LETTER OF ACCEPTANCE

Jakarta, March 27, 2025
Number: 006-ICASTE/UNTAR/III/2025

Attention to : **I Wayan Sukania, Lamto Widodo, Marthinus Chandra, Florencia Charlene Teng**
The Author(s) of Paper ID: **006 - ICASTE**

CORRELATION AND REGRESSION ANALYZE HOW PULSE RATE CHANGES WITH PEDALING SPEED AND STATIC LOAD

We are pleased to inform you that your full paper submission has been accepted for presentation in **the International Conference on Applied Science, Technology, and Engineering (ICASTE) 2025**, which will be held in hybrid mode on April 14-15, 2025. This paper will be published in the **International Journal of Application on Sciences, Technology, and Engineering (IJASTE)** *or* **IOP Publishing,** which is currently undergoing confirmation. We will contact participants whose manuscripts have been accepted as soon as a decision is made.

Please revise your manuscript according to the review result. Before submitting your full paper, we recommend you check your manuscript to minimize apparent errors, such as formatting and grammatical errors. The maximum point for the Turnitin test is 20%. To avoid unnecessary delay, please send your revised manuscript in Microsoft Office Document file format (doc or docx) to the ICASTE 2025 committee at icaste@untar.ac.id by April 4, 2025. It would be appreciated if you could put your reference number and your name as your file name in full paper format: Paper ID_Name_Revised (e.g. 001-ICASTE_Untarian_Revised).

Please complete your registration. We encourage participants to complete the confirmation form as soon as possible. We urgently need your prompt attention. You are eligible to complete the registration before submitting the revision. The registration form can be accessed at https://bit.ly/ICASTE-ICEBSH-REGISTRATIONFORM-2025.

We invite you to present your paper at the conference. Further updated information will be published on our website (https://icaste.untar.ac.id/2024/index.php). If you have any questions, please do not hesitate to contact us.

Thank you very much for your attention.

The ICASTE 2025 Chairperson

Didi Widya Utama, ST., MT., Ph.D.

CORRELATION AND REGRESSION ANALYZE HOW PULSE RATE CHANGES WITH PEDALING SPEED AND STATIC LOAD

I Wayan Sukania[1]*, Lamto Widodo[2], Marthinus Chandra[3], Florencia Charlene Teng[3]

[1,2]Faculty of Engineering, Tarumanagara University Jakarta
Email: wayans@ft.untar.ac.id, lamtow@ft.untar.ac.id
[3,4]Departement of Industrial Engineering, Tarumanagara University Jakarta
Email: marthinus.545230003@stu.untar.ac.id, florencia.545230002@stu.untar.ac.id

ABSTRACT

The objective of this study is to analyze the correlation and regression between heart rate variations and changes in pedalling speed and resistance on a stationary bike. In this study, heart rate is considered the primary indicator of physical activity and the body's response to exercise. The research was conducted in a laboratory setting using a Dynamic Bike stationary bicycle, where pedalling speed was categorized into three levels (slow, moderate, and fast), as well as pedal resistance, which was divided into light, moderate, and heavy categories. Heart rate data was measured digitally and then analysed using linear regression to reconstruct the relationships between these variables. Correlation and regression analyses serve different purposes. Correlation analysis aims to determine the relationship between pedal resistance and pedalling speed concerning heart rate variations. On the other hand, regression analysis seeks to estimate the pattern of heart rate changes based on pedal resistance and pedalling speed. The results of this study indicate that heart rate is positively correlated with the pedalling speed of the stationary bike, and pedal resistance is also positively correlated with heart rate variations. This study suggests using a stationary bike with predetermined speed and resistance settings for more efficient aerobic training.

Keywords: heart rate, pedaling speed, pedal load, bicycle statistics, physical activity, correlation, regression

1. PREFACE

The increase in non-physical activity due to the development of ways and methods of working means that humans have less physical activity or movement. Someone who works using a laptop as their main means of work must sit for a long time in front of the laptop. Research on the length of laptop use among several students shows that 41% use laptops 2-3 hours a day [1]. Factory operators in the packaging department must be willing to sit or stand statically for long periods. On the other hand, operators who work dynamically are given means of movement so that operators can move places without moving their feet. Ease of activity also occurs in various other fields of work. It is fully realized that the increasingly modern era forces people to work more to save time, save energy, and save various savings in other sectors. Progress has brought improvements in efficiency and effectiveness in work. Modern technology can improve human life standards. [2]

However, there are always negative aspects of progress if it is not addressed in a balanced manner. The development of means of moving places makes people increasingly lazy to walk. For example, to go shopping at a supermarket that is less than 500 m away, someone still uses a motorbike. The neat division of work tasks in a factory makes almost all work done in a sitting or standing posture for a long time. Currently, almost all equipment used by humans provides extraordinary convenience. Someone who uses a computer as the main work tool is required to sit for a long time while working. It is known that the length of sitting, work period, and workstation design of work that uses a computer are work factors that can trigger low back pain complaints [3]. In general, it can be said that human body movement is increasingly minimal with the help of technology. Modern patterns and lifestyles are increasingly being applied by society as a manifestation of progress in development and technological development. World Health

Organization (WHO) says that four out of every five teenagers in the world do not do enough physical activity, or around 81% of teenagers and 27.5% of adults. This is because most people depend on technological devices to help almost all their activities, and most teenagers spend time playing with gadgets [4]. Lack of movement has recently been more popular with the word lying down. Lying down for too long makes the metabolism in the body slow, so that the body lacks energy, as a result, the body becomes increasingly lazy to think and do activities. Some of the most common diseases due to lack of physical activity, including the first obesity, because when the body lacks movement, blood circulation in the body becomes irregular, then the metabolism in the body becomes slow, and finally the energy produced by the body is also low, [4]. In addition, a study from WHO (World Health Organization) states that a sedentary lifestyle is 1 in 10 causes of death and disability in the world. More than two million deaths each year are caused by lack of movement or physical activity. In developed and developing countries around the world, 60% to 85% of adults do not do enough physical activity [5]. Technological advances have unknowingly reduced physical activity. In Indonesia, the prevalence of lack of physical activity in the population over 10 years of age reaches 48.2% [6].

Given the many negative effects of lack of exercise, it is very necessary to regain awareness of the importance of keeping moving or exercising. Exercise should be prioritized to maintain health and physical fitness to prevent bad changes in a sedentary lifestyle. Physical fitness can be assessed through maximum oxygen volume (VO$_2$ Max). Sufficient exercise intensity is needed to maximize physical fitness. Heart rate frequency checks are one indicator to measure the adequacy of exercise intensity. [7] Limited space and time are sometimes obstacles. However, stationary bicycles have long been a solution for very appropriate movement needs. Stationary bicycles are a solution for special needs, for example, to burn body fat, reduce and control weight, increase fitness and stamina, improve sleep quality, strengthen joints, strengthen thigh, abdominal, calf, and back muscles, control heart and blood vessel health and controlling diabetes symptoms [8]. Stationary bicycles can be used for indoor exercise and can be an alternative to cycling but do not have much free time or are reluctant to go outdoors and be exposed to air pollution. Stationary bicycles are practical, safe, and easy-to-use exercise equipment. So, for maximum benefits, stationary bicycles must be used in the right way. On a stationary bike, several components can be adjusted for their characteristics. The pedal rotation load can be adjusted by turning the load button. The greater the load, the harder it is to pedal the bike, and the greater the energy expended to rotate it at a certain speed. The faster the pedal rotation, the higher the energy expended by the body to pedal it. To burn a certain amount of fat over a certain period, knowledge and understanding of data regarding the relationship between heart rate and calories burned are required. Therefore, it is very necessary to research to see the relationship between heart rate, pedal speed, and pedal rotation load. Here, heart rate is the dependent variable influenced by 2 independent variables, namely the pedalling speed variable and the rotation load variable. The number of calories needed for activity and heart rate are approached by a quadratic regression equation. [9] Data on calories burned from the calculation results are compared with the number of calories shown on the monitor screen on the stationary bike.

