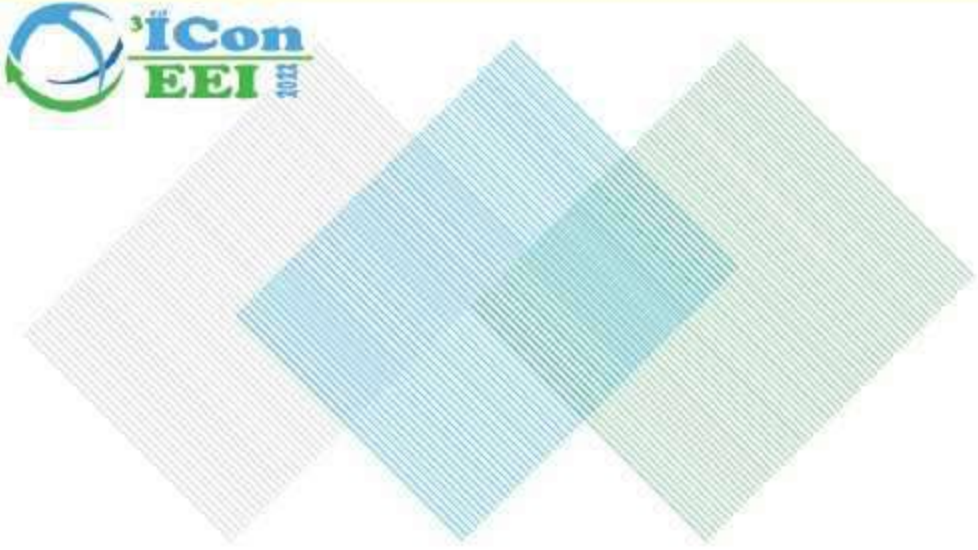
ICon EEI 2022

The 3rd International Conference on Electrical Engineering and Informatics

Virtual Conference October 19th-20th

BOOK PROGRAM AND ABSTRACT



SUSTAINABLE ENGINEERING FOR INDUSTRIAL REVOLUTION 4.0

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2022 3rd International Conference on Electrical Engineering and Informatics (ICon EEI)

2022 3rd International Conference on Electrical Engineering and Informatics (ICon EEI) took place 19-20 October 2022 virtually.

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Welcome Message from General Chair

Assalamualaykum Warahmatullahi Wabarakatuh.

Honorable, Prof Jun Kondoh, from Shizuoka University Japan. Honorable, Prof Azridjal Aziz, Dean of Engineering Faculty Universitas Riau. Dear colleagues, professors, lecturers, researchers, ladies, and gentlemen.

Alhamdulillahirabbil Aalamain, all prise due to Allah SWT and peace and blessing be upon his final messenger Muhammad Rasulullah SAW by reciting Allahumma shalli ala Muhammad wa ala ali Muhammad.

It is my great pleasure to welcome you to 2022 3rd International Conference on Electrical Engineering and Informatics (ICon EEI 2022) virtual conference.

ICon EEI 2022 is intended to provide a forum and bring together academicians, professionals, and governments in the fields of electrical power system, electronics, telecommunication engineering, control engineering, informatics, computer engineering, information technology and other Electrical Engineering and Informatics domains in order to learn about the latest developments in the research findings and share experience and ideas how we can all work together to make and deal with "**future electric system and big data analysis challenges in the most efficient way**".

This year, the ICon EEI 2022 received 64 paper submissions from 15 countries throughout the world which are Indonesia, Japan, France, Vietnam, Malaysia, Pakistan, Italy, Ireland, India, China, Sri Lanka, Germany, Nigeria, Bangladesh, USA, Iraq, Saudi Arabia, Egypt, and Taiwan. All the submitted papers were thoroughly and independently reviewed by at Technical Program Committee totaling 65 people and additional 24 reviewers in accordance with standard blind review process. Based on the results of the rigorous review process, 37 papers have been selected. These papers have been grouped into 3 tracks which are:

- Firstly, Electrical Power System, Renewable Energy and High Voltage Engineering;
- Secondly Electronic, Control System and Telecommunication;
- and lastly Informatics, Computer Science, Computer Engineering and Information Technology. Besides those regular tracks,

The conference committee has invited Keynote speakers, namely: Prof. Jun Kondoh, Professor of Wave Electronics Engineering from Shizuoka University Japan.

