us/j/93569571652?pwd=YmF5MXpyMGZOZUoxWS9sQTVvWGpTQT09
14.30 – 15.30	Plenary Session 1 Keynote Speaker 4: Yanuar Alan Sulistio, Ph.D, Hanyang University (Offline)	

Time – Central Indonesia Time (WITA)	Agenda					Room/Zoom details
	Moderator: **Prof. Rudy Agung Nugroho, PhD** Handover of certificates to keynote speakers					Meeting ID: 935 6957 1652 Passcode: ICMSc
15.30 – 15.45	Coffee Break					
15.45 - 17.00	Parallel Session					
	Room 1 **Mathematics** SLC (Offline), Zoom virtual room (Online) Moderator: **Sri Wigantono, S.Si., M.Sc** Invited Speaker: **Syaiful Anam, S.Si, M.T, Ph.D** **(Offline)** (15.45-16.00) Operator: Fedy Harlanto, S.Si (Discussion Room 3rd floor)	**Room 2** **Statistics** SLC (Offline), Zoom virtual room (Online) Moderator: **Siti Mahmuda, S.Si., M.Si** Invited Speaker: **Dr. Fatia Fatimah, S.Si., M.Pd** **(Offline)** (15.45-16.00) Operator: Ruli Yuniarto, S.Si (Classroom 1, 3rd floor)	**Room 3** **Chemistry** SLC (Offline), Zoom virtual room (Online) Moderator: **Irfan Ashari Hiyahara, S.Pd., M.Si** Invited Speaker: **Dr. Eng. Suripto Dwi Yuwono, S.Si., M.T.** **(Offline)** (15.45-16.00) **Ahmad Hafizullah Ritonga, S.Si., M.Si.** (16.00 – 16.15) Operator: Muhammad Fakhrurrozy, S.Kom (Classroom 4, 4th floor)	**Room 4** **Physics + Geophysics** SLC (Offline), Zoom virtual room (Online) Moderator: **Dr. Rahmawati, M.Si** Invited Speaker: **Prof. Darmawati Darwis, S.Si., M.Si., Ph.D** (15.45-16.00) **Prof. Dr. rer. nat. Abdul Haris** (16.00-16.15) Operator: M. Rasyid Rahman, S.Si (Discussion Room, 4th floor)	**Room 5** **Biology** SLC (Offline), Zoom virtual room (Online) Moderator: **Dr. Dijan Sunar Rukmi, M.Si** Invited Speaker: **Ki Ageng Sarwono, M.Sc., M.IL., Ph.D** (15.45-16.00) Operator: Rudianto, S.Si (Classroom 2, 3rd floor)	**Room 7** **Student Chapters** Einstein (Offline) Moderator: **Hardina Sandariria, S.Si., M.Sc** Operator: (Einstein)

Time – Central Indonesia Time (WITA)	Agenda	Room/Zoom details
19.00 – 21.00	Gala dinner	Midtown Hotel, Samarinda

Day 2:
11 October 2022

Time – Central Indonesia Time (WITA)	Agenda	Room/Zoom details
08.00 – 08.55	Registration Conference regulation (MC)	**Theater Room, SLC (Offline)** UTV is inviting you to a scheduled Zoom meeting. Topic: The Fourth International Conference on Mathematics and Science Time: Oct 9-11, 2022 07:00 WITA Join Zoom Meeting https://unmul.zoom.us/j/93569571652?pwd=YmF5MXpyMGZOZUoxWS9sQTVvWGpTQT09 Meeting ID: 935 6957 1652 Passcode: ICMSc
08.55-09.00	Opening by MC (**Aria Dwi Budi Santoso** & **Qonita Qurrota A'yun, M.Sc**)	
09.00-10.00 (11.00-12.00 AEST Queensland)	Plenary Session 2 Keynote Speaker 1: **Prof. Kerrie Mengersen, Queensland University of Technology** Moderator: **Andrea Tri Rian Dani, S.Stat., M.Stat** Handover of certificates to keynote speakers	
10.00 – 10.15	Coffee Break	
10.15 - 11.15 (04.15-05.15 CEST Trondheim)	Plenary Session 2 Keynote Speaker 2: **Prof. Agus Hasan, Ph.D, Norwegian University of Science and Technology** Moderator: **Yuki Novia Nasution, S.Si., M.Sc** Handover of certificates to keynote speakers	

Time – Central Indonesia Time (WITA)	Agenda	Room/Zoom details
11.15 - 11.30	Break – Interactive Quiz (**Dr. R.R. Dirgarini Julia Nurlianti, M.Sc**)	
11.30 - 11.50	Information session Publication in AIP Publishing (**Meiliani Siringoringo, M.Si**)	
11.50 - 12.00	Parallel session sharing information by MC (Information on the best presenters)	
12.00 – 13.30	BREAK	SLC (Offline)
13.30 - 15.15	Parallel Session	
	Theater Room, SLC (Offline) UTV is inviting you to a scheduled Zoom meeting. Topic: The Fourth International Conference on Mathematics and Science Time: Oct 9-11, 2022 07:00 WITA Join Zoom Meeting https://unmul.zoom.us/j/93569571652?pwd=YmF5MXpyMGZOZUoxWS9sQTVvWGpTQT09 **Meeting ID: 935 6957 1652** **Passcode: ICMSc**	

Time – Central Indonesia Time (WITA)	Agenda					Room/Zoom details
	Parallel Session					
	Room 1 **Mathematics** SLC (Offline), Zoom virtual room (Online) Moderator: **Sri Wigantono, S.Si., M.Sc** Invited Speaker: **Dr. Eridani, M.Si** (13.30 - 13.45) Operator: Fedy Harlanto, S.Si (Discussion Room 3rd floor)	**Room 2** **Statistics** SLC (Offline), Zoom virtual room (Online) Moderator: **Siti Mahmuda, S.Si., M.Si** Invited Speaker: **Dr. Achmad Choiruddin, S.Si, M.Sc** (13.30 - 13.45) Operator: Ruli Yuniarto, S.Si (Classroom 1, 3rd floor)	**Room 3** **Physics+Geophysics** SLC (Offline), Zoom virtual room (Online) Moderator: **Qori Fajar Hermawan, S.Si., M.Sc** Invited Speaker: **Jordi Mahardika Puntu, S.Si., M.Sc** (13.30 - 13.45) Invited Speaker: **Dr. Junios, M.Si** (13.45 – 14.00) Operator: Ryan Rachmad Ramadhan, S.Si (Classroom 3, 4th floor)	**Room 4** **Biology** SLC (Offline), Zoom virtual room (Online) Moderator: **Dr. Dijan Sunar Rukmi, M.Si** Invited Speaker: **Dr.dr. Karina, Sp.BP(RE)** (13.30 - 13.45) Operator: Rudianto, S.Si (Classroom 2, 3rd floor)	**Room 7** **Student Chapters** Einstein (Offline) Moderator: **Hardina Sandariria, S.Si., M.Sc** Operator: Hardina Sandariria, S.Si., M.Sc (Einstein)	**Room 8** **Monitoring and Evaluation of Public Service** Meeting Room 2 SLC (Offline) Moderator: Dr. Retno Aryani, S.Si., M.Si Operator: Muhammad Fakhrurrozy, S.Kom

Time – Central Indonesia Time (WITA)	Agenda	Room/Zoom details
15.15 – 15.30	Coffee Break	SLC (Offline)
15.30 – 16.30	Closing Ceremony 1. Greeting by Master of Ceremony (**Aria Dwi Budi Santoso** & **Qonita Qurrota A'yun, M.Sc**) 2. Announcement of the best speakers 3. Closing remarks: Dean of Faculty of Mathematics and Natural Sciences (**Dr.Eng. Idris Mandang, M.Si**) 4. Photo Session	Theatre Room, SLC (Offline) UTV is inviting you to a scheduled Zoom meeting. Topic: The Fourth International Conference on Mathematics and Science Time: Oct 9-11, 2022 07:00 WITA Join Zoom Meeting https://unmul.zoom.us/j/93569571652?pwd=YmF5MXpyMGZOZUoxWS9sQTVvWGpTQT09 Meeting ID: 935 6957 1652 Passcode: ICMSc

PARALLEL SESSION SCHEDULE

Field: MATHEMATICS

Date : October 10, 2022 (Day 1)
Room : Science Learning Center, Floor 3, Discussion Room + Zoom Virtual Meetings (Breakout Room: Mathematics 1)
Moderator : Sri Wigantono, S.Si., M.Sc
Operator : Fedy Harlanto, S.Si

No	Code	Authors	Title	Session	Time
1	IVTS	Syaiful Anam, Zuraidah Fitriah, Noor Hidayat	Diagnosing Diabetes Mellitus using K-Means Clustering Method with Robust Centroids Initialization Based Swarm Intelligence Algorithm	Offline	15.45-16.05
2	502-MATH	Moh Nurul Huda, Qonita Qurrota A'yun, Indriasri Raming, Sri Wigantono, Asmaidi Asmaidi, Yuki Novia Nasution, Hardina Sandariria	Global Stability of Phytoplankton-Zooplankton Models with Ratio-Dependent Functional Response	Offline	16.05-16.15
3	631-MATH	Wasono Wasono, Syaripuddin Syaripuddin, Fidia Deny Tisna Amijaya, Sri Wigantono, Desi Febriani Putri	Analysis Of Laptop Marketing Strategies Using Game Theory Based On Fuzzy Logic In Determining Optimal Marketing Strategies For Vocational School Students In The City Of Samarinda	Offline	16.15-16.25
4	641-MATH	Lutfia Kartika Sari, Tri Atmojo Kusmayadi	The Local Metric Dimension of Cocktail Party Graph and Mushroom Graph	Online	16.25-16.35
5	697-MATH	Marjono Marjono, Saadatul Fitri, Abdul Rouf Alghofari, Corina Karim, Rahmalia Firdausi Tamara, Estelita Maria Fernandes Gaspar, Ni Made Asih	Coefficient Inequalities for Starlike And Bazilevic Functions	Online	16.35-16.45
6	566-MATH	Suhadi Wido Saputro	On Independent [1,2]-Sets of Comb Product Graphs	Offline	16.45-16.55

No	Code	Authors	Title	Session	Time
7	634-MATH	Galuh Oktavia Siswono, Yeni April Lina, Verencia Pricila	The Application of LSTM and Holt-Winter Methods to Predict the Factors Caused a Hurricane in Indonesia	Online	16.55-17.05
8	657-MATH	Primadina Hasanah	Determining Fire Insurance Premium using Extreme Value Theory-Peaks Over Threshold (Case Study: Balikpapan)	Online	17.05-17.15
9	565-MATH	Ahmadin, Janson Naiborhu	Control Design on a Non-Minimum Phase Bilinear System with Relative Degree Two by Redefinition of The Output	Online	17.15-17.25
10	550-MATH	Imam Nugraha Albania, Rizky Rosjanuardi, Sumanang Muhtar Gozali	A Module Structure Constructed by Convolution on Cyclically Ordered Group	Online	17.25-17.35

Field: STATICTICS

Date : October 10, 2022 (Day 1)
Room : Science Learning Center, Floor 3, Classroom 1 + Zoom Virtual Meetings (Breakout Room: Statistics 1)
Moderator : Siti Mahmuda, M.Si
Operator : Ruli Yuniarto, S.Si

No	Code	Authors	Title	Session	Time
1	IVTS	Fatia Fatimah	*N* – Soft Sets: Theory and Applications in Statistics	Offline	15.45-16.05
2	557-STAT	Dedi Rosadi, Deasy Arisanty, Widyastuti Andriyani	Improving Machine Learning Prediction of Forest Fire Occurrence in Peatlands for Unbalanced Data using ANS-SMOTE Approach	Offline	16.05-16.15
3	575-STAT	Sifriyani Sifriyani, Andrea Tri Rian Dani, Meirinda Fauziyah, Memi Nor Hayati, Sri Wahyuningsih, Surya Prangga	Spline And Kernel Mixed Estimators In Multivariable Nonparametric Regression For Dengue Hemorrhagic Fever Models	Offline	16.15-16.25
4	597-STAT	Anik Anekawati, Mohammad Rofik	A Spatial Structural Equation Modeling of the Family Resilience in the Spread of Covid-19	Offline	16.25-16.35
5	616-STAT	Suyitno Suyitno, Darnah Andi Nohe, Ika Purnamasari, Meiliyani Siringoringo, Rito . Goejantoro, Meita Nor Rahma	The Analysis of The Pollution Potensial of Mahakam River Water in Tropical Rain Forest Environment East Kalimantan Using Weibull Regression Model	Offline	16.35-16.45
6	618-STAT	Dedi Rosadi, Abdurakhman, D I Asih Maruddani, Agus Sihabuddin, Ifan Mohammad Ihsan, Ayu Ajeng Jayanti, Taufik Anwar, Cicilia Debbie Simangunsong, Dinda Awanda Ramadhani, Iqbal Hanif Anggita Adi, Danny Theodore Dunrui, Putu Indra Wibisana, Pingky Oktiawati, Tarisa Putri Cahyani, Ulfasari Rafflesia	"Analyzing Indonesian Government Yield Curve during Pandemic COVID-19 using Class of Nelson Siegel Models"	Offline	16.45-16.55

No	Code	Authors	Title	Session	Time
7	664-STAT	Umu Sa'adah, Endang Wahyu Handamari, Kwardiniya Andawaningtyas	Implementation of Fuzzy c-Means Algorithm for Provinces Clustering in Indonesia Based on Education Indicators	Offline	16.45-16.55
8	569-STAT	Anik Anekawati, Emdat Suprayitno, Naily Huzaimah	Family Quality Modeling of The Potential Spread of COVID-19 with A Structural Equation Modeling Approach	Offline	16.55-17.05
9	696-STAT	Mutijah, Ulfah Rulli Hastuti	Multinomial Logistic Regression Model On The Faith of Mathematics Education Students	Offline	17.05-17.15
10	696-STAT	Lilis Laome, I Nyoman Budiantara, Vita Ratnasari	Poverty Modelling with Spline Truncated, Fourier Series and Mixed Estimator Geographically Weighted Nonparametric Regression	Online	17.15-17.25
11	535-STAT	Mitha Rabiyatul Nufus, I Nyoman Budiantara, Vita Ratnasari	Estimation of The Truncated Spline Regression Curve and The Fourier Series on The Open Unemployment Rate Data in Indonesia In Multivariable Nonparametric Regression	Online	17.25-17.35

Field: CHEMISTRY

Date : October 10, 2022 (Day 1)
Room : Science Learning Center, Floor 4, Classroom 4 + Zoom Virtual Meetings (Breakout Room: Chemistry 1)
Moderator : Irfan Ashari Hiyahara, S.Pd., M.Si
Operator : Muhammad Fakhurrozy, S.Kom

No	Code	Authors	Title	Session	Time
1	IVTS	Suripto Dwi Yuwono, Irza Sukmana, Anita Sukmawati, Nurhasanah, Putu Ristyaning Ayu	The Effect of Gelatin on Characteristic and Properties of Poli Lactic Acid/Cellulose Flims	Offline	15.45-16.00
2	IVTS	Ahmad Hafizullah Ritonga, Novesar Jamarun, Syukri Arief, Hermansyah Aziz	The Influence of Precipitated Calcium Carbonate as Filler in LLDPE/CNR Blends with the Existence of LLDPE-g-OA in the Solvent System	Online	16.00-16.15
2	534-CHEM	RR Dirgarini Julia Nurlianti Subagyono, Siti Sarah, Veliyana Londong Allo, Rahmat Gunawan	Synthesis and Characterization of Mesoporous Silica SBA-15 Prepared by The Ultrasonic Assisted-Sol Gel Method	Offline	16.15-16.25
3	622-CHEM	Moh Syaiful Arif, Alimuddin Alimuddin, Cindi Fitria Nisaul Khasanah	Colorimetric detection of chloramphenicol (CAP) based on aggregation of L-cysteine-stabilized silver nanoparticles	Offline	16.25-16.35
4	591-CHEM	Saskia Kurnia Rachmani, Subur P. Pasaribu, Erwin Erwin, Aman Sentosa Panggabean	Antioxidant And Antibacterial Activities from Edible Film Durian Seeds Starch with Bay Leaves Ethanol Extract Incorporation	Online	16.35-16.45
5	700-CHEM	Veliyana Londong Allo, Gabby Encha Farhanah, Rahmat Gunawan	In Silico Analysis of Auron Coumpound from Gedi Leaves as an Inhibitor of Covid-19 MPro	Offline	16.45-16.55
6	658-CHEM	Nanang Tri Widodo, Soerja Koesnarpadi	Humic Acids-Tropical Peat Soil Suporting On Nanoparticles Fe3O4 For Effectivally Of Pb(Ii) Sorption	Offline	16.55-17.05
7	556-CHEM	Riryn Novianty	Molecular docking and ADMET screening of five areca nut compounds against monoamine oxidase-A	Online	17.05-17.15
8	542-CHEM	Rita Rusman, Eva Oktaviani, Rosamah Eni, Medi Hendra, Widia Fatria Sari, Irawan Wijaya Kusuma	Biological Activity and Phytochemicals of Selected Invasive Plants in East Kalimantan, Indonesia	Online	17.15-17.25

Field: PHYSCIS + GEOPHYSICS

Date : October 10, 2022 (Day 1)
Room : Science Learning Center, Floor 4, Discussion Room + Zoom Virtual Meetings (Breakout Room: Physics 1)
Moderator : Dr. Rahmawati, M.Si
Operator : M. Rasyid Rahman, S. Stat

No	Code	Authors	Title	Session	Time
1	IVTS	Darmawati Darwis	Role of Morphology of Precipitated P3HT/PCBM Nanoparticles in Organic Solar Cells	Online	15.45-16.05
2	IVTS	Prof Haris UI		Online	16.05-16.25
3	540-PHY	Roniyus Marjunus, Arin Sadita, Mesy Meilani Putri, Indriya Wati, Iqbal Firdaus	Optimization of TiO2 Purity Level of Lampung's Iron Sand using Leaching Method by Variation of Iron Sand - NaOH Ratio and H2SO4 Concentration	Offline	16.25-16.35
4	555-GYPH	Wahidah Wahidah, Piter Lepong, Andi Alamsyah, Djayus Djayus, Supriyanto Supriyanto, Qori Fajar Hermawan	Analysis and Evaluation of Stability for the Reactivated Road Landslide Using Electrical Resistivity and Induced Polarization in Muara Badak District, East Kalimantan Province, Indonesia	Offline	16.35-16.45
5	703-GYPH	Idris Mandang, Rahmiati Rahmiati, Muhammad Rizam Zetsaona Sitohang, Nanda Khairunisa	Hydrodynamics and Ecosystem Model to Estimate Mitigation of Climate Change in the Ecosystem and Physical Environment in Estuary Delta Mahakam Kalimantan Timur Indonesia	Offline	16.45-17.00
6	510-PHY	Dadan Hamdani, Sahara Hamas Intifadhah, Ahmad Zarkasi, Kholis Nurhanafi, Rahmawati Munir	Improved PV/T System Performances with Air Collector:Thermodynamics and Photonic Analysis	Offline	17.00-17.10
7	633-PHY	Nadiya Ayu Astarini	Photovoltaic Performance of ZnO Nanorod based Organic Dye with Different Light Intensity for Dye-sensitized Solar Cells	Online	17.10-17.20

No	Code	Authors	Title	Session	Time
8	577-GYPH	Titi Anggono, Syuhada Syuhada, Lina Handayani	Estimation of Peak Ground Acceleration around Lake Toba, North Sumatra Indonesia from the Observation of Horizontal-to-Vertical Spectral Ratio	Online	17.20-17.30

Field: BIOLOGY

Date : October 10, 2022 (Day 1)
Room : Science Learning Center, Floor 3, Classroom 2 + Zoom Virtual Meetings (Breakout Room: Biology 1)
Moderator : Dr. Dijan Sunar Rukmi
Operator : Rudianto, S.Si

No	Code	Authors	Title	Session	Time
1	IVTS	Ki Ageng Sarwono	Dietary Approach to Mitigate Methane from Rumen	Online	15.45-16.05
2	625-BIO	Mohammad Fadnan Akhmadi, Ricky Febrinaldy Simanjuntak, Imra Imra, Ira Maya Abdiani, Rukisah Rukisah, Mala Nurilmala, Agus Oman Sudrajat	Genetic Identification Of Stone Crab (Myomenippe Spp.) With DNA Barcoding Approach Caught In Tarakan City Sea Waters	Online	16.05-16.15
3	645-BIO	Imam Rosadi, Muhammad Fauzi Arif, Hetty Manurung, Dwi Susanto, Retno Aryani, Rudy Agung Nugroho	Antibacterial Activity of Tanikkara Extract (Dillenia excelsa (Jack) Martelli ex Gilg) against Escherichia coli and Staphylococcus aureus	Offline	16.15-16.25
4	676-BIO	Dhiya Lathifah, Priyanti, Ardian Khairiah	Diversity of Food Crops at Mobile Vegetable Traders in Kalideres District, West Jakarta	Offline	16.25-16.35
5	672-BIO	Ervinda Yuliatin, Alfia Nasyeka, Anggi Triwijayanti, Rabi'atul Adawiyah, Nova Hariani, Fatmawati Patang, Mukhlis, and Bodhi Dharma	A Preliminary Study on Indigenous *Bacillus* spp. Isolated from Acidic Soil as Agent of Bioinsecticide	Offline	16.35-16.45
6	547-BIO	Narti Fitriana, Endah Hari Utari, Fahma Wijayanti	Community Structure of Dragonfly in Sokokembang Forest, Central Java Province	Offline	16.45-16.55
7	509-BIO	Megga Ratnasari Pikoli, Dinda Ikhwanti, Taufiq, Wisnu Priambodo, Achmad Baihaqi Ulma, Suhendra	Combination of Volume and Frequency of Fungi Inoculation on Agarwood Formation in Gyrinops versteegii of Cijeruk, Bogor	Offline	16.55-17.05
8	501-BIO	Rudy Agung Nugroho, Retno Aryani, Esti Handayani Hardi, Hetty	Proximate Analysis of Hermetia Illucens Larvae Fed Palm Oil Meal Waste	Offline	

No	Code	Authors	Title	Session	Time
		Manurung, Rudianto, Widha Prahastika, Nadhifa Aurelia Wirawan, Nadya Salsabila	and Fish Feed Enriched Various Levels of Fructose		17.05-17.15
9	517-BIO	Retno Aryani, Rudy Agung Nugroho, Hetty Manurung, Muhammad Hafidz Rulimada, Erin Maytari, Angeline Siahaan, Rudianto	Antiangiogenic Activity of Silver Nanoparticle of Ficus deltoidea using Chorioallantoic Membrane Assay	Offline	17.15-17.25
10	489-BIO	Eko Kusumawati, Catur Retnaningdyah, Irfan Mustafa, Suharjono Suharjono	Variations in water quality profiles and abundance of sulfur-oxidizing bacteria in post-coal mining ponds of different ages in Samarinda, East Kalimantan	Online	17.25-17.35
11	519-BIO	Syamsuardi Syamsuardi, Nurainas Nurainas, Erizal Erizal, Adi Bejo Suwardi	Collection and potential of wild Baccaurea species in Jambi, Indonesia	Online	17.35-17.45

Field: BIOLOGY

Date : October 10, 2022 (Day 1)
Room : Zoom Virtual Meetings (Breakout Room: Biology 2)
Moderator : M. Fauzi Arif, S.Si., M.Sc
Operator : Ryan Rachmad Ramadan S.Si

No	Code	Authors	Title	Session	Time
1	572-BIO	Muhammad Rasyid Ridha, Nur Mahdi, Muhammad Riki Shindi Praristiya, Deni Setiawan	Biolarvicide and Inhibit Egg Hatching from Spondias dulcis Leaf Extract Against Aedes aegypti (Diptera: Culicidae)	Online	15.45-16.00
2	505-BIO	Jarulis, Geka Suci Puspita, Choirul Muslim	The Nucleotide Polymorphism of Blue-Crowned Hanging Parrot Loriculus Galgulus (Aves: Psittacidae) based on Cytochrome B Mitochondrial DNA Gene	Online	16.00-16.10
3	681-BIO	Rida Tiffarent, Fathia Ramadhani, Herjuno Ari Nugroho, Syaiful Rizal, Nina Herlina, Nova Dilla Yanthi, Sugiyono Saputra	The Basic Pharmacophore Virtual Screening of Alternative Ligands and NUDT15 Enzyme Interaction	Online	16.10-16.20
4	668-BIO	Frans Dany, Uly Alfi Nikmah, Fitrah Ernawati, Mutiara Prihatini, Aya Yuriestia Arifin	Genotype Distribution of TCF7L2 Rs7903146 Polymorphism And Its Implication On Triglyceride-Glucose Index Ability To Predict Type 2 Diabetes Mellitus Among Indonesians In Bogor	Online	16.20-16.30
5	627-BIO	Fasya Fadhila, Nova Hariani, Fatmawati Patang	Effectivity Of Phyto-Insecticides of Nutmeg Essential Oil (Myristica Fragrans) and Clove Essential Oil (Syzygium Aromaticum) Toward Sitophilus Oryzae	Online	16.30-16.40
6	701-BIO	Mujiyanto Mujiyanto, Made Agus Nurjana, Hayani Anastasia	Spatial Modeling of Dengue Cases in Palu City, Central Sulawesi, Indonesia	Online	16.40-16.45
7	694-BIO	Eva Oktaviani, Yaya Rayadin, Chandradewana Boer, Paulus Matius, Emi Purwanti, Rachmad Budiwijaya Suba	Study of The Potential Deer Breeding (*Rusa timorensis* and *Axis axis*) Tourism at West Java	Online	16.45-17.00

No	Code	Authors	Title	Session	Time
8	605-BIO	Mery Budiarti, Sari Haryanti, Anshary Maruzy, Rohmat Mujahid	Morphological Identification and Cytotoxicity Evaluation of Various Well-known Bajakah from Central Kalimantan, Indonesia	Online	17.00-17.10
9	580-BIO	Rohmat Mujahid, Slamet Wahyono, Wahyu Jokopriyambodo, Mery Budiarti1 and Harto Widodo	Sinensetin Content In Jawa Tea (Orthosiphon Aristatus (Blume) Miq.) Based On Age Level Of Leaf	Online	17.10-17.20
10	468-BIO	Dewi Restika Ayu Safitri, Mahfut, Ayu Octavia Tanjung Putri	Application of Plant Growth Promoting Fungi (PGPF) using Trichoderma sp. on the Growth of Sweet Corn Varieties of Baruna (Zea mays L. var. saccharatta)	Online	17.20-17.30

Field: MATHEMATICS

Date : October 11, 2022 (Day 2)
Room : Science Learning Center, Floor 3, Discussion Room + Zoom Virtual Meetings (Breakout Room: Mathematics 1)
Moderator : Sri Wigantono, S.Si., M.Sc
Operator : Fedy Harlanto, S.Si

No	Code	Authors	Title	Session	Time
1	IVTS	Eridani	Diagnosing Diabetes Mellitus using K-Means Clustering Method with Robust Centroids Initialization Based Swarm Intelligence Algorithm	Online	13.30-13.50
2	503-MATH	Tuti Zubaidah, Dewi Annisa, Rahmah Johar, Khaluka Ahsana Fitri	Teacher's Pedagogical Content Knowledge (PCK) in Implementing Realistic Mathematics Education (RME)	Online	13.50-14.00
3	654-MATH	Muh. Fadlan, Hadrian Andradi	Characterization Theorems and Dcpo-completion of Posets in Domain Theory	Online	14.00-14.10
4	646-MATH	Dewi Suhika, Roberd Saragih, and Dewi Handayani	Application of Nonlinear Robust Adaptive Sliding Mode Control on Mathematical Model for Spreading of Covid-19	Online	14.10-14.20
5	478-MATH	Agustan Syamsuddin, Abdul Rahman Rahim, Wahyuddin, Jainuddin, Andi Syukriani	Media of Learning Program Using Blended Design: A Learning Development in Mathematical Economic with an Integrative Learning Design Framework Approach	Online	14.20-14.30
6	492-MATH	Anisah Romsiyatun, Lucia Ratnasari, Siti Khabibah	On Constructing Edge Irregular Total k-Labeling of Sierpinski Gasket Graph	Online	14.30-14.40
7	630-MATH	Zainal Arifin, Nur Hamid, Nurul Jannah	The Comparison of Some Historical Ciphers on A Linear Code over F2	Online	14.40-14.50
8	686-MATH	Fidyatus Safitri, Purwanto, Santi Irawati	Laplacian Spectrum of the Complement of Identity Graph of Commutative Ring Z2p	Online	14.50-15.00
9	677-MATH	Ratsimandresy Yeriel Fiandrianana, Purwanto , I Made Sulandra	Sets of Flattened Partitions Avoiding Patterns	Online	15.00-15.10
10	702-MATH	Munirah Rossdy, Rashidah Omar, and Shaharuddin Cik Soh	Applications of a New Generalised Operator in Bi-Univalent Functions	Online	15.10-15.20

Field: MATHEMATICS

Date : October 11, 2022 (Day 2)
Room : Zoom Virtual Meetings (Breakout Room: Mathematics 2)
Moderator : Desi Febriani Putri, S.Si., M.Si
Operator :

No	Code	Authors	Title	Session	Time
1	466	Asmiati, Wenty Okzarima, Kurnia Muludi, Suhadi Wido Saputro	The Locating Number of Sun Graph and Barbell Operation	Online	15.20-15.30
2	467	Rofilde Hasudungan	Variable Precision Rough Set for Selecting Naive Bayes Attributes in Student Data Analysis	Online	15.30-15.40
3	488	Rofilde Hasudungan, Rudiman Rudiman, Wawan Joko Pranoto	Rought Set Theory for Attribute Reduction for Student Satistication in Online Learning	Online	15.40-15.50
4	538	Solomon Uche Obiwulu	Variant Approach for Solving Difficult Indicial Problems	Online	15.50-16.00
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Field: STATICTICS

Date : October 11, 2022 (Day 2)
Room : Science Learning Center, Floor 3, Classroom 1 + Zoom Virtual Meetings (Breakout Room: Statistics 1)
Moderator : Siti Mahmuda, M.Si
Operator : Ruli Yuniarto, S.Si