2. RESEARCH METHOD
Regression formulas
A mathematical equation that allows scientists to predict the value of a dependent variable given the values of one or more independent variables is called a regression equation. [10] A random sample of size from the population expressed in coordinates (x,y), can be symbolized as data from existing variables (free and bound) is spread or plotted to produce points called a scatter diagram or scatterplot. The diagram can show whether the points follow a straight line, either up or down.

If the points are linearly related, the diagram and data can be expressed mathematically with a straight-line equation called a linear regression line. According to mathematics, the straight-line equation can be written in the form

$\hat{y} = a + bx$,

Where a is intersection of the vertical axis and is the slope or gradient. The symbol $\hat{y}$ is the forecast value resulting from the regression line, while is the value of certain

$$b = \frac{n\sum_{i=1}^{n} x_i y_i - (\sum_{i=1}^{n} x_i)(\sum_{i=1}^{n} y_i)}{n\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2} \qquad (1)$$

$a = \underline{y} - b\underline{x}$ or

$$a = \frac{\sum_{i=1}^{n} y_i - b\sum_{i=1}^{n} x_i}{n}$$
$\qquad$ (2)

where,

a $\qquad$: *intersect*

b $\qquad$: gradient

$\underline{y}$ $\qquad$: average value of y

$\underline{x}$ $\qquad$: average value of x

n $\qquad$: number of data

In finding the values of a and b in the formula above, first determine the number of multiplications of x by y, the number of values of x, the number of values of y, and the number of squares of the values of x.

Correlation formulas

Correlation shows the measure of how strong the relationship is between the independent variable (x variable) and the dependent variable (y variable) which is called the correlation coefficient which is expressed in r .The following is the easiest formula when calculating the correlation coefficient manually.

$$r = \frac{n\sum_{i=1}^{n} x_i y_i - (\sum_{i=1}^{n} x_i)(\sum_{i=1}^{n} y_i)}{\sqrt{n\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2 \times n\sum_{i=1}^{n} y_i^2 - (\sum_{i=1}^{n} y_i)^2}}$$
$\qquad$ (3)

So, a perfect linear relationship exists for the values of X and Y in the sample if $= 1$ or $= -1$. When ≈ 1 or ≈ -1, the relationship between the two variables is strong and has a high correlation. However, if approaching zero, then the linear relationship between X and Y is very weak or there is no correlation.

Apart from the correlation coefficient, there is the term coefficient of determination, which is symbolized by 2. The coefficient value states the proportion of the total diversity of the values of the Y variable that can be explained by the values of the X variable through a linear relationship (the previous regression equation). The coefficient of determination can be determined by squaring the value of the correlation coefficient.

Research equipment

The research was conducted in the Laboratory of Work System Design and Ergonomics. The main equipment used is a stationary bicycle. Other measuring instruments are digital pulse meters. The image below shows a stationary bicycle type X2 FIT. The stationary bicycle is equipped with a pedal rotation load control button. The further to the right the load is greater and the harder the effort to pedal it. The monitor screen displays speed, heart rate, calories burned and distance traveled.

Figure 1. Overall View of the Bike Static On Type X2 FIT..

Figure 2. Pedal Load Adjustment Button Stationary Bike On Type X2 FIT.

Figure 3. Monitor on a stationary bike type X2 Fit

Figure 4. Pedals on a Bicycle on type X2 FIT.

Figure 5. Saddle height adjuster on stationary bike on type X2 FIT

Figure 6. Forerunner 255S Heart rate monitor watch

Research flow chart

The stages of research activities from start to finish are presented in Figure 7 below.
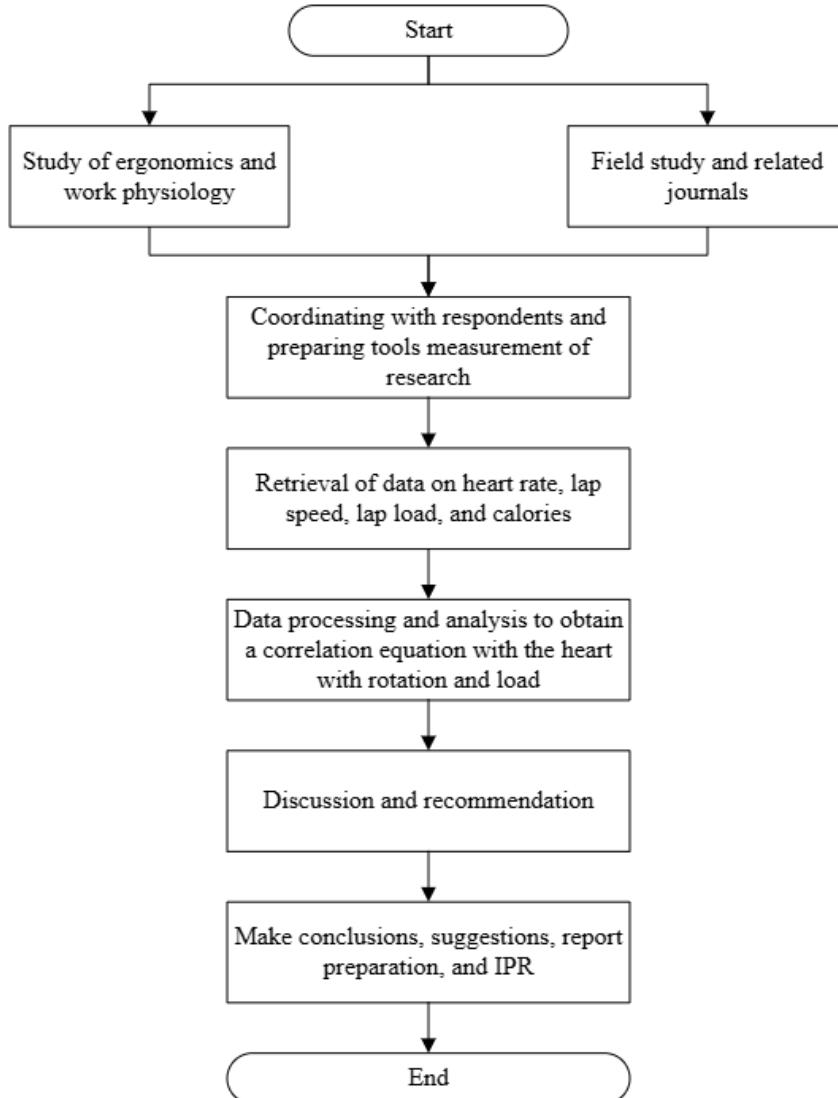
Figure 7. Research flow chart

Work procedures

The following is the work procedure for collecting static bicycle research data, as follows

a.   Prepare static bicycle equipment and heart rate measuring equipment.

b.   Prepare data recording sheets, video camera document the progress of the research.

c.   Adjust the height of the saddle and handlebars of the stationary bicycle according to the respondent's anthropometry.

d.   Activate the monitor by pressing the ON button on the back of the monitor screen.

e.   Set the rotation load starting from the lightest, which is 1, and continue to increase during the measurement. The load level is divided into 3 levels.

f.   Respondents pedal at a certain speed, starting with the lowest speed. In this study, the rotation speed level is divided into 3 levels.

g.   Recording of rotation speed, load, heart rate and calories is done for each combination of speed and load.

h.   After data collection is completed, respondent 1 continues with the next respondent.