As general chair, I am deeply indebted to all organizing committee members from Department of Electrical Engineering Universitas Riau, TPC members, volunteer reviewers, IEEE Indonesia section and IEEE MTT/APP Chapter Indonesia who have greatly contributed to the success of the ICon EEI 2022. Many thanks should be given to our keynote speakers and invited speakers who will present their works in this conference. In addition, our sincere gratitude should be given to all authors who submitted their works to ICon EEI 2022.

Thank you very much and Assalamualaykum Wr Wb

Sincerely yours,

Dr. Febrizal Ujang
General Chair of ICon EEI 2022

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Wednesday, October 19

Wednesday, October 19 8:00 - 8:30

RE: Registration

Room: Opening Virtual Room

Wednesday, October 19 8:30 - 9:00

OS: Opening Session

Dean, General Chair

Room: Opening Virtual Room

Wednesday, October 19 9:00 - 9:45

KS: Keynote Speech

Prof. Jun Kondoh Professor of Wave Electronics Engineering Shizuoka University Japan

Room: Opening Virtual Room

Wednesday, October 19 10:00 - 12:00

VP: Virtual Presentation Track 1 Morning

Morning

Room: Track 1

Applied Symbiotic Organisms Search Algorithm to Solve Economic Emission Dispatch Problems

Phan Van Hong Thang (Ho Chi Minh City University of Technology & HBT Company, Vietnam); Tran The Tung (Ho Chi Minh City University of Technology, Vietnam)

Nowadays using of energy sources to produce electricity has many changes in increasing the proportion of using renewable energy. However, with the stability in generating capacity, fossil energy resources still play an important role in the power system. Therefore, solving the economic dispatch problem in terms of ensuring environmental factors is always a difficult task. This paper contributes one of the new effective method for solving the environmental economic dispatch problems - Symbiotic Organisms Search Algorithm (SOSA). The problems are solved in three optimization case: fuel cost, emission, and economic emission with the constraints on load balance, power generation limits, and fuel. The Symbiotic Organisms Search Algorithm will be applied to electrical systems include: 5-unit; 10-unit with power retaining in three weeks and IEEE 30 bus with wind turbines. These results have been compared with other algorithms in the same power system to demonstrate the effectiveness of Symbiotic Organisms Search Algorithm.

High Voltage Plasma Convert Coconut Shell Charcoal to Few Layer Wrinkled Graphene (FLwG)

Fri Murdiya, Dede Irawan, Amir Hamzah and Suwitno Suwitno (Universitas Riau,

Oil palm is an important industrial plant producing cooking oil, industrial oil, and fuel (biodiesel). One of the factors that can cause a decrease in production yields on oil palm plants are pests. Palm oil companies through the Pest and Plant Diseases team prevent the breeding of pests by taking leaf samples first, for leaf sampling, they must carry out the stages of preparing an early observation schedule, determining sample points and sample lines, and determining sample subjects and will take a long time. long enough to get the results. In this study, the detection of the population of caterpillar eggs contained in oil palm leaves was carried out using digital image processing with the Segmentation method using a Marker Watershed. The stage of image processing begins with taking data obtained from one of the palm oil companies in Riau, then cropping is carried out and followed by color segmentation using Hue Saturation and Value (HSV) by taking the Value score and then segmenting the marker watershed. The method of testing the credibility of the system uses the one feature method: single decision threshold. The results of testing the credibility of the system obtained a Sensitivity Value Percentage of 90.8%, so that there were still 9.2% of the number of caterpillar eggs of oil palm leaf pests that had not been identified and the system accuracy was obtained at 89.4%.

