PEECOM
EED EXTENDED ABSTRACT

2023

VOLUME 2

ELECTRICAL ENGINEERING DEPARTMENT (EED)
POLITEKNIK TUANKU SULTANAH BAHIYAH

EDITOR'S NOTE

CHIEF EDITOR

Dr. Rahimah binti Abdul Rahman

Alhamdulillah to Allah SWT for His grace and mercy. It is with great pleasure that we present the latest edition of PEECOM - EED Extended Abstract. This publication highlights the exceptional research and innovation produced by the final year students of our esteemed department. The Extended Abstracts included in this edition cover a wide range of topics, from cutting-edge technology to creative solutions for real-world problems.

We are also proud to feature the various activities that have taken place within our department over the past year. These activities include academic events, workshops, and competitions that have provided our students with valuable opportunities for personal and professional development.

We hope that this edition of PEECOM - EED Extended Abstract serves as a testament to the hard work, dedication, and creativity of our students and faculty. We believe that the research and innovation highlighted in this publication will make a significant contribution to the advancement of knowledge in their respective fields.

Thank you for your continued support, and we hope you enjoy reading this edition.

What's inside...

ABOUT PEECOM

PEECOM is the abbreviated name for Electrical Power, Electronic, Communication, and Computer Engineering. PEECOM is an annual newsletter published by the Electrical Engineering Department (EED), Politeknik Tuanku Sultanah Bahiyah.

PEECOM shares EED activities, program information, and technical articles produced by lecturers and students.

HIGHLIGHT

1 Course Information

2 Final Year Project (FYP) Extended Abstract

3 2022 EED Activities

DIRECTOR'S NOTE

TN. HAJI MOHD RUZI B. HAMZAH

DIRECTOR OF PTSB

Alhamdulillah to Allah SWT for His grace and mercy. I am delighted to present to you the Power Electrical Electronic, Communication and Computer (PEECOM) - EED Extended Abstract, which highlights the innovative and insightful projects of our talented students in the Department of Electrical Engineering.

As an institution, we are committed to providing an enriching educational experience that nurtures creativity, critical thinking, and practical skills. The extended abstracts in this publication are a testament to the dedication and hard work of our students, who have applied their knowledge and skills to solve real-world problems.

I would like to express my appreciation to the students, faculty members, and staff who have contributed to the success of this publication. It is my hope that this publication will inspire future generations of students to pursue excellence in their academic pursuits and make valuable contributions to their respective fields.

HEAD OF DEPARTMENT'S NOTE

Alhamdulillah to Allah SWT for His grace and mercy. I am pleased to introduce the latest edition of the PEECOM - EED Extended Abstract, which features the outstanding work of our final year students in the Department of Electrical Engineering (EED). This publication is a testament to the dedication and hard work of our students, as well as the guidance and mentorship of our esteemed EED members.

In this edition, you will find a diverse range of topics, from innovative IOT systems in agriculture to cutting-edge research in renewable energy. These extended abstracts provide a glimpse into the breadth and depth of the work being carried out by our students, and serve as a testament to the quality of education and training that our department provides.

I would like to extend my heartfelt congratulations to all the students who have contributed to this publication. Your hard work and dedication have paid off in producing innovative and impactful research that has the potential to shape the future of our industry.

I would also like to express my gratitude to the lecturers who have supported and guided our students throughout their academic journey. Your unwavering commitment to education and research has inspired our students to achieve great heights of excellence.

I hope that this publication will serve as a source of inspiration and motivation for all of our readers, and that it will continue to highlight the incredible work being done by our students and EED members.

PN IDA SAFINAR BT AZIZ
Head of EED Department

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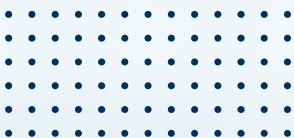Akma Binti Che Ishak
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EDITOR: EED ACTIVITIES

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ELECTRICAL ENGINEERING DEPARTMENT

COURSE INFORMATION

Electrical Engineering Department (EED) is the of the academic departments in Politeknik Tuanku Sultanah Bahiyah (PTSB). It offers an engineering program in electrical and electronics field for diploma level.

EED offers quality efficient education and professional services through a broad-based knowledge within the field of electrical and electronic engineering. The aim is to produce graduates with potential, competent and competitive as well as highly skilled. In order to achieve commendable work, EED is comprised of dedicated professional trainers, with sufficient infrastructure.

EED

PROGRAMS OFFERED

1 Diploma in Electrical Engineering (DET)

2 Diploma in Electronic (Communication) Engineering (DEP)

3 Diploma in Electronic (Computer) Engineering (DTK)

4 Diploma in Electrical and Electronic Engineering (DEE)

PROGRAM SYNOPSIS

DIPLOMA IN ELECTRONIC ENGINEERING (COMPUTER)

The Diploma in Electronic Engineering (Computer) covers the broad discipline of electronics engineering, with specialization in computer technology, which includes electrical and electronic fundamentals, computer fundamentals and programming, semiconductor devices and computer aided design while emphasizing the area of specialization. The specialization courses include microprocessor fundamental, computer architecture and organization, database system, operating system, internet based controller, computer diagnosis and maintenance, CMOS