No	Code	Authors	Title	Session	Time
1	IVTS	Achmad Choiruddin, Nur Iriawan, Sutikno, Aisah, Finola Trisnisa, Siska Oktaviana Dwi Angraeni	Log-Gaussian Cox Point Process: Spatial Flexible Model for Earthquake Modeling and Poverty Analysis	Online	13.30-13.50
2	593-STAT	Ezra Putranda Setiawan, Dhoriva Urwatul Wutsqa, Agus Maman Abadi	Probability Models for Pricing Earthquake Catastrophe Bonds: A Literature Survey	Online	13.50-14.00
3	613-STAT	Apik Wulan Sari, Isnandar Slamet, Hasih Pratiwi	Implementation of Recurrent Neural Network (RNN) and Long ShortTerm Memory (LSTM) with Vector Representation of Time (Time2vec) for Remaining Useful Life Prediction of Lithium-ion Batteries.	Online	14.00-14.10
4	592-STAT	Nailatul Muna, Agnes Tuti Rumiati, Dedy Dwi Prastyo	Small Area Estimation of Poverty Severity Index for Kecamatan Using Empirical Best Linear Unbiased Prediction Method (Case study : Poverty Severity Index in the city of Surabaya in 2020)	Online	14.10-14.20
5	612-STAT	Zahra Cantia Bela	Speech Command Recognition System Using Neural Network	Online	14.20-14.30
6	651-STAT	Siwi Azizah Oktaviana, Isnandar Slamet, Winita Sulandari	Application of Convolutional Neural Network to Detect Driver Drowsiness	Online	14.30-14.40
7	663-STAT	Hani Dwi Retnani, Neva Satyahadewi, Hendra Perdana	Critical Illness Insurance With Terminal Illness Conditions	Online	14.40-14.50
8	692-STAT	Joji Ardian Pembargi, Dewi Santri Ramdani, Aulia Syifa, Rohyatul Audil, Nurul Fitriyani	Analysis of Factors that Influence the Learning Interest of the University of Mataram Students in the Covid-19 Era	Online	14.50-15.00

No	Code	Authors	Title	Session	Time
9	590-STAT	Nur Achmey Selgi Harwanti, Agnes Tuti Rumiati, Kartika Fithriasari	The Effectiveness of Small Area Estimation with Best Linear Unbiased Prediction Method on Various Sample Sizes with Resampling Simulation on SUSENAS Data in the case of Mean Years School Of Kecamatan (Sub-District) in Surabaya	Online	15.00-15.10
10	583-STAT	Ruth Andini	Implementation of Machine Learning Models to Reduce Ambiguity of Medical Abbreviations	Online	15.10-15.20

Field: STATISTICS

Date : October 11, 2022 (Day 2)
Room : Zoom Virtual Meetings + Zoom Virtual Meetings (Breakout Room: Statistics 2)
Moderator : Meirinda Fauziyah, S.Si., M.Stat
Operator :

No	Code	Authors	Title	Session	Time
1	539-STAT	Rehana Parvin	Does The Exchange Raye Have An Asymmetrical Effect on Economic Sustainability in Bangladesh?	Online	13.30-13.45
2	707-STAT	Dyah Setyo Rini, Sigit Nugroho, Herlin Fransiska, Winalia Agwil, Filo Supianti, Hilma R. Hasbiyah, Muhammad Gabdika Bayubuana, Okta Saputra, Cinta Rizki Oktarina	Poverty Modeling in Bengkulu Province using Machine Learning and Spatial Regression	Online	13.45-14.00
3	508-STAT	Agus Suharsono, Sarah Putri Maharani, Rina Wahyuningsih	Time Replacement Optimization of Bucket Hydraulic Cylinder on Mining's Excavator Owned by PT "XYZ" Using the Power Law Process Method	Online	14.00-14.15
4	531-STAT	Isma Fitria Arta, Hasih Pratiwi, Etik Zukhronah	Classification of Human Development Index in Indonesia using Random Forest	Online	14.15-14.30
5	523-STAT	Grace Wulandari, Sri Wahyuningsih, Meiliyani Siringoringo, Andrean Sergio	Inflation Forecasting for Samarinda City Using Hybrid Singular Spectrum Analysis-Neural Network Model	Online	14.30-14.45
6	525-STAT	Muhammad Zidni Subarkah, Winita Sulandari, Respatiwulan	Implementation of Transfer Learning in Convolutional Neural Network Architecture for Android-Based Handwriting Quality Detection	Online	14.45-15.00
7	610-STAT	Edy Saputra Rusdi, Nur Hilal A.Syahrir	The comparison of supervised learning method in predicting antibacterial and non-antibacterial activity of marine compounds in South Sulawesi, Indonesia	Online	15.00-15.15

No	Code	Authors	Title	Session	Time
8	708-STAT	Eka Ariyanti, Siti Qomariah2, Nurhasanah3	Cloud Computing Modelling Based On The Intersection of Circles and DBSCAN For Characterizing Density of The City	Online	15.15-15.25
9	471-STAT	Jovinto Ferdinand Kusniawan, William Wiguna Iskandar, Hans Christian Conrad, Daniel Daniel, Steven Daniel Yanto	Analyzing and Practizing Public Interest in Metaverse using Sentiment Analysis with TextBlob	Online	15.25-15.35
10					
11					

Field: PHYSCIS + GEOPHYSICS

Date : October 11, 2022 (Day 2)
Room : Science Learning Center, Floor 4, Discussion Room + Zoom Virtual Meetings (Breakout Room: Physics 1)
Moderator : Qori Fajar Hermawan, S.Si., M.Sc
Operator : M. Rasyid Rahman, S. Stat

No	Code	Authors	Title	Session	Time
1	IVTS	Jordi Mahardika Puntu	Geoelectrical and Ground Penetrating Radar Techniques: Past, Present, and Future	Online	13.30-13.45
2	IVTS	Junios, Freddy Haryanto, Zaki Suud, Novitrian	Exploring of Monte Carlo Simulation from Case Study of Particle Transport in Gamma Knife Perfexion™ Machine	Online	13.45-14.00
3	475-PHY	Yessi Gusnia, Widayani Sutrisno	Montmorillonite and Chitosan Composite as Adsorbent for Methylene Blue Dye Waste	Online	14.00-14.10
4	607-PHY	Fika Desy Ramadhani, Djayus Djayus	Study of Land Cover On CG (Cloud To Ground) Lightning Strikes in Balikpapan Area in 2015 – 2019	Online	14.10-14.20
5	504-GYPH	Nandi Haerudin, Rustadi, I Gede Yogi Suandana and Suharno	Investigation Prosfecting of Saline Water Intrusion: A Case Study of Aquifer Coastal Bandar Lampung, Indonesia	Online	14.20-14.30
6	494-GYPH	Vikki, Firda Islamaya Farhan	Interpretation of Geoelectrical Data for Road Construction Effectiveness in Serindang Village, Sambas Regency	Online	14.30-14.40
7	607-PHY	Fika Desy Ramadhani, Djayus Djayus	Study of Land Cover On CG (Cloud To Ground) Lightning Strikes in Balikpapan Area in 2015 – 2019	Online	14.40-14.50
8	500-GYPH	Abdul Wahid, Sunaryo , Adi Susilo , Wiyono	Analysis of Aquifer Karst and Mitigation of Land Use Vulnerability at Sendang Biru Beach Karst using Geoelectric Resistivity Method	Online	14.50-15.00
9	604-GYPH	Hengky Himawan Sadewo, Djayus Djayus	Identification of The Presence of Groundwater Aquifers Using	Online	15.00-15.10

No	Code	Authors	Title	Session	Time
			Geoelectric Mapping And Sounding Methods In Tanah Merah Village, North Samarinda District		
10	699-GYPH	Fajar Raihan, Lenny Eka Nurhawaillah, Rahmat Asy'Ari, Oghi Risky Pratama, Winda Beatrix Alamako, Nihawa Hajar Pudjawati, Rian Saputra, Salsa Fauziyyah Adni, Neviaty Putri Zamani, Rahmat Pramulya, Yudi Setiawan	Spatial Distribution of Urban Tree Canopy in Private Residential Property in Jakarta Bay Reclamation using Google Earth Engine Cloud Computing	Online	15.10-15.20
11	628-GYPH	Salwa Nurisanti Maulidina	The Potential of AgroSilvopastoral Systems (SPS) in Bogor Regency: Best Agroecological Practice at the Plantation Area	Online	15.20-15.30
12	576-PHY	Erly Rosita, Irawan Wijaya Kusuma, Edy Budiarso, Isna Yuniar Wardhani, Wiwin Suwinarti	Physical and Mechanical Properties of Cement-Bonded Particleboard Produced from Stem and Branch of Sengon Wood (Falcataria moluccana (Miq.) Barneby & J.W. Grimes)	Online	15.30-15.40
13	574-PHY	Jufriah Jufriah, Rudianto Amirta, Wiwin Suwinarti, Irawan Wijaya Kusuma, Isna Yuniar Wardhani	The Effect of Alkali Treatment and Mixture of HDPE - PP as Matrix on Wood-Plastic Composites made by Red Meranti Sawdust	Online	15.40-15.50
14	554	Muhammad Fikruddin Aslam, Hasna Sri Aprilianti, Muhammad Resta Destyana, Rahmat Asy'ari, Winda Beatrix Alamako	Mapping of Land Use Change Sentinel-2 Time Series Imagery And Based On Cloud Computing: A Case Study In Makassar City	Online	15.50-16.00
15	673	Mudrik Haikal, Adila Hasanah, Naufal Amir Jouhary	The Impact of The Mount Anak Krakatau Eruption and Tsunami on Sebesi Island's Environments	Online	16.00-16.10
16	687	Mislan Mislan, Nanda Khoirunnisa, Rahmiati Rahmiati, Djayus Djayus, Supriyanto Supriyanto	Utilization of Hydrometry Data to Support Flood Disaster Risk Reduction in The Karang Mumus River Sub-Watershed	Online	16.10-16.20

Field: BIOLOGY

Date : October 11, 2022 (Day 2)
Room : Science Learning Center, Floor 3, Classroom 2 + Zoom Virtual Meetings (Breakout Room: Biology 1)
Moderator : Dr. Dijan Sunar Rukmi
Operator : Rudianto, S.Si

No	Code	Authors	Title	Session	Time
1	IVTS	Karina	Our 11 Years of Clinical Experiences in using Autologous Activated Platelet-Rich Plasma	Online	13.30-13.50
2	484-BIO	Donan Satria Yudha	Diversity and abundance of lizards and snakes (Reptilia: Squamata) in Winongo River, Province of DIY	Online	13.50-14.00
3	669-BIO	Rahmat Agung Munggaran, Ida Kinasih, Ramadhani Eka Putra	Observation of Feed Sources and Visitation Activity of Stingless Bee (Trigona sp.) to Support Beekeeping in Beji Organic Village, Wonogiri	Online	14.00-14.10
4	623-BIO	Zidni Ilman Navia	The Diversity of Wild Raspberry (Rubus, Rosaceae) and Their Potential for Local People in Aceh Tamiang, Aceh Province, Indonesia	Online	14.10-14.20
5	648-BIO	Sari Haryanti	Apoptosis Induction and Cell Cycle Arrest of *Hippeastrum puniceum* Bulbous Extract on Breast Cancer 4T1 Cells	Online	14.20-14.30
6	650-BIO	Slamet Wahyono, Sari Haryanti, Rohmat Mujahid, Wahyu Jokopriyambodo, Mery Budiarti	Cytotoxic Potential and Phytochemical Profiling of *Scurrula atropurpurea* (Bl.) Dans Extracts against T47D Cell Line	Online	14.30-14.40
7	705-BIO	Isna Yuniar Wardhani, Harish Jundana, Irvin Dayadi, and Agus Sulistyo Budi	Application of Natural Rubber As Adhesive On Three Wood Species	Online	14.40-14.50
8	514-BIO	Ariyani Noviantari and Putri Reno Intan	Review: Mesenchymal Stem Cells from Human Breast Milk	Online	14.50-15.00
9	499-BIO	Anis Nur Widayati, Arief Mulyono, Gunawan Gunawan, Made Agus Nurjana, Murni	Ecological Index of Rats in Southeast Sulawesi Province, Indonesia	Online	15.00-15.10

No	Code	Authors	Title	Session	Time
		Amirudin, Ristiyanto Ristiyanto			
10	527-BIO	Adi Bejo Suwardi, Syamsuardi Syamsuardi, Erizal Mukhtar, Nurainas Nurainas	Wild edible fruit plants used as food by the Talang Mamak Tribe in Bukit Tiga Puluh National Park, Indonesia	Online	15.10-15.20

Field: BIOLOGY

Date : October 11, 2022 (Day 2)
Room : Zoom Virtual Meetings (Breakout Room: Biology 2)
Moderator : M. Fauzi Arif, S.Si., M.Sc
Operator : Ryan Rachmadan S.Si

No	Code	Authors	Title	Session	Time
1	594-BIO	Wien Kusharyoto	Secretory Expression of Bovine Trypsinogen by Pichia pastoris Employing a Truncated Alpha-Factor Leader Sequence and a Modified Propeptide Sequence	Online	13.50-14.00
2	559-BIO	Tri Yusnikusumah, Mukhlisi,Ulfah Sari, Ardiyanto Nugroho, Ishak Yassir	Environmental Management Effort of Ex-Coal Mining Pit (Void) within IKN Nusantara Area	Online	14.00-14.10
3	545-BIO	Pujiati Pujiati, Nurul Kusuma Dewi, Nur Fadillah	Evaluate the Quality of Compost Fertilizer with Additional Bio-Slurry on Mustard Plants (Brassica rapa L.)	Online	14.10-14.20
4	665-BIO	Gunawan Wibisana, Ida Kinasih, Ramadhani Eka Putra	Diversity and Flower-visiting Insect Activities of Yellow Passion Fruit (Passiflora edulis forma flavicarpa)	Online	14.20-14.30
5	520-BIO	Dwi Kameluh Agustina, Amin Setyo Leksono, Bagyo Yanuwiadi, Akhmad Rizali	Parasitoid Survey of Fruit Flies (Bactrocera spp) in Chili (Capsicum annum) through the Citizen Science Project	Online	14.30-14.40
6	473-BIO	Mirna Widiyanti, Setyo Adiningsih	Human Immunodeficiency Virus-1 (HIV-1) Subtype Based on pol gene among Heterosexual Patient in Jayapura City Papua	Online	14.40-14.50
7	670	Sugiyono Saputra, Herjuno A. Nugroho, Amir Hamidy	Identification of Potential Zoonotic Bacteria Isolated from Cyclemys Dentata and Siebenrockiella Crassicollis	Online	14.50-15.00
8	660	Ratih Rinendyaputri, Aryani Noviantri, Uly Alfi Nikmah, Lisa Andriani L Negoro, Sunarno, Hasta, Rachmawati Noverina, Ahmad Faried, Frans Dany,	An Easy Method for Isolation and 2D Culture of Human Wharthon's Jelly Derived Mesenchymal Stem Cells/Hwjmsc	Online	15.00-15.10

No	Code	Authors	Title	Session	Time
		Arie Polim, Arief Boediono			
9	519-BIO	Syamsuardi Syamsuardi, Nurainas Nurainas, Erizal Erizal, Adi Bejo Suwardi	Collection and potential of wild Baccaurea species in Jambi, Indonesia	Online	15.10-15.20
10	627	Fasya Fadhila, Nova Hariani, Fatmawati Patang	The Effectiveness of Nutmeg Essential Oil (*Myristica fragrans*) and Clove Essential Oil (*Syzygium aromaticum*) in Controlling Rice Weevil (*Sitophilus oryzae*) Pests	Online	15.20-15.30
11	666	Rustam Rustam	Wildlife Corridor to Connect Isolated Habitat In The New Capital Of Indonesia: Will It Work?	Online	15.30-15.40
12	469	Trinil Susilawati, Aulia Puspita Anugra Yekti, Achadiah Rahmawati, Sri Wahjuningsih	The Success Rate and Causes of Artificial Insemination Failure in Friesian Holstein Cow	Online	15.40-15.50
13	512	Hetty Manurung, Retno Aryani, Rudy Agung Nugroho, Ratna Kusuma, Berliana Simanjuntak	Allelophatic Potential of Tabat Barito (*Ficus deltoidea* Jack.) Leaves Against the Spiny Pigweed (*Amaranthus spinosus* L.) and Minnieroot (*Ruellia tuberosa* L.)	Online	15.50-16.00

STUDENTS CHAPTER SCHEDULE

Students Chapter

Date : October 10, 2022 (Day 1)
Room : Einstein
Moderator : Hardina Sandariria, S.Si., M.Sc
Operator : Hardina Sandariria, S.Si., M.Sc

No	Code	Authors	Title	Session	Time
1	*490-Mathematics*	Baso Indar, Moh. Nurul Huda, Yuki Novia Nasution, Syaripuddin Syaripuddin	Analysis of a Discrete Predator-Prey Model for Controlling the Extinction of The Pesut Mahakam (Orcaella brevirostris) with Toxic Effect at The Mahakam River	Offline	15.50-16.00
2	*596-Statistics*	Deva Khoirotunnisa, Sifriyani Sifriyani, Moh. Nurul Huda	Spline Nonparametric Regression with Generalized Maximum Likelihood (GML) Knot Point Selection Method on Tuberculosis Cases	Offline	16.00-16.10
3	*480-Physics*	Elfrida Dwi Saputri, Rahmawati Munir, Adrianus Inu Natalisanto	Crystallographic and Diffraction Pattern Representation of Vanadium - Doped TiO2 Using VESTA Program	Offline	16.10-16.20
4	*656-Geophysics*	Nur Kholis Ash Shidiq, Djayus Djayus, Supriyanto Supriyanto	Identification of Subsurface Lithology Using the Electrical Resistivity Tomography Method	Offline	16.20-16.30
5	*481-Biology*	Chintia Adela, Yanti Puspita Sari, and Enos Tangke Arung	Biosynthesis, Stability, and Antioxidant Activity of Silver Nanoparticle Using Multi bulb Garlic Callus Extract (*Allium sativum* L.)	Offline	16.30-16.40
6	*548-Chemistry*	Muhammad Irvan Mulya Pratama, Veliyana Londong Allo, Noor Hindryawati	Utilization Pandan Leaf (*Pandanus Amaryllifolius*) and Purple Eggplant Peel (*Solanum Melongena* L.) Extracts As A Dyes For The Fabrication of Dye Sensitized Solar Cells (DSSC)	Offline	16.40-16.50
7	*606-Chemistry*	Sri Astika Putri, RR Dirgarini Julia Nurlianti Subagyono, Rahmat Gunawan	Pyrolysis of Ironwood Sawdust (*Eusideroxylon zwageri*) with Pyrolysis-Gas Chromatography-	Offline	16.50-17.00

No	Code	Authors	Title	Session	Time
			Mass Spectroscopy Instrument (Py-GC/MS)		
8	*573-Biology*	Shafira Nur Maulida, Ratna Kusuma, Samsurianto Samsurianto	In Vitro Growth Response of Black Orchid (*Coelogyne pandurata*) with Addition of Yeast Extract	Offline	17.00-17.10
9	*615-Chemistry*	Rusda Vera Anggraini, Soerja Koesnarpadi, Nanang Tri Widodo	Magnetite Functionalized Peat Soil-Humic Acids For Efficient Removal of Methylene Blue	Offline	

Students Chapter

Date : October 11, 2022 (Day 2)
Room : Einstein
Moderator : Hardina Sandariria, S.Si., M.Sc
Operator : Hardina Sandariria, S.Si., M.Sc

No	Code	Authors	Title	Session	Time
1	*507-Mathematics*	Dwi Yulianti Bambang Suprapto, Wasono Wasono, Moh. Nurul Huda	Implementation of Game Theory Using Linear Programs in Determining Optimal Marketing Strategies for Smartphone Products	Offline	13.30-13.40
2	*603-Statistics*	Anggi Jaya Utami, Sifriyani Sifriyani, Fidia Deny Tisna Amijaya	Nonparametric Regression Model of Birespon Spline with Knot GCV And GML Points Selection Methods For Dengue Fever Data	Offline	13.40-13.50
3	*521-Mathematics*	Leniy Eka Watiy, Syaripuddin Syaripuddin, Qonita Qurrota A'yun	Max-Plus Algebra for Calculating the Duration of Traffic Light at Air Putih Samarinda Crossroad	Offline	13.50-14.00
4	*638-Statistics*	Ni Made Shantia Ananda, Suyitno Suyitno, Meiliyani Siringoringo	Parameter Testing of Geographically Weighted Panel Regression (Case Study: Human Development Index Data in East Kalimantan Province in 2017-2020)	Offline	14.00-14.10
5	*659-Geophysics*	Nisa Batrisyia, Djayus Djayus, Supriyanto Supriyanto	Application of Geophysical Logging Data for Seam Coal Interpretation	Offline	14.10-14.20
6	*667-Physics*	Igor Levi Satriani, Dadan Hamdani, Rahmat Fadhilah	Optimalization of HIT (Heterostructure with Intrinsic Thin Layer) Solar Cell Efficiency with Doped Layer	Offline	14.20-14.30
7	*570-Biology*	Melly Dwi Muzarina, Lariman Lariman, Mukhlis Mukhlis	Addition Effect of Shrimp Flour (*Litopenaeus vannamei* Boone, 1931) On Artificial Food Toward the Growth of Catfish (*Clarias gariepinus* Burchell, 1882)	Offline	14.30-14.40

No	Code	Authors	Title	Session	Time
8	*680-Geophysics*	Emy Khairil Hendarwati, Piter Lepong, Suyitno Suyitno	The Best Semivariance Selection with Cross Validation on Spatial Data for Gold Exploration Crew Mas	Offline	14.40-14.50
9	*679-Physics*	Alris Sanca Pratama Putra, Akbar Perdana, Adrianus Inu Natalisanto, Rahmawati Munir	Preliminary Study: Physisorption Analysis of Heavy Metal Iron (Fe) Reduction from Mahakam River Water using Eggshells Powder	Offline	14.50-15.00

PUBLIC DEDICATION SCHEDULE

Date : October 11, 2022 (Day 2)
Room : Ruang Rapat SLC Lantai 2
Moderator : Dr. Retno Aryani, S.Si., M.Si
Operator : Muhammad Fakhurrozy, S.Kom

No	Code	Authors	Title	Session	Time
1	*Mathematics*	Fidia Deny Tisna Amijaya, Syaripuddin Syaripuddin, Wasono Wasono, Moh. Nurul Huda, Qonita Qurrota A'yun, Asmaidi Asmaidi, Indriasri Raming, Sri Wigantono, Hardina Sandariria, Desi Febriani Putri	Scholastic Potential Test Training for 12th graders of high school in Samarinda City in order to face the 2023 Computer-Based Test	Offline	13.40-13.50
2	*Chemistry*	Djihan Ryn Pratiwi, Irfan Ashari H., Noor Hindryawati, Erwin	Utilization of Organic Waste Into Liquid Fertilizer	Offline	13.50-14.00
3	*Statistics*	Sifriyani Sifriyani, Meirinda Fauziyah, Andrea Tri Rian Dani, Surya Prangga, Sri Wahyuningsih	Public Dedication: Training Using Nonparametric Regression Program and Spatial Statistics Modeling for Supporting Regional Development Program in East Kalimantan	Offline	14.00-14.10
4	*Biology*	Ratna Kusuma, Samsurianto, Hetty Manurung, Lariman, Dwi Susanto	Verticulture Development Efforts To Empower Housewives In Gn.Kelua Samarinda (Vertical Crop cultivation solution on Narrow Land)	Offline	14.10-14.20
5	*Physics*	Ahmad Zarkasi, Erlinda Ratnasari Putri, Kholis Nurhanafi, Akbar Perdana, Dadan Hamdani, Rahmawati Munir	Dissemination of Water Purification Using Eggshell Powder of The Community in Senoni Village, Sebulu District, Kutai Kartanegara Regency	Offline	14.20-14.30
6	*Geophysics*	Wahidah Wahidah, Piter Lepong, Andi Alamsyah, Djayus Djayus, Supriyanto	Analysis and Evaluation of Stability for the Reactivated Road Landslide Using Electrical	Offline	14.40-14.50

No	Code	Authors	Title	Session	Time
		Supriyanto, Qori Fajar Hermawan	Resistivity and Induced Polarization in Muara Badak District, East Kalimantan Province, Indonesia		

The List of Keynote Speakers
The 4th International Conference on Mathematics and Sciences (ICMSc)

Dark Matter Searches with COSINE-100 Experiment

Hafizh Prihtiadi
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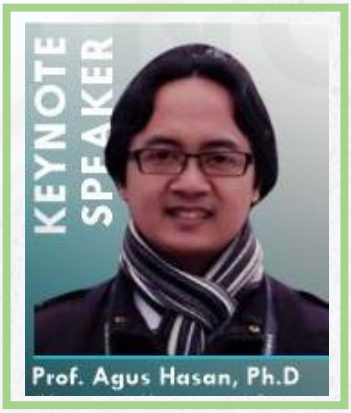
Abstract

COSINE-100 is an international collaboration that operates a direct detection dark matter search experiment based at the Yangyang Underground Laboratory (Y2L) in South Korea. The goal is to test DAMA/LIBRA's long-standing of an annual modulation signature using the same target material and search method. COSINE-100 experiment has been collecting physics data since September 2016. It consists of ~106 kg of low background NaI(Tl) detectors submerged in a 2 tons liquid scintillator veto counter. In this talk, I present the evidence beyond the dark matter model from the astronomical observations. It is including the experimental design, detector installation, COSINE-100 physics results and future phases.



Fundamental Aspect of Digital Twin

Agus Hasan
Norwegian University of Science and Technology

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Abstract

Digital twin can be defined as a virtual representation of a physical asset enabled through data and simulators for real-time prediction, optimization, monitoring, controlling, and improved decision making. The technology has been considered as a main pillar in industry 4.0, which historically evolves from the traditional modelling and simulation due to advancement in information, communication, and sensor technology. In this talk, we will discuss the fundamental aspects of digital twin, which include formal definitions, typologies, and its enabling technologies. Furthermore, some examples will be presented to showcase the applications of digital twin in science and engineering.

Visions of the Bright Future: Correlative Multi-Scale Electron Microscopy for Quantum Fluorescent Nanodiamonds

Shery L. Y. Chang
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Abstract

The world is slowly recovering from COVID-19 pandemic, which has already caused over 6 million death and pushed the global economy to a near-standstill. The pandemic disproportionally impacts populations with limited access to health care. This issue highlights the need of better, more sensitive and affordable technologies for diagnostics, drug and vaccine development. Recent development in nanoparticle based nano-sensors and drug delivery platforms play a critical role in the technologies for advancing healthcare. For example, gold nanoparticles have been used in the lateral flow tests of a range of diseases and viruses including COVID-19. More recently nanodiamond particles have been shown to signal to presence of HIV disease with 5 orders of magnitude improvement in sensitivity compared to gold particles. My research group at UNSW in the past few years has been focusing on the nanodiamond materials that show tremendous potential in ultra-sensitive diagnostics, imaging and drug delivery. This new class of nano-carbon material is non-toxic, biocompatible, earth abundant and low cost. It is therefore poised as one of the key materials that can have an impact to technologies for health. On the other hand, electron microscopy is critical in understanding the structures of nanostructured materials, and correlating with their properties. However, there is often a “scale gap” between the property and the atomic structure measurement. For example, the optical properties are measured at the scale at very best of few hundreds nanometer whereas the atomic structures measured from electron microscopy is at a resolution of 0.1nm. To bridge such gap, my group has developed a new correlative electron microscopy method combined with machine learning approach to obtain direct structure-property relationship of nanomaterials. We have utilized such method for developing and understanding nanodiamond for sensing and drug delivery. The new method has revealed new fluorescent and colloidal properties of nanodiamond that were not known before.

Analysis of Sloppiness in Model Simulations: Unveiling Parameter Uncertainty when Mathematical Models are Fitted to Data

Kerrie Mengersen
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Abstract

This presentation reports on a paper just published in Science Advances, led by Dr Gloria Monsalve-Bravo. We introduce a comprehensive approach to assess the sensitivity of model outputs to changes in parameter values, constrained by the combination of prior beliefs and data. This approach identifies stiff parameter combinations strongly affecting the quality of the model-data fit while simultaneously revealing which of these key parameter combinations are informed primarily by the data or are also substantively influenced by the priors. We focus on the very common context in complex systems where the amount and quality of data are low compared to the number of model parameters to be collectively estimated and showcase the benefits of this technique for applications in biochemistry, ecology, and cardiac electrophysiology. We also show how stiff parameter combinations, once identified, uncover controlling mechanisms underlying the system being modeled and inform which of the model parameters need to be prioritized in future experiments for improved parameter inference from collective model-data fitting.

LIN28A Enhances Regenerative Capacity of Human Somatic Tissue Stem Cells and Mitochondrial Reprogramming

Yanuar Alan Sulistio
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Abstract

Cellular aging and senescence are regarded as the key cause for the decline of the naïve regenerative properties of stem cells in somatic tissues (somatic stem cells, SSCs). In this study, we propose that forced expression of LIN28A is an efficient method to improve the therapeutic utility of SSCs cultured from various human somatic tissues by enhancing self-renewal and differentiation capacities. Mechanistically, LIN28A induced metabolic reprogramming from oxidative phosphorylation (OxPhos) to glycolysis via PDK1-mediated glycolysis-TCA uncoupling. The reprogramming allows SSCs to undergo cell proliferation more extensively with low levels of oxidative and mitochondrial stress. This study provides mechanistic and practical approaches of utilizing LIN28A and metabolic reprogramming to improve SSCs utility in regenerative medicine.

Further Understanding of Storm Surge Development Mechanism

Ide Yoshihiko
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Abstract

Understanding the mechanism of storm surge generation and gaining new knowledge is important for the advancement of numerical simulations and the consideration of disaster prevention measures. Previous studies have shown that even when the external forces (wind and pressure) of a typhoon are the same, the storm surge anomalies generated change when the tidal phase at the time the typhoon strikes is different. This is because the difference in the tidal phase causes a change in water depth. The conventional formula can be used to understand the rough variation characteristics of storm surge anomaly, but no quantitative study has been conducted. In this study, I quantitatively examined the change in storm surge anomaly with water depth and derived an analytical solution that is more accurate than the conventional formula. Subsequently, parameters indicating the effect of changes in water depth on storm surge anomaly were derived, and the characteristics of major bays in Japan were examined using these parameters.