3. RESULT AND DISCUSSION

The research data were obtained from the static bicycle pedalling activities carried out by the respondents. The pedalling activities were carried out at various variations of loads and variations of pedalling speed. The following is documentation of several respondents during data collection.

Figure 8. Florencia Charlene Teng

Figure 9. Nico Alvino Crisda

Figure 10. Wilson Patrick Tirtamidjaja

Figure 11. Anjerina Hartanto Widjaya

Figure 12. Vanessa Sutanto

Figure 13. Josevan Limdrian

Figure 14. Lucky Ang

Figure 15. Michelle Yvonne Leo

Figure 16. Miftah El Rizqa Yusran

Figure 17. Stephanie Putri Kosim

The following are the stages for determining the regression equation in SPSS:
1.   Open software SPSS
2.   Enter your heart rate, speed, and load data.
3.   In the variable view, enter the names "Pulse", "Speed", and "Load". In the speed and load variables, change Measure to "Scale". These steps can be seen in Figure 18.

Figure 18. Editing Variable View

4.   Back to Data View, click Analyze, choose Regression, choose Linear. This stage can be seen in Figure 19.
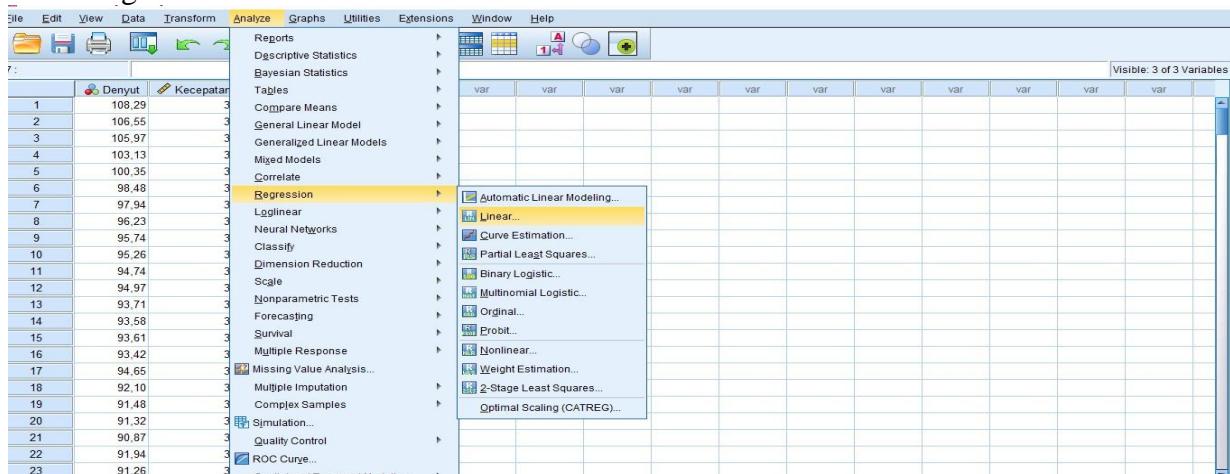
Figure 19. Click Analyze, Regression, and Linear

5.   On the menu Linear Regression, enter the variable "Pulse" to" Dependent", while the variables "Speed" and "Load" are entered into the variable "Independent(s)". Then click OK. This stage can be seen in Figure 20.
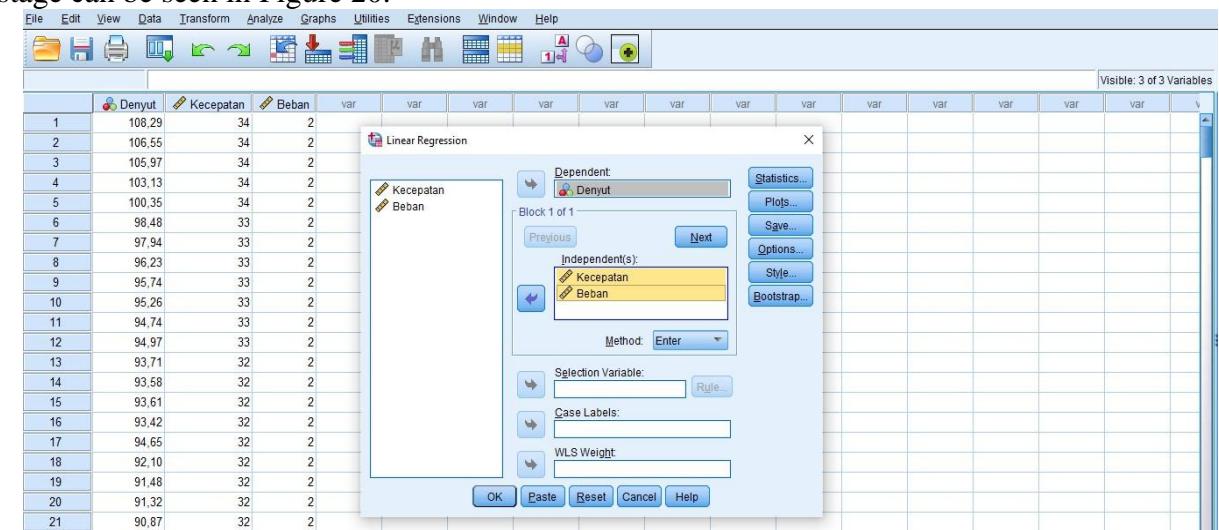
Figure 20. Input Variables

6.   The regressions output results can be seen in the table "Model Summary" and "Coefficients". The regressions output results can be seen in Figure 21.
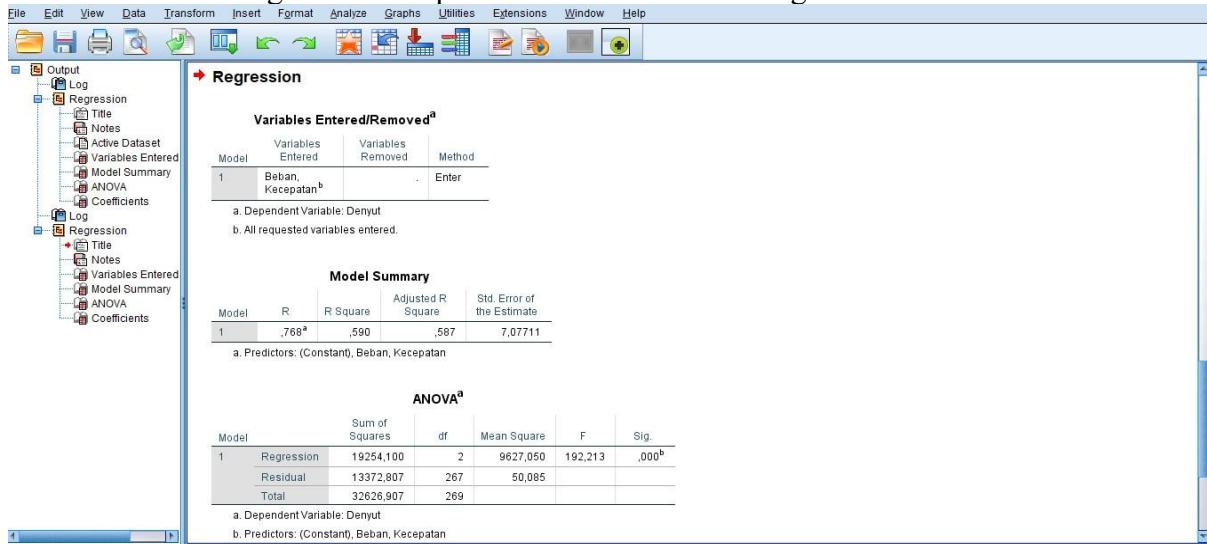
Figure 21. Output of Regression