Fire Hotspots Mapping and Forecasting in Indonesia Using Deep Learning Algorithm

Sri Listia Rosa and Evizal Abdul Kadir (Universitas Islam Riau, Indonesia); Abdul Syukur (National Taiwan University Science and Technology, Taiwan); Hitoshi Irie (Chiba University, Japan); Rizky Wandri (Universitas Islam Riau, Indonesia); Muhammad Fikri Evizal (National Taiwan University Science and Technology, Taiwan)

Indonesia is one of the countries in South East Asia has significant forest fire with dangerous impact to neighboring countries of the emission of haze and carbon. In this research aims to do plotting and mapping location with high number fire hotspot then forecasting potential number of hotspots in future time based on previous of history data collected. The forecasting data achieve is very important and beneficial for the authorities as one of references for preventive action and avoid scattering of forest fire. Long Short-Term Memory (LSTM) algorithm implemented in this research for analysis and forecasting of fire hotspot number while Python programming used to plot hotspot point. The source of fire hotspot dataset is referred to The National Aeronautics and Space Administration (NASA) Moderate Resolution Imaging Spectroradiometer (MODIS) recorded from year 2021 with total number is about 100,000 hotspots in Indonesia region. Results show the distribution of fire hotspot concentration most in Sumatra and Kalimantan Island because the typical of land which peat that potential for getting fire. Forecasting of number hotspot for the year 2022 has achieve with good results with error less than 5% which only 4.56%.

Wednesday, October 19 15:30 - 16:00

CR: Close and Awards

Room: Opening Virtual Room

ICon EEI 2022
The 3rd International Conference on Electrical Engineering and Informatics
Virtual Conference October 19th-20th

Certificate of Appreciation

This certificate is awarded to

Evizal Abdul Kadir

as

PRESENTER

who has participated in The International Conference on Electrical Engineering and Informatics (ICon EEI 2022) Virtual Conference, 19-20 October 2022

General Chair of ICon EEI 2022

Dr. Febrizal, S.T., M.T.

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Interactive English Teaching and Learning Based on Mobile Application

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***Abstract*—English is a universal language used worldwide as the primary language. Learning English can open more opportunities for someone to get involved with the international world. In Indonesia, English is not the primary language, but English still occupies an important position in daily life. For some students, English is not something easy to learn, and they constantly face difficulties such as lack of self-confidence, hard to understand grammar, and hard memorize English vocabulary. The author developed an Android application to help high school students to learn English. This application contains theory for grammar, English vocabulary to memorize with a track record, and a chatbot to increase self-confidence to speak in English. Interactive English Learning Application has user's status to track how far users have already learned English and helped with quizzes. This application was developed using flutter as its front-end, MySQL as its database, and PHP as the backend.**

Keywords—English, Language, Android, Application, Status

I. Introduction

English is a universal language most countries use as the primary language. Besides that, English is an international language that is very important to learn. Having the ability to speak English can open more ample opportunities for someone to get involved with the international world. Even some British colonial countries used English as their second language that must be mastered. Even though English is a foreign language in Indonesia, English still occupies an important position in daily life. Therefore, necessary for the public, elementary students until senior high school students to learn English.

For some students, English is something that is not easy to learn. Because there are always difficulties faced by students who are learning English, like a lack of self-confidence in learning English which results in the low ability of students to communicate, if we want to be fluent in English, it must apply more often in daily life.

The next difficulty that is often faced by students who are learning English is studying grammar. Because when studying grammar, there are so many rules and sentence structure patterns that must be remembered so the interlocutor can receive every sentence spoken well.

Next, students face difficulty because they don't have friends to practice their English. Communicating in English is vital because learning to communicate using English can improve basic aspects such as vocabulary.

Leveraging mobile technology based on Android, which is currently increasing and has become the most operating system used in Indonesia, can be used to develop English learning media applications that can help students in studying English as interactive by providing various features according to student needs, such as vocabulary group, grammar, and many more. The authors developed an interactive English learning-based-on android application that helps students learn English.