The List of Invited Speakers
The 4th International Conference on Mathematics and Sciences (ICMSc)

Prof. Darmawati D., M.Si., Ph.D
Tadulako University
(Physics)

Prof. Dr. rer. nat. Abdul Haris
University of Indonesia
(Geophysics)

Dr. Eng. Suripto Dwi Y., S.Si., M.T.
Lampung University
(Chemistry)

Dr. dr. Karina, Sp.BP-RE
- *Faculty of Medicine, University of Pembangunan Nasional Veteran.*
- *HayandraLab, Hayandra Peduli Foundation*
(Biology)

Dr. Achmad Choiruddin, S.Si., M.Sc
Institut Teknologi Sepuluh Nopember
(Statistics)

Dr. Eridani, M.Si.
Airlangga University
(Mathematics)

Dr. Junios, M.Si.
Nusantara Prima Health Institute, Bukittinggi
(Physics)

Syaiful Anam, S.Si, M.T, Ph.D
Brawijaya University
(Mathematics)

Ki Ageng S., M.Sc., M.IL., Ph.D
Research Center for Applied Zoology-OR HL BRIN
(Biology)

Ahmad Hafizullah R., S.Si., M.Si.
Sari Mutiara University of Indonesia, Medan *(Chemistry)*

Jordi Mahardika P., S.Si., M.Sc.
(Ph.D candidate)
National Central University, Taiwan
(Geophysics)

Dr. Fatia Fatimah. S.Si., M.Pd.
Padang Terbuka University
(Statistics)

Diagnosing Diabetes Mellitus using K-Means Clustering Method with Robust Centroids Initialization Based Swarm Intelligence Algorithm

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Abstract

Diabetes mellitus is a disease characterized by abnormal glucose homeostasis resulting in an increase in blood sugar. Diabetes mellitus causes various complications, including: cardiovascular disease, nerve damage, diabetic retinopathy, severe foot infections, kidney failure and sexual dysfunction. Risk analysis and early diagnosis of diabetes mellitus are needed for preventing the impact of diabetes mellitus and its complications. The clustering algorithm is one method that can be used for diagnosing the risk of diabetes mellitus automatically based on the previous data. However, the K-mean Clustering method is easy to be implemented, has fast computational time and adapted easily. However, the centroids of clusters of K-means are initialized randomly that causes to be stuck in local optima. For this reason, the robust centroids initialization on the K-means clustering method are necessary to handle this problem. This paper uses swarm intelligence algorithm for this goal since it has good ability to find the global optimum from many local optimums, is robust and easy to be implemented. Therefore, this research proposes a method for diagnosing diabetes mellitus using the K-means clustering method with robust centroid initialization-based swarm intelligence algorithm. The experimental results show that the proposed method has better performance than original K-means clustering.

Integral Operator on Lebesgue Spaces

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Abstract

At this point we consider integral operators, with special kernel such a radial-functions and we discuss its boundedness in Lebesgue spaces, and its generalization. Our kernel satisfy some important conditions, such that our operator is bounded in Lebesgue spaces. Using some classical inequalities such as Minkowski's, H¨older's and even Young' s inequality, we will have some results about the boundedness of this operator, even with new indices on our inequalities. About the generalization of our radial kernel, we consider such that our kernel is belong to some of Lebesgue spaces, with special indices. And finally, we consider a new version of Young's inequality, for radial kernel. Our result will be served as a generalization of another result about the boundedness of Bessel-Riesz operators on Lebesgue spaces.

N – Soft Sets: Theory and Applications in Statistics

Fatia Fatimah
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Abstract

Molodtsov initiated the concept of soft set theory on the fundamental idea of parameterization for dealing with uncertainty. N-soft set is a multivalued extension of soft sets that can provide a more delicate granular structure with higher distinguishable power. In this talk, we first summarize the N-soft set, including numerous hybrid models based on it. Next, we study some of their essential properties. In addition, we also mention applications of the N-soft set and its extensions in statistics with real-life examples and indicate some possible directions for future research.

Log-Gaussian Cox Point Process: Spatial Flexible Model for Earthquake Modeling and Poverty Analysis

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Abstract

Log-Gaussian Cox point process (LGCP) has been widely considered to model spatial point pattern due to its flexibility. In this study, we study the LGCP to model the distribution of earthquake epicenters in Sulawesi-Maluku and locations of sampled house hold in Kendal, Central Java along with its income per capita. In the earthquake modeling, we show that the LGCP is able to detect cluster effect due to seismic activity and involve spatial inhomogeneity due to geological variables. We also demonstrate that the LGCP can model the aggregation of the sampled house hold in Kendal due to socio-economy, demography, and other unobservable variables. In both applications, the LGCP outperforms the other models.

The Effect of Gelatin on Characteristic and Properties of Poli Lactic Acid/Cellulose Flims

Suripto Dwi Yuwono[1], Irza Sukmana[2], Anita Sukmawati[3], Nurhasanah[1], Putu Ristyaning Ayu[4]
[1] Department of Chemistry, Faculty of Natural Science Lampung University, Indonesia
[2] Department of Mechanical Engineering, University of Lampung, Indonesia
[3] Department of Pharmacy, Muhammadiyah University of Solo, Indonesia
[4] Department of Medicine, University of Lampung, Indonesia

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Abstract

In this study, Poli Lactic Acid (PLA) and Celullulose were blended with gelatin as a plasticizer by the solution blending technique to form blend films. The gelatin content was varied to evaluate gelatin content's effect on the PLA, Celullose properties and obtain an optimum weight ratio of PLA-Cellulose/glycerol (PLA/Cel/Gel) blend films with improved properties. The effect of the addition of compatibilizer on the properties of the composite films was also observed. The films' properties were characterized by FTIR, DTA/TGA, and SEM. The results of the FTIR characterization of PLA-cellulose showed O-H absorption at 3429.43 cm-1, C=O at 1759.08 cm-1, C-C at 1488.18 cm-1, C-H at 1366.82 cm-1, O-CH2 at 1186.22 cm-1. The results of the SEM characterization of PLA-cellulose blending have a random morphology and have not blended, while the PLA-cellulose-gelatin blending has more morphology. The best mixing results are shown by adding a variation of 1.5 grams. The results of the characterization of DTG/TGA PLA-cellulose-gelatin showed that the degradation temperature increased after adding gelatin to the DTG results. The highest degradation speed was adding 1.5 grams of gelatin, and the degradation temperature was 270.0℃ with a rate of 409.1µg/min. The DTG result shows that the highest mass decrease was found in the TGA with the addition of 1.5 grams of gelatin which the reduction of mass of 30.3% at a temperature of 233.2℃.

The Influence of Precipitated Calcium Carbonate as Filler in LLDPE/CNR Blends with the Existence of LLDPE-g-OA in the Solvent System

Ahmad Hafizullah Ritonga[1], Novesar Jamarun[2], Syukri Arief[2], Hermansyah Aziz[1]
[1] Department of Chemistry, Faculty of Science and Information Technology, University of Sari Mutiara Indonesia, Medan, Indonesia
[2] Department of Chemistry, Faculty of Mathematics and Natural Sciences, Andalas University, Padang, Indonesia

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Abstract

In this study, we report that precipitated calcium carbonate (PCC) filler has been successfully added to the LLDPE/CNR blends in the existence of linear low-density polyethylene graft oleic acid (LLDPE-g-AO) compatibilizer through a blending process with the solvent system. This study investigates the influence of PCC filler in improving the mechanical, thermal, and morphological properties of the LLDPE/CNR/LLDPE-g-AO blends. These polymer blends were prepared using the blending method, where LLDPE, CNR, and LLDPE-g-AO compatibilizer were dissolved in n-hexane solvent at 140 °C. Next, the PCC filler was added while stirring continuously for 15 min. The results obtained indicate that there has been an increase in the mechanical properties of tensile and impact strength compared to without filler, with the optimum variation in the PCC composition of 4%. The existence of PCC also resulted in a melting point temperature of 124.6 °C and a decomposition temperature of 472.1 °C. Morphology has displayed significant differences in the presence of PCC nanoparticle fillers.

Role of Morphology of Precipitated P3HT/PCBM Nanoparticles in Organic Solar Cells

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Abstract

This Report presents a systematic study on the fabrication of Nanoparticulate (NP) films and organic photovoltaic devices from poly(3-hexylthiophene):phenyl C61 butyric acid methyl ester (P3HT:PC61BM) NP aqueous dispersions prepared by the precipitation method. This method is performed in more environmentally friendly solvents compared with the harmful organic solvents used in conventional organic electronic device fabrication processes. The NP inks were stable for more than 4 days. We have incorporated the films produced from nanoparticulate dispersions into nanoparticle organic photovoltaic (NP-OPV) devices which resulting efficiency of 1 %. By analysing the morphology and performance of the surfactant free NP_OPV devices, we observed that an optimal blend is responsible for the photocurrent and devices efficiency. These results were confirmed by grazing-incidence x-ray diffraction (GIXRD) analysis, which revealed that the surfactant free nanoparticle were resistant to thermal phase segregation, allowing thermal conditioning of the NP films. These results show that precipitated NPs provide a pathway to thermally stable NP-OPV devices with higher photocurrents and efficiencies, approaching those of optimal bulk heterojunction (BHJ) OPV devices.

Exploring of Monte Carlo Simulation from Case Study of Particle Transport in Gamma Knife Perfexion™ Machine

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Abstract

Monte Carlo simulation is the golden technique to investigate the particle transport in medium. The aim of this study is to explore the advantages of Monte Carlo simulation for understanding the charaterizations of beam which is generated by Gamma Knife machine. For this study, the EGSnrc code is implemented to simulate the particle transport in Gamma Knife Perfexion. To know the beams charaterization, Gamma Knife Perfexion is divide into three parts. The first part is to investigate the quality of beams that emitted from capsulated Co-60. The energi spectrum is obsevered in this part. The second part is focused on the forming of beams using three different collimators. From the second part, the comparison of beam profiles is taken account. Then the last part is to learn the distributed dose in Phantom. The measured dose distribution is also made using Gafchromic EBT3 film. The energy spectrum from capsulated Co-60 has more low energy than the energy spectrum from uncapsulated source. The material from capsule is reduced the energy of Co-60. From the second part, fluence and energy fluence depends on the size of collimator. Full width of half maximum of fluence is 1.87 mm for collimator size of 4 mm, 3.80 mm for 8 mm and 7.80 mm for 16 mm. The decreasing of energy fluence about 18.5 keV is found for collimator size of 16 mm. From the last part, the comparasion between the measured and simulated dose distribustion has a good agreement. The gamma passing rates for all collimator sizes are more than 97%. This study concludes that the Monte Carlo simulation is a comprehensive tool to analyze the beam charaterization from Gamma Knife machine. The Monte Carlo simulation help to undestand about the each aspects of physical phenomena which occured in the machine.

Building International Academic Reputation of Mathematics and Natural Sciences

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[1] Department of Physics, Faculty of Mathematics and Natural Sciences, University of Indonesia

Corresponding Author: -

Abstract

One of the urgencies of building international academic reputation is to strengthen partnership and collaboration, which leads to open new opportunities for research, teaching, community service, and even greater income for the institution. The ten main factors that influence academic views on the university's reputation include the quality of research, the quality of students and lecturers, the ranking of subjects or study programs on the campus, and testimonials from fellow academics or the scientific community, who are partners who work with the university. Then the quality of the activities and conferences held in the university, their ranking on a global scale, the quality of facilities and infrastructure, the rankings on a domestic scale, and the experience of people who have worked with the university. It's time to FMIPA Universitas Mulawarman to emerge as the leading MIPA campus in Indonesia and the world.

Geoelectrical and Ground Penetrating Radar Techniques: Past, Present, and Future

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Abstract

Electrical and electromagnetic geophysics have evolved over the last century from a traditional resistivity method to a modern technology that utilizes complex data acquisition systems with a cutting-edge processing performance for improved data modeling and interpretation. This talk will focus on the development of two techniques, i.e., Geoelectrical and Ground Penetrating Radar (GPR). Both techniques are widely considered to be the most flexible and suitable methods for near-surface investigations, e.g., groundwater exploration, mining exploration, building and structure inspections, soil contamination, and so forth. However, due to several limitations during data acquisition, processing and interpretation, many researchers have turned their interest from simple approaches to advanced procedures in order to enhance the outputs (2D/ 3D model) from these techniques. This presentation aims to introduce new insight into geoelectrical and GPR techniques, not only the methods or equipment but also how machine learning and geostatistical can be utilized to model and interpret the data. Overall, the present finding might help to cope with the problem that occurred in geoelectrical and GPR past studies with the present knowledge, while paving the road ahead.

Dietary Approach to Mitigate Methane from Rumen

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Research Center for Applied Zoology, National Research and Innovation Agency (BRIN), West Java, Indonesia

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Abstract

Ruminants are a major contributor to animal-based protein such as milk and meat. However, ruminants emit greenhouse gas, primarily methane, from the normal feed digestion process in the rumen. Methane also represents a loss of dietary energy in ruminants. In order to reduce methane emissions, many strategies were proposed including dietary strategies. Dietary strategies are the most direct and arguably most effective method to mitigate enteric methane Many compounds were used as methane mitigation agents including antibiotic growth promotor (AGP). Since 2006, the use of AGP was banned in Europe and it shift the preference from synthetic compounds to natural compounds originating from plants for mitigating methane emissions from ruminants. Some natural compounds had been investigated to understand their potential as methane inhibitors. The addition of plant secondary metabolites such as tannin, saponin, and essential oils, showed a direct and/or indirect inhibition of methanogenesis in the rumen. Future research should study other possible candidates for methane inhibitor agents such as oil or chitosan from insects.

Our 11 Years of Clinical Experiences in using Autologous Activated Platelet-Rich Plasma

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Abstract

Autologous activated platelet-rich plasma (aaPRP) contains a thousand proteins that may have the potential for regenerative medicine. This study aimed to evaluate the use of aaPRP based on our 11 years of experience. The aaPRP was prepared using an innovative method that we build so it is safe to administer through intravenous. The technique provides a promising therapy by promoting healing through the body. We performed aaPRP on healthy patients or with various pathological conditions such as diabetes mellitus, hypertension, stroke, osteoarthritis, post-cardiac stenting, anti-aging, psoriasis, chronic obstructive pulmonary disorder, dementia, and Parkinson's. Our results showed that intravenous administration of autologous aaPRP is safe.

Abstracts: Oral Presentations

The 4th International Conference on Mathematics and Sciences (ICMSc)

Bio-468

Application of Plant Growth Promoting Fungi (PGPF) using *Trichoderma* sp. on the Growth of Sweet Corn Varieties of Baruna (*Zea mays* L. var. *saccharatta*)

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Abstract

Baruna variety sweet corn (*Zea mays* L. var. *saccharata*) is a food crop that is currently receiving extra attention from the government. However, maize production in Indonesia still faces several obstacles, one of which is slow growth and attack by disease-causing pathogens. This research was conducted to determine the effectiveness of using *Trichoderma* sp. as a Plant Growth Promoting Fungi (PGPF). This research was conducted on January 04 – February 12, 2022 at the Balai Pelatihan Pertanian Lampung. The method used was a randomized block design using 4 different doses, namely 0 grams (control), 10 grams, 20 grams, and 30 grams. The parameters used were plant height, number of leaves, and the level of disease infection. Data analysis of plant height and number of leaves was carried out using the F test. If there were differences, further tests were carried out using the Tukey HSD test. Meanwhile, the infection rate was analyzed using the formula KP = (n x v) / N x V x 100%. The results showed that the induction of *Trichoderma* sp. significant effect on plant height and number of leaves of corn plants, namely the average height of 42 cm and the average number of leaves 11.33. Corn plants induced by *Trichoderma* sp. also more resistant to infection than corn plants that were not induced by *Trichoderma* sp. Based on field observations, it is known that corn plants show symptoms of leaf blight which is thought to be caused by the fungus *Helmithosporium turcicum*.

Bio-469

The Success Rate and Causes of Artificial Insemination Failure in Friesian Holstein Cow

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Abstract

The problem in Indonesia is the high import of milk in Indonesia, around 80%, due to the high demand for milk. So far, the increase in the population of dairy cows is carried out through imports. Therefore it is necessary to increase reproduction efficiency through artificial insemination in dairy cows. This field research aimed to determine the success rate and causes of failure of Artificial Insemination for Friesian Holstein cow. The research was conducted on a smallholder farm in the Pujon sub-district, Malang Regency, Indonesia. The material used was 100 cows that were inseminated using a single-dose straw. The cows had BCS ranging from 2.5 -4 (score of 1-5) and had given birth. Before AI treatment, the estrus on cows was observed visually, and then the vitamin of BIO ATP has injected as much as 10 ml per cow. The frozen semen was thawed using tap water (28oC) for 45 seconds. The deposition of AI was on the uterine corpus. After one cycle, NRR-1 was observed; if the cows did not show the estrus sign, it was considered pregnant. On the next cycle, NRR-2 was observed on cows. the USG was performed to confirm the pregnancy two months after AI. The results showed that the NRR-1 was 79%, the NRR-2 was 62%, the CR was 49%, and the pregnancy rate was 59%. Repeat Breeder was 41%, consisting of normal ovaries as much as 90.24%, Corpus luteum persistence is 7.32%, ovarian hypofunction 2.44%, and none of them have cystic follicles.

Bio-473

Human Immunodeficiency Virus-1 (HIV-1) Subtype Based on Pol Gene among Heterosexual Patient in Jayapura City Papua

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Abstract

The distribution of HIV-1 subtypes in a population tracks the spread and evolution of the epidemic. HIV-1 is characterised by a high genetic variability and includes three groups, with the main group responsible for the HIV pandemic (group M) being further divided into several subtypes and a number of mosaic strains known as circulating recombinant forms (CRF). HIV-1 subtypes show a specific geographical distribution on the global map. The aim of this study was to determine which human immunodeficiency virus type 1 (HIV-I) subtypes were circulating in Jayapura City based on pol gene. Descriptive-analytic methods was attended at the VCT clinic DOK II Hospital. Blood sample from 20 HIV patients was amplified by RT-PCR and nested PCR. Subtype HIV-1 was based on pol gene sequences integrase (the partial coding region including nucleotides 55-601 regions) and PCR DNA sequencing. Results showed the presence of subtype CRF01_ AE , subtype B, subtype C, and subtype CRF02 AG. The most frequent HIV-1 genetic form was CRF01_AE (70%), followed by subtype B (20%), subtype C (5%) and CRf02_AG (5%). The present study confirms the high prevalence and rapid spread of CRF01_AE strains by heterosexual contact in Jayapura City .

Bio-484

Diversity and Abundance of Lizards and Snakes (Reptilia: Squamata) in Winongo River, Province of DIY

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Abstract

River area are one of the potential habitat for reptiles such as lizards, snakes, monitor lizards, crocodiles and turtles. Based on the research in 2012 along Code River, 2013 along Opak River and 2014 along Gadjah Wong River, reptiles commonly found along river area in Province of Daerah Istimewa Yogyakarta (DIY) are lizards and snakes (Yudha, et al, 2016a; 2016b; 2018). Research on the diversity of lizards and snakes is essential to know its diversity and to understand its habitat along and near the river area in Province of DIY. Research and publication concerning the diversity of lizards and snakes along Winongo River has not been done. Methods used was Visual Encounter Survey combined with transect line and time search. Data analysed using Shannon-Wiener Index, Pielou Evenness Index and degree of abundance based on Buden (2000). Results obtained were: 9 species of lizards and 15 species of snakes. Most abundant lizards along Winongo River were: *Eutropis multifasciata* and *Bronchocela jubata*, meanwhile most abundant snakes along Winongo River were: *Dendrelaphis pictus* and *Ahaetulla prasina*. The diversity of lizards in upstream and downstream categorized as very low, meanwhile in midstream categorized as low. Pielou's evenness of lizards in upstream and downstream indicates an unstable population, meanwhile in midstream indicates a stable community. The diversity of snakes upstream categorized as low, in midstream was very low and downstream was medium category. The evenness of snakes from upstream to downstream categorized as a stable community.

Bio-489

Variations in Water Quality Profiles and Abundance of Sulfur-Oxidizing Bacteria in Post-coal Mining Ponds of Different Ages in Samarinda, East Kalimantan

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Abstract

The purpose of this study was to evaluate variations in water quality profiles and the abundance of sulfur-oxidizing bacteria in post-coal mining ponds with an age of fewer than 5 years and more than 20 years. The research was conducted in an exploratory descriptive manner by measuring water quality parameters including conductivity, sulfur concentration, DO, pH, COD, temperature, and TSS; and the abundance of sulfur-oxidizing bacteria in post-mining ponds of different ages. Differences in water quality between pools were determined based on analysis of variance and biplot analysis using Principal Component Analysis (PCA) with the PAST program. The results of the analysis of variance and biplot showed that ponds aged more than 20 years had better water quality than ponds aged less than five years. Old ponds are characterized by lower conductivity values (0.21-0.40 mS/cm), water temperature (29.1-30.1oC), and sulfur content (2.35-6.44 mg/L). higher pH (6.57-7.61), and an abundance of sulfur-oxidizing bacteria (217-364 CFU/mL). Young ponds have poorer water quality with characteristics inversely proportional to old ponds. DO levels (2.61-3.82 mg/L) and TSS (0.03-2.03 mg/L) for all pond ages were below the quality standard, while BOD levels (3.25-11.61 mg/L) and COD levels (12.149-89.908 mg/L) were above the quality standard. Better water quality in old ponds indicates the success of the pond water remediation process by sulfur-oxidizing bacteria. Therefore, it is necessary to study the potential of indigenous bacteria in post-mining pond water in oxidizing sulfur.

Bio-499

Ecological Index of Rats in Southeast Sulawesi Province, Indonesia

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Abstract

Rat is one of the mammals whose species are studied related to their role as reservoirs of various tropical diseases. The purpose was to determine the ecological indexes, including the diversity (H'), similarity (E), and dominance (C) of rat species. The study was conducted in Bombana, Konawe, and Muna Regency, South East Sulawesi Province in 2016. Rats were caught using 100 live traps for three consecutive days in each location. The location of trapping was carried out in two types of ecosystems, near and far from settlements, with three types of habitats (forest, plantation, and coastal). The results showed that the total number of rats caught was 339, consisting of 18 different species. The H' indexes in near and far settlements were 1.127 and 1.944. The E index was 0.701 in far settlement ecosystems, and 0.490 in the near settlements. The dominance indexes in far and near settlement ecosystems were 0.211 and 0.510. The diversity of rats in near and far from settlements was included in the moderate category with moderate community stability. The distribution of individuals rat was found to be evenly distributed in both study ecosystems. The dominance of species in both ecosystems was found to be low so that no particular species was found that dominates the ecosystem. This shows that the condition of the ecosystem in Southeast Sulawesi is still good in supporting the survival of the species. So, it is important to preserve the environment and maintain the balance of the ecosystem.

Bio-501

Proximate Analysis of Hermetia Illucens Larvae Fed Palm Oil Meal Waste and Fish Feed Enriched Various Levels of Fructose

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Abstract

Proximate composition of black soldier fly (Hermetia illucens) larvae or known as BSFL processed by seven different groups of treatment was analysis. The resulting products of dried BSFL which reared in the different substrates and various fructose supplementation levels namely: Palm oil meal waste (POMW); Fish pellet (FP); POMW+FP; POMW+FP added with fructose at 2.5; 5;7.5; and 10% with ratio of POMW: FP was 1:1. Present results found that there was no significant different in the proximate analysis (Crude protein, Carbohydrate, Crude lipid, moisture and ash). However, there was a significantly different fatty acid composition BSFL reared in the POMW+FP added with 10% of fructose. Specifically, the lauric acid of BSFL reared in the substrate (POMW+FP) enriched with 10% of fructose showed significantly higher than other groups. In general, the fatty acid composition of the dried BSFL reared in the POMW+FP substrate tested in the present study was influenced by the addition of fructose.

Bio-505

The Nucleotide Polymorphism of Blue-Crowned Hanging Parrot *Loriculus galgulus* (Aves: Psittacidae) based on *Cytochrome B* Mitochondrial DNA Gene

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Abstract

Genetic data of *Loriculus galgulus* is needed to support its conservation in Indonesia, but the data are still limited. The aim of our study was to reveal the nucleotide polymorphism, genetic distance, and phylogenetic of *L. galgulus* using mtDNA cytochrome b gene. Blood samples (0.1-0.5 ml) were collected from six Blue-crowned Hanging Parrot individuals confiscated by BKSDA, Bengkulu in Seluma District, Sumatra, and preserved with EDTA. Genome DNA was isolated by Dneasy® Blood and Tissue Kit according to the Spin-Column Protocol, Qiagen. Cytochrome b gene replication was carried out with a PCR machine and the product was electrophoresed using 1.2% agarose gel and visualized with a UV transilluminator (λ=300 nm) on a gel document system, Axygen. The nucleotide sequences were analyzed using BIOEDIT and MEGA 10.1 software. The results showed that the nucleotide sequences of the mtDNA cytochrome b gene (859 bp) of six *L. galgulus* individuals contained 820 bp (95.46%) conservative sites and 39 (4.54%) variable sites. The composition of AT (49.6%) was lower than that of GC (50.4%). Nucleotide variation between individuals of *L. galgulus* was found at 30 sites and eight of them were specific sites. We obtained a mean genetic distance of intraspecific was 0.015 (1.5%) and interspecific 0.057 (5.7%). All individuals grouped together with two other individuals from GenBank and were relatively far apart from different species. The cytochrome b gene sequence that we obtained can be used as a comparison for future research in the field of bird biosystematics, especially the Psittacidae family.

Bio-509

Combination of Volume and Frequency of Fungi Inoculation on Agarwood Formation in Gyrinops versteegii of Cijeruk, Bogor

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Abstract

Gyrinops versteegii is one of the agarwood-producing plants containing various compounds that are useful in the pharmaceutical and cosmetic industries. The exploitation of agarwood that threatens the existence of this plant can be prevented through an artificial induction of agarwood formation using fungal inoculants. This study aimed to determine the volume and frequency of inoculation of a mixture of fungi SP1 and SP2 (both belong to the genus *Penicillium*) which was most suitable for inducing agarwood in *G. versteegii* of Cijeruk, Bogor. The stages of this research consisted of the production of agarwood extract, manufacture of enrichment media, production of inoculants, and inoculation. The treatments observed were a combination of volume and frequency of inoculation, namely 2 ml once, 2 ml twice, 2 ml 3 times, 3 ml once, 3 ml twice, and 3 ml 3 times. The quality of agarwood observed was color intensity, area, and aroma after 6 months of inoculation. The data were processed by one-way analysis of variance and Duncan test ($p<0.05$). The results showed that all treatments had a significant effect on the color intensity, area, and aroma of the agarwood. In conclusion, the most suitable inoculation of a mixture of SP1 and SP2 fungi to induce agarwood in *G. versteegii* of Cijeruk, Bogor was the largest volume (3 ml) and the most frequent (3 times), and it will potentially give better results if the volume and frequency of inoculation were increased.

Bio-512

Allelophatic Potential of Tabat Barito (*Ficus deltoidea* Jack.) Leaves Extract Against the Spiny Pigweed (*Amaranthus spinosus* L.) and Minnieroot (*Ruellia tuberosa* L.)

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Abstract

Studies investigating the allelopathic effect of leaf methanolic extract on the seed germination and the growth of spiny pigweed and minnieroot were conducted in a completely randomized design with 4 replication. The crushed *Ficus deltoidea* leaves were extracted using 96% methanol for 72 h, filtered, and evaporated using a rotary evaporator. The crude extract was dissolved using methanol 98% to concentrations of 25, 50, and 75%. Seedling emergence, seedling vigor index, and total biomass of spiny pigweed and minnieroot were significantly reduced in extract concentration of 75%. The higher the concentration of F.deltoidea the higher reduction of germination index, time index germination, shoot length, biomass, and the growth of test crop. These results indicated that the leaf extract of *F. deltoidea* suitable source of natural compounds potentially usable as natural herbicides.

Bio-514

Review: Mesenchymal Stem Cells from Human Breast Milk

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Abstract

Stem cells have the ability to self-renewal cells that have no specific shape, and function but can differentiate into other cells. Mesenchymal stem cells (MSCs) can be isolated from a variety of sources, including bone marrow, adipose tissue, dental pulp, placenta, amniotic fluid, Wharton Jelly, umbilical cord blood, breast milk, and others. Human breast milk is a complex fluid that has developed to satisfy the nutritional requirements of infants. In addition to carbohydrates, proteins, lipids, and other biologically active components, breast milk is also reported to contain stem cells. MSCs can differentiate into different cell types but are limited to just one cell group by expressing multiple specific or multipotent markers. This paper is a review of the literature through a literature search obtained from the internet in isolation, differentiation ability, and characterization of MSCs from human breast milk. MSCs isolated from human breast milk can be isolated and express some specific markers. MSCs from human breast milk can differentiate into osteoblasts, chondrocytes, adipocytes, and. neurons. Therefore, MSCs from breast milk have great potential and maybe hopefully be used in the treatment of regenerative therapy.

Bio-517

Antiangiogenic Activity of Silver Nanoparticle of *Ficus deltoidea* using Chorioallantoic Membrane Assay

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Abstract

Silver nanoparticles shows a special physical and biological properties which have gained intension in research interest due to its important medical applications. Present study silver nanoparticles (AgNPs-tb) were biosynthesized using *Ficus deltoidea* leaves extract. The structure and properties of AgNPs-tb were determined using UV-visible spectroscopic techniques, transmission electron microscopy (TEM). The UV-visible spectroscopic analysis indicated the absorbance peak at 450 nm, showing the biosynthesis of silver nanoparticles. The average particle diameter as determined by TEM was found to be 20 ± 2 nm. As angiogenesis is a crucial factor which causes the acceleration of cancer growth, the anti-angiogenic properties of AgNPs-tb was determined using the Chicken Chorioallantois Membrane (CAM) model. The results showed that AgNPs-tb lead to a reduction in the length and number of vessel-like structures. The synthesized of AgNPs-tb from the *Ficus deltoidea* leaves extract, which do not include any harmful chemicals were well-dispersed and stabilized through this biosynthesized and found as potential medicinal benefits against angiogenesis.

Bio-519

Collection and Potential of Wild Baccaurea Species in Jambi, Indonesia

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Abstract

Baccaurea is a member of the Phyllanthaceae family, which includes 43 species discovered in India, Borneo, Sumatra, Java, Peninsular Malaysia, Thailand, the Philippines, and the Pacific islands. Some of these plants are widely cultivated throughout the country, while others are grown in natural forests. Despite the fact that wild *Baccaurea* species produce edible fruits, they are relatively unknown and underutilized. The current study aims to investigate the diversity and potential of wild *Baccaurea* species in Jambi, Indonesia. The study was conducted in three districts, namely Tebo, Bungo, and Merangin. The exploration method was used to collect wild *Baccaurea* species. The value of *Baccaurea* was assessed through interviews with 30 key informants (10 in each district) to assess its potential as a food as well as a source of germplasm for future domestication. A total of 8 wild Baccaurea species were discovered. *Baccaurea polyneura*, *Baccaurea macrocarpa*, and *Baccaurea deflexa* are some of the potential wild Baccaurea species.