The following is the SPSS output as a coefficient for the regression equation in Figure 22.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	71,211	1,834		38,824	,000
	Kecepatan	,423	,025	,681	17,029	,000
	Beban	3,464	,269	,515	12,878	,000

a. Dependent Variable: Denyut

Figure 22.SPSS Output as Coefficients for Regression Equations

By referring to the output table resulting from data processing by SPSS, the regression equation for this research can be determined, as follows

$$Y = 0{,}423X_1 + 3{,}464X_2 + 71{,}211$$

where, X_1 is speed variable; X_2 is load

The following is the SPSS output as a coefficient for the correlation in Figure 23.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,768[a]	,590	,587	7,07711

a. Predictors: (Constant), Beban, Kecepatan

b. Dependent Variable: Denyut

Figure 23.SPSS Output as Correlation

From the table image above, the correlation coefficient (R) value is 0.768. This means that the linear relationship between the dependent variable (namely heart rate) and the predictor variables (namely load and speed) is a positive correlation that is not very high, namely around 0.768 (more than 0.5 and less than 1). Apart from that, the coefficient of determination (R^2) is 0.590 or 59%. This means that 59% of the data among the variations in dependent values can be explained by a linear relationship with the predictor variable.

Pulse rate is a physiological parameter to determine how the body responds to physical activity. This research aims to analyze the relationship between heart rate and the influence of speed and pedal load on stationary bicycle activities. This can be explained by the theories of anatomy, physiology, and ergonomics. [11].

Based on the pulse measurement table above, the pulse rate increases with increasing speed and the load applied. Heavier loads can cause increased resistance to movement which can increase heart rate, while higher speeds can increase blood flow and require an adequate supply of oxygen to be distributed to actively working muscles. So, the heart's workload can increase due to two factors, namely stroke volume, namely a heavier load requires an increase in the volume of blood pumped every second; and heart rate, namely activities with high intensity or speed that can increase the pulse rate which can affect metabolic needs in the body.

At slow speeds (26-35 revolutions per minute) it tends to be lower than other speeds. This means that low activity requires little oxygen and energy, so the physiological workload of the heart is relatively light. At moderate speed (36-55 revolutions per minute), the pulse increases, especially with increased load. With this, the physiological load can also increase due to the combination of higher energy requirements and the increased pedal load. At fast speeds (between more than 56 revolutions per minute), the average heart rate is higher than at slow and moderate speeds. This is caused by the high energy requirements required and increased work in the cardiovascular system. With high speeds and loads, physiological performance can worsen due to the transition or change to a high-intensity level that requires a person to do more physically demanding work.

Next, we will discuss comparisons based on speed and load. From the data above with the same load and different speeds, the heart rate increases significantly from slow, to medium, to fast speeds. This significant difference is in accordance with the principle of work physiology, namely that a higher activity intensity requires a higher cardiovascular output. With different loads and the same speed, higher loads require greater force, thereby increasing muscle work and oxygen demand, which can increase heart rate

4.   CONCLUSIONS AND RECOMMENDATIONS

From this research, it was concluded that pulse rate was positively correlated with pedaling speed on a stationary bicycle, and pedal rotation load was positively correlated with changes in pulse rate. It is also known that the regression line equation connecting the variables pulse (Y) and rotational speed (X1) and rotational load (X2) is $Y = 0.423X1 + 3.464X2 + 71.211$.

To get more accurate results, besides using a pulse measuring instrument, it can be equipped with a measuring instrument for the volume of oxygen inhaled by the lungs (VO2), so that the amount of work calories required in various conditions is more accurate. An increase in the length of measurement time for a condition is also needed so that the measured pulse rate is more representative of that condition.

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ICASTE 2025

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International Conference on Applied Science, Technology and Engineering

CERTIFICATE

OF PARTICIPATION

I WAYAN SUKANIA, S.T., M.T., IPM.

FOR THE CONTRIBUTION AS:

PRESENTER

TAINAN, TAIWAN April 14 – 15, 2025

Prof. Dr. Amad Sudiro, S.H., M.H., M.Kn., M.M.
Rector of Universitas Tarumanagara

Professor Dr. Lee,Tien-Shang
The President of Kun Shan University

PROGRAM
BOOK

International Conference on Applied Science, Technology, and Engineering

April 14 - 15, 2025
TAINAN, TAIWAN

International Conference on Applied Science, Technology, and Engineering
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Tainan, Taiwan, April 14-15th 2025

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WELCOMING MESSAGE

FROM THE CHAIRPERSON OF ICASTE 2025

Good morning, ladies and gentlemen.

On behalf of the organizing committee, it is my great pleasure to welcome you all to ICASTE 2025 (International Conference on Applied Science, Technology, and Engineering) hosted at Kun Shan University, Taiwan.

This year, Universitas Tarumanagara (UNTAR), in collaboration with our co-hosts Kun Shan University and INTI International University, is proud to organize these conferences, bringing together scholars, researchers, and professionals from diverse disciplines under a shared mission. With the theme "Accelerating Global Sustainable Development Through Higher Education," these conferences serve as a vital platform for discussing innovations, exchanging ideas, and fostering collaborations that contribute to sustainable global progress.

We extend our deepest gratitude to Prof. Dr. Ariawan Gunadi, S.H., M.H., Chairman of Tarumanagara Foundation, for his unwavering support; Prof. Dr. Tien-Shang Lee, President of Kun Shan University, for graciously hosting us at this esteemed institution; and Prof. Dr. Amad Sudiro, S.H., M.H., M.Kn., M.M., Rector of Universitas Tarumanagara, for his leadership in making this event a reality. Additionally, we appreciate Assoc. Prof. Dr. Hetty Karunia Tunjungsari, S.E., M.Si., Head of Research & Community Service Institute, for her dedication to advancing academic research and facilitating this conference.

We are privileged to have distinguished keynote speakers who will share their insights and expertise:
Prof. Dr. Ariawan Gunadi, S.H., M.H. – Chairman of Tarumanagara Foundation
Assoc. Prof. Chang-Lin Chuang, Ph.D. – Kun Shan University, Taiwan
Assoc. Prof. Dr. Chan Choon Kit – INTI International University, Malaysia

This year, we are proud to have received a total of 42 papers for ICASTE 2025 and 114 papers for ICEBSH 2025, demonstrating the enthusiasm and commitment of our participants in advancing knowledge and research across multiple fields.