II. Research Methodology

A. Data Collection

Data collection is a research stage where the researcher applies scientific methods and techniques to collect data systematically.

- Interview

  The author directly interviewed students, exceptionally high school students. "The interview is a meeting of two people or more to change information or an idea with the question and answer so that it can be reduced to a conclusion or meaning in a particular topic" [1]. In the interview results, students faced three main difficulties when studying English, grammar, vocabulary, and lack of self-confidence.

- Observation

  "Observation is one data collection that uses direct or indirect observation" [2]. The author did observation by observing information and data needed in this research. The result of this observation is that grammar is one of important things and the first step to fluency in English.

- Literature Study

  "A literature study is a series activity related to collecting library data, reading, taking notes, and processing research materials" [3]. The literature study was done by reading and learning about the topic discussed in this research. The author found five works of literature related to this research from the literature study.

B. *Literature Review*

The first research entitled, “Chatbot Pembelajaran Bahasa Inggris Berbasis Media Sosial” conducted by Sarosa et al [4]. Result from this research chatbot that was implemented to 60 three-year diploma students department of English, Politeknik Negeri Malang obtained 98% stated chatbot helps students learnt English, 90% stated the material presented is quite exciting, and 72% stated that chatbot application did not burden the performance of their cellphones. This research aims to use social media to study English, where English training is carried out online (chat) from a chatbot application, so there are 24 hours for students to learn English.

The second research conducted by Afrianto et al. entitled, “Aplikasi Chatbot Speak English Media Pembelajaran Bahasa Inggris Berbasis Android” [5]. In conclusion, chatbot technology can become a solution for interactive learning media, one of them as a temporary English conversation practice media using two conversation methods provided. This research aims to develop a chatbot application as an alternative to learning English.

The third research entitled, "Aplikasi Media Pembelajaran Tenses Bahasa Inggris Berbasis Android" [6], have some exciting features, such as a page containing tenses that can be learnt for students, a page contains quizzes, and a page containing score from the quiz that has been done. This research aims to make it easier for students to understand tenses and to make it easier to remember tense's structure and pattern, and find student abilities.

The fourth research entitled, “Penerapan Aplikasi Pembelajaran Bahasa Inggris Dasar Berbasis Multimedia” [7], using multimedia based on Android application to practice student’s vocabulary. The purpose of this research is to see students' vocabulary ability by providing vocabulary training using multimedia as learning media.

The fifth research entitled,, “Analisa dan Perancangan Aplikasi Pembelajaran Bahasa Inggris Dasar Berbasis Android” [8], develop an android application for studying English. The purpose of this research is to see how students can learn English anywhere without the limitation of time using an android application.

III. Result And Discussion

A. *Application Design*

The author uses flutter to design and develop the application. Flutter is Software Development Kit (SDK) developed in 2017 by Google. Using flutter can help the developer to create a mobile cross-platform application. In its development, flutter brings a hot reload that directly compiles codes and shows the results [9]. The following is the input design for the application

- Login Design

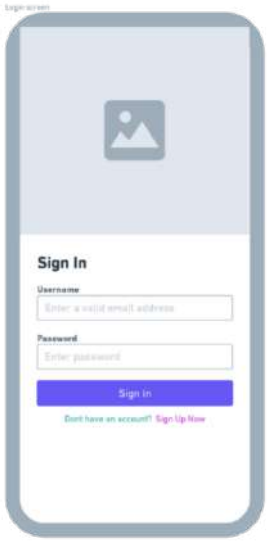

Fig. 1. Application Login Design

The application saves users' data, so users don't need to learn first again. Before user using the application completely, they must login first into the application. On the login page, the application asked for a username, the user's email that was registered before, and a password.

- Sign Up Design

Fig. 2. Application Sign Up Design

For the users to use their account, they must register first. There are only three fields for users to fulfil, username, user's full name, and password for their account.