Bio-520

Parasitoid Survey of Fruit Flies (*Bactrocera* spp.) in Chili (*Capsicum annum*) through the Citizen Science Project

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Abstract

This study aims to determine the parasitoids on chili peppers obtained from the citizen science project survey results in 3 chili crops, Sumberejo village, Batu District, Batu City, East Java. This research was carried out from July to August 2022. This study was conducted using a survey method on chili peppers infected by fruit fly ovipositors (*Bactrocera* spp) as many as 100 pieces from a collection of each chili garden. The collection of chilies for rearing was carried out by 9 villagers who were participants in the Citizen Science Project. Through rearing the chili plant, fruit fly pupae (*Bactrocera* spp.) were obtained. The parasitoid imago that had emerged from the pupa was observed and identified with the researchers descriptively to the family level. The results obtained were 14 parasitoids identified in crop 1 Psyttalia sp. with a parasitization rate of 36.8% and *Opius* sp. numbered 9 with a parasitization rate of 23.7%. In crop 2 2.23 parasitoids were identified, *Psyttalia* sp. with a parasitism rate of 32.9%, and in crop 3, there were no parasitoids, so the parasitoid rate was 0%. This study concludes that the parasitoids on chili peppers obtained from citizen science surveys are in the *Psyttalia* sp. and *Opius* sp. families with the most dominant parasitoid level in *Psyttalia* sp. in chili crops 1 and 2 compared to *Opius* sp. in chili crop 3. The Citizen Science Project helps researchers quickly identify chili garden areas related to parasitoids and fruit flies (*Bactrocera* spp) through scientific activities.

Bio-527

Wild Edible Fruit Plants Used as Food by The Talang Mamak Tribe in Bukit Tiga Puluh National Park, Indonesia

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Abstract

The Talang Mamak tribe has a long history of gathering food from the forest, including wild edible fruit plants. This knowledge, however, has not been scientifically documented. The aim of the present study was to investigate the wild edible fruit plants used as food by the Talang Mamak tribe in Bukit Tiga Puluh National Park, Indonesia. Field surveys, plant collection, and semi-structured interviews were used in this study. A total of 43 wild edible fruit plant species from 18 plant families were used as food by the Talang Mamak tribe. Artocarpus integer, Baccaurea deflexa, Baccaurea macrocarpa, Baccaurea polyneura, Durio oxleyanus, Nephelium juglandis folium, and Nephelium maingayi are the most popular wild edible fruit plants used as foods by the Talang Mamak tribe. More than 60% of traditional knowledge related to the use of wild edible fruit plants as foods was obtained from their families

Bio-545

Evaluate the Quality of Compost Fertilizer with Additional Bio-Slurry on Mustard Plants (*Brassica rapa* L.)

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Abstract

Mustard plant/Pakcoy (*Brassica rapa* L) is a leafy vegetable with a unique and simple cultivation method. This study intends to assess the impact of compost fertilizer formulations containing bioslurry on plant growth pakcoy. This research utilized 126 polybags. This study applied a completely randomized design (CRD) with 14 treatments and three replications. The biosolids are treated further with three distinct types of irrigation: including irrigation with groundwater; watering with bioslurry liquid; and watering with a bioslurry solution that is 1:1 with water. In this investigation, the following parameters were observed: plant height, number of leaves, leaf width, wet weight, and dry weight. Temperature and humidity analyses; N,P, K, and pH quality tests; color, odor, and texture observation of compost. The analysis of variance revealed that all treatments significantly affected the development of pakcoy plants ($P < 0.05$). The best results come from a P7 treatment (PK 40% (manure) + SO 30% (organic waste) + T 20% (soil) + SL 10% (slurry)) that uses a bioslurry solution that has been diluted with water.

Bio-547

Community Structure of Dragonfly in Sokokembang Forest, Central Java Province

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Abstract

Community structure of dragonfly can be determine of habitat function in used. This study aims to identify, analyze ecological index, distribution pattern and find out of the effect of abiotic factor of dragonflies present in Sokokembang Forest (Jamban River and Rambut River). This study used survey method, the collection of dragonflies was carried out on transects along 200 m by using insect net. The result showed that 625 individuals of dragonflies were identification on this study, belong to 7 spesies and 5 families namely are Libellulidae (Anisoptera), Calopterygidae, Coenagrionidae, Euphaeidae, and Platysticdae (Zygoptera). *Orthetrum sabina*, *Drepanosticta spatulifera* and *Euphaea variegata* are commonly dragonflies in our research. Drepanosticta spatulifera is an endemic species dragonfly from Java, data deficient based on IUCN. The diversity index of dragonfly in Sokokembang Forest is moderate, the highest in Jamban River H' = 1.605, the Evennes Index in Rambut River is 0.860 and Similarity Index is 77%. The distribution pattern of dragonfly in Sokokembang Forest are uniform, clumped, and random. The Canonical Correspondent Analysis show that the intensity of light and degree of acidity of water have a influence of dragonfly present in Sokokembang Forest.

Bio-559

Environmental Management Effort of Ex-Coal Mining Pit (Void) within IKN Nusantara Area

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Abstract

In Indonesia, most coal mining systems are carried out using the open pit mining method. This method is considered cheaper and easier to apply in the field but has an impact on the creation of ex-coal mining pits (void). Recent regulation states that every mining company is obliged to carry out reclamation including environment management efforts for mining pits. However, not all mining business actors have complied with this effort, especially companies that do not have official permits. This void existence in the IKN delineation area phenomenon becomes a crucial issue to be managed appropriately and wisely. The IKN Nusantara is the future capital city of Indonesia designed as a smart forest city, where 75% of the total area is maintained as a green space. This paper describes the management effort than can be carried out in the ex-coal mining pits (void) within IKN Nusantara. All of the environmental management efforts for void need to be aligned with detailed urban spatial plans in the future. There are several alternative efforts to utilize void that can be carried out, for example, as a source of clean water and raw materials, tourist destinations, sports areas, wildlife wetland habitats that are connected to the surrounding forest, landfills, agricultural reservoirs, and also water sources for forest fire mitigation.

Bio-572

Biolarvicide and Inhibit Egg Hatching from *Spondias dulcis* Leaf Extract Against *Aedes aegypti* (Diptera: Culicidae)

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Abstract

Aedes (stegomyia) aegypti L is the main vector of dengue fever which is commonly found in urban areas and is currently causing resistance to chemical insecticides.This study aims to determine the Inhibit Egg Hatchability of leaf extract of *Spondias dulcis* against the dengue vector *Aedes aegypti* observed by increasing the concentration of the solution. The larvicidal LC50 and LC50 values were 2178 and 2770 ppm, respectively, while the LT50 and LT90 values were 2414 and 4742, respectively. The LC50 and LC 90 values are 23.3 and 2498 minutes, respectively. There is a relationship of (R square=0.997) and a positive pattern between the concentration of S. dulcis leaf extract and the mortality of Ae. aegypti larvae. Leaf extract of S. dulcis has the potential to control *Aedes aegypti* in the immature phase in the future as a vector for dengue fever.

Bio-580

Sinensetin Content In Jawa Tea (*Orthosiphon aristatus* (Blume) Miq.) Based on Age Level of Leaf

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Abstract

Java tea (*Orthosiphon aristatus* (Blume) Miq.) is one of the plant's origin materials for herbal medicine commonly used as a diuretic, renal stones remedy, and to lower high blood pressure. The quality determination of the material is by measuring the sinensetin leaf content. Like other flavonoid derivatives, the sinensetin content in the leaf is affected by the age of the leaves. This study aims to measure the sinensetin content of java tea leaves based on their age level. The leaves are divided into four groups: young leaves (M), old leaves (T), a mixture of young and old leaves (C), and senescent leaves/yellow (K). The sample was sonicated using ethanol, the sinensetin content was determined using the TLC densitometry method using stationary phase Silica gel 60 GF 256 and Chloroform: Ethyl Acetate (6:4) as mobile phase with a development distance of 8 cm and measured at a wavelength of 366 nm Fluorescent. The sinensetin contents of M, T, C, and K were 0.0104, 0.0078, 0.0105, and 0.0071% respectively, which showed a very significant difference ($P = 1.24 \times 10^{-6}$) in the single factor ANOVA test). Therefore, the utilization of java tea as a single ingredient or a mixture in traditional medicine is advisable not to separate the young and old leaves.

Bio-585

The Quality of Liquid Biostimulant Formula of Microbial-Based During Packaging and Storage

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Abstract

The microbial-based liquid biostimulants are very sensitive to the storage environment and are easily degraded, so they have relatively short storage. The study aims to obtain a good packaging and storage temperature for a microbial-based biostimulant formula to maintain its durability and stability for 3 months. In this study, the types of plastic packaging used were clear plastic bottles and cloudy plastic bottles, and the storage temperatures were room temperature (26℃) and AC temperature (19℃). The analysis used phytohormones content, Total Plate Count (TPC), pH, microbial contaminant test (Escheriachia coli, Salmonella sp.), and chili and tomato seed germination test. The total population of bacteria in the biostimulant formula packaged in cloudy bottles or clear bottles and stored at 19℃ and 26℃ until storage for 12 weeks still had a relatively stable population, which was 106 cfu/mL. In the cloudy bottle, contains relatively better phytohormones (IAA concentration = 15.54 ppm; Gibberellin = 19.87 ppm) than in a clear bottle (IAA concentration = 10.37 ppm; Gibberellin = 18.45 ppm). Microbial-based liquid biostimulant formula on storage until the 12th week of 4 treatments showed negative results for the microbial content of E. coli and Salmonella sp. Microbial-based liquid biostimulant formulas are packaged in cloudy bottles and stored at 19℃ for 3 months were able to stimulate the germination of plant seeds.

Bio-594

Secretory Expression of Bovine Trypsinogen by *Pichia pastoris* Employing a Truncated Alpha-Factor Leader Sequence and a Modified Propeptide Sequence

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Abstract

Trypsin plays a crucial role in processing recombinant precursor insulins, especially in removing a peptide linker or a peptide spacer by cleaving the peptide after a lysine or arginine residue. To reduce the cell toxicity of the expressed trypsin and increase the secretory expression, we developed a strategy for producing a recombinant bovine trypsinogen by the methylotrophic yeast *Pichia pastoris*. The expression cassette contains the gene encoding a truncated mating alpha-factor from Saccharomyces cerevisiae with the cleavage site for a Kex2 endoprotease, a short propeptide having the cleavage site for autolysis (DDDDK), followed by the sequence for the active trypsin. Furthermore, based on a 3D structure model, we constructed a variant of bovine trypsin, which would have a higher specificity in cleaving a polypeptide after a lysine residue rather than an arginine. Zeocin-resistant clones were successfully obtained and verified with PCR using AOX1-specific primers for the integration of the expression cassette into the *P. pastoris* genome and identification of Mut phenotypes. The secretion of trypsinogen into the culture supernatant was confirmed using SDS-PAGE, where a single band of the secreted trypsinogen with a molecular mass of approximately 25 kDa was detected. The method described here represents an initial step in developing "halal" trypsin, particularly for its application in the production of recombinant insulin and its analogs.

Bio-605

Morphological Identification and Cytotoxicity Evaluation of Various Well-known Bajakah from Central Kalimantan, Indonesia

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Abstract

Bajakah refers to a type of liana plant usually utilized in the traditional medication of the Dayak ethnic, Indonesia. The popularity of bajakah is rising in parallel with the spread of information regarding its potential for cancer treatment, specifically breast cancer. However, the information is not supported by reliable scientific evidence. This study aims to identify various bajakah through morphological analysis and evaluation of their cytotoxic activity against 4T1 breast cancer cells. Eight collection numbers of bajakah were collected from natural habitats and markets. Species were identified through direct morphological observations, photographs, and literature studies. The toxicity test was carried out in vitro on 4T1 cells using the MTT assay method utilizing water (infusion) and ethanol (maceration) extracts. In addition, phytochemical screening was performed by the TLC method. This study obtained five species of the eight bajakah samples, including two species belonging to *Uncaria* cf. *gambir* (W.Hunter) Roxb., *Willughbeia* cf. *angustifolia* (Miq.) Markgr., *Uncaria* cf. *cordata* (Lor.) Merr, *Mucuna biplicate* Teijsm. & Binn. Ex Kurz, while the other three samples were not identified. But it is suspected that the three difficult samples to identify are of the *Uncaria* genus. The ethanol extract of *W.* cf. *angustifolia*, with an IC50 of 97 µg/mL, exhibited anti-cancer potential in an in vitro cytotoxic test against 4T1 breast cancer cells. Phytochemical analysis revealed that the majority of the eight bajakah samples contained flavonoids, alkaloids, phenolics, stigmasterols, and steroids. The finding is expected to increase public knowledge and awareness about bajakah for traditional treatment.

Bio-623

The Diversity of Wild Raspberry (Rubus, Rosaceae) and Their Potential for Local People in Aceh Tamiang, Aceh Province, Indonesia

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Abstract

Rubus is a tropical indigenous plant with a high potential for improving food security and public health, particularly in rural areas. The majority of these plants are found growing wild in the forest and have not been fully explored. The increasing rate of deforestation in recent years, as well as the trend of decreasing knowledge among local people about wild plant species, pose a threat to the existence of Rubus in nature. This study aims to determine the diversity of Rubus and its importance for local people in Aceh, Indonesia. This study was conducted in Aceh Tamiang district. The plant specimens were collected with an exploratory method, while information on the use of Rubus was gathered from literature studies and interviews with local people. A total of 5 species were found growing wild in the forests and farmland such as *Rubus chrysophyllus* Reinw. ex Miq., *Rubus lineatus* Reinw. ex Blume, *Rubus moluccanus* L, *Rubus pyrifolius* Hook.f.&Thomson ex.Hook.f., *Rubus rosifolius* Sm. All the species found have the potential to be a source of food and medicinal plants.

Bio-625

Genetic Identification of Stone Crab (*Myomenippe* spp.) with DNA Barcoding Approach Caught in Tarakan City Sea Waters

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Abstract

The aim of this study is to genetically identify stone crab samples obtained from the sea waters of Tarakan City and compare their sequences with the GenBank database. DNA extraction was carried out following the protocol of the DNA extraction kit (genomic DNA Purification wizard, Promega). COI gene fragments were amplified by the PCR method, using COI Universal Primer. Sequencing was carried out in two directions, namely forward and reverse with the Sanger termination dideoxy method. The DNA sequencing process is carried out by a sequencing service company, namely the St Base company in Singapore. The results of the DNA sequence obtained have a length of 599 - 832 base pairs. The results of the comparison of homology with the NCBI database and the BOLD system show that this sample has similarities with the COI sequences of *Myomenippe fornasinii* and *Myomenippe hardwickii* with similarities reaching 91.56% to 97.22%. The genetic distance obtained from the genetic distance analysis shows that samples C2 and C1 have the closest genetic distance value with a value of 0.019 and the farthest value obtained between samples is C1 and B2, which is 0.041. The results of the phylogenetic analysis showed the formation of 2 clusters, in which cluster A was filled with samples A1, A2, B2, C1 and C2 and for cluster B was filled with additional data obtained from the NCBI GenBank.

Bio-627

The Effectiveness of Nutmeg Essential Oil (*Myristica fragrans*) and Clove Essential Oil (*Syzygium aromaticum*) in Controlling Rice Weevil (*Sitophilus oryzae*) Pests

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Abstract

This study is about experiment of phyto-pesticides of nutmeg essential oil and clove essential oil toward *Sitophilus oryzae* because the usage continuously of chemical pesticide for pest control could have some negative impacts especially for human health. The purpose of this study is to determine the growth resistor of *Sitophilus oryzae* by nutmeg essential oil and clove essential oil and the mortality of *Sitophilus oryzae* towards nutmeg essential oil and clove essential oil. This study was located on Ekologi dan Sistematika Hewan Laboratory of Faculty Mathematics and Natural Sciences, Mulawarman University. There were two methods used in this study. First, to inhibit *Sitophilus oryzae* to produce F1 generation by applying nutmeg essential oil and clove essential oil on rice. Second, by using filter paper method to get the effect of nutmeg essential oil and clove essential oil toward *Sitophilus oryzae* with observation on 24 hours, 48 hours, and 72 hours. The conclusion of this study on the first method, best essential oil to inhibit *Sitophilus oryzae* to produce F1 generation is nutmeg essential oil with concentrate 5%, 10%, and 20%, while on the second method, essential oil that has the highest mortality is nutmeg essential oil with concentrate 10%, and 20% because it could kill 100% of *Sitophilus oryzae* in 24 hours, followed by nutmeg essential oil with concentrate 2.5%, 5%, and clove essential oil with concentrate 20%. It is expected that this study could be used to control pest well, especially Sitophilus oryzae.

Bio-645

Antibacterial Activity of Tanikkara Extract (*Dillenia excelsa* (Jack) Martelli ex Gilg) against *Escherichia coli* and *Staphylococcus aureus*

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Abstract

The purpose of this study was to determine the effect of various concentrations of tanikkara leaf extract (*Dillenia excelsa* (Jack) Martelli ex Gilg) which can inhibit the growth of *Escherichia coli* and *Staphylococcus aureus* bacteria. The process was started by leaf extraction. The crushed tanikkara leaves were extracted using 96% methanol, filtered using filter paper, and evaporated using a rotary evaporator. The crude extract was used for the phytochemical test. The extract was dissolved using sterile distilled water to concentrations of 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100%. The well diffusion method was used to determine the antibacterial activity. The diameter of the inhibition zone was measured to determine the antibacterial activity. Gentamicin Sulfate 0.1% was used as a positive control and aquadest as a negative control. The methanol extract contains alkaloids, flavonoids, phenolics, triterpenoids, and tannins. The extract inhibits the growth of *E. coli* and *S. aureus* with an inhibition zone ranging from 0.60 to 7.20 mm and 0.01 to 4.90 mm. The high concentration generated a wider diameter of the inhibition zone. *S. aureus* were more resistant to the extract at the highest concentration.

Bio-648

Apoptosis Induction and Cell Cycle Arrest of *Hippeastrum puniceum* Bulbous Extract on Breast Cancer 4T1 Cells

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Abstract

Breast cancer is the main cancer type and the major cause of cancer related death among women worldwide. Hippeastrum puniceum commonly named as Amarylis, is recognized globally as a beautiful flowering decorative plant. It is also grown in several nations for medical purposes with limited relevant scientific information. This study explored the cytotoxic potential of H. puniceum bulbous extract in 4T1 breast cancer cell lines. The bulbous powder was macerated with 70% ethanol for five consecutive days, filtrated, and dried at 50°C. MTT assay was used to determine the cytotoxic effect. The cell cycle profile and apoptosis induction were analyzed by flow cytometry. The extract considered a potential cytotoxic effect in 4T1 cells with an IC50 value of 12.0±0.6 ug/mL, and demonstrated high selectivity in normal Vero cells with an IC50 of 121.5±9.5 µg/mL. Apoptosis and G2/M arrest were both strongly modulated by the extract 5 µg/mL. As a result, the bulbous extract of H. puniceum provokes cytotoxic effect through cell cycle arrest stimulation and apoptosis induction. H. puniceum may therefore be developed further as a prospective anticancer agents.

Bio-650

Cytotoxic Potential and Phytochemical Profiling of *Scurrula atropurpurea* (Bl.) Dans Extracts against T47D Cell Line

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Abstract

The parasitic plant (*Scurrula atropurpurea* (Bl.) Dans) has been widely used in traditional medicine and is known for treating diuretic, mitotic, and cancer diseases. It grows on various trees, such as tea, mangoes, and avocados. In this study, the activity of the ethyl acetate and ethanol extract of *Scurrula atropurpurea* (Bl.) Dans (grown on avocado trees) were tested on the T47D breast cancer cell line using the MTT assay method. Extraction was carried out by soxhletation using ethyl acetate solvent, and the dregs were extracted again with ethanol. Phytochemical screening using the HPTLC method contained four peaks on the ethyl acetate extract, while the ethanol extract had six peaks. The research results showed that the IC50 of the ethyl acetate extract was 17.93 µg/ml, and the ethanol extract was 32.70 µg/ml. Thus, the ethyl acetate fraction has the most potential to develop as a cytostatic compared to the ethanol fraction.

Bio-660

An Easy Method for Isolation And 2D Culture of Human Wharton's Jelly Derived Mesenchymal Stem Cells/Hwjmsc

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Abstract

Mesenchymal stem cells (MSC) are adult stem cells that can be obtained from various tissue sources. Human Warthon's Jelly is one of the sources obtained from the extra embryonic development of the mesoderm lineage. The differentiation ability of the mesoderm lineage is bone, muscle, tendon, heart, kidney, etc. The differentiation and secretome ability of MSCs contains various cytokines, extracellular vehicles/EVs, growth factors and chemokines. In this study, the explant method of Wharthon's Jelly was carried out by separating the arteries and veins. Wharthon's Jelly was washed in 1% gentamicin in PBS then cut into 2-3 mm, placed in a 24-well plate with the outer tissue position on top. Add 200 l to each well with 1 piece of tissue. Every 2 days the medium was changed and observed, on the 10th day fibroblast cell like began to emerge from under the tissue. Examination of positive markers for MSC showed 96% (CD105, CD90, CD73, CD44) and negative markers 3.4%. 2D culture on MSCs showed the ability to differentiate into 3 lineages of adipocytes, osteocytes and chondrocytes and normal chromosomes in MSCs produced in this study showed that the explant method could be effective for the isolation of MSCs from Whrthon's Jelly.

Bio-665

Diversity and Flower-visiting Insect Activities of Yellow Passion Fruit (*Passiflora edulis* forma *flavicarpa*)

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Abstract

Yellow passion fruit is a self-incompatible plant. Naturally, the fruit production strongly depends on insect pollinators, especially solitary bees. This research aimed to study diversity and flower-visiting insect activities of yellow passion fruit. Data were obtained during daylight (0.30-2.30 p.m) and evening (4.00-6.00 p.m) in four observation sites located at Kampung Organik Beji, Wonogiri Regency from January-February 2022. Diversity observation was done using the scan sampling method, while flower-visiting insect activities were monitored by focal sampling method. Results found 26 species of visitors from 5 Ordo and 12 Families with moderate diversity index (H'=2.15), evenly distributed (J'=0.66), and low domination (D=0.32). Three of 26 insect visitors (Xylocopa latipes, Tetragonula laeviceps, and Apis cerana) were considered as pollinators. Xylocopa latipes (Vt=11.81±7.44 second, Fvr=2.41±1.55) visited flower (Vt) on shorter times, and more flower visitation rate (Fvr) than Tetragonula laeviceps (Vt=12.36±8.32 second, Fvr=1.10±0.30).

Bio-666

Wildlife Corridor to Connect Isolated Habitat In The New Capital Of Indonesia: Will It Work?

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Abstract

To evaluate the sustainability of mammalian habitat in the New Capital of Indonesia (NCI) in East Kalimantan, we investigated the abundances of small to large ground-dwelling mammals in a forested areas by camera trapping. NCI (265.000 ha) will apply forest city concept, with 65% as forest cover, zero emission, and smart city. We interpreted the land use and land cover (LULC) classification by aerial photograph of 2019 made by Indonesian Geospatial Information Agency (BIG) and combined with SPOT and Sentinel images of 2021 for LULC updated. The LULC classification used to find out the forested area and identify the connected areas. We obtained photos of ground-dwelling mammals with infrared sensor cameras set at 30 random points in forested area. Based on the numbers of photos taken over 119,450 camera days in all of camera's point, we calculated the mean trapping rate (MTR) of each species for each point. Over the 30 cameras, we obtained 12,814 photos of 42 small-to-large mammals (i.e., clouded leopard, bay cat, marbled cat, sun bear, sambar deer, and so on); these included many elusive and endangered species. By habitat modeling we identified the corridor indicative in this area. The mammalian diversity in NCI is important factor for preparing master plan and spatial plans. Our results support the idea for wildlife corridor or interconnecting forested area in and around NCI by forest city concept.

Bio-668

Genotype Distribution of TCF7L2 Rs7903146 Polymorphism and Its Implication on Triglyceride-Glucose Index Ability to Predict Type 2 Diabetes Mellitus Among Indonesians in Bogor

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Abstract

Single nucleotide polymorphism (SNPs) are believed to play a role in ever-increasing trend of diabetes mellitus, one of which being TCF7L2 gene polymorphism. TCF7L2 gene is one of the most studied genes when it comes to T2D risk but its genetic pattern can be varied among different ethnicities, SNP location and methods. This study was aimed to review TCF7L2 polymorphism, rs7903146, and the association of its genetic model with T2D in a cohort population in Bogor, Indonesia. We performed the genotyping in cryopreserved samples which consisted of control and case group by running real-time PCR using Taqman Assay kit. Homozygous variants (TT) were only found less than 5% of total samples. Meanwhile, logistic regression analysis showed that CT+TT model were significantly associated with T2D when T allele was deemed dominant (OR 1.765, 95%CI: 1.062-2.934, p value 0.028). Receiver curve operating (ROC) analysis in this model also demonstrated good classification of triglyceride-glucose index with regard to T2D risk (AUC 0.832, p value <0.001). This investigation demonstrated the potential role of TCF7L2 polymorphism in T2D among Indonesian population and may need further investigation on its interaction with other genes and determinants.

Bio-669

Observation of Feed Sources and Visitation Activity of Stingless Bee (*Trigona* sp.) to Support Beekeeping in Beji Organic Village, Wonogiri

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Abstract

Source of food is the main requirement in the cultivation of stingless bees. Feed from stingless bees has variations and this is closely related to the ecological conditions and plant diversity in the cultivation site. This study aims to observe the food and activities of stingless bees in Beji Organic Village. Food source plants were observed using the multiple line transect method, the activity of stingless bee visits using the scan sampling method at three times at 07.00-09.00, 10.00-12.00 and 01.00-04.00. then observed foraging activities that were observed using the focal sampling method every 10 minutes at 07.00 AM-04.00 PM. Several types of plants were observed the length of time the flowers bloom and the time of anthesis. The morphological form of pollen on the feet of bees without stingers was observed. Based on observations, there were 23 types of plants visited to be used as a source of feed, either nectar, pollen, or resin. There were 22 types of plants whose pollen was collected by stingless bees with a monad unit morphology. The activity of stingless bee visits begins in the morning and peaks at noon at 12.00 and then decreases thereafter.

Bio-670

Identification of Potential Zoonotic Bacteria Isolated from *Cyclemys dentata* and *Siebenrockiella crassicollis*

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Abstract

Cyclemys dentata and *Siebenrockiella crassicollis* are two species of freshwater turtles that have been heavily harvested from nature for consumption. In this study, we aimed to assess biological risk by culturing and identifying bacterial species isolated from freshwater turtles. A total two cloacal swabs were obtained from two species of freshwater turtles from a slaughterhouse in Kotawaringin Timur, Kalimantan Tengah. The swabs were inoculated into buffered peptone water and subsequently streaked to selective medium Salmonella Shigella Agar (SSA). Several bacterial colonies were picked and purified; and subjected to DNA extraction and amplification of 16Sr RNA genes. Sanger dideoxy sequencing was performed and DNA sequences were trimmed in MEGA software. BLAST analysis showed that two isolates were identical to *Bordetella trematum* and *Shigella flexneri*, which classified as bacterial isolates in Risk Group II. This study indicated that freshwater turtles may be potential as pathogen reservoir, therefore each processing facilities must implement proper sanitation and biosecurity to prevent the spread of potential zoonoses to environment.

Bio-672

A Preliminary Study on Indigenous *Bacillus* spp. Isolated from Acidic Soil as Agent of Bioinsecticide

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Abstract

Bacillus spp. are the most abundant bacteria in the soil and release a wide range of benefits. Especially to produce the specific toxin for inhibiting mosquito life cycle. This study aimed to isolate *Bacillus* spp. from acidic soil and investigate its potential as a natural mosquito insecticide. The soil was collected from the oil palm plantation (KS) and secondary forest (HS) in Berambai, Samarinda, East Kalimantan. All samples were shaken and followed by a heat treatment technique. Furthermore, the dilution was spread onto Luria Bertani agar to obtain *Bacillus* spp. As a result, the soil physicochemical analysis showed the pH of HS was 5,38 ± 0,81 (acid), and KS was 4,41 ± 0,55 (very acid). The density of *Bacillus* spp. from HS and KS were 10.1×104 CFU/g and 1.1×104 CFU/g, respectively. Five selected isolates (T1HS4.1, T1KS4.2, T2HS6.1, T3KS4.1, and T3KS4.2) were grown on LB broth for culture starters (6%). Each culture starter was diluted into mosquito larvae water habitats to determine the mortality rate. The result showed that the highest mortality of mosquito larvae using A and B methods were 70% and 80% in isolate T3KS4.2, while another isolate T1HS4.1 showed zero mortality at 24 hours. Therefore, isolate T3KS4.2 produced the specific toxin that killed the larvae within 24 hours and presented the potential of indigenous *Bacillus* spp. as a bioinsecticide for mosquito larvae. Further, the molecular method is necessary to identify the species of *Bacillus* spp. potential like *Bacillus thuringiensis* as a natural mosquito insecticide.

Bio-676

Diversity of Food Crops at Mobile Vegetable Traders in Kalideres District, West Jakarta

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Abstract

Food is a primary need for humans which is distributed on a macro basis in traditional and modern markets. A micro basis carried out by business actors who sell food plants by walking around in residential areas. The purpose of this study was to determine the diversity of food crops sold by mobile vegetable traders in Kalideres District, West Jakarta. The method used in this study is purposive sampling of 5 mobile vegetable traders in five villages which are included in the Kalideres District, West Jakarta. Interviews with mobile vegetable traders used purposive sampling. The results of this study obtained 10 species including spices, 2 species as a carbohydrates source, 38 species of vegetables, and 14 species of fruits. Species of vegetables are included in Fungi are Auricularia auricula (ear fungus) and Pleurotus ostreatus (oyster mushroom) while leaf and seed vegetables Gnetum gnemon (melinjo) are included in Gymnosperms and 36 species are classified as Angiosperms. The variety of fruits sold by mobile vegetable traders were categorized into seasonal fruits (Manilkara kauki or sapodilla and Dimocarpus longan or longan) while 12 species were seasonal fruits. The availability of food crops adjusts to consumer tastes in the area of mobile vegetable traders selling their wares.