We sincerely appreciate the contributions of all authors, presenters, and attendees from Indonesia, Malaysia, Taiwan, and beyond. Your participation enriches these conferences and strengthens our collective efforts to drive impactful research and global sustainable development.

We hope these conferences will provide valuable discussions, meaningful collaborations, and inspiring experiences. Wishing you all a productive and enjoyable conference.

Thank you.

Didi Widya Utama, S.T., M.T., Ph.D.
Chairperson of ICASTE 2025

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FOREWORDS

FROM THE RECTOR OF UNIVERSITAS TARUMANAGARA

Ladies and gentlemen, esteemed colleagues, honoured partners, speakers, presenters, and all participants,

It is both a privilege and a pleasure to be here with all of you today at this esteemed international conference held at Kun Shan University (KSU) in the vibrant city of Tainan, Taiwan.

I would like to extend my heartfelt gratitude to our hosts especially for Professor Dr. Lee, Tien-Shang, The President of KSU for their warm welcome. I would also like to express my deepest thanks and appreciation to INTI International University, Malaysia, for their cooperation and collaboration as the co-host of this seminar.

This event brings together to dedicate our focus to one of the most pressing challenges of our time: "sustainable development." The theme of this conferences, "Accelerating Global Sustainable Development Through Higher Education," resonates deeply with the core mission of our institutions: to educate, innovate, and inspire future generations to create a more equitable and sustainable world.

As we embark on this crucial dialogue, let us reflect on the transformative power of higher education. Universities have long been catalysts for change, shaping minds and equipping students with the knowledge and tools to address complex global issues. In these times of unprecedented environmental, economic, and social challenges, our role has become even more critical.

Sustainable development is not just a goal; it is a commitment to ensure that our economic and social growth occurs within the ecological limits of our planet. Achieving this requires a concerted effort across disciplines—collaborating not only within our institutions but also with governments, industries, and communities. By integrating sustainability into our curriculum, research, and community engagement program, higher education can lead the way in cultivating innovative solutions and fostering a culture of responsibility and resilience.

Over the next few days, I invite each of you to engage actively in our discussions. Together, we will have the opportunity to share successful strategies, explore partnerships, and generate new ideas that can propel our efforts forward. Let us leverage our collective expertise and experience to accelerate the progress toward a sustainable future.

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In closing, I am excited about the insights that will emerge from our conversations here at KSU. Let us embrace this opportunity to collaborate, inspire, and ignite the passion for sustainable development within our academic institutions and beyond.

Thank you, and I am looking forward to the engaging exchanges we will share.

Prof. Dr. Amad Sudiro, S.H., M.H., M.Kn., M.M.
Rector of Universitas Tarumanagara

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FOREWORDS

FROM THE PRESIDENT OF KUN SHAN UNIVERSITY

Dear distinguished guests,

It is my great pleasure to welcome you to the 2025 International Conference on Economics, Business, Social, and Humanities (ICEBSH) and the International Conference on Applied Science, Technology, and Engineering (ICASTE), jointly organized by Universitas Tarumanagara from Indonesia, Kun Shan University from Taiwan, and INTI International University from Malaysia.

This year's theme, "Accelerating Global Sustainable Development Through Higher Education," highlights the critical role of higher education institutions in shaping a more sustainable and interconnected world. As drivers of innovation, universities are uniquely positioned to address the pressing global challenges outlined in the Sustainable Development Goals (SDGs) through research and technology.

By bringing together ICEBSH and ICASTE, this event serves as a dynamic platform for interdisciplinary collaboration, allowing experts from diverse fields—ranging from economics and business to science and engineering—to exchange ideas and explore innovative solutions for a better future. The diversity of our participants and speakers brings a wealth of perspectives, which we believe will offer profound insights into the transformative potential of collaboration in research and technological advancement.

I would like to extend my sincere appreciation to the Universitas Tarumanagara Foundation Chairman, Prof. Dr. Ariawan Gunadi, S.H., M.H., and Rector, Prof. Dr. Amad Sudiro, S.H., M.H., M.Kn., M.M., for hosting this event and for their invaluable support in fostering collaboration between Kun Shan University and various Indonesian universities. I would also like to express my gratitude to INTI International University for co-hosting this conference and for their commitment to academic excellence and international cooperation.

Looking ahead, Kun Shan University remains committed to strengthening partnerships with academic institutions through a wide range of initiatives, including academic visits, joint lecturing programs, collaborative research, academic resource sharing, elite student exchanges, and more.

I would also like to thank all of our distinguished speakers for their valuable contributions and express my deep appreciation to the organizing committee for their dedication and tireless efforts in making this conference a success.

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Let us move forward together in the spirit of collaboration, innovation, and global impact, and I wish you all a productive and inspiring conference.

Prof. Dr. Tien-Shang Lee D.B.A.
President of The University
Kun Shan University

International Conference on Applied Science, Technology, and Engineering
Accelerating Global Sustainable Development Through Higher Education
Tainan, Taiwan, April 14-15th 2025

Website: icaste.untar.ac.id/2025   Email: icaste@untar.ac.id

TIME AND VENUE

The International Conference on Applied Science, Technology and Engineering will be held in hybrid (offline and online) with the following details:

Venue : Kun Shan University

No. 195 號, Kunda Rd, Yongkang District, Tainan City, Taiwan 710

Plenary Session   : College of Creative Media C Building 2nd floor

Parallel Session   : International Conference Hall, L Building 10th Floor

Date   : 14-15th April 2025

Time   : 08.30 – 17.45 CST (GMT+8)

Join Zoom   : http://untar.ac.id/zoomICASTEICEBSH2025

Meeting ID   : 822 1802 8078

Passcode   : Untar65

SPEAKERS

Prof.Dr. Ariawan Gunadi, S.H., M.H.
(Universitas Tarumanagara, Indonesia)

Assoc. Prof. Chang-Lin Chuang, Ph.D.
(Kun Shan University, Taiwan)

Assoc. Prof. Dr. Chan Choon Kit
(INTI International University, Malaysia)