- Answer Input Design

Fig. 3. Application Input Design

In this application, there is a quiz feature, where there is a field to input an answer from the user.

B. Interface Design

The author uses Figma to create an application interface design. Figma is a tool used to create designs and prototypes from developed applications. The prototype that creates is based on cloud and digital projects. Figma can be used to create the user interface and user experience from an application that is developed. One of Figma's best features is collaborating with other team members [10]. The following is the interface design for the application

- Home Page

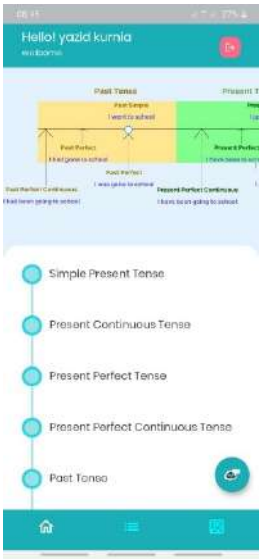

Fig. 4. Application Home Page

The home page is the main page that shows the user's name, material in the application, and other features.

- Theory Page

Fig. 5. Application Theory Page

The application shows the theory the user needs to learn on this page. The theory that shows is a fundamental theory to learning English.

- Vocabulary Page

Fig. 6. Application Vocabulary Page

This page application provides a vocabulary that users can memorize, and there is a button to check whether vocabulary has already been memorized or not yet.

- Chatbot Page

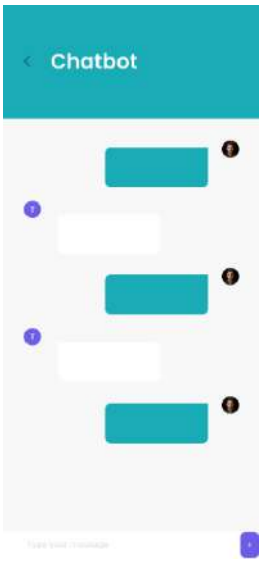

Fig. 7. Application Chatbot Page

On this page, the application provides a chat to practice English conversation. The author hopes users can grow their confidence when using the chatbot.

C. *Application Testing*

The application test uses the black box testing method. There are scenarios to test the application, and it can be seen from the following

TABLE I. . APPLICATION BLACK BOX TESTING

Scenario	Test	Function	Expected Result	Result
Theory Menu	Choose Theory Menu	Shows Theory	Theory Appears on The Page	Succeed
Vocab Menu	Choose Vocab Menu	Shows Vocab	Vocab Appears on The Page	Succeed
Chatbot Menu	Choose Chatbot Menu	Shows Chatbot	Chatbot Appears on The Page	Succeed

The black box testing indicates that the interactive English learning application is ready for students. After black box testing, the author implements this application to teach high school students English. As many as 50 high school students are using this application to learn English. The author used fifty high school students to implement this system as students who don't understand grammar, lack confidence, and have difficulty memorizing English vocabulary.

TABLE II. . APPLICATION IMPLEMENTATION

No.	Questions	Respondents			
		Very Good	Good	Not Good	Bad
1	Are the output and input displays easy to understand	26	24	0	0
2	Is theory from application easy to understand	40	8	2	0
3	Is vocabulary from the application easy to memorize	27	23	0	0
4	Is grammar theory from this application easy to learn and understand	26	24	0	0
5	Is chatbot from this application can increase self-confidence when speaking in English	27	20	3	0
Total		146	99	5	0

The result from system implementation indicates that 89.1% of high school students strongly agreed to use interactive English learning applications because they can help them to learn English from basic.

IV. CONCLUSION

Research "Interactive English Learning Application" can be concluded as follows:

- Interactive English Learning applications can be used as learning media for high school students.
- As many as 89.1% of high school students are helped in learning English.
- As many as 88.6% of high school students are helped in memorizing vocabulary.
- As many as 88% of high school students are helped in learning and understanding grammar.
- As many as 87% of high school students are helped increase their self-confidence to speak English.
- Using interactive English learning applications can detect students' progress.

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