Bio-681

The Basic Pharmacophore Virtual Screening of Alternative Ligands and NUDT15 Enzyme Interaction

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Abstract

Metabolism and therapeutic effect of nucleobase and nucleoside analog (NNA), in particular acyclovir (ACV) and ganciclovir (GCV) as antivirus and anticancer, were affected by NUDT15 enzyme. NUDT15 is able to hydrolyze thiophosphate metabolites of ACV and GCV, thus the patients with NUDT15 deficiency have better infection control. This study aimed to identify the best interaction between alternative potential ligands form Herbal Indonesia Database with NUDT15 through basic pharmacophore virtual screening to aid patients with high NUDT15, increasing the treatment's effectiveness. Software used in the study were Marvin Sketch, LigandScout 4.4.5, AutoDock ver 4.2.6, LigPlus, and Notepad++. The databases were gathered from Protein Data Bank, PubChem, ChemSpider, SwissADME, admetsar, Herbal Indonesia Database. Based on the bioinformatic analysis using software and database, twenty-one ligands were analyzed from Herbal Indonesia Database. The top 3 ligands found were Torvanol A, DIMBOA glucoside, and 2-Phenylethylglucosinolate, which had the best ligand-protein docking results of analyzed parameters (lowest binding energy, lowest inhibition constant, follow the Lipinski's Rules criteria, and safe toxicity profile). Torvanol A showed the best analysis results of parameters among analyzed ligands. The basic pharmacophore virtual screening helps us to have the understanding about protein and ligand interaction so that we are able to find the compound candidate which expected to have good interaction based on bioinformatic analysis. Torvanol A, DIMBOA glucoside, and 2-Phenylethylglucosinolate were potential ligands with good docking profile to NUDT15, thus expected to be candidates for further testing (in vitro and in vivo) to improve treatment of patients with high NUDT15.

Bio-694

Study of The Potential Deer Breeding (*Rusa timorensis* and *Axis axis*) Tourism at West Java

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Abstract

Deer is one of the wild animals that has many benefits that currently Crisis because increasingly rare population that is now starting to decrease due to damage. Because of this, it is necessary to have ex-situ deer breeding to develop deer populations with natural conditions that can support deer breeding to keep populations in the future so as to avoid extinction (Dewi, 2019). The research was carried out using a descriptive method with a cross-sectional are interviews with the manager and keeper of the breeding at Wana Wisata, Kebun Raya Bogor, Jbound and Perum Pertamina. The results of interviews there are 14 deer in Wana Wisata, 700 deer in the Kebun Raya Bogor, 25 deer in Jbound and 4 deer in Perum Pertamina. The captive breeding at the 4 locations of the deer has its own charm and becomes an attractive tourist attraction to be visited and has the potential to increase the economic value and ecological value for the preservation of the deer in order to avoid extinction. This research is expected to be a reference for captive managers to obtain information about the potential for deer breeding so that they can attract tourists with improved management and infrastructure.

Bio-701

Spatial Modeling of Dengue Cases in Palu City, Central Sulawesi, Indonesia

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Abstract

The *Aedes aegypti* mosquito spreads the virus that causes dengue. An important global public health issue is dengue. Dengue hemorrhagic fever and dengue fever have both been on the rise in Indonesia. This study used a Geographic Information System (GIS) to create a geographical model of dengue fever cases in Palu City, Central Sulawesi. This study examined dengue cases from 46 communities between 2011 and 2016. Data were gathered from the Palu Health Office. To access cases of geographical distribution, two spatial statistical analyses—Directional Distribution (Standard Deviational Ellipse) and Kernel Density estimation—were applied. The Standard Deviational Ellipse approach was used to examine the trend of case movement between 2011 and 2016. The ellipse direction indicates the trend of case movements that involve transmission or spread of cases. The results showed that the transmission of DHF tended to the north and south from the center of Palu City. The results of the Kernel Density analysis showed that the highest risk area is the red color with the darkest gradation. The downtown area includes North Lolu, South Lolu, Siranindi, Kamonji, Ujuna, North Tatura. Areas outside the city center include Palupi, Pengawu, and Mamboro. Areas to watch out for because they are at the lower level include Lasoani, Petobo, Tondo. According to the study, it is possible to better understand the distribution of dengue cases in a certain area by integrating spatial analysis with GIS.

Bio-705

Application of Natural Rubber as Adhesive on Three Wood Species

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Abstract

Most of adhesives in wood industry have formaldehyde gas that unhealthy for human. One of formaldehyde free adhesives is natural rubber. The purposes of this research were (1) to analyze the shear strength of balau (Shorea laevis Ridl.), red meranti (Shorea sp.) and matoa (Pometia sp.) glued by natural rubber (Biomattex) and (2) to analyze the effect of glued surface orientation to shear strength. Preparation and testing of samples according to EN 14080:2013 standard. Factorial experimental design was conducted with 10 replications for each treatment. The results indicate that the range of shear strength of balau was 0.523 – 0.640 N/mm2, red meranti was 0.358 – 0.740 N/mm2 and matoa was 0.643 – 0.693 N/mm2. Based on surface orientation of glue line, tangential to tangential gives the highest shear strength (0.674 N/mm2) than radial to radial (0.621 N/mm2) as well as radial to tangential (0.532 N/mm2). Statistical analysis gives information that all factors have significant effect to glue line shear strength and the best one is red meranti in tangential-tangential orientation. Natural rubber could be as adhesive to make glued laminated lumber (GLT) of balau, red meranti and matoa, but its shear strength is unfulfilled the requirement of standard.

Chem-526

Tannin Content of Empty Fruit Bunch of Palm Oil and It's Function as Natural Dye for Doyo Leaf Fiber

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Abstract

This research aimed to investigate tannin content of aqueous extract empty fruit bunch of palm oil (AEEFB) and its function as natural dye for doyo (Curculigo latifolia) leaf fiber. The tannin content was analyzed using titration method and the dyeing process was using bath method. The conditions for dyeing the doyo leaf fibers using the AEEFB were: dye pH solution, 13; material to liquor ratio, 1:50; dyeing time, 30 min; and dyeing temperature, 92oC. Fe2+, Fe+3, Cu2+, and Al3+ were used as mordant in dying process with pre-, meta-, and post mordanting techniques. The AEEFB was obtained as a dark brown solution and its tannin content was 6.24 mg/ml. The colors of doyo leaf fibers dyed with the AEEFB were observed to be varied from pale brown to brown. It is indicated that the empty fruit bunch of palm oil is potentially used as source of natural dye for dyeing doyo leaf fibers.

Chem-534

Synthesis and Characterization of Mesoporous Silica SBA-15 Prepared by The Ultrasonic Assisted-Sol Gel Method

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Abstract

The synthesis of mesoporous silica material SBA-15 using the Ultrasonic Assisted Sol-gel Method has been conducted. The synthesis of SBA-15 was carried out by varying the sonication time (3-5 hours) and the template removal method. The mesoporous silica materials were characterized by N_2 adsorption/desorption Analysis, Small Angle X-Ray Diffraction (SAXRD), Scanning Electron Microscopy (SEM), and Fourier Transform Infrared (FTIR). The results showed that the length of sonication time and template removal method affected the surface area, pore volume, pore diameter, lattice spacing (d100) and unit cell parameters, as well as the morphology of the resulting SBA-15 material. SBA-15 material resulted from the calcination method for template removal has a surface area of 620-770 m^2/g, a pore volume of 1.06-1.21 cm3/g and a pore diameter of 6.3-6.8 nm, while the SBA-15 material with the addition of H2O2 for template removal has a surface area of 177-195 m^2/g, a pore volume of 6.9 cm^3/g and a pore diameter of 14-15 nm. The SAXRD pattern of SBA-15 showed three distinctive peaks with Miller indices of 100, 110 and 200 respectively. The morphology of the SBA-15 material was macaroni-like and in aggregate form. Infrared spectra of SBA-15 showed the presence of functional groups, namely Si-O-Si, Si-OH and –OH.

Chem-542

Biological activities and phytochemicals of Selected Invasive Plants in East Kalimantan, Indonesia

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Abstract

Invasive plants are the second biggest threat to biodiversity after habitat destruction. Effective control of invasive plants in term of strategy to obtain economic value from invasive plant uses is in urgent. The present work aims to evaluate biological activities and phytochemicals of four invasive plant species, Mikania micrantha, Borreria alata, Lygodium flexuosum and Solanum torvum. The plants were collected from Paser Regency in East Kalimantan, Indonesia. Plant powder was macerated with methanol to yield methanolic extract. Antioxidant activity of the extract was evaluated in DPPH radical scavenging activity. Antimicrobial activity was determined using agar-well diffusion assay against Cutibacterium acnes, Streptococcus sobrinus, S. mutans and Candida albicans. The presence of phytochemicals was analyzed using qualitative and quantitative methods. The highest antioxidant activity was displayed by the Lygodium flexuosum leaves extract, while Mikania micrantha appeared to be the lowest. The antioxidant IC50 of the plant extract tested were 41.72 - 140 µg/ml. In antimicrobial assay, Borreria alata leaves extracts showed to be the most active. The total phenolic content of the leaves extracts was 117 – 421 µg GAE/mg extract, while the total flavonoid content was in the range of 64 – 240 µg CE/mg extract. Our present study displayed potential uses of selected invasive plants as antioxidant and antimicrobial agents.

Chem-556

Molecular Docking and ADMET Screening of Five Areca Nut Compounds Against monoamine oxidase-A

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Abstract

Depression is an emotional and mental disorder due to the catalytic activity of the MAO enzyme, causing a neurotransmitter imbalance which is generally treated with antidepressants. The purpose of this study was to screen the prediction of pharmacokinetics, druglikeness, and toxicity of the areca nut active compounds using SwissADME and ADMETLab and determine the binding free energy of the molecular docking of areca nut active compounds, then identify the interaction of the ligand-protein bonds formed after the addition of the areca nut active compounds with MAO-A enzymes. The method was used to identified syringic acid, 3,4-dihydroxybenzaldehyde, guvacoline, homoarecoline, and arecoline in arecu nut with binding sites for each protein structure downloaded from RCSB PDB (https://www.rcsb.org/) were predicted by PrankWeb (https://prankweb.cz/) by uploading a .pdb file. From the data it can be seen that the hepatoxicity and AMES toxicity of the 3 compounds (syringic acid, 3,4-dihydroxybenzaldehyde, guvacoline) showed negative results. While homoarecoline compounds are hepatotoxic and based on AMES toxicity criteria, arecoline compounds are toxic. Based on the pharmacokinetic properties, druglikeness and toxicity, it can be concluded that the best active compounds from areca nut are syringic acid, 3,4-dihydroxybenzaldehyde, and guvacoline. The three compounds were further tested by molecular docking and the results showed that the active compound of areca nut which is potential as an antidepressant candidate is 3,4-dihydroxybenzaldehyde because it is close to the native ligand (Harmine/HRM)

Chem-591

Antioxidant And Antibacterial Activities From Edible Film Durian Seeds Starch With Bay Leaves Ethanol Extract Incorporation

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Abstract

The research on fabrication of edible film based on durian seeds starch durian (Durio zibethinus Murray) with the incorporation of ethanolic extract of bay leaves (Syzygium polyanthum (Wight) Walp.) has been done. The purpose of this research are to knowing the highest antioxidant activity and the best antibacterial activity against Escherichia coli and Staphylococcus aureus of edible film with incorporation of ethanol extract of bay leaves as well as knowing the characteristic of edible film produced. The fabrications of edible film with the formulation of starch 6%, glycerol 25%, and bay leaf extract 1%, 2%, 3%, 4% (w/v) showed the highest antioxidant activity in the incorporation of 4% extract with an IC50 value of 188,78 ppm and the best antibacterial activity in the incorporation of 2% extract against Escherichia coli was 11,33 mm and Staphylococcus aureus was 8,83 mm. The characteristics of each edible film in the form of water content were 10.98%; 7.15%; 6.03%; 5.86%; and 5.40%, the thickness were 0.22 mm; 0.23 mm; 0.28 mm; 0.29 mm, and 0.32 mm, then the water vapor transmission rate were 34.06 g/m2/hour; 31.04 g/m2/hour; 28.76 g/m2/hour; 27.15 g/m2/hour; and 20.57 g/m2/hour.

Chem-622

Colorimetric detection of chloramphenicol (CAP) based on aggregation of L-cysteine-stabilized silver nanoparticles

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Abstract

A simple colorimetric method is described for the determination of chloramphenicol using L-cysteine -stabilized silver nanoparticles (AgNPS). The binding of L-cysteine capped AgNPs to chloramphenicol induced aggregation of the L-cysteine-AgNPs that led to the changes in the color and absorption profile of the probe. Aggregation of L-cysteine–Ag NPs has been confirmed with UV–vis absorption spectra, and the color changed from yellow to brown. The systems exhibited a wide linear range, from 1 x 10–6M to 1 x 10–5 M with a correlation coefficient of 0.999 with the limit of detection (LOD) 0.331 µM

Chem-658

Humic Acids-Tropical Peat Soil Suporting On Nanoparticles Fe3O4 For Effectivally Of Pb(Ii) Sorption

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Abstract

Humic Acids-Tropical Peat Soil suporting on Nanoparticles Fe3O4 (HA- Fe3O4) were prepared using co-precipitation methods and its application to Pb(II) sorption in aqueous solutions. Humic acid from tropical peat soil in Samboja area, East Kalimantan, Indonesia was obtained in alkaline extraction. The adsorbent prepared HA- Fe3O4 sorbent was characterized by FT-IR spectrometer, X-ray Difractometer (XRD), scanning electron microscopy (SEM) and vibrating sample magnetometer (VSM). Determination of total acidity and content of carboxyl and hydroxyl phenolic groups of HA and HA- Fe3O4 were also performed. The result showed that adsorption Pb(II) on HA-Fe3O4 was optimum in pH 5.0 with contact time of 20 minutes and adsorption capacity of 10.69 mg/g. Adsorption capacity Pb(II) on HA-Fe3O4 more higher and efective than Fe3O4 unsuported by HA.

Chem-700

In Silico Analysis of Auron Coumpound from Gedi Leaves as an Inhibitor of Covid-19 MPro

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Abstract

Main protease (Mpro) plays a role in mediating the replication and transcription processes that occur in viruses. Natural compounds derived from auron are believed to be potential inhibitors of the main protease (Mpro). In this study, the native N3 ligand re-docking and the molecular docking of auron-derived compounds using Autodock 4.2 were carried out against the Mpro 6LU7 virus protein. The yield of bond energy for re-docking of native N3 ligands is -9.34 kcal/mol and the value of bond energy for molecular docking of auron compounds is from -7.60 to -7.38 kcal/mol. Based on the value of bond energy, compounds that have potential as Mpro inhibitors are compounds 3',4,6-trihydroxy 4'-ethoxy auron. This is also supported by the 8 hydrogen bonds formed between the ligand and the MPro protein.

Gphy-494

Interpretation of Geoelectrical Data for Road Construction Effectiveness in Serindang Village, Sambas Regency

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Abstract

This study aims to identify subsurface structures and weak zones that are suspected to be the cause of road cracks in Serindang Village, Sambas Regency, West Kalimantan based on geoelectrical data interpretation. Research data obtained from direct data collection in the field using an automatic resistivity meter in the form of 4(four) tracks. The inversion results from the apparent resistivity data show that most of the subsurface soils have low resistivities ranging from 2.00 to 10.00 Ωm. By doing two-dimensional modeling, it can be assumed that the subsurface structure in the study area is dominated by clay which is the weak zone of the road. With very fine grains, clay soils have high porosity, but low permeability. These characteristics will trigger water to easily enter below the surface and absorb it in a relatively long time, resulting in the soil becoming soft and easily deformed when loaded beyond the threshold above it. The data from the identification of weak zones below the road surface can be used as a reference in road construction for optimization land use in the research area.

Gphy-500

Analysis of Aquifer Karst and Mitigation of Land Use Vulnerability at Sendang Biru Beach Karst using Geoelectric Resistivity Method

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Abstract

Geoelectric resistivity methods application in the Sendang Biru Beach karst is located inSumbermanjing Wetan District of South Malang Regency, East Java Province, Indonesia, which has the potential for field development of tourism and fisheries supported by the existence of Sempu Island Nature Reserve and Nusantara Fisheries Port. This research aims to analyze the presence of karst aquifers and mitigation of karst land use vulnerabilities. The results obtained reveal the presence of karst aquifers in zone A low resistivity values 1.2 - 8.5 Ω.m interpreted as conduit aquifer karst channels and in zone B moderate resistivity values 9 - 26, 8 Ω.m as karst limestone cracked contain wet clays saturated with water. Mitigation vulnerability of land use that occurs in zone A and zone B due to waste resulting from agricultural activities, rice fields and community settlement development, if unorganized and controlled will cause damage to the environment and ecosystem potential karst land.

Gphy-504

Investigation Prosfecting of Saline Water Intrusion: A Case Study of Aquifer Coastal Bandar Lampung, Indonesia

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Abstract

Gravity and geoelectric surveys have been carried out to study the influence of bedrock on the presence of aquifers in the southern part of Bandar Lampung. Gravity measurements at 51 points were randomly distributed in order to get the basin and thickness of sedimentary formations. 7 VES geoelectric points were used to determine the presence of the aquifer. The VES measurement uses a Schlumberger configuration with an AB/2 span of 1 - 150 m. Geoelectric mapping results identify coastal aquifers at a depth of 3 – 20 m with a resistivity value of 9 – 35 Ohm m. The low resistivity value is caused by mixing with seawater, where the measured value of EC reaches 4850. The radius of the aquifer that has been exposed to seawater reaches 1 km from the shoreline.

Gphy-554

Mapping of Land Use Change Sentinel-2 Time Series Imagery And Based On Cloud Computing: A Case Study In Makassar City

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Abstract

Makassar City is one of the largest cities in Indonesia with a total population of 1.4 million people in 2020. Urbanization and economic growth in an area spur increased infrastructure and housing development, thus having an impact on changes in land-use types. The high changes in types of land-use that are uncontrolled and unsustainable will give rise to various problems in urban areas such as floods due to degradation of vegetated land on riverbanks, food crises due to peri-urban land fragmentation, land crises, and others. This requires good spatial management and supervision and of course, requires spatially based data that can be monitored remotely quickly. For this reason, land-use mapping is carried out using MSI Sentinel-2 imagery and through the cloud computing-based Google Earth Engine platform. One of the machine learning classification methods is the Random Forest algorithm and various indices (vegetation-water-built up index) are involved to classify the types of land-use according to the training data reference. The types of land-use that have been detected in Makassar City consist of forest areas, agriculture, plantations, settlements, and water bodies. This research is expected to be used as an evaluation material for development in urban areas.

Gphy-577

Estimation of Peak Ground Acceleration around Lake Toba, North Sumatra Indonesia from the Observation of Horizontal-to-Vertical Spectral Ratio

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Abstract

North Sumatra region is located at the plate boundary of Indo-Australian and Eurasian Plates. The plate boundary is characterized by high seismicity due to the subduction and Sumatra fault zones. One of the main tourist attractions in North Sumatra is Lake Toba, a large caldera formed due to Mt. Toba eruption. In recent years, it has become one of the most attractive destinations in Indonesia. Due to rapid development around this region, it is necessary to understand the seismic risk for hazard mitigation. Microzonation analysis is carried out from the installed temporary short period seismometers around Lake Toba region. Then we estimate the peak ground acceleration (PGA) from the obtained horizontal-vertical spectral ratio (HVSR) using four ground model prediction equations. We use two earthquake sources to calculate the PGA. The results show the high PGA located in north to west area or region from Lake Toba. However, further analysis are still needed especially from strong motion data observations to verify our observation. We hope this preliminary result may provide information for future analysis for the disaster risk reduction.

Gphy-604

Identification of The Presence of Groundwater Aquifers Using Geoelectric Mapping And Sounding Methods In Tanah Merah Village, North Samarinda District

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Abstract

The need for raw water in Tanah Merah Village, North Samarinda District can only be met by groundwater whose the position of aquifer has not been known for sure until now. The purpose of this study was to identify the existence and type of aquifers. This research is carried out in Serayu-Citanduy Road section. This research was conducted by morphological, geological, geoelectric mapping and sounding. Geoelectric measurement data are then interpreted to determine the location and type of aquifer and also compared to data from morphological and geological observations. The results of the mapping data show that the layer indicated as an aquifer is sandstone with the resistivity above 100 Ωm that stretching to a depth of 36.9 meters below the surface. The layer indicated as aquiclude is claystone with resistivity below 80.3 Ωm. Meanwhile, the results of sounding data shows two types of aquifers consisting of unconfined aquifer at a depth of 5.24 meters and forming a groundwater basin to a depth of 200 meters with a resistivity of 110-668 Ωm and confined aquifers at depths below 100 meters with a resistivity of 138.4-357.4 Ωm. This suggests that there is an interrelated relationship between data mapping and data sounding.

Gphy-607

Study of Land Cover On CG (Cloud To Ground) Lightning Strikes in Balikpapan Area in 2015 – 2019

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Abstract

The increase in the number of people in the Balikpapan region demands the use of land for settlements, resulting in a decrease in green open land and potentially increasing lightning strikes. The purpose of this study was to determine the density of CG (Cloud to Ground) lightning strikes and the effect of land cover on CG (Cloud to Ground) lightning in the Balikpapan area 2015-2019. This study used lightning strike data for 2015-2019 obtained from BMKG Balikpapan. Furthermore, the 2015-2017 data was processed using LD2000 software and the 2018-2019 data has begun to be processed using NexStorm V.8.4 software, so that lightning strike density is processed. Land cover data for 2015-2019 was obtained from BPKH Samarinda, then analyzed so that a land cover classification was produced. Furthermore, it is correlated so as to produce the influence of land cover on lightning strikes. The results showed that the highest lightning density in the Balikpapan area was located in South Balikpapan District in 2019 with a value of 171.04 with land cover dominated by residential areas and airports, the high lightning strikes in this area were caused by tall buildings being an alternative medium for lightning to go to the earth.

Gphy-628

The Potential of AgroSilvopastoral Systems (SPS) in Bogor Regency: Best Agroecological Practice at the Plantation Area

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Abstract

Agrosilvopastoral is a land use scheme that involves agricultural land with livestock activities and minimizes the existing ecological impact. This scheme is meant to follow up the efforts to maximize land use in an area towards food security and sustainability. Bogor Regency as a support area for the Jabodetabek Megacity urban area so it requires available food resources for urban communities such as animal protein. Therefore, this study was conducted with the coverage of plantation land areas identified using a geospatial approach and continued with an analysis of the potential for forage production and livestock holding capacity. Citra Sentinel-2 succeeded in identifying the potential use of plantation land covering an area of 12,709.48 ha which can be used as forage planting land in Bogor Regency so that it has potential in the development of the livestock sector. This feed potential is one of the recommendations for local governments in managing plantation areas combined with the livestock. In addition, this agrosilvopastoral scheme can be used as the best agroecological practice in traditional land management at the farmer level.

Gphy-673

The Impact of the Mount Anak Krakatau Eruption and Tsunami on Sebesi Island's Environments

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Abstract

As a part of Kawasan Konservasi Pesisir dan Pulau-Pulau Kecil (KKP3K), Sebesi Island has become a concern for the government after the 2018 eruption of Mount Anak Krakatau, which cause silent tsunami that intensely damage its terrestrial and atmospheric environment. Therefore, we certainly need data related to the disaster impact to plan a good post-disaster rehabilitation. The use of Cloud Computing-Based Geospatial Technology can be a good way of identifying the spatial impact of disasters due to its ease and time-saving. This research was conducted to identify pre and post-disaster environmental conditions using Sentinel 2 data through the EVI, SLAVI, IBI, and ANDWI index, whereas the atmospheric conditions were identified using HYSPLIT data to provide a model for the direction of volcanic ash and the concentration of SO2 using Sentinel 5p. Results showed that 60.3 hectares of Sebesi Island underwent vegetation damage. It can certainly affect life on Sebesi Island. Furthermore, the volcanic ash was identified to spread along the north and northeast of the mountain leading to 20% SO2 elevation in Sebesi Island. The elevation of SO2 concentration increases the acute respiratory infection risk. Hence, providing a good dataset is important in the post-disaster rehabilitation of the KKP3K area.

Gphy-687

Utilization of Hydrometry Data to Support Flood Disaster Risk Reduction in The Karang Mumus River Sub-watershed

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Abstract

Flooding is one of the problems in the Karang Mumus Sub-Watershed, which continues to increase and is detrimental. The purpose of this study is to analyze hydrometric data that can support disaster risk reduction in the Karang Mumus sub-watershed. Water level data from the automatic water level recorder (AWLR) station, which is secondary data in this study, is analyzed to determine the criteria for normal, alert, alert, and danger preparedness. To determine the suitability of the preparedness criteria, field checks and interviews with the community were carried out. The results showed that there are 5 AWLR locations whose water level data can be used as early preparedness information, namely: (1) Sei Siring AWLR, (2) Pampang AWLR, (3) Lempake Dam AWLR, (4) Gunung Lingai AWLR, and (5) AWLR KP3 Karang Mumus River Estuary. AWLR Lempake Dam is the most important with water level criteria (TMA): normal if TMA<7.5; alert if 7.5≤TMA<8.2; standby if 8.2≤TMA<9.2 and dangerous if TMA≥9.2. When the condition of the Lempake Dam TMA was >8.2 villages that began to inundate, they were North Sempaja, Mount Lingai, South Sempaja, and East Sempaja. The village was inundated after 6-8 hours of water in the Lempake Dam leaving the main spillway. Presenting information on the water level in the Lempake Dam up to date can improve the community's early preparedness for flooding in the Karang Mumus sub-watershed.

Gphy-699

Spatial Distribution of Urban Tree Canopy in Private Residential Property in Jakarta Bay Reclamation using Google Earth Engine Cloud Computing

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Abstract

Jakarta bay reclamation as a solution to control Jakarta flood and development business units. Reclamation was carried out with construction of 18 small islands in front of coastline. Pantai Indah Kapuk, has invested in this Jakarta bay reclamation program with plans to build 5 islands, but until 2022 only 2 Islands are almost ready. As an urban area, Pantai Indah Kapuk should have a green open area. Purpose of this study was to look at distribution of trees in the private residential property area Pantai Indah Kapuk in jakarta bay reclamation C and D Island. Research uses Google Earth Engine Cloud Computing application with sentinel-2A image data source. Classification uses several index to obtain the area of vegetation. Results showed that classification of water bodies area of 622.14 Ha, vegetation area of 63.27 Ha, land area of 220.23 Ha, and buildings area of 139.71 Ha. Accuracy test obtained Overall Accuracy of 87.5% and Kappa Accuracy of 83.3%. Conclusion of this study is vegetation area in private residential property Pantai Indah Kapuk of 63.27 Ha. Results of this study can be used as a basis in making reclamation management policies that prioritize ecological roles and functions and minimize negative environmental impacts.

Gphy-703

Hydrodynamics and Ecosystem Model to Estimate Mitigation of Climate Change in the Ecosystem and Physical Environment in Estuary Delta Mahakam Kalimantan Timur Indonesia

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Abstract

Estuary Delta Mahakam (EDM) is known as a very unique coastal landscape. It has the largest Nypa vegetation (Nypa fruticans) in Indonesia. EDM is located in the tropics area influenced by river and sea flow. Therefore, it is affected by the temperature and high salinity of the Sulawesi Sea and the Pacific Ocean. In addition, the El Nino Southern Oscillation (ENSO) also has an impact in EDM. Moreover, the rapid development activities, such as residential areas, fisheries, oil platforms, river shipping, as well as logging activities of mangrove vegetation. All of them have an impact on the ecological pressure of the Estuary Delta Mahakam (EDM) ecosystem. The aim of this research is to estimate the effect of climate change on the physical environment and its relationship with the ecosystem in EDM using hydrodynamics and ecosystem models. We use elevation data that was taken from EDM. Tide, salinity, and climate data such as wind data, temperature, rainfall, long wave radiation flux, and short wave radiation. These data were taken from the European Centre for Medium-Range Weather Forecasts (ECMWF) and Topex-Poseidon Satelite. The research compares the salinity during El Nino and La Nina events. We use salinity data in this case with three observation stations (top, middle, and bottom of EDM). The model shows that there is a different value of salinity at each observation station during the El Nino and La Nina events. In the El Nino event, the maximum value is 33.221 ppt (at the bottom) and the minimum value is 18.493 ppt (in the middle). In the La Nina event, the maximum value is 33.041 ppt (at the bottom) and the minimum value is 7.643 (in the middle). The effect of ENSO on salinity indicates that climate change has an impact in salinity on the EDM. Therefore, it has also affected to the physical environment and ecosystem in EDM.

Math-466

The Locating Number of Sun Graph and Barbell Operation

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Abstract

Chartrand introduced the locating chromatic number of a graph in 2002, combining two graph concepts: vertex coloring and partition dimension of a graph. The locating chromatic number of graph G is the smallest k, so G has a locating k- coloring. In this paper, we discuss the locating chromatic number of sun graph and barbell operation. The locating chromatic number of the sun graph is 5, and the same result is obtained for the barbell operation.

Math-467

Variable Precision Rough Set for Selecting Naïve Bayes Attributes in Student Data Analysis

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Abstract

Naïve Bayes is one of popular data mining methods. This method has been applied to various applications such as economy, astronomy, health, and education. However, due to the equal assumption to the attributes, for some data, for example in education data, this assumption reduces the performance of classification. In real data, there is noise data that should be considered. This paper proposed variable precision rough set to select the attribute by eliminating the superfluous attributes as well as handling noise data by defining certain degree that tolerate the misclassification. By using this approach, an experiment is conducted to student data based on stress factor shown that the proposed method has better accuracy result 61.33% compared to Naïve Bayes 60%.

Math-478

Media of Learning Program Using Blended Design: A Learning Development in Mathematical Economic with an Integrative Learning Design Framework Approach

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Abstract

Learning design with a blended approach is a crucial thing that needs to be developed to meet online and face-to-face learning. This study aims to develop a prototype blended learning for mathematical economic subject. The development of learning program with blended learning approach uses the Integrative Learning Design Framework (ILDF) model which consists of three stages, namely exploration, preparation and evaluation. This research involves 3 people who are experts in the fields of teaching material, learning media and information technology. To measure the practicality of the learning design developed, questionnaire was used by involving 40 students in filling it out. The questionnaire contains the readiness of facilities and infrastructure, prototype of teaching material and media as well as measurement of student's responses. The results showed that the percentage of student response scores reached 83.75% which was in the practical category. Thus, the learning design developed can be used as an alternative used in learning economics mathematics which increase student learning independence.

Math-488

Rough Set Theory for Attribute Reduction for Student Satisfaction in Online Learning

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Abstract

Dimensionality reduction or attribute reduction is one stage in the data mining process. This process eliminates unnecessary attributes or reduces the computational cost since data with high dimensionality has a high computational cost. Several popular data-reduction approaches are PCA, neural networks (NN) and support vector machine (SVM). However, these approaches have some limitations, such as some variables being neglected, the size being still large, and sensitive to over-fitting. This paper intends to present three attribute reduction methods based on rough set theory (RST) to select attributes for student satisfaction in online learning. The methods are 1) RST based on the Pawlak model (RST), 2) maximum dependency attribute (MDA), and Variable Precision Rough Set (VPRS). Based on experiments showing that RST can reduce 22 attributes to 15 attributes, MDA reduces 22 attributes to 13 attributes, VPRS with three different reduce 22 attributes to 15 (), 13 () and 11) attributes. In evaluating the attributes reduction, this study uses two classification models: 1) Naïve Bayes and 2) Decision Tree (C4.5). In the Naïve Bayes classifier using all attributes, the accuracy level is 64.05%. Using attributes produced by attribute reduction reduces the accuracy level, where the highest accuracy level is 62.71 (using VPRS (11 attributes)). Meanwhile, the accuracy of the decision tree using all attributes is 56.05%. Using attributes produced by attribute reduction increases the accuracy level, where the highest accuracy is 64.62% (VPRS with (13 attributes)). This accuracy level is higher than the Naïve Bayes classifier.