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Kun Shan University
MAP

ICASTE & ICEBSH Conference 2025
14 - 15 April 2025

PLENARY SESSION
College of Creative Media
2nd floor - C building

PARALLEL SESSION
International Conference Hall
10th floor - L building

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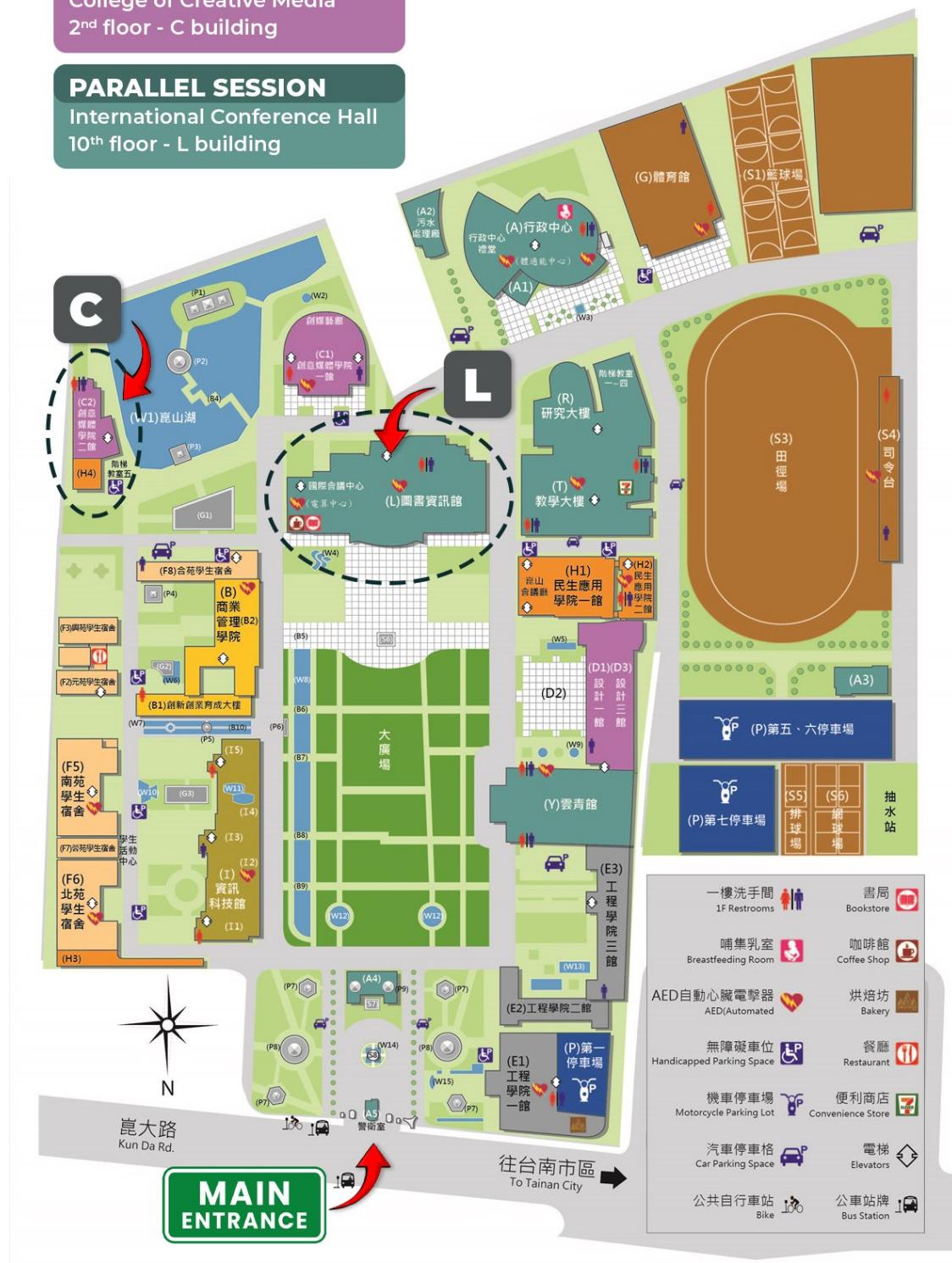
EVENT SCHEDULE

CONFERENCE PROGRAM
International Conference on Applied Science, Technology and Engineering (ICASTE) 2025
"Accelerating Global Sustainable Development through Higher Education"

Monday & Tuesday, 14th & 15th April 2025
Location   : Kun Shan University, Tainan, Taiwan (Hybrid)
Time Zone   : GMT +8 (CST/Taiwan Time)

Time	Program	Venue
Monday, 14th April 2025		
08.30 – 09.00	ICASTE ICEBSH 2025 Registration & Coffee Morning *Accelerating Global Sustainable Development through Higher Education*	College of Creative Media 2nd Floor, C Building
09.00 – 09.15	**Opening Ceremony:** • Taiwan Culture Dance • Greetings by MC	
09.15 – 09.30	**Opening Speech:** • **Professor Shuhn-Shyurng Hou, Ph.D.** *Vice President for Academic Affairs Kun Shan University* • **Prof. Dr. Amad Sudiro, S.H., M.H., M.Kn., M.M.** *Rector of Universitas Tarumanagara*	
09.30 – 09.35	**Certificate Presentation for Co-Host**	
09.35 – 09:40	**Moderator Introduction** Oscar Li, Ph.D. *Kun Shan University, Tainan – Taiwan*	
09:40 – 10:20	**Keynote Session 1** Assoc. Prof. Chang-Lin Chuang, Ph.D *Kun Shan University, Tainan – Taiwan* (Presentation 30" + QnA 10")	
10:20 – 11:00	**Keynote Session 2** Assoc. Prof. Dr. Chan Choon Kit *INTI International University, Malaysia* (Presentation 30" + QnA 10")	

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Time	Program	Venue
11:00 – 11:40	**Keynote Session 3** Prof. Dr. Ariawan Gunadi, S.H., M.H. *Universitas Tarumanagara, Jakarta – Indonesia* (Presentation 30" + QnA 10")	
11:40 – 11:50	**Certificate Presentation for Keynote Speakers and Photo-Taking Session**	
11:50 – 12:00	**Plenary Session Closing** and Briefing for Parallel Session	
12:00 – 13:30	**Lunch Break**	International Conference Hall, 10th Floor, L Building
13:30 – 15:00	**Parellel Session I** *Schedule refer to Program Book*	
15:00 – 15:15	**Coffee Break**	
15:15 – 17:00	**Parellel Session II** *Schedule refer to Program Book*	
Tuesday, 15th April 2025		
08:30 – 09:00	**Day 2 Registration & Coffee Morning**	International Conference Hall, 10th Floor, L Building
09:00 – 12:00	**Parellel Session III** *Schedule refer to Program Book*	
12:00 – 13:00	**Lunch Break**	

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CONFERENCE TOPIC

This year, the committee organized an international conference in the field of Technology and Engineering with the theme: **Accelerating Global Sustainable Development Through Higher Education.** This conference aims to collect a variety of positive thoughts about Engineering and Technology related topics. Hopefully it will be a forum for practitioners, government, academicians and experts to share and exchange their ideas, thoughts and experiences related to the topics. Thus, it is expected to contribute more comprehensive and applicable problem-solving framework.

TOPIC AREA

The conference will bring together leading researchers, engineers and scientists in the domain of interest from around the world. Topic area for submission includes, but are not limited to:

TOPIC	SUB TOPIC
Civil and Earth Environmental Engineering	- Bridge and Tunnel Engineering - Geotechnical Engineering - Modern Trends in Civil Engineering - Construction Technology and Structural Engineering - Hydraulic Engineering - Safety Management - Surveying - Transportation Engineering - Water resource Engineering - Coastal Engineering - Engineering Management - Energy-saving Technology - Sustainable Urban and Environmental Management

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TOPIC	SUB TOPIC
	- Sustainable Development - Environmental-friendly Construction and Development - Sustainable Design and Planning - Green Architecture - Heritage Conservation and Management
Mechanical Engineering and Technology	- Hydraulic and Pneumatics System - Fluids & Thermal Systems - Dynamics and Mechanical Vibrations - Mechanical Design and Manufacturing - Microsystems Integration - Cooperative Intelligent Systems - Advances for Process Industries - Power Generation – Conventional and Renewable - Computer Integrated Manufacturing - Design and Manufacturing Engineering - Industrial and Systems Engineering - Operations Research - Production Planning and Control
Electrical and Electronic Engineering	- Power Generation, Transmission and Distribution - Power Electronics, Systems and Applications - Electrical Machines and Adjustable Speed Drives - Electrical Power Systems - Circuits and Systems - Communication Systems - Analog and Digital Electronics - Electric Drives and Control - Instrumentation Engineering - Power System Engineering - Smart Grids Technologies & Applications - Computer Application Technology - Control Technology - Telecommunication Engineering - Network Engineering Communication - Signal and Image Processing - 4G/3G/LTE Mobile Networks Applications - Renewable Energy Sources, Smart grids Technology & Application - High Voltage Engineering and Insulation Technology Controls
Food and Agriculture Technology	- Agricultural Machinery - Biotechnology - Biofuel - Food Processing - Food Safety - Technologies in secure food packaging

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TOPIC	SUB TOPIC
	- Irrigation & water management - Forest and Natural Resource Management - New strategies in food packaging
Materials Sciences and Engineering	- Destructive and Non-destructive Testing, Microstructural characterization, Failure Analysis - Materials Application / Energy/ Biomedical / High Temperature - Materials Characterization, Modelling and Performance - Materials-Environment Interaction and Protection - Materials Recycling and Other Related Topics - Materials Processing and Product Manufacturing - New Materials for Structural and Functional Applications - Innovative Composites, Functionally Graded Materials
Informatic Engineering & Technologies	- Computer Application Technology - Software Engineering - Multimedia Technology - Mobile Computing - Artificial Intelligent - Computer Vision - Information Systems - Database Systems - Geographic Information Systems

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CONFERENCE COMMITTEE

HONORARY CHAIR

Prof. Dr. Amad Sudiro, S.H., M.H., M.Kn., M.M.

Assoc. Prof. Sri Tiatri, M.Si., Ph.D. Psi.

STEERING COMMITTEE

Assoc. Prof. Hetty Karunia Tunjungsari, S.E., M.Si.

Prof. Dr. Ir. Agustinus Purna Irawan, I.P.U., Asean Eng.

Dr. Ir. Steven Darmawan, S.T., M.T.

CO-HOST COMMITTEE

Assoc. Prof. Lu, Te-Tsai, Ph.D.

Assoc. Prof. Dr. Linda LinChin Lin

ORGANIZING COMMITTEE

Chair   : Didi Widya Utama, S.T., M.T., Ph.D.

Co-Chair   : Assoc. Prof. Dr. Fransisca Iriani R.Dewi, M.Si.

Secretary   : Dr. Wulan Purnama Sari, S.IKom, M.SI.

Nafiah Solikhah, S.T., M.T.

Treasurer   : Dr. Mei Ie. S.E., M.M.

International Relation:

Assoc. Prof. Dr. Hugeng, S.T., M.T.

Journal Publication:

Mohammad Agung Saryatmo, S.T., M.M., Ph.D.

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Paper Management:

Dr. Keni, S.E., M.M.

Desi Arisandi S.Kom., M.T.I.

Program **:** Rorlen, S.E., M.M.

Nadia Ayu Rahma Lestari, S.T., M.Sc.

Patrick Kosmayadi, S.Ds.

Design and Website:

Jessica Ho

Joselin Sandra W

Shareen Stephanie

Victoria Valentina

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SCIENTIFIC COMMITTEE

Dr.-Ing. A. Ruggeri Toni Liang	Karlsruhe Institute of Technology, Germany
Assoc. Prof. Dr. Chan Choon Kit	INTI International University, Malaysia
Dr. Chang Kai Ming	Tunku Abdul Rahman University College, Malaysia
Dr. Channing	Kun Shan Univeristy, Taiwan
Dr. Ing. Joewono Prasetijo	Universiti Tun Hussein Onn, Malaysia
Dr. Liew Chiam Wen	Tunku Abdul Rahman University College, Malaysia
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Prof. Dyah Erny Herwindiati	Universitas Tarumanagara, Indonesia
Prof. Leksmono Suryo Putranto	Universitas Tarumanagara, Indonesia
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Prof. Lina, Ph.D.	Universitas Tarumanagara, Indonesia
Assoc. Prof. Dr. Widodo Kushartomo	Universitas Tarumanagara, Indonesia
Assoc. Prof. Ir. Harto Tanujaya, Ph.D.	Universitas Tarumanagara, Indonesia

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PARALLEL SESSION

Session 1   : Monday, 14th April 2025
                      13.30 – 15.00 CST (GMT +8)

Session 2   : Monday, 14th April 2025
                      15.15 – 17.00 CST (GMT +8)

Session 3   : Tuesday, 15th April 2025
                      09.00 – 12.00 CST (GMT +8)

Onsite Room Details

Room	Topic(s)		
	Session 1	**Session 2**	**Session 3**
ICASTE 1	Information Technology	---	Urban Planning, Industrial Engineering
ICASTE 2	---	---	Architecture, Engineering

Online Room Details

Room	Topic(s)		
	Session 1	**Session 2**	**Session 3**
ICA-On-1	Engineering	Art & Design, Medicine, Information Technology	Engineering

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ONSITE PARALLEL SESSION

ROOM ICASTE 1
International Conference Hall, 10th Floor, L Building

Monday, 14th April 2025 (GMT +8)
Session 1   : Information Technology
Moderator   : Dr. Chuang, Yao-Kai

Time	Paper ID	Paper Title	Author(s)	Institution
14.00 - 14.15	022	Consumer Comment Analysis With Vader And Word Clouds For Product Recommendation Competitor Insights	Viny Christanti Mawardi, Devany Aguslia, Sachi Granita Vigo, Fathiyah Azzahra	Universitas Tarumanagara
14.15 - 14.30	023	Leveraging LSTM To Organize Data From Educational Websites For Private University Recommendation Systems	Daniel Jahja Surjawan, Viny Christanti Mawardi, Mohamad Ardan	Universitas Tarumanagara
14.30 - 14.45	020	Leveraging Fine-Tuning To Optimize Edubuddy For Indonesian Primary Students With Command R	Jessen Chayadi, Devany Aguslia, Viny Christanti M.	Universitas Tarumanagara
14.45 - 15.00		Panel Discussion		

Tuesday, 15th April 2025 (GMT +8)
Session 3   : Urban Planning & Engineering
Moderator   : Dr. Chuang, Chang-Lin

Time	Paper ID	Paper Title	Author(s)	Institution
09.30 - 09.45	009	Transformation Of Property Marketing In Indonesia Through Digital Technology	Meyriana Kesuma, Regina Suryadjaya	Universitas Tarumanagara
09.45 - 10.00	010	Implementation Of Sustainable Value Stream Mapping For Sustainable Performance In Agricultural Equipment Production	Lithrone Laricha Salomon, Wilson Kosasih, Marcella, Michelle Roselyn	Universitas Tarumanagara

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Time	Paper ID	Paper Title	Author(s)	Institution
10.00 - 10.15	021	Developing A Conceptual Framework For SAP S/4 Hana-Based Warehouse Management To Enhance Supply Chain Efficiency	Hans C Lietanujaya, Wilson Kosasih, M. Agung Saryatmo	Universitas Tarumanagara
10.15 - 10.30		Panel Discussion		

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ONSITE PARALLEL SESSION

ROOM ICASTE 2
International Conference Hall, 10th Floor, L Building

Tuesday, 15th April 2025 (GMT +8)
Session 3   : Architecture
Moderator   : Dr. Hou, Chung-Kuang