Math-492

On Constructing Edge Irregular Total k-Labeling of Sierpinski Gasket Graph

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Abstract

An edge irregular total k-labeling of a simple and undirected graph G = ($V(G)$, $E(G)$), is a map $\varphi : V(G) \cup E(G) \rightarrow \{1,2, \dots , k\}$ such that any different edges xy and their weights, i.e., $\varphi(x)$ + $\varphi(y)$ + $\varphi(xy)$ and $\varphi(x')$ + $\varphi(y')$ + $\varphi(x'y')$ are distinct. The minimum k for which the graph G has an edge irregular total k-labeling is called the total edge irregularity strength of G and denoted by $tes(G)$. The Sierpinski Gasket graph is a graph whose shape is similar to the Sierpinski triangle. In this paper, determine the exact value of the total edge irregularity strength of the Sierpinski Gasket Graph.

Math-502

Global Stability of Phytoplankton-Zooplankton Models with Ratio-Dependent Functional Response

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Abstract

This paper studies a prey-predator model in the context of marine plankton interaction with predation by planktivorous fish. The functional response of predators in this model is considered as Ratio-dependent type. Consider that some phytoplankton and zooplankton can be harvested for food. The local stability analysis of the system is carried out. The global asymptotic stability of the equilibrium in the model was investigated by the Lyapunov method. Numerical In addition, to verify the validity of the analytical results, numerical simulations were carried out.

Math-503

Students' Mathematical Communication Ability through Realistic Mathematics Education Approach in Solving Plane Geometry Problems

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Abstract

Mathematical communication ability is the ability to present mathematical ideas verbally, in writing, pictures, graphics, and other visual forms. It is one of the skills that enables student to demonstrate mathematical ideas in various ways and need to be improved. On the other hand, implementing Realistic Mathematics Education approach can enhance student mathematical communication ability. The purpose of this study is to examine students' mathematical communication ability through realistic mathematics education approach in solving plane geometry problems. There were 24 students involved as the subject of the study. They were 3th grader of elementary school in Banda Aceh. Two steps were implemented in conducting this study. First, learning process was conducted for two meetings. They were held using realistic mathematics education approach. Second, test was carried out using five problems that were formulated based on mathematical communication indicators. Based on the result of the research, that is known that students have low mathematical communication ability based on the indicators. Student still have the low score in solving written text problem and average score for each drawing and mathematics expression indicators.

Math-538

Variant Approach For Solving Difficult Indicial Problems

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Abstract

In this paper some mathematical equations are solved using a modified approach that applies the rules of logarithm in solving exponential equations as well as representing those rules as a certain constant factor. The model developed is employed in solving difficult exponential equations. While some ideas and theories presented in this model are not all encompassing since further research may be required to validate the extended use, the progressive orderliness, agreement and inter-relationship between the designs cannot easily be set aside. Diverse exponential equations were developed and conveniently solved by the proposed model. And this modification method is called Variant Approach.

Math-550

A Module Structure Constructed By Convolution On Cyclically Ordered Group

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Abstract

We consider the ternary relation R(a, b, c) on group $Z \oplus Z$ which is derived by partial order $\preceq$ on $Z \oplus Z$. We note that our ternary relation R which is derived from $\preceq$ is not total. First, we find that the non-trivial c-convex subgroup of $mZ \oplus nZ$ are $mZ \oplus 0$ and $0 \oplus nZ$ with respect to such R and we consider the convolution on $mZ \oplus 0$ and $0 \oplus nZ$. The method to constructs our module structure, we collect real-valued integrable functions on $mZ \oplus 0$ and $0 \oplus nZ$ in which summable denoted by S and define a set for any real-valued function on $mZ \oplus 0$ and $0 \oplus nZ$ in which the convolution with an element of S is finite and we denote this set by Ω_f for $f \in S$. Here, we can take Z as a ring instead of a field for the scalar and the span Ω_f is the module that we are referring to. We also checked whether Ω_f for $f \in S$ is suffice to become a module or not.

Math-565

Control Design on a Non-Minimum Phase Bilinear System with Relative Degree Two by Redefinition of The Output

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Abstract

In this paper, we design the control of the non-minimum phase bilinear system with relative degree 2. We use coordinate transformation to determine the normal form. Here, we construct some theorem that states a non-minimum phase bilinear system become a minimum phase by redefining a new output. Next, we design control to stabilize the original system. From these results, it can be obtained the original system is stable with a new output.

Math-566

On Independent [1,2]-Sets of Comb Product Graphs

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Abstract

Let G be a finite, simple, and undirected graph. Let S be a subset of V(G). The set S is called an independent dominating set of G if every two distinct vertices in S is not adjacent each other and every vertex in V(G)\S is adjacent to a vertex in S. If an independent dominating set S of G satisfies every vertex in V(G)\S adjacent to at most two vertices, then S is called an independent [1,2]-set of G. The [1,2]-independent number of G is the minimum cardinality of independent [1,2]-sets of G. In this paper, we consider a graph which is obtained by the comb product between two connected graphs. Let o be a vertex of H. The comb product between G and H in the vertex o, is a graph obtained by taking one copy of G and |V(G)| copies of H, and identifying the i-th copy of H at the vertex o to the i-th vertex of G. In this paper, we provide all properties of G and H such that the comb product graph between G and H has an independent [1,2]-set. We also provide the [1,2]-independent number of comb product graph G and H for some connected graphs H.

Math-630

The Comparison of Some Historical Ciphers on A Linear Code over F2

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Abstract

Encoding helps protecting a sending data against errors on the channel. On the other hand, encryption can convert the sending data into secret code that hides its true meaning. In this study, we apply some historical ciphers on a linear code over a finite field of size 2. We compare the result of each cipher. The code used is the Red-Muller code of cardinality 32. In addition, we show some polynomials related to the code appearing.

Math-631

Analysis Of Laptop Marketing Strategies Using Game Theory Based On Fuzzy Logic In Determining Optimal Marketing Strategies For Vocational School Students In The City Of Samarinda

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Abstract

The mathematical approach to formulating competitive situations and conflicts between two different interests can use game theory. Game theory can solve the problem of marketing competition that occurs in society carried out by several types of the same product from different companies. The basic concepts of game theory in solving problems in a competition include the number of players, game strategies and game values. The game value is obtained from the game matrix obtained on fuzzy logic through the process of fuzzification and defuzzification. This study applies two players to determine the application of fuzzy logic-based game theory in completing marketing strategies for HP and Lenovo brand laptop providers in order to produce optimal strategies. The research was aimed at vocational students majoring in Informatics Engineering in the city of Samarinda. Attribute strategy to see the level of importance and satisfaction as many as 7 attributes. The attributes that are most important to students in choosing a laptop brand are memory and processor. In the satisfaction analysis, it was found that the Asus brand users showed the highest level of satisfaction on the processor attribute with an average value of 7.3333 while the Aser brand users showed the highest level of satisfaction on the processor attribute with an average value of 6.9333.

Math-634

The Application of LSTM and Holt-Winter Methods to Predict the Factors Caused a Hurricane in Indonesia

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Abstract

A hurricane is categorized as one of catastrophic event generated by extreme weather conditions which can cause severe damage to the area it passes through. Based on the factors that cause hurricanes, high-intensity rain accompanied by strong winds is the factor that most common causes hurricanes. In recent years, several areas in Indonesia, particularly East Java Province, have been hit by a hurricane. Many fallen trees and houses were damaged by this natural disaster, hence in this study, we are interested in predicting the level of rainfall and wind speed in East Java so that tornadoes can be expected earlier, and an early warning system can be made. Forecasting the two factors are conducted by using the Long Short-Term Memory (LSTM) and Holt-Winter (HW) methods. The results showed that the Long Short Term Memory method could predict rainfall and maximum wind speed very well, with an accuracy value of 97.433% and 99.018%, respectively.

Math-641

The Local Metric Dimension of Cocktail Party Graph and Mushroom Graph

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Abstract

Let G be a nontrivial connected graph with vertex set V(G). For an ordered set W= {w_1,w_2,⋯ ,w_n } of vertex n which is different from G, the representation of vertex v∈V(G) with respect to W is an sequential pair of r(v|W)= (d(v,w_1),d(v,w_2),⋯ ,d(v,w_n)). The set W is a local metric set of G if the representations of each pair of adjacent vertices with respect to W are different. The local metric set with minimum cardinality is called local metric basis. The cardinality of a local metric basis is called the local metric dimension, denoted by dim_l(G). The cocktail party graph that denoted by CP_n is a graph by two rows of paired vertices where all the vertices except the paired ones are connected by an edge. The mushroom graph that denoted by Mr_m is defined for m the set of natural numbers is a graph with the set of vertices V = {v_i,w,u_i | i = 1,2,3,...,m} and the set of edges E = {wv_i | i = 1,2,... ,m} ∪ {wu_i | i = 1,2,... ,m} ∪ {v_i v_(i+1) | i =1,2,... ,m}. This research is literature study by combining relevant references. In this paper, we determine the local metric dimension. We obtain the local metric dimension of cocktail party graph is dim_l(CP_n)=n-1 for n≥2. The local metric dimension of mushroom graph is dim_l(Mr_m)=1 for m=1, dim_l(Mr_m)=2 for 2≤m≤5, and dim_l(Mr_m)=⌊(n+2)/4⌋ for m≥6.

Math-646

Application of Nonlinear Robust Adaptive Sliding Mode Control on Mathematical Model for Spreading of COVID-19

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Abstract

Coronavirus is a collection of viruses that infect the respiratory system. Corona viruses are usually transmitted from person to person through respiratory droplets and direct contact. In this study, the model SEQIJR (Susceptible, Exposed, Quarantined, Infectious not hospitalized, Hospitalized Infectious, Recovered) was studied with a control in the form of isolation. In the mathematical model of the spread of COVID-19, there are many unknown parameters, so the genetic algorithm method is used to estimate the parameters of the COVID-19 spread model. The weakness of mathematical modeling is the uncertainty of parameters. Sliding mode control is used to overcome parameter uncertainty, which aims to reduce the number of infected individuals but not hospitalized through a tracking scheme. Furthermore, the Lyapunov approach was used to prove the robustness and stability of the whole system. Adaptive mode sliding control is used to overcome the limitations related to the parameter uncertainty values. The simulation results show that the use of controls can reduce the spread of COVID-19 by 63%.

Math-654

Characterization Theorems and Dcpo-completion of Posets in Domain Theory

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Abstract

One of the most renowned characterizations in domain theory is "a poset is continuous if and only if the Scott-topology is completely distributive". In this paper, we revisit this theorem and provide a similar characterization for algebraic posets, which is a subclass of continuous posets. The characterization of algebraic posets uses the concepts of Scott-topology, superway-below relation, and superalgebraic posets. One instance of algebraic posets that is often discussed is ideal-completion. Ideal-completion is a dcpo-completion, a procedure to generate dcpos from arbitrary posets. However, one of the drawbacks of this completion is the lack of idempotence. We are going to illustrate the lack of idempotence of ideal-completion and compare this with another dcpo-completion, which is called the D-completion. Lastly, we present some properties that are preserved by D-completion.

Math-657

Determining Fire Insurance Premium using Extreme Value Theory-Peaks Over Threshold (Case Study: Balikpapan)

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Abstract

Fires are considerable os one of disaster risk in the city of Balikpapan. The risk of fire triggers the emergence of insurance products, which the one of those is micro insurance for the fires loss. The insurance can guarantee economic losses without having a worry about expensive premiums. This study aims to perform a premium calculations using the Extreme Value (EVT) Peaks Over Threshold (POT) method. The data used is the value of losses due to house fires in Balikpapan from 2011 and 2015-2020. There are several stages in this study. The first stage is to resampling data with Maximum Entropy Bootsraping (MEBoot), the estimation threshold value to obtain some extreme data, the parameter estimation with the maximum likelihood method, the Kolmogorov-smirnov test to determine the suitability of the data with Generalized Pareto Distribution (GPD). After that, the process is continued by calculation of the Operational Value at-Risk (OPVAR) value with the confidence level of 90%, 95%, and 99% where this method provides an overview of the maximum value of losses and the last stage determined the premium of the results of the OPVAR EVT-POT. The premium obtained on this study consists of premium rate 1 = 85,138/ year with a claim value of Rp7,597,018, a premium rate the 2 = Rp123,043 /year with a claim value of Rp10,979,375 and the premium rate 3 = Rp141,181/year claim value of Rp12,597,728.

Math-677

Sets of Flattened Partitions Avoiding Patterns

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Abstract

Let [n] denote the set {1, 2, ..., n}, τ be a permutation of [4] and π=B_1 |B_2 |...|B_k be a partition of [n], in the standard sense, where the blocks be arranged such that the first entries from each block be in increasing order, and entries in each block be also in increasing order. A flattened partition f of [n] is the permutation of [n] obtained by erasing the symbol which separates each block in π; f avoids the pattern τ, or f is τ-avoiding, if there is no subsequence of f which is order-isomorphic to τ. A run in f is a subsequence of the form f_i f_(i+1)...f_(i+p) with f_i<f_(i+1)<...<f_(i+p), where f_i<f_(i-1) and f_(i+p+1)<f_(i+p); f_i is called the starting point of the run. Pattern avoidance in flattened partition is an open and active area of research, and so far only few related works have been published. In this paper, we give a formula which counts the number of flattened partition of [n] avoiding the pattern 1234 and 1243, for n≥1, by considering the number of runs in it and using a simple yet powerful principle, namely the pigeonhole principle.

Math-686

Laplacian Spectrum of the Complement of Identity Graph of Commutative Ring Z2p

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Abstract

Research on the algebraic graph theory is still developed many researcher. Let Z be a commutative ring. The I(Z) is a graph with vertex set of unit Z and two vertices x,y in Z are adjacent if and only if xy=1 , and also every vertices adjacent with 1. The complement of I(Z)=(V(I(Z)),E(I(Z))) is denoted by I(Z)=(V(I(Z)),E(I(Z))), where V(I(Z))=V(I(Z)) and E(I(Z))={xy=not equal E(I(Z)):x,y in V(I(Z))}. The Laplacian matrix L(I(Z)) of I(Z) is defined by L(I(Z))=D(I(Z))-A(I(Z)), where D(I(Z)) is degree matrix of and A(I(Z)) is adjacency matrix of I(Z). The Laplacian spectrum of square matrix L(I(Z)) that denoted by SpecL(I(Z)) is the set of all eigenvalues of L(I(Z)) with multiplicities. In 2020, Laplacian eigenvalues of the zero divisor graph of the ring Zn have been studied. This paper aims to determine the Laplacian spectrum of the complement of identity graph I(Z2p), where p>=5 is prime, that can be constructed by investigating the eigenvalues of I(Z2p). The result shows that all eigenvalues of I(Z2p) are integer.

Math-697

Coefficient Inequalities For Starlike And Bazilevic Functions

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Abstract

Let f be analytic in $D = \{z: |z| < 1\}$ with the Taylor expansion $f(z) = z + \Sigma_{n=2}^{\infty} a_n z^n$ normalised by $f(0) = 0$ and $f'(0) - 1 = 0$. We focuses in subclass of Starlike and Bazilevic functions. By using some lemmas of functions with positive real part, Miller-Mocanu Lemma and Caratheodory Toeplietz inequalities we got the result. We give sharp estimates for various coefficient problems for functions in subclass of Starlike and Bazilevic $B_1(\alpha)$ .These results contribute to the Geometric Functions Theory. Some part of this is the work of Saadatul Fitri my former PhD student.

Math-702

Applications of a New Generalised Operator in Bi- Univalent Functions

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Abstract

Let A be denoted as the class of all analytic and univalent functions $f(z) = z + \sum akz \infty k\ k=2$ in the open unit disk $\mathbb{D} = \{z : |z| < 1\}$. The classes of all functions in A that are univalent in $\mathbb{D}$ are further represented by S. There is an inverse f −1 for each function $f \in S$. If both f and its inverse $g \in f$ −1 are univalent, a function $f \in A$ is said to be bi-univalent in $\mathbb{D}$. Results for covering theorem, distortion theorem, rotation theorem, growth theorem, and the radius of convexity for functions of the class Σ of bi-univalent functions that are connected to a generalised differential operator $D\lambda,\alpha\ s,m,kf(z)$, are obtained in this paper. In order to get the desired results, we utilised the elementary transformations where the class Σ is preserved. Then, the theorems of the required properties of bi-univalent functions are attained. These results can be reduced to other previous well-known findings by assigning different initial coefficient $|a2|$.

Phy-475

Montmorillonite and Chitosan Composite as Adsorbent for Methylene Blue Dye Waste

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Abstract

Methylene blue (MB) dye waste is a pollutant commonly produced from textile factories that are harmful to the environment, so it must be treated before being released into the environment. In this study, removing of MB dye waste was carried out through an adsorption process by the adsorbent in the form of composite of montmorillonite (MMT) and chitosan (CS). MMT-CS composites were prepared using varied CS mass concentration (20%, 40%, 60%, 80% and 100%) of MMT to investigate the effect of CS on adsorption capacity. The MB adsorption were studied using UV-Vis spectrophotometer. The measurement results showed that the highest adsorption capacity (qt) were 2.86241 mg/g achieved at contact time of 45 minutes by the MMT-CS 100% composite which 95.41% of MB is adsorbed. Adsorption kinetics were studied with pseudo-first order and pseudo-second order kinetics. It was found that the adsorption kinetic mechanism follows pseudo-second order with a rate constant (k2) increases with increasing CS. The highest k2 value is 8.13923 g/mg min which was obtained for composite of MMT-CS 100% with the correlation coefficient reached 0.9999.

Phy-510

Improved PV/T System Performances with Air Collector:Thermodynamics and Photonic Analysis

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Abstract

In this paper, the analysis of PV/T system with air collector have been done as an attempt to investigate the system performances based on energy and exergy analysis using thermodynamics (thermal) and photonic analysis. The experimental data for a typical day of June 10th 2012 for Samarinda City, East Kalimantan are used for calculation of the energy, exergy, energy and exergy efficiencies of the PV and PV/T systems. It is found that varies flow of energy(thermal and electrical) from a minimum of 114 W to maximum of 682 W, the PV exergy varies from a minimum of 14W to a maximum of 48 W corresponding to the total energy of system and PV/T exergy varies from a maximum of 147W to a minimum of 21 W, respectively. Meanwhile, the exergy efficiency for the PV/T system varies from a maximum of 16.1% to a minimum of 9.6% and exergy efficiency for the PV system varies from a minimum of 1.5% to a maximum 7.5%. Energy and exergy analysis using various wavelength of the visible spectrum for performances of PVsystem shows that the photonic energy and exergy are higher for lower wavelengths of visible spectrum show that the maximum photonic energy and exergy can be seen about 1045 W and 87 W, respectively for 400 nm of wavelength and a minimum of 597 W and 50 W, respectively for 700 nm of wavelength.

Phy-540

Optimization of TiO2 Purity Level of Lampung's Iron Sand using Leaching Method by Variation of Iron Sand - NaOH Ratio and H2SO4 Concentration

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Abstract

TiO_2 is used for many purposes of technology. One of the TiO_2 sources is iron sand. The province of Lampung has many iron sand deposits. The researchers have done extraction of TiO_2 from Lampung's iron sand for several years, but the TiO_2 purity is still not high enough. In this research, the purity level of TiO_2 from Lampung's iron sand has been tried to improve using the leaching method by variation of iron sand and NaOH ratio (i.e., 1:2, 1:3, and 1:4) and variation of H_2SO_4 concentration (8, 10, and 12 M). Then, iron sand is roasted at a temperature of 450°C for 2 hours. After that, the water leaching process was carried out three times and then continued with leaching using H2SO4 once at 90°C for 90 minutes and washed again using distilled water. Then it proceeded with the drying stage and ended with the calcination stage at a temperature of 480°C for 2 hours. In this study, nine samples were characterized using XRF, XRD, and SEM. The highest purity of TiO_2 is reached with the iron sand and NaOH ratio of 1:3 and 10 M of H_2SO_4 i.e., 21,352 %.

Phy-574

The Effect of Alkali Treatment and Mixture of HDPE - PP as Matrix on Wood-Plastic Composites made by Red Meranti Sawdust

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Abstract

Recently wood-plastic composites (WPC) have been commercial products having wide applications in construction, automotive, furniture, and others. The purpose of this study was to analyze the physical and mechanical properties of WPC prepared from Red Meranti sawdust and mixture HDPE-PP. Alkali treatment was done by soaking sawdust in 3% NaOH solution for 2 hours. Ratio compositions of HDPE-PP were 100:0, 75:25, 50:50, 25:75 and 0:100 (w/w). Sawdust and plastic ratio was 40: 60 (w/w), Maleic Anhydride 3% was used as coupling agent. Panels were processed by pressing temperature 180°C with 30 bar for 20 minutes to give panels density 0.7 g/cm3. Determination of physical and mechanical properties of WPC was done according to ASTM standards. Experimental design of this study have done by factorial design with 5 replications for each parameter. The results showed that the range of panel density 0.63 - 0.73 g/cm^3, moisture content 2.82 -3.58%, water absorption 13.58% - 30.50%, thickness swelling 1.30 - 4.51%, MoE 2,229.67 - 3,332.91 N/mm^2, MoR 4.93 - 10.94 N/mm^2 , IBS 0.39 – 0.54 N/mm^2 and impact resistance 46.63 – 65.72 Joule/m. The statistical analyze showed that the alkali treatment caused significant effect on all the physical properties of the WPC, as well as IBS. The difference of HDPE-PP ratio gave very significant effect on density, water absorption and MoR. Interaction effect of both treatments gave very significant effect to thickness swelling and MoE. The best treatment was 100% HDPE for most of mechanical properties of WPC.

Phy-576

Physical and Mechanical Properties of Cement-Bonded Particleboard Produced from Stem and Branch of Sengon Wood (Falcataria moluccana (Miq.) Barneby & J.W. Grimes)

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Abstract

The aim of this study was to analyze the effect of stem and branch mixture of sengon wood (Falcataria moluccana (Miq.) Barneby & J.W. Grimes) on physical and mechanical properties of cement-bonded particleboard. Twelve years old and 20 m high of sengon tree was felt from nearby Samarinda. Cement-bonded particleboard was made by conventional method by using various ratios of stem and branch mixture i.e.: 100:0, 75:25, 50:50, 25:75 and 0:100 (w/w). Target density and thickness of panels were 1.2 g/cm^3 and 12 mm. Ratio of cement to particle was 75:25 (w/w). The particles were pretreated by boiling (100°C) for 30 minutes. Panels were processed by 30 bars of pressure. the physical and mechanical properties of cement-bonded particleboard were evaluated with reference to ISO 8335:1987. The results showed that the hydration temperature of stem and branch were 52°C for 14 hours and 55°C for 11 hours, respectively. The physical properties of the panels were as follow: thickness 12.37-12.45 mm, density 1.16-1.18 g/cm^3, moisture content 8.91-9.36%, thickness swelling 2.04-1.83%. The mechanical properties of the panels were as follow: MOE 4316-4855 N/mm^2 and MOR 12.48- 14.21 N/mm^2. All of physical and mechanical properties of the panels were not significantly affected by the mixture treatment. The physical and mechanical properties of the panels fulfill the requirement of ISO 8335:1987. The present study suggested that stem and branch sengon wood have potential as raw material of cement-bonded particleboard.

Phy-633

Photovoltaic Performance of ZnO Nanorod based Organic Dye with Different Light Intensity for Dye-sensitized Solar Cells

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Abstract

Strategies to improve the performance of dye-sensitized solar cells (DSSC) are continuously being carried out to enhance the DSSC performance. Nowadays, a lot of strategies that has been performed to improve photovoltaic performance by introducing environmentally friendly materials. ZnO nanorods as photoanodes have potential photovoltaic performance since their high surface area significantly increase the reaction sites in the electrolyte interface contact. Furthermore, organic dyes have a push-pull system that works in the electron donor process. Organic dyes work to overcome the weakness of low electron injection on ZnO nanorods. However, the performance of DSSC is constrained by the incident light intensity. In this work, ZnO nanorod was synthesized using a precursor (Zn(CH3COO)2·2H2O) as a seed layer and then grown by hydrothermal method for 6 hours. To study the potential of ZnO material under standard irradiation conditions, the I-V measurement was carried out at different light intensities (20, 40, 60, 80, and 100 mW/cm2). The cells were characterized using XRD, FTIR, SEM-EDX, UV-Vis and I-V. The ZnO nanorod crystal structure is composed of hexagonal atoms (space group P 63 m c). This spectrum functional group shows CH, SO, NCO, and OH bonds. Morfology of photoanode indicated that surface porosity was up to 82.5%. Optical characteristics resulted in the low bandgap (2.94 eV). The best DSSC performance occurred at the lowest intensity of 20 mW/cm2 (3.79%). This work shows that ZnO nanorod with organic dye can work optimally under conditions with a standard light intensity of 1-Sun irradiance (100 mW/cm2).

Stat-471

Analyzing and Predicting Public Interest in Metaverse using Sentiment Analysis with TextBlob

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Abstract

The term metaverse has always been around since 1992. It came up with many unknowns about its impact on the future. From past events, many would believe that metaverse would be the next social media. Some people will feel hyped for new transformative technologies, but some will feel unsure. Now in the modern days, there are data-driven ways to predict the future of the metaverse. With plenty of tweet data, it is more than possible to analyze the metaverse sentiments and predict the future impact. This paper looks into analyzing the metaverse both from past and present sentiments to get further insights about the metaverse's future outcome by utilizing sentiment analysis techniques on past sentiments represented as training data which shows how the sentiments will shift in the upcoming future.

Stat-491

Prediction Analysis of Coal Production PT "B" Using ARIMA-Asymmetric Garch Method

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Abstract

Coal has an important role in country growth. Coal production in Indonesia decreased by 53,63 million tons in 2020 because of Covid-19 Pandemic, declining coal consumption and low coal prices. Indonesia has many coal producers, one of them is PT "B". PT "B" has not been able to meet its daily production target due to ups and downs in operation problems. So, predictive analysis of coal production is needed to help companies prepare for coal demand in the market. In this study, predictive analysis of coal production, especially actual coal getting PT "B" will be carried out in the daily production period in March 2021 - March 2022 using ARIMA-Asymmetric GARCH. The ARIMA method can be used on all data models, the data are not stationary, and have high accuracy for short-term predictions. Meanwhile the GARCH model can be used on data that has a heteroskedasticity effect on the residuals and Asymmetric GARCH can handle the asymmetric effects of the GARCH model. The goodness of the model and the level of accuracy will be seen through the values of AIC, SBC, RMSE and MAD. The result of this study can also assist companies in making decisions for preparation of coal production. Based on analysis, ARIMA([1,6],1,[1,13,14])-EGARCH(1,1) model is better than ARIMA([1,6],0,[1,13,14]) model, because it has an smaller AIC, SBC, dan RMSE values that is equal to 5.174,284, 5.188,823, and 2.500,988. Meanwhile, the MAD values for ARIMA([1,6],1,[1,13,14])-EGARCH(1,1) and ARIMA([1,6],0,[1,13,14]) models tend to be same that is equal to 2.381,585.

Stat-508

Time Replacement Optimization of Bucket Hydraulic Cylinder on Mining's Excavator Owned by PT "XYZ" Using the Power Law Process Method

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Abstract

Bucket hydraulic cylinder is a repairable excavator component so that damage to this component can be overcome by repair and replacement on a regular basis. The problem is that the timing of replacing the bucket hydraulic cylinder cannot be done at random because it can cause cost overruns due to damage. Therefore, in this study, optimization of the bucket hydraulic cylinder replacement time was carried out in order to minimize costs due to component damage. Power Law Process, which is a Non-Homogeneous Poisson Process model, is used to model the rate of component damage. The results of the analysis show that the optimal replacement time for the bucket hydraulic cylinder is when the component reaches the age of 3,367 hours meters or when the component experiences the 6th damage, whichever occurs first. At the time of the replacement, the estimated cost due to the damage was Rp. 24,229 per hour meter, equivalent to Rp. 78,429,273 per average replacement age, which is 3,237 hours meter. When compared with the current policy, the replacement time resulting from this optimization will reduce the cost of damage by 6.81% for each component.

Stat-523

Inflation Forecasting for Samarinda City Using Hybrid Singular Spectrum Analysis-Neural Network Model

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Abstract

Hybrid method is a combination of two or more forecasting methods. One of the hybrid methods is Singular Spectrum Analysis (SSA)-Neural Network (NN). SSA performs well in identifying trend, seasonal, cyclical and noise patterns in time series data. NN is able to process large data and provide high accuracy in predicting. The SSA-NN hybrid model is a good combination for forecasting economic data that tends to have trend and seasonal patterns such as inflation data. The purpose of this study was to obtain a comparison of the forecasting performance between the SSA model and the best hybrid SSA-NN model also to obtain the results of inflation forecasting for Samarinda City in 2022. Based on SSA modeling in Samarinda City inflation, the Root Mean Square Error (RMSE) value was 0.0435, while the best SSA-NN 3 neuron hybrid model value of RMSE was 0.0160. The best SSA-NN hybrid model performed better than the SSA model because it produced the smaller RMSE value. Inflation forecasting of Samarinda City in 2022 using the hybrid SSA-NN 3 neuron model was the highest inflation occurred in July at 0.83% and the lowest in August at -0.39%.

Stat-525

Implementation of Transfer Learning in Convolutional Neural Network Architecture for Android-Based Handwriting Quality Detection

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Abstract

Handwriting is a number, letter, word, or sentence written on a piece of paper that comes from human or individual handwriting. Handwriting has benefits that can help fine motor coordination, memory, and cognitive development in multi-sensory activities. There are several problems in the world of education that involve handwriting. First, handwriting that is difficult to read can cause students to get low grades and even fail to graduate from school. Second, sloppy handwriting makes students lose confidence. Third, students who have bad handwriting have the potential to be bullied by friends at school. The description of these problems causes the author to be interested in developing a digital technology innovation in detecting the quality of handwriting. The purpose of this study is to detect handwriting quality using Convolutional Neural Network in transfer learning process of EfficientNet B0 model architecture on fixed features. The data used are secondary data from the CSAFE Handwriting Database at Iowa State University collected by researchers at the Center for Statistics and Applications in Forensic Evidence. This data includes 27 scanned handwriting samples from each of 90 participants for total of 2430 handwritten image samples. The model generated from EfficientNet B0 optimization of Stochastic Gradient Descent (SGD) with learning rate of 0.001 at the 31st epochs is very good model obtained. Furthermore, from evaluation of model obtained accuracy, precision, recall, and f1-score of 83%. Then model is integrated into cloud computing. Furthermore, implementing the best model, android application is developed called Rayuan (Rate Your Handwriting).

Stat-531

Human Development Index Classification District/City in Indonesia with Methods Random Forest

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Abstract

The Human Development Index (HDI) is an indicator used to see the success of human resource development. Human development achievements in an area at a particular time can be grouped into four groups: very high, tall, medium, and low. Random Forest is one method that is often used in classification. The HDI comprises components of human development, namely long and healthy life, knowledge, and a decent standard of living. Longevity and healthy life are measured by life expectancy at birth. Knowledge-based is on the average number of years of schooling and expected years of schooling. Standard of living as measured by adjusted real per capita income. This study looks at the performance of the Random Forest algorithm in classifying HDI districts/cities in Indonesia. The imbalance in HDI data is overcome by the Minority Over-sampling Technique and Cluster-Based Undersampling Technique (SCUT) method. The analysis results show that the Random Forest method with 3000 decision trees produces an accuracy of 94.17%, with per capita expenditure as the primary variable forming the decision tree.

Stat-535

Estimation of The Truncated Spline Regression Curve and The Fourier Series On The Open Unemployment Rate Data In Indonesia In Multivariable Nonparametric Regression

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Abstract

The nonparametric pattern is the pattern of the relationship between the response variable and the predictor variable whose form of function is unknown. The methods that are widely used to model nonparametric regression are Spline Truncated and Fourier Series Estimator. The advantage of Spline Truncated is that it tends to find its own estimated data where the data pattern moves and also has high flexibility. While the Fourier series is good for describing curves whose data patterns are repeated. This study will examine the estimation of nonparametric spline regression and Fourier Series and then will be carried out an estimation of the curve on the Open Unemployment Rate data in Indonesia with the criteria for selecting the best model is based on the maximum R2 value and the minimum GCV and MSE. The modeling results show that the Spline Truncated model is better than the Fourier Series in the TPT case, this can be seen from the GCV of the Spline Truncated model of 1.03 while the GCV of the Fourier series is 6.44. Then it can also be seen from the MSE value of the Spline Truncated model of 0.76 while the MSE of the Fourier series is 2.01 and it can be seen from the goodness of the the Spline Truncated model of 90.90% while the Fourier series is 58.57%.

Stat-537

Implementation of Partitioning Clustering and Hierarchical Clustering On COVID -19 Cases in Central Java and Special Region of Yogyakarta

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Abstract

It has been more than two years since the Covid-19 pandemic has swept the world. Since being declared a pandemic by the World Health Organization (WHO) on March 11, 2020, the disease has had a significant impact on human life. At least, until the end of 2021, more than 278 million people in the world have been infected. Of these, nearly 5.5 million died from it. This research discusses the distribution of Covid 19 cases in Indonesia, especially in the Central Java and Special Region of Yogyakarta. The analysis was carried out using a partitioning clustering algorithm and a hierarchical clustering algorithm. The first algorithm includes partitioning around medoids (Pam) and clustering large applications (Clara), while the second includes agglomerative nesting (Agnes) and divisive analysis (Diana).The results of the analysis of the Covid-19 case data in May 2022 show that Pam and Clara algorithms are able to provide an average silhoutte of 0.8, which is greater than the one of Agnes and Diana algorithms. There are two clusters formed, the first cluster contains four members covering the Semarang City, Bantul Regency, Sleman Regency, and Yogyakarta City, while the second cluster has 36 other regencies/cities. The first cluster is the areas with the number of cases, the number of cures and the number of deaths are greater than the areas in the second cluster.

Stat-539

Does the Exchange Rate Have An Asymmetrical Effect on Economic Sustainability in Bangladesh?

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Abstract

Exchange rate fluctuations have a significant impact on microeconomic factors such as export growth and capital formation, both of which are highly volatile. This is the first study in Bangladesh to investigate the nonlinear impact of exchange rate fluctuations on annual gross domestic products (GDP). In this study, we use a technique termed non-linear autoregressive distributed lag (NARDL), which was recently developed, to test for an unequal influence of the exchange rate on GDP growth as well as proxies for government expenditure and inflation. In Bangladesh, we discovered that a strong currency reduces GDP growth, whereas a weak currency increases it. Aside from that, we find evidence of imbalance in the short, long, and readjustment runs, as well as the asymmetric contribution of the exchange rate to economic growth in Bangladesh. Policymakers and exchange rate managers must concentrate on strategies that produce better results. In order to achieve the goal of sustainable development, policymakers must focus on maintaining the Bangladeshi currency rate low.

Stat-557

Improving Machine Learning Prediction of Forest Fire Occurrence in Peatlands for Unbalanced Data using ANS-SMOTE Approach

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Abstract

It is known that only a small number of studies is available for modeling peatlands fire occurrences in Indonesia. In our previous study, it was applied various machine learning approaches for prediction of the forest fire occurrence in the peatlands area using some classification methods. It is found that in the previous empirical study using data from South Kalimantan Province, we found that the datasets are unbalanced between the two classes of data, i.e., the occurrence of fire hotspots and the nonoccurrence of fire hotspots areas. In this paper, to improve the performance of the classification method, we consider balancing the data using what so called Adaptive Neighbor Synthetic Majority Oversampling Technique (ANS-SMOTE). All computations are done using open-source software R.

Stat-560

Poverty Modelling with Spline Truncated, Fourier Series and Mixed Estimator Geographically Weighted Nonparametric Regression

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Abstract

Geographically weighted regression is the development of multiple linear regressions used in spatial data. It is used to solve the problem of regression models that do not meet the assumptions of homogeneity caused by the local nature of each location. As a result, the global model is less suitable for use. In addition, the regression function for each free variable is considered different, so it is possible to use a mixed estimator. The purpose of this study is to model poverty data with geographically weighted nonparametric regression (GWNR). The study focuses on modeling poverty data with three nonparametric regression models on the Spline GWNR, Fourier GWNR and Mixed GWNR mixed. The results showed that the GWNR mixed was better than the GWNR Spline and Fourier Series based on MSE and R-square values.

Stat-569

Family Quality Modeling of the Potential Spread of COVID-19 with a Structural Equation Modeling Approach

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Abstract

The Corona Virus Disease 2019 (COVID-19) pandemic has distorted economic development activities. Prevention efforts had carried out systematically and massively up to the family level. As the smallest social unit of society, the family is the first and main defense in preventing the spread of COVID-19. The study aims to explore the factors of family quality that affect zone status based on the level of risk for the spread of COVID-19. The data for the study were collected through a questionnaire survey, and the respondents were the head of the household in Sumenep Regency. This study involved one endogenous variable, namely the zona status of the Covid-19 spread, and six exogenous variables. Indicators of exogenous variables were determined referring to the self-assessment of the InaRisk application developed by the National Disaster Management Agency (BNPB), Indonesia. The relationship among latent variables was investigated using structural equation modeling. The results indicate that the six indicators have a loading factor value of less than 0.5 and one exogenous latent variable has a value of a reliable composite, and Cronbach's alpha is less than 0.6. The significance test on the outer model shows that some indicators are not valid. Meanwhile, the inner model shows that the variables of family members' commitment to Covid-19 prevention and the quality of the home environment affect the zona status. The R-square value of 0.950 indicates that the model is in a strong category.

Stat-575

Spline And Kernel Mixed Estimators In Multivariable Nonparametric Regression For Dengue Hemorrhagic Fever Models

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Abstract

This article describes innovations in the field of Statistics implemented in the Health Sector. Development of a nonparametric regression model using a mixed estimator truncated spline and kernel, to estimate the regression curve. This method is able to handle differences in data patterns between predictors in multiple nonparametric regression. The research is implemented on the handling and mitigation of Dengue Hemorrhagic Fever (DHF) with a special issue of factors that affect the increase in DHF. Truncated spline is polynomial pieces that have segmented and continuous properties. Truncated splines have knot points that are able to find their own estimated data wherever the data pattern moves. While the kernel estimator depends on bandwidth, which serves to control the smoothness of the regression curve. Empirical analysis of DHF data obtained that the mixed estimators of truncated spline and kernel was able to modeling DHF cases. The Coefficient of Determination (R2) of the best model is 88.46%, and based on simultaneous hypothesis testing there is at least one significant predictor variable in the model.

Stat-583

Implementation of Machine Learning Models to Reduce Ambiguity of Medical Abbreviations

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Abstract

Health services and health workers (doctors, nurses, etc.) use medical abbreviations to communicate with patients in the medical field. The increasing number of types of diseases, drugs, and technological advances in the medical field have led to an increase in medical abbreviations which often have the same abbreviation even though they have different meanings. The similarity of these abbreviations causes ambiguity which can be fatal to the patient. This ambiguity can be reduced by using machine learning models. In this paper, a comparison of machine learning models with Naive Bayes, LSTM, and SVM methods is carried out to get the best model to reduce the ambiguity of medical abbreviations. The experimental in this paper results LSTM model is the best method to reduce the ambiguity of medical abbreviations, which is 98.78% accuracy, 99.11% precision, 98.17% recall, and 98.64% f1-score.

Stat-590

The Effectiveness of Small Area Estimation with Best Linear Unbiased Prediction Method on Various Sample Sizes with Resampling Simulation on SUSENAS Data in the case of Mean Years School Of Kecamatan (Sub-District) in Surabaya

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Abstract

SDGs aim to improve the quality of life from one generation to the next. One of the SDGs goals is quality education. One of the indicators that make up this goal is Mean Years School (MYS) In Indonesia, MYS is generated from Susenas. Susenas methodology is designed for the purposes of estimating macro indicators up to the district/city level, so the data from the Susenas cannot be used directly to estimate smaller areas/domains. In this study, MYS at the sub-district level will be estimated using SAE. SAE is a method that is often used to produce better precision in estimating a parameter in a small area, in this case a sub-district. SAE method used in this study is EBLUP. In SAE with the EBLUP based on the area level and using accompanying variables, it is able to provide a better estimation value than the direct estimation results. From the available samples, the adequacy of SAE precision can be determined by performing bootstrap resampling simulations at different sample sizes. Furthermore, an evaluation of the simulation has been carried out by looking at the goodness of the model and the comparison of the estimation results for each sample size. It found that even though the sample size was smaller than the Susenas sample, it could produce an estimated value that was almost the same as the entire Susenas sample size, besides that the R-Square value of the overall sample size also remained in the range of 40%.

Stat-592

Small Area Estimation of Poverty Severity Index for Kecamatan Using Empirical Best Linear Unbiased Prediction Method (Case Study: Poverty Severity Index in The City of Surabaya in 2020)

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Abstract

Reducing poverty, one of the development goals, becomes a world, national and provincial priority as stated in first of Sustainable Development Goals: No Poverty. There are three poverty indicators calculated by BPS, one of which is the poverty severity index. The poverty severity index describes the level of disparity in spending among the poor. The Central Bureau of Statistics provides poverty data at the national, provincial and district/city levels but not at the sub-district/village levels. Whereas the need for data at a spesific level such as the sub-district can help the implementation of poverty alleviation program is right on target. Therefore, in this study, the SAE method with the Empirical Best Linear Unbiased Prediction (EBLUP) approach to estimate the poverty severity index at the sub-district level in Surabaya with auxiliary variables. Using Susenas data of Surabaya in 2020, the simulation does with the generate data of lognormal distribution and normal distribution shown that for both generate data distributions, the EBLUP approach with the REML procedure has the smaller MSE and RRMSE than the EBLUP method with ML procedure and direct estimation method, so, REML procedure is able to produce the best estimator. The poverty severity index at kecamatan (sub-district) level in Surabaya is affected by population growth variable, population density, crude birth rate (CBR) and the number of economic facilities and infrastructure. Then, Kecamatan Benowo is the sub-district with the highest poverty severity index that 0.0207 while Kecamatan Mulyorejo has the lowest poverty severity index which close to zero.

Stat-593

Probability Models for Pricing Earthquake Catastrophe Bonds: A Literature Survey

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Abstract

Earthquake catastrophe bonds (cat bonds) are important instruments for transferring the financial risk of catastrophes, especially earthquakes, into the stock market. In this study, we conducted a literature survey to list and compare several methods of calculating the earthquake risk/probabilities for pricing catastrophe bonds. We use literature in the form of journal articles and proceedings written in English, indexed by Google Scholar. As the topic is relatively new, we include all literature published 30 years up to now, i.e., from 1992 to the present. In looking for scientific literature, we included several types of earthquake-related financial instruments, such as (earthquake) catastrophe bonds and earthquake insurance. We also considered some earthquake probability models that are not yet used for pricing financial instruments. In general, we find that there are several statistical models for earthquakes, namely (1) models for amounts of indemnity/loss, (2) models for physical measurement such as magnitude and depth, (3) models for the inter-occurrence time between earthquakes, and (4) models for the effects of the earthquake, such as the resistance of buildings. Not all these models can yield the probability measurement useful for pricing earthquake catastrophe bonds.

Stat-597

A Spatial Structural Equation Modeling of the Family Resilience in the Spread of COVID-19

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Abstract

When the sample unit is a location that possibly has a spatial effect and at the same time involves latent variables, then spatial structural equation modeling (SEM) is more appropriate. The spread of COVID-19 is certainly influenced by the affected location. If one of the sub-districts has a family infected by COVID-19, then the family in the adjacent sub-district is the most highly likely to be infected as well. Questionnaire survey data were 7,243 heads of families in 27 sub-districts in Sumenep Regency. The first step is to evaluate the model on SEM, both outer and inner models. Spatial modeling in this study employs queen contiguity weights. Spatial SEM modeling is run by modeling the variables in the spatial model, but the dependent and independent variables are replaced by factor scores. The factor score is the estimation result of latent variables using the SEM-PLS method. The dependency test on factor scores was carried out to obtain a spatial model of the inner model on SEM using the Lagrange multiplier test. The results of the spatial dependence test on the family resilience model against the potential spread of COVID-19 led to an autoregressive spatial model of error (SERM-SEM) at a significance level of 5%. The variables of family members' commitment to Covid-19 prevention and the quality of the home environment affect the zone status, with the negative coefficient variables of family members' commitment. R square value is 93.54%, and AIC is 12.77.

Stat-610

The Comparison of Supervised Learning Method in Predicting Antibacterial and Non-Antibacterial Activity of MarineCompounds in South Sulawesi, Indonesia

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Abstract

Nowadays, marine organisms have become the most recent source of bioactive natural products as potential drugs. By 2016, about 28,500 marine natural products (MNPs) had been identified. However, most of the biological activity reported for MNPs accounted for cytotoxic and anticancer properties, while fewer MNPs were reported as antibacterial properties. Searching for biologically active marine products for antibacterial compounds is still challenging. This study aimed to identify the antibacterial properties of the marine compounds using supervised learning methods. We compared five machine learning method to predict the activity of antibiotics. Accuracy, sensitivity, and specificity of model were used to evaluate the model and determine the best method. The result shows that the random forest has good accuracy in distinguishing antibacterial and non-antibacterial compounds with accuracy accounts for 92%. Thus, random forest was applied to predict antibacterial and non-antibacterial activity of marine compounds. We obtained three compounds from 73 marine compounds that were predicted as potential activity compound, namely, (–)-Globostellatic acid, (–)-Sarasinoside J, (–)-Sarasinoside K.

Stat-612

Speech Command Recognition System Using Neural Network

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Abstract

Automatic Speech Recognition (ASR) is a speech recognition technology that converts human speech signals into text and interprets them as a command executed by the computer system. The main challenge of ASR is noise at the speech input which can degrade system performance. This research aims to create and improve the performance of ASR that can recognize human speech in clean and noisy conditions. Initially, ASR was developed using Artificial Neural Network (ANN) then the next research used Deep Neural Network (DNN) method which has a higher performance. Currently, Convolutional Neural Network (CNN) is a popular method for ASR. In this research, we developed a robust CNN architecture for speech commands by exploring the depth of the architectural layers. We also optimized the best model using early stopping and two types of optimizers, i.e., Adam and SGD (Stochastic Gradient Descent). In the clean condition, CNN showed an accuracy of 90.64%, while ANN and DNN models exhibited accuracy of 85,23% and 86,7%. In noisy conditions, increasing the number of CNN layers improves the robustness of ASR. The CNN method achieves 70.56% (trained on clean data) and 86.96% (trained on noisy data) accuracy.

Stat-613

Implementation of Recurrent Neural Network (RNN) and Long Short Term Memory (LSTM) with Vector Representation of Time (Time2vec) for Remaining Useful Life Prediction of Lithium-ion Batteries.

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Abstract

Lithium-ion battery is one type of secondary battery or rechargeable battery. The use of lithium-ion batteries is currently very popular in daily life such as smartphones and electronic devices. However, it is important in estimating battery life or reviewing when a lithium-ion battery will be replaced because the performance of a lithium-ion battery will decrease over time due to continuous recharging. Battery performance can be measured by the prognostics and health management (PHM) and PHM in the battery field can be seen as a prediction of the remaining battery life (RUL). In this study, we used the RNN method and the LSTM method for predicting the remaining useful life (RUL) using multi-channel input and as a comparison we use an additional feature vector representation of time (Time2Vec) in the RNN and LSTM methods. Our experiments were conducted using the lithium-ion batteries dataset of NASA. By using mean absolute percentage error (MAPE) performance evaluation, The RNN+Time2vec method has an error of 1.55% smaller than the regular RNN method with an error of 1.98. Just like the RNN method, the LSTM+Time2vec method has an error of 1.27% smaller than the regular LSTM method with an error of 2.17%. So with the addition of time2vec can reduce errors by 21% on RNN and 41% on LSTM. As another comparison, we also increase the parameter hidden nodes in all methods. However, the results show that the LSTM+Time2Vec method is the best method and time2vec works well in improving model performance.

Stat-616

The Analysis of The Pollution Potensial of Mahakam River Water in Tropical Rain Forest Environment East Kalimantan Using Weibull Regression Model

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Abstract

Mahakam River has important roles in supporting the need of people of East Kalimantan province. Activities around Mahakam watershed such as restaurants, fishery, industries, mining, and resident's house were in the potential of generating waste in the river flow. The waste can threat to the Mahakam River water quality and has the potential to cause water pollution. The Mahakam River's water pollute was a threat to the health of East Kalimantan people, and therefore, a prevention is needed. The proposed prevention in this study is a statistically prevention, that is to give a public information regarding the factors influencing the increasing of the potential of polluted water in Mahakam River through a Weibull regression modeling. The Weibull regression modeling in this research was applied to data of water pollution indicator of the Dissolved Oxygen (DO). The goal of the research is to obtain the Weibull regression model to the DO data of Mahakam River water and to find out the factors that influence water pollution. The parameter estimation method was Maximum Likelihood Estimation (MLE). The conclusion of research is factors influencing the polluted Mahakam River water are TDS, water temperature, the concentration of ammonia and ferro. The increasing of TDS, water temperature, concentration of ammonia and ferro can increase the probability of the polluted Mahakam River water; can increase the rate of the polluted Mahakam River water, and can decrease of DO.

Stat-618

Analyzing Indonesian Government Yield Curve during Pandemic Covid-19 using Class of Nelson Siegel Models

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Abstract

Yield curve in bond investment will provide visualization of yields of bond as the function of the time to maturities. A normal yield curve shows bond yields increasing steadily with the length of time until they mature but flattening a little for the longest terms. The bond market can help predict the direction of the economy. In this study, we analyze the progress of Indonesian Government Yield Curve (IGYSC) during the pandemic Covid-19. Here, we especially analyse the connection between the progress of the pandemic waves and the development of IGYSC. We apply the Nelson-Siegel-Svensson model to obtain the IGYSC and the empirical study has been done using FR (Fixed Rate) bonds of Indonesian Bond Market and HIMDASUN data. All the computation are done using R software.

Stat-651

Application of Convolutional Neural Network to Detect Driver Drowsiness

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Abstract

The high number of traffic accidents due to driver errors is the main focus that must resolve immediately. Driver errors such as not focusing on driving due to drowsiness or fatigue harm not only the driver but also cause other chaos, including damaging road facilities and causing many casualties on the part of other road users, including pedestrians. Therefore, we need a system that can help reduce the high number of accidents using deep learning. The research was conducted to build a system that can identify driver sleepiness so that it can use to detect the driver's condition early by utilizing the features of eye movement and mouth conditions. The detection model recognizes driver drowsiness status built using two approaches, namely simple Convolutional Neural Network (CNN) and ResNet architecture. The proposed framework was evaluated using a dataset containing image data consisting of eyes closed, eyes open, yawning, and closed mouth. The experimental results show that the ResNet architecture can outperform the existing simple CNN based on its accuracy value of 85.22%.

Stat-663

Critical Illness Insurance With Terminal Illness Conditions

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Abstract

Long Term Care (LTC) insurance is a treatment insurance related to critical illness conditions. An insured with LTC insurance does not have to worry about the medical care he will need when diagnosed with an illness or undergoing medical treatment. This study discusses the calculation of LTC insurance premiums, where the compensation given is not only when you die but also includes treatment costs when diagnosed with a terminal illness. Terminal illness is a critical illness condition when it has reached the final stage and is diagnosed by a specialist that the life expectancy of the insured is less than 12 months since the diagnosis was given. The types of critical illnesses used in this study are cancer, heart disease, stroke, and diabetes mellitus which are the dominant causes of death in Indonesia. The data used are in the form of Indonesia's 2019 mortality table, and data on the prevalence of critically ill patients with terminal illness conditions. Based on the case study, the amount of net single premium that must be paid by an insured male aged 35 years in good health is IDR 12,692,741 for the protection period and the payment period is 10 years. The compensation value obtained when the insured dies or is diagnosed with a terminal illness is IDR 300,000,000 where the interest rate used is 3.75%.

Stat-664

Implementation of Fuzzy C-Means Algorithm for Provinces Clustering in Indonesia Based on Education Indicators

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Abstract

In 2015, the United Nations designed 17 Sustainable Development Goals (SDGs) to achieve human and planet welfare by 2030 by integrating three dimensions of sustainable development: economy, social, and environment. Without exception, education which has an essential role in sustaining human life also becomes one of the SDGs, that is, number 4, Quality Education. The targets of SDG 4 are to ensure the quality of education that is inclusive and equitable also to increase lifelong learning opportunities for all. The purpose of this study is to determine whether educational equity in Indonesia has been realized or not, through clustering provinces in Indonesia based on education indicators defined by Statistics Indonesia. Education indicators include participation in formal education, participation in formal and non-formal education, literacy rate, population with information technology and computer skills rate, average school life, and education completion rate. This study used the Fuzzy c-Means (FCM) algorithm to cluster provinces in Indonesia. This study also used cluster validity index: Fuzzy Silhouette (FS), Partition Coefficient (PC), Modified Partition Coefficient (MPC), and Partition Entropy (PE) to evaluate the accuracy of the result. Based on value of the cluster validity index, optimal number of clusters is three clusters. Of the three clusters, one cluster shows the lowest education indicator, that is, Papua Province. In order to achieve educational equity in Indonesia, Papua Province has the highest level of urgency to improve education quality. Education quality improvement can be implemented through strategic program schemes

Stat-692

Analysis of Factors that Influence the Learning Interest of the University of Mataram Students in the Covid-19 Era

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Abstract

The learning interest is an essential factor in the sustainability of learning success. Therefore, students' interest considerably influences the learning process. Lack of interest in learning will lead to insufficient attention, participation, and effort in the learning process. The result of a lack of learning interest will undoubtedly have an impact on the students' academic scores and achievements. This study aims to analyze the factors influencing students' interest in the Department of Mathematics, Faculty of Mathematics and Natural Sciences, the University of Mataram, in the Covid-19 era. The research method used factor analysis with 13 variables. Based on the results of the factor analysis that has been carried out, it is found that three main factors influence the learning interest of students. The first factor is the most dominant because it has an eigenvalue of 4.317 and can explain 33.211% of the variation. The second and third factors have eigenvalues of 1.634 and 1.325, respectively. Moreover, the second can explain 12.569% of the variation, and the third factor can explain 10.193% of the variation.

Stat-707

Poverty Modeling in Bengkulu Province using Machine Learning and Spatial Regression

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Abstract

The Indonesian government seeks to work effectively in poverty alleviation as one of the goals of the Sustainable Development Goals. For this reason, specific programs are needed for each region to be more targeted and provide optimal impact because each region has different problems and potential resources. Bengkulu Province is a province in Sumatra that has a fairly high percentage of poor people. This study uses a machine learning approach and spatial modeling to model poverty in Bengkulu Province. Data were obtained from the Susenas 2021 which consisted of 1 dependent variable and 21 independent variables. The initial stage starts from classification using the Random Forest, Naïve Bayes, Support Vector Machine, and KNN methods. At this stage, the highest accuracy value is generated by the Random Forest model of 92.48% where the important variables are the average monthly non-food expenditure, the amount of protein consumption per capita a day, the amount of fat consumption per capita a day, number of daily per capita calorie consumption, average monthly household food expenditure, and number of daily carbohydrate consumption. Furthermore, spatial regression modeling was carried out, the result obtained is the SAR model with the significant variable was the average monthly non-food expenditure and ρ = 0,84583.

Stat-708

Cloud Computing Modelling Based On The Intersection of Circles and DBSCAN For Characterizing Density of The City

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Abstract

The density of a city is very influential on to the environmental health of the city community. The character of a city needs to be developed and identified to develop an optimal follow-up coordination. A city that will be built requires an information network pattern as a framework for the density center of the city environment. While a city that already exists, requires the identification on to the city density character as an effort to maintain the environmental health. The objective of this research was to provide a cloud computing model for a city in a computer network to control the density of the city environment. The intersection of circles and DBSCAN were used as the basis for modeling. The center of urban neighborhood density was marked as spatial data, where the coordinates were the center of the clusters. The urban environmental development plan was used as a labeling reference. Then, the computational design was interpreted, which was the main result of the research. The main conclusion of this research was a method to control the density of the city environment based on cloud computing.

Stat-696

Multinomial Logistic Regression Model On The Faith of Mathematics Education Students

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Abstract

Faith is theoretically constructed by two dimensions, namely the beliefs and the attitudes and feelings. The measurement of faith is categorized into five level categories. This aims of research to describe the category of faith level of second semester students of the Mathematics Education Study Program, Faculty of Tarbiyah and Teacher Training Sciences, State Islamic University of Prof. K.H. Saifuddin Zuhri Purwokerto, to analyzed the suitability and goodness of the multinomial logistic regression model on the faith of them, to analyzed the effect of two dimensions of faith together and partially, and to model the logistic regression of the multinomial logistic regression model with a very low baseline. This research used the multinomial logistic regression method by 81 sample of 101 population taken randomly. This research resulted that the level of faith of the second semester students is in the moderate category. The dimensions of beliefs and the attitudes and feelings both together have an influence on faith by 100% and partially, the influence of the dimensions of belief is greater than the attitudes and feelings. The other word, the dimensions of beliefs and the attitudes and feelings can be trusted 100% that the variables which building the faith of second semester students and the final result, the two dimensions of faith have no meaning in the logistic regression model with a very low baseline, which means that the binary logistic regression cannot be modeled between the response variables of the very low category against every other category.

Abstracts: Poster Presentations

The 4th International Conference on Mathematics and Sciences (ICMSc)

Bio-582

Feeding Behavior and Nutritional Status of Siamang (Symphalangus syndactylus Raffles, 1821) at Tegal Alur Animal Rescue Center, Jakarta

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Abstract

Siamang (Symphalangus syndactylus Raffles, 1821) is an endangered species of black long-armed ape that is protected by national and international regulations, therefore conservation efforts need to be carried out with good management. The Tegal Alur Jakarta Animal Rescue Center (PPS) is the only existing conservation area under the Jakarta BKSDA which manages gibbons. This study aims to analyze feeding behavior, feed management and nutritional status of gibbons in PPS Tegal Alur. The study was conducted in March - July 2020, using focal animal sampling and ad libitum sampling methods. Food management data collection includes information on feeding and the amount of feed, while nutritional status includes physical characteristics of the body, anthropometry and analysis of feed composition. The results showed that the feeding schedule for gibbons was in accordance with the feeding times of gibbons in nature, namely 07.00 WIB, 13.00 WIB and 15.00 WIB. PPS Tegal Alur provides food in the form of nine types of fruit, two types of vegetables and one type of leaves. Siamang at Tegal Alur PPS has met the amount of feed consumption according to body weight. The nutritional status based on anthropometry shows that the body weight of the gibbon is not in accordance with its natural habitat. Morphological observations showed that the gibbon's teeth and eyes were healthy, while some gibbons had hair loss and depigmentation. Nutritional needs have not met the standards in all gibbons due to too high protein and too low fat.

Chem-586

Toxicity Test, Antioxidant Evaluation, And Determination Of Total Flavonoid Content Of N-Hexana And Ethil Acetate Fractions From Uncaria Nervosa Elmer (Bajakah) Root Wood

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Abstract

Uncaria nervosa Elmer (local name: Bajakah) is one of the medicinal plants used as a cancer drug by the people of Muara Badak, East Kalimantan. The purpose of this study was to determine the total flavonoid content, toxicity, and antioxidant activity of the n-hexane (NH) and ethyl acetate (EA) fractions of Uncaria nervosa root wood. Determination of total flavonoids was carried out using a UV-Vis spectrophotometer with quercetin as a standard, toxicity test was carried out using the brine shrimp lethality test (BSLT) method, and antioxidant test using the DPPH radical reduction method. Based on the results of this study, the total flavonoid content of NH and EA were 19.20% and 42.50%, respectively. Based on the results of the toxicity test on Artemia salina L. shrimp, the LC50 values were 11.91 ppm for NH and 33.19 ppm for EA. These LC50 values indicate that NH is very toxic and EA is toxic against to Artemia salina L. Meanwhile, the antioxidant test by scavenging DPPH radicals obtained IC50 for NH and EA was 75.93 and 17.54 ppm, respectively. Based on the IC50 value, NH belongs to the active category while EA is very active as an antioxidant.