Time	Paper ID	Paper Title	Author(s)	Institution
09.30 - 09.45	028	Housing As A Verb: Urban Vernacular Of Kampung Tanjung Gedong, West Jakarta	Widia Sari, Derio Julis, Samuel Chandra, Titin Fatimah, Nafiah Solikhah	Universitas Tarumanagara
09.45 - 10.00	029	Existence Of Urban Vernacular In Jakarta: Insights From Urban Kampung In Tanjung Duren Utara, West Jakarta	Jason Caesar Liewarnata, Titin Fatimah, Nafiah Solikhah	Universitas Tarumanagara
10.00 - 10.15	030	Spatial Transformation Of Urban Kampung In Kampung Aquarium, North Jakarta	Josephine Quin Destania, Angel Stevany, Titin Fatimah, Nafiah Solikhah	Universitas Tarumanagara
10.15 - 10.30	031	Typo-Morphological Of Urban Vernacular In Kampung Penjaringan, North Jakarta	Kheisa Aurellia, Sarah Lumongga, Titin Fatimah, Nafiah Solikhah	Universitas Tarumanagara
10.30 - 10.45		Panel Discussion		

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ONLINE PARALLEL SESSION

ROOM ICASTE-ON-1
via Zoom Meeting

Monday, 14th April 2025 (GMT +8)
Session 1   : Engineering
Moderator   : Lithrone Laricha Salomon, S.T., M.T.

Time	Paper ID	Paper Title	Author(s)	Institution
13.30 - 13.45	001	Identification Of Building Project Risks	Mega Waty, Lidwina Sri Ayu, Hendra Eko Prasetya, Michael Sylvester Boenyamin	Universitas Tarumanagara
13.45 - 14.00	004	Risk Management Analysis Using The Hiradc Method And Ishikawa Diagram: A Case Study Of PT XYZ	Christhoper Robin, Bonifasius Justin Abel Goklas, Sylvia, Mohammad Agung Saryatmo, Ronald Sukwadi	Universitas Tarumanagara
14.00 - 14.15	005	Flexural Strength Of Cfldrhs Beam With Single And Double Web Holes	Andy Prabowo, Ikhsan Prabowo, Wati Asriningsih Pranoto	Universitas Tarumanagara
14.15 - 14.30	006	Correlation And Regression Analyze How Pulse Rate Changes With Pedaling Speed And Static Load	I Wayan Sukania, Lamto Widodo, Marthinus Chandra, Florencia Charlene Teng	Universitas Tarumanagara
14.30 - 14.45	018	Recommendations For Improving The Marketing Strategy Of PT. BKE Service Company	Ahmad, M Agung S, Rafeal J, Angelina D, C.D Farhana	Universitas Tarumanagara
14.45 - 15.00	027	Quality Standard Evaluation Based On Walkability Index Parameters In Glodok Chinatown Pedestrian	Fitri Isnaini, Titin Fatimah, Samsu Hendra Siwi	Universitas Tarumanagara

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ROOM ICASTE-ON-1
via Zoom Meeting

Monday, 14th April 2025 (GMT +8)
Session 2   : Art & Design, Medicine, Information Technology
Moderator   : Lithrone Laricha Salomon, S.T., M.T.

Time	Paper ID	Paper Title	Author(s)	Institution
15.15 - 15.30	011	The Impact Of Glare On Students' Visual Comfort In Net Zero Energy School Building In Jakarta	Noeratri Andanwerti, Anastasia Cinthya Gani	Universitas Tarumanagara
15.30 - 15.45	024	Artificial Lighting In The Exhibition Room Of The Presidential Museum, Balai Kirti, Bogor City, West Java	Heru Budi Kusuma, Melissa Thanos, Luisa Octania Sutanto	Universitas Tarumanagara
15.45 - 16.00	014	The Role Of Social Norm, Tax Knowledge, And Administrative Sanctions In Enhancing Tax Compliance Of SMES	Michelle Kristian, Bryan Christover	Universitas Tarumanagara
16.00 - 16.15	003	Quantitative Analysis Of Hand Hygiene Using Lumigerm And Its Association With Handwashing Knowledge	Kezia Yemima Siallagan, Erick Sidarta, Arlends Chris	Universitas Tarumanagara
16.15 - 16.30	041	Implementation Of TF-IDF In A Web-Based QA System For Retrieving Playstation-Related Information	Adryanus Rinaldi, Lely Hiryanto, Viny Christanti Mawardi	Universitas Tarumanagara

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ROOM ICASTE-ON-1
via Zoom Meeting

Tuesday, 15th April 2025 (GMT +8)
Session 3   : Engineering
Moderator   : Joni Fat, S.T., M.E., M.T.

Time	Paper ID	Paper Title	Author(s)	Institution
09.00 - 09.15	035	Implementing Markov Decision Process For Automated Forex Trading Systems	Joni Fat, Hadian Satria Utama, Dion Dwi Wijaya, Tyven Christopher Gilbert	Universitas Tarumanagara
09.15 - 09.30	034	Analysis Of Calorie Variations In Stationary Cycling Due To Changes In Speed And Pedaling Load	I Wayan Sukania, Lamto Widodo, Marthinus Chandra, Florencia Charlene Teng	Universitas Tarumanagara
09.30 - 09.45	038	Analysis Of The Application Of Cleaner Production With The Quick Scanning Method Towards An Environmentally Friendly Garment Manufacturing Industry (Case Study: PT Pancaprima Ekabrothers)	Defandra Nur Aditya Sasmita, Carla Olyvia Doaly	Universitas Tarumanagara
09.45 - 10.00	039	Industrial Organizational Psychology Approach To Mental Workload: A Nasa-TLX Study In Product And Service Departments Of PT XYZ	Aurelia Febrianti, Ahmad	Universitas Tarumanagara
10.00 - 10.15	040	Mental Workload Analysis Of Purchasing Division With Nasa-TLX Questionnaire	Teresa Novita, Carla Olyvia Doaly	Universitas Tarumanagara
10.15 - 10.30	042	Analysis With Nasa-TLX In Logistic Department Of PT XYZ	Nelson Claudius, Ahmad	Universitas Tarumanagara
10.30 - 10.45		**BREAK**		
10.45 - 11.00	032	Design And Development Of A Pet Bottle Slitting Machine For 3D Printer Filament Production: Enhancing Lifecycle Sustainability	Andrew Putra Sulan, Didi Widya Utama, Agus Halim, Sarina Abdul Halim Lim	Universitas Tarumanagara, Universiti Putra Malaysia

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Time	Paper ID	Paper Title	Author(s)	Institution
11.00 - 11.15	033	Implementing Circular Economy And Business Sustainability By Extending The Life Cycle Of Pet Plastic Bottle Waste Through Filament Machine Pultrusion Systems	Oween Niccollas, Didi Widya Utama, Agus Halim, Jason Waworuntu	Universitas Tarumanagara, National Cheng Kung University
11.15 – 11.30	036	Development And Design Of A Cold Air Intake System For The Toyota Agya 1.2	Alessandro Darren Halim, Agustinus Purna Irawan, Didi Widya Utama	Universitas Tarumanagara
11.30 – 11.45	037	The Design And Fabrication Of A Pattern Leveling Machine For Pet Plastic Bottle Waste For 3D Printer Filament Production	Eveneser Putra Kristanto, Agus Halim, Didi Widya Utama	Universitas Tarumanagara

Secretariat

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021-5671747, ext. 215