Chem-588

Synthesis of Antimicrobial Edible Film From Mahakam River Pole Shrimp Chitosan (Macrobrachium Rosenbergii)

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Abstract

Synthesis of *N*-salicyl chitosan with the addition of honey as an development of antimicrobial edible film was experimented. The synthesis process of *N*-salicyl chitosan was carried out by reacting chitosan with methyl salicylate derived from esterification of salicylic acid with methanol. Edible film was made by dissolving *N*-salicyl chitosan with 1% lactic acid solution and then added with honey. The analysis result of *N*-salicyl chitosan compound with FT-IR showed the functional groups O-H, N-H, C-H sp^3, C-H sp^2, C=O Amide, C=C aromatic, C-O-C, C-OH and C-N. The characteristics of edible film were 0.32 gr (size 2x2 cm), 16.20% moisture content, 0.41 mm thickness, water vapour transmission rate 18.36 gr/m^2/hour, tensile strength 1 N /mm^2 and 10% elongation percentage. Based on results of the antibacterial activity test of *N*-salicyl chitosan with the addition of honey, it inhibited *Salmonella typhi* ATCC 422 and did not inhibit *Streptococcus sobrinus* KCCM 11898.

Gphy-496

Geotechnical Assessment Techniques For Slope Stability Studies Support Geophysical Logging

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Abstract

The research location is in the Bantuas area, Palaran, East Kalimantan, which is part of the Kampung Baru formation. In this formation there are sandstone, siltstone and sandy claystone, with coal inserts. The presence of sandstone and claystone is known as one of the factors causing landslides in the soil, because the weathered lithological composition becomes the entrance for deeper water, dissolving rocks and creating occasion for landslides. The existence of the research location on the edge of the Mahakam river, then the landslide occurred by the abrasion of the river flow against soil resistance. The geological structure in the research area is a syncline, with a relatively gentle slope of around 4°. This study aims to examine the basic geotechnical aspects of the security properties of rock. Therefore, information is needed from drilling data, based on 3 drilling holes, 13% of sandstone is obtained, 5% of sitly sandstone, 15% of coal, and carbonaceous claystone, as much as 5%, silty claystone as much as 4%, swamp material (clay) by 16% and dominated clay material (claystone/mudstone) by 42%. Combination of drilling data and geophysical logging to determine the depth and type of lithology, so that the overburden rock in the research location is in the form of medium to coarse sandstone which is loose and easily eroded, while claystone which is plastic in nature expands easily when exposed to water. This is the basis for conducting geotechnical studies on security around the research area.

Stat-472

Analysis Blockchain Technology in Cryptocurrency System and the Impact to the Economy

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Abstract

Blockchain technology development got attention for the last few years. In 2008, blockchain technology was implemented into a popular currency that was called cryptocurrency, which has also gained popularity among people. Blockchain is a peer to peer digital transaction ledger that is publicly known to everyone and is distributed to all decentralized users. To verify transactions, blockchain technology uses cryptography and consensus mechanisms. Blockchain technology is mostly used in cryptocurrency systems nowadays. But other than being used for cryptocurrencies, the functions of blockchain technology are still very large and wide, and there are still many potential functions of blockchain that have not yet been implemented.

Abstracts: Student Chapter

The 4th International Conference on Mathematics and Sciences (ICMSc)

Analysis of a Discrete Predator-Prey Model for Controlling the Extinction of The Pesut Mahakam (Orcaella brevirostris) with Toxic Effect at The Mahakam River

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Abstract

Pesut mahakam (Orcaella brevirostris) is an East Kalimantan animal which is in critical condition towards extinction. One of the causes of pesut mahakam extinction is the toxic effect of environmental pollution. In this study, the analysis of discrete predator-prey model between pesut mahakam (Orcaella brevirostris) and their prey was investigated. The dynamic analysis covered determining the equilibrium points, analyzing the stability of the equilibrium points, and numerical simulations. The results of the dynamic analysis showed that the discrete predator-prey model had three equilibrium points, namely equilibrium point E1 for the extinction point of predator and prey, equilibrium point E2 for the extinction point of predator, and equilibrium point E3 for the preservation point of predator and prey. The equilibrium point E1 was always unstable, while the equilibrium points E2 and E3 were stable if the local stability conditions for each point were fulfilled. The parameter value of the pesut mahakam (predator) growth rate was obtained by fitting the curve based on data in the field. Numerical simulations were carried out to illustrate the analysis results. Changes in the parameter value of the toxic effect rate had an influence on the number of pesut mahakam and their prey.

490-Mathematics

Implementation of Game Theory Using Linear Programs in Determining Optimal Marketing Strategies for Smartphone Products

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Abstract

Smartphone brands that are widely circulated in the market include Samsung and Oppo. Competition between smartphone companies to gain public interest must have different marketing strategies. One of the ways that can be used to analyze marketing strategy is the application of game theory using linear programming. The goal of the research is to obtain the optimal strategy for Samsung and Oppo companies towards the use of smartphones by students of the Faculty of Mathematics and Natural Sciences, Mulawarman University. The game model used is a zero-sum two-person game which has two solutions, i.e. pure strategy and mixed strategy. Based on the analysis, it cannot be solved with a pure strategy because the saddle point has not been reached, so a mixed strategy is used. The solution of mixed strategy using linear programming with simplex method. The results of the research analysis, obtained the optimal game value of 16.83. The optimal strategy obtained is the same, i.e. the RAM/memory and battery strategy. The probability of success of Samsung using the RAM/memory strategy is 8.33% and the battery strategy is 91.67%. While the probability of success for Oppo using the RAM/memory strategy is 58.33% and the battery strategy is 41.67%.

507-Mathematics

Max-Plus Algebra for Calculating the Duration of Traffic Light at Air Putih Samarinda Crossroad

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Abstract

Max-plus algebra provides mathematical theory and techniques for solving nonlinear problems that can be given the form of linear problems, when arithmetical addition is replaced by the operation of maximum and arithmetical multiplication is replaced by addition. This research aims to calculate the duration of traffic light at Air Putih Samarinda crossroad. This research is based on traffic light duration data on Air Putih Samarinda crossroad. Then, precedence graph is created and represents the direction of vehicle movement. The max-plus algebra model is compiled based on precedent graph. Then, eigenvalue and eigenvector from the model is calculated to obtain periodic traffic light duration. The traffic light duration from max-plus algebra model is analyzed by comparing the calculation results with the initial data.

521-Mathematics

Spline Nonparametric Regression with Generalized Maximum Likelihood (GML) Knot Point Selection Method on Tuberculosis Cases

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Abstract

Nonparametric regression is an estimation model based on an approach that does not depend on the assumption of a regression curve shape where the regression curve is only uses smoothness. The spline approach has excellence in overcoming data patterns that show how sharp the rises or falls with helps of knot points and the result of the curve is relatively smooth. The best estimator of spline truncated is an optimal knot point. Method for selecting optimal knot point in this study is Generalized Maximum Likelihood (GML) method. The supremacy of this method is good to be used for correlated data. In this study uses data the number of Tuberculosis cases on the island of Kalimantan. The data used is sourced from the website of the Provincial Health Office and the Provincial Central Statistics Agency. The purpose of this study is to obtain the estimated value of the parameters of nonparametric regression model with a spline truncated approach in the case of Tuberculosis on the island of Borneo using one knot point, two knot points and three knot points, to determined the factors that influence Tuberculosis cases and to know the interpretation of the nonparametric regression model with the spline truncated approach on Tuberculosis case data on the island of Kalimantan.

Nonparametric Regression Model of Birespon Spline with Knot GCV And GML Points Selection Methods For Dengue Fever Data

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Abstract

Nonparametric regression is one of the nonparametric methods for estimating the shape of the regression curve f is the spline method. The spline method used is a spline with a truncatedpolynomial base. One of the advantages of the spline is that there is a knot point. Several methods in the selection of optimal knots, including the Generalized Cross Validation (GCV) and Generalized Maximum Likelihood (GML) methods. The advantages of the GML methodare good for correlated data. Regression consists of one or more predictor variables that affect two response variables assuming there is a correlation between response variables. This study aims to compare the method of selecting GCV and GML knot points on data on factors that affect the number of dengue cases and the number of dengue death cases, including the percentage of poor people, the percentage of health services, the percentage of proper sanitation use in households and the percentage of public places meeting health requirementsin Indonesia in 2020.

603-Statistics

Parameter Testing of Geographically Weighted Panel Regression (Case Study: Human Development Index Data in East Kalimantan Province in 2017-2020)

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Abstract

The Geographically Weighted Panel Regression (GWPR) model is a panel regression model applied to spatial data. This research uses the Fixed Effect Model (FEM) on GWPR to model Human Development Index (HDI) regencies/municipalities in East Kalimantan Province data over the years 2017–2020. The aim of this research is to obtain the GWPR model as well as the factors that affect HDI regencies/municipalities in East Kalimantan Province over the years 2017–2020 based on the GWPR model. The parameters of the GWPR model were estimated for each observation location using the weighted least square method, which is an ordinary least square method with the addition of spatial weighting. The spatial weighting in the GWPR model was calculated using fixed bisquare, fixed tricube, adaptive bisquare and adaptive tricube functions. The optimum weighting function is adaptive tricube, which provides a minimum Cross Validation (CV) value of 5.1419. Based on GWPR parameter testing, factors that affect HDI are local and diverse in each of the 10 regencies/municipalities in East Kalimantan Province. These factors are the labor force participation rate, number of health facilities, Gini ratio, population growth rate, open unemployment rate, poverty gap index, and percentage of food expenditure. The coefficient of determination of the GWPR model obtains a value of 94.36%, while the Root Mean Square (RMSE) is 0.1221.

Crystallographic and Diffraction Pattern Representation of Vanadium - Doped TiO2 Using VESTA Program

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Abstract

The visualization of crystal structure and simulation of X-ray diffraction pattern for TiO2 (Titanium Dioxide) were successfully performed by VESTA program. The aim of this research is to obtain the relation between lattice parameters and composition to perform diffraction pattern before and after TiO2–V doped. The source of crystal structure data obtained from COD (Crystallography Open Database). The output of the VESTA program are crystal structure and diffraction pattern graphs. Futhermore, the diffraction pattern graphs can be used to estimate the size of the crystal. The result of this research showed that TiO2 has a tetragonal shape crystal structure with a diffraction pattern that indicates the position of diffraction peaks based on the angle of 2 theta and intensity parameters. The addition of Vanadium dopant does not change the crystal structure and the peak position for diffraction pattern graph.

480-Physics

Optimalization of HIT (Heterostructure with Intrinsic Thin Layer) Solar Cell Efficiency with Doped Layer

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Abstract

Numerical simulation on HIT (Heterostructure with Intrinsic Thin Layer) solar cell with hetero-solar cell structure TCO/(p+)a-Si:H/(i)a-Si:H/c-Si/ITO been concluded using AFORS-HET (Automat For Simulation of Heterostructures) as software. The purpose of this simulation is to provide validation as well optimization of solar cell performances. The simulation had been operated observatively relying on data analysis from input parameters such as acceptor-donor alike NA, thin conductive-oxide work function (WFtco), Energy gap, dangling-bond defects, etc. Various input parameters added on the simulation, resulting data analysis such as band-energy diagram, recombination-rate, field-current profile, short-circuit current, even carrier concentration. The data analysis shows a significant increase on solar cell performance. An intrinsic-layer given on hetero interface from solar-cell would cause passivation effect to emerge causing recombination-rates decrease, as a validation FOMs data shows solar-cell efficiency 23,67% (Voc=634,2 mV; Jsc=51,2 mA/cm2; FF=72,91 %) achieved with given acceptor-donor alike, dangling-bond defects, thin conductive-oxide work function, and other input parameters which has been optimized.

667-Physics

Preliminary Study: Physisorption Analysis of Heavy Metal Iron (Fe) Reduction from Mahakam River Water using Eggshells Powder

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Abstract

The aim of this study is to analyze the physisorption of heavy metal reduction of Fe in Mahakam river water using eggshell powder. Through a simple physical process, eggshell powder is synthesized by heating and reducing its size into powder. Eggshell waste was prepared by pulverizing it into powder and heating at 110C for 1 hour using a pastry blender and oven. Next, the resulting powder is ready for use. The effect of increasing the mass of eggshell powder on the decrease in heavy metal levels of Fe in Mahakam river water has been observed based on the results of the Atomic Absorption Spectroscopy (AAS) test. The Mahakam river water sample was tested first and showed a Fe content of 1.5 mg per liter. Futhermore, eggshell powder is added with a mass variation of 1 gram, 2 gram, 3 gram...10 gram into 20 ml of water sample. From the test results, it was found that the concentration of Fe metal content decreased significantly. With the addition of 1 gram of eggshell powder adsorbent, the concentration of Fe metal becomes 0.8 mg per liter and decreases with the addition of 10 gram of eggshell adsorbent to the remaining 0.11 mg per liter of water sample. So it can be concluded that the addition of eggshell powder concentration in Mahakam river water samples can reduce the concentration of heavy metal Fe.

Identification of Subsurface Lithology Using the Electrical Resistivity Tomography Method

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Abstract

Mining road is one of the most important infrastructures because it serves as a link to important locations in mining companies. The strength and bearing capacity of the soil are important factors in terms of safety for the process of transporting mining materials. One method that can be used to identify subsurface conditions is the geoelectric method. This research was conducted at PT. Kaltim Prima Coal, West Kutai. The configuration used in this study is the Wenner Alpha configuration. The purpose of this study was to determine the subsurface lithology of the mine access road construction. The results of data processing are interpreted to indicate the type of rock that is below the surface of the study site. Based on the interpretation results, it is known that the lithology in each measurement path is dominated by top soil, claystone and sandy clay.

656-Geophysics

Application of Geophysical Logging Data for Seam Coal Interpretation

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Abstract

In coal exploration activities, geophysical methods are usually used. One of the most accurate and effective geophysical methods that is still used in coal exploration until now is the well logging method. The purpose of this study was to determine the thickness and depth of the coal seam in each drill hole. The data used in this study is secondary data which includes Gamma Ray Log data, Density Log data, and coordinate point data. Gamma Ray Log and Density Log data are interpreted to determine the thickness and depth of the coal seam. Interpretation results show that the least coal seam is 1 seam in DH-10 with a thickness of 0.65 meters, and the most coal seam, 6 seams, is in DH-02 with an average thickness of 0.85 meters, DH-03 with an average thickness of 0.63 meters, DH-04 with an average thickness of 0.79 meters, DH-05 with an average thickness of 0.82 meters, and DH-20, with an average thickness of 0.63 meters . The thickest coal seam thickness is found in seam 5 on DH-08 which is 3.40 meters and the thinnest coal seam thickness is found in seam 1 on DH-08 and seam 2 on DH-12 which is 0.20 meters, while the average thickness is 0.20 meters. The average coal seam is 0.82 meters.

659-Geophysics

The Best Semivariance Selection with Cross Validation on Spatial Data for Gold Exploration Crew Mas

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Abstract

Semivariogram is a basic geostatistical tool for visualizing, modeling, and calculating spatial autocorrelation between data. There are three semivariogram models, including the spherical model, the Gaussian model, and the exponential model. The purpose of this research is to determine the best semivariogram model based on the smallest RMSE value obtained through the cross validation process. The selected semivariogram model is then used in the kriging interpolation process.

680-Geophysics

Biosynthesis, Stability, and Antioxidant Activity of Silver Nanoparticle Using Multi bulb Garlic Callus Extract (*Allium sativum* L.)

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Abstract

Multi bulb garlic (*Allium sativum*) is an important vegetable used for cooking and traditional medicine. Plant callus from tissue culture has the benefit to increase the production of secondary metabolites. Silver nanoparticle (AgNPs) using plant callus extract is eco-friendly with the potential to have high antioxidants and antibacterial effect. This research aimed to determine the optimum silver nitrate (AgNO3) concentration and stabilization of AgNPs using callus extract of multi bulb garlic, and antioxidant activity in callus extract and AgNPs of callus extract. The methods are callus induction and subculture of garlic bulbs, ethanol extraction, biosynthesis of AgNPs with AgNO3 concentrations, stability of colloid nanoparticles at temperature, pH measurement, absorption rate, and antioxidant activity test (callus extract and colloid nanoparticle). The results showed that the AgNPs biosynthesis from multi bulb garlic callus extract showed solution color changes from dark yellow to brown as an indicator of AgNPs formation. The nanoparticle stability test with an AgNO3 2 mM is the optimum concentration with a pH of 5, the temperature of 28°C, and the absorption peak of AgNPs at a wavelength of 400-450 nm. It is revealed that AgNPs have a high level of antioxidant activity similar to callus extract.

481-Biology

Addition Effect of Shrimp Flour (*Litopenaeus vannamei* Boone, 1931) On Artificial Food Toward the Growth of Catfish (*Clarias gariepinus* Burchell, 1882)

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Abstract

Fodder contains energy which has a role in increasing fish growth. The high-priced of fodder is a major problem in fish cultivation. The addition of flour from shrimp's head (Litopenaeus vannamei Boone, 1931) to the artificial food of catfish (Clarias gariepinus Burchell, 1882) can be an alternative to these problems. The aim of this study to determine the effect of adding flour from shrimp head (Litopenaeus vannamei Boone, 1931) to artificial feed on the growth of catfish (Clarias gariepinus Burchell, 1882). This study used a Randomized Design with 5 treatments and 4 replications. The frequency of feeding was 2 times a day at 08.00 and 16.00 MIT as much as 5% of it biomass. Measurements of weight, length, survival rate, and water quality every 7 days. The results showed that the addition of shrimp head flour to artificial feed could significantly increase the weight and length of fish. The best composition was obtained in 1st treatments with 25% commercial feed + 75% shrimp head flour. This treatment gave an average weight and length increase of 49,36 (P0) – 80,63 (P1) grams and 11,37 (P0) - 30,17 (P1) cm, and the survival rate was 97,5-100%.

570-Biology

In Vitro Growth Response of Black Orchid (*Coelogyne pandurata*) with Addition of Yeast Extract

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Abstract

Black Orchid (*Coelogyne pandurata*) is the mascot flora of East Kalimantan Province. Conventionally propagation of this orchid takes a long time and the flowers are difficult to cross, therefore we need a propagation technique through biotechnology, namely tissue culture (in vitro) with the addition of organic matter as a growth regulator from yeast extract obtained and has an affordable price. This study aims to determine the effect of yeast extract on the in vitro growth of black orchids. This study used yeast extract concentrations with 4 levels (0.0.5 g/l, 1 g/l and 1.5 g/l) statistical test analysis using SPSS version 25 program with Kruskal-Wallis non-parametric test analysis, and continued with the Mann-Whitney follow-up test. The results showed that the yeast extract had a significant effect on the average number of shoots and the number of roots and did not have a significant effect on the average number of leaves. The concentration of 1 g/l yeast extract affected the best number of shoots and leaves, namely the average number of shoots was 4.33 and the number of leaves was 8.00. The concentration of 1.5 g/l of yeast extract had an effect on the average number of the best roots, which was 3.00. This research is expected to provide information about the growth of black orchids in vitro and become a reference for further research. The provision of the best yeast extract is expected to be used as a reference in black orchid cultivation activities.

573-Biology

Utilization Pandan Leaf (*Pandanus Amaryllifolius*) and Purple Eggplant Peel (*Solanum Melongena* L.) Extracts As A Dyes For The Fabrication of Dye Sensitized Solar Cells (DSSC)

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Abstract

Application of TiO2 semiconductors and dyes from pandan leaf extract and from purple eggplant peel extracts for the fabrication of Dye Sensitized Solar Cells (DSSC) has been carried out. This study aims to determine the percent efficiency value produced by DSSC from pandan leaf extract and purple eggplant peel extract and a mixture of both. The research stages consisted of sample preparation and extraction, DSSC assembly, TiO2 characterization using Scanning Electron Microscopy (SEM), characterization of pandan leaf extract and purple eggplant peel extract using UV-Vis Spectrophotometer and FTIR spectroscopy. Then proceed with testing the voltage and current on the DSSC with 2 different light source and calculate the efficiency value. The results of the characterization of UV-Vis spectrophotometer and FTIR spectroscopy showed that chlorophyll compounds were detected in pandan leaf extract while anthocyanin compounds were detected in purple eggplant peel extract. The results of measurements using a sunlight and lamp, the highest efficiency using sunlight was obtained from DSSC pandan leaf dye with efficiency is 5,06798 × 10-7% on day 1. For DSSC purple eggplant peel dye is 0,83993 x 10-7% on day 3 and for the DSSC mixed dye is 1,09104 x 10-7%. Meanwhile, on the measurement using light from lamp, DSSC with pandan leaf extract also obtained highest efficiency with an efficiency is 15,7138 × 10-7%. For DSSC purple eggplant skin dye is 2,29798 x 10-7% on day 1 and the DSSC mixed dye is 8,57516 x 10-7% on day 1.

Magnetite Functionalized Peat Soil-Humic Acids For Efficient Removal of Methylene Blue

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Abstract

Optimization of pH, contact time and adsorption capacity on the adsorption of methylene blue by magnetite coated with humic acid (Fe3O4-HA) using the batch method has been carried out. Humic acid is obtained through an alkaline extraction process, namely NaOH based on IHSS (International Humic Substances Society).The synthesis of magnetite coated humic acid (Fe3O4-HA) was carried out by coprecipitation method with a ratio of 1:2 (w/w). Optimization of pH and contact time of magnetite coated humic acid (Fe3O4-HA) was carried out with 30 ppm methylene blue concentration and 0.1 g Fe3O4-HA mass. The optimum pH, contact time and adsorption capacity of methylene blue by Fe3O4-HA are pH 7, 120 minutes and adsorption capacity of 19 mg/g.

615-Chemistry

Pyrolysis of Ironwood Sawdust (*Eusideroxylon zwageri*) with Pyrolysis-Gas Chromatography-Mass Spectroscopy Instrument (Py-GC/MS)

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Abstract

Pyrolysis of ironwood sawdust (*Eusideroxylon zwageri*) with pyrolysis-gas chromatography-mass spectroscopy (Py-GC/MS) instrument has been performed. This study was conducted to determine the chemical composition resulting from the pyrolysis process of ironwood sawdust (*Eusideroxylon zwageri*) using the Py-GC/MS instrument. Pyrolysis was performed at a temperature of 350 oC, 450 oC and 550 oC under the flow of helium gas (He). The product's chemical composition resulting from the pyrolysis process of ironwood sawdust is lignin derivative products of 56-73%, cellulose/hemicellulose derivative products of 17-22%. The pyrolysis products with the highest per cent are phenol,4-ethenyl-2,6-dimethoxy-; .beta.-D-Glucopyranose,1,6-anhydrous; and isoelemicin.

Abstracts: Public Dedication

The 4th International Conference on Mathematics and Sciences (ICMSc)

Public Dedication: Training Using Nonparametric Regression Program and Spatial Statistics Modeling for Supporting Regional Development Program in East Kalimantan

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Abstract

Statistics is the science that studies how to plan, collect, present, interpret data, analyze and draw a conclusion from results analysis. The role of statistics in agency government requires data management to make it easier for professionals like population data management, calculating and analyzing population, research education, index welfare, and index development human. Besides data management, knowledge statistics has useful software for supporting visualization charts and maps based on available data. Central Bureau of Statistics (BPS) and Bappeda, the province of East Kalimantan, is an agency government in scope East Kalimantan Province which has same suitability field related to data and there is one field unique in data management or statistical unit. BPS is located at Jl. Kemakmuran No. 4 Sungai Pinang Luar Subdistrict and Bappeda have their address at Jalan Kusuma Bangsa No. 2, Sungai Pinang Luar Village, District Samarinda Ulu Samarinda City, East Kalimantan. As for devotion to society, then will conduct Training Use QGIS Mapping Software Spatial and Regression Program Introduction Nonparametric in BPS and Bappeda East Kalimantan Province to support planned work programs in Term Development Plan Regional Medium. As a result of activity dedication, the writer has registered Intellectual Property Rights (IPR) for regression program syntax nonparametric. Through activity this, it is expected that the assigned staff follow the training and get convenience in managing and visualizing data.

Scholastic Potential Test Training for 12th graders of high school in Samarinda City in order to face the 2023 Computer-Based Test

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Abstract

The scholastic potential test is one of the entrance tests for state universities. In order to increase the chances of entering state universities, grade 12 high school students need to be given training on the scholastic potential test. The object of this research is 27 high school students grade 12 in Samarinda. The methodology used is conducting a pretest, providing training on scholastic potential test questions, conducting a posttest and conducting a different test for the average scores of the pretest and posttest. The result is the value of |t stat| = |-7.81602| > t critical two pair = 2.0556, it means that there is an average difference between the results of the pretest and posttest. And from the average pretest result = 50.37 > the average posttest result = 78.148, it means that there is an increase in the understanding of the scholastic potential test training for 12th grade high school students in Samarinda.

Mathematics

Utilization of Organic Waste Into Liquid Fertilizer

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Abstract

Garbage is the rest of human activities in the form of organic or inorganic materials that are considered useless so that they are disposed of into the environment. Waste management cannot be solved only by the government but must be carried out in an integrated manner with the community so that waste problems can be handled properly. One of the orphanages in the city of Samarinda is the Ruhamaa orphanage which is located on Jalan Suryanata, Bukit Pinang Village. The Ruhama Orphanage meets the needs of the children being cared for, such as housing, food, daily needs and education. In their daily life, the Ruhama Orphanage produces a lot of waste. This service activity is deemed necessary because the number of residents of the orphanage is around 40 people so that the amount of waste produced is large, so far this waste has only been disposed of in landfills and has not been managed and utilized. In this service, the lecturer of the Department of Chemistry, FMIPA UNMUL collaborates with PT. The Global Environmental Laboratory which is engaged in environmental analysis provides training on waste management, manufacture of decomposers and liquid organic fertilizer for Ruhamaa Orphanage students with the aim that orphanage students are able to carry out waste management processes and can utilize organic waste, especially leftover rice as decomposers and liquid organic fertilizer, can be applied to the orphanage garden.

Verticulture Development Efforts To Empower Housewives In Gn.Kelua Samarinda (Vertical Crop cultivation solution on Narrow Land)

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Abstract

Verticulture is an agricultural cultivation system that is carried out vertically and multi-storey on the scale of indoor plants and outdoor plants, generally, verticulture is carried out using buildings through a container model. The object of the study was a mother who was a member of several neighboring neighborhoods in the village in the mountain environment of Samarinda Village, with as many as 30 participants, This activity aims to 1) develop the skills of housewives in the field of plant cultivation; 2) Limited / Narrow land use. 3). Utilization of used containers/waste into farming containers, which includes theory and field practice with a percentage of 25% theory and 75% practice. The average questionnaire result data showed the response of all participants, overall obtained the average participant satisfaction score was Very Good (Scale value 5) as much as 96% and Good (value scale 4) 4%. On a scale of 3 to 1 (Enough, Less, and very less) is 0%. Participants are very enthusiastic, feel useful and helped by the introduction activities, development of this verticulture technology.

Biology

Dissemination of Water Purification Using Eggshell Powder of The Community in Senoni Village, Sebulu District, Kutai Kartanegara Regency

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Abstract

The implementation of this community service is the dissemination of utilization of research results to provide problem-solving for the Senoni Village, Sebulu District, Kutai Kartanegara Regency about water conservation based on natural products. The development of natural products as water purification media has the potential to be utilized in Senoni village to actualize an environmentally friendly village. The application of scientific studies regarding the utilization of eggshell waste that has been synthesized into powder for water purification has the potential to be developed, due to the nature of this eggshell powder, which was able to absorb impurity particles in water. It was even able to absorb heavy metals Iron and Lead based on previous research. The synthesis of eggshell powder is easy because it only involves a physical process. By heating and reducing the size of the eggshell using an oven and a pastry blender, the eggshell powder is ready to be used. Next, the eggshell powder is mixed into turbid water at a ratio of 1 gram per 500 ml of water. Then the mixture is stirred, precipitated, and filtered to produce clear water. This method is considered simple to do by the community because of the easy availability of materials and tools.

Physics

Analysis and Evaluation of Stability for the Reactivated Road Landslide Using Electrical Resistivity and Induced Polarization in Muara Badak District, East Kalimantan Province, Indonesia

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Abstract

Muara Badak is one of the districts that prone to the road landslide in Kutai Kertanegara Regency of East Kalimantan province in Indonesia. Reactivated landslides have been identified in several locations in the road access to Muara Badak district, for instance the Simpang-3 Sambera. Geophysical study has been carried out using Wenner Alpha of Electrical Resistivity Tomograhy (ERT) and Time Domain of Induced Polarization (IP) methods. Assessment and measurement conducted in three lines parallel to the road using MAE Unit - 48 electrodes with three meters interval. Resistivity inversion shows the area predominantly composed of clay, sandy clay and coal, with resistivity value within 1-80 ohm.m, 81-200 ohm.m and >200 ohm.m respectively. Slip surface has been interpreted about 6 meter depth, occurring between the contacts of less-consolidated sandy clay and consolidated clay with translation pattern and thicker to the toe of the landslide. The IP data using to interpret the groundwater table at the depth of 3-4 meter based on the pattern of chargeability that closed to the surface. Furthermore and correlated to the Standard Penetration Test (SPT) data, the contact between the weak zone and the hard zone is interpreted to be at the depth of 6 meters. It is concluded that the trigger of the reactivated landslide in Simpang-3 Muara Badak were triggered by several factor including, rainfall and run of water, groundwater and steeply slope.

Geophysics

General Information
The 4th International Conference on Mathematics and Sciences 2022
10-11 October 2022

How to join the online conference

1. View the Conference Schedule and find the Zoom Link to join the meeting.
2. The registration form will be shared when the conference is running on day 1 and day 2.
3. If you are joining the Session before the host has started the meeting, please wait until the host starts the Session.

We are happy to welcome you as a participant at the 4th International Conference on Mathematics and Natural Sciences (ICMSc 2022)!

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 breakout 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 minutes 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 Oral Presenters

Parallel Session

We are happy to welcome you as a presenter at the 4th International Conference on Mathematics and Natural Sciences (ICMSc 2022)! 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.

ONLINE PRESENTATION GUIDELINES

1. The zoom link will be given by the committee to presenter via whatapps. Please use the newest version of zoom
2. For presenter, please join by using your presentation code name:
   Example: 458 BIO-Adam Kurniawan
3. The presenters must be in a breakout room during their presentation session
4. The presenters should be used a virtual background and camera is on from beginning until the end of parallel session
5. The presenters must ensure that they are online at least 10 minutes before the session start
6. The presentation time is no more than 7 minutes, and 3 minutes for Q&A question
7. Presenter must be available online in their room to fulfil conference participation and respond to the questions led by moderator
8. If you have difficulty, please contact the committee as soon as possible

OFFLINE PRESENTATION GUIDLINE

1. Presenter should be ready 10 minutes before the beginning of parallel session in their room
2. Each presenter has 10 minutes, including 7 minutes presentation and 3 minutes for Q&A session

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 3 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 from your own laptop or PC. Presenters can also send the slides to the committee if you find it difficult to

share the slides 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

We would like to thank Bank Tabungan Negara (BTN) for financial support for ICMSc 2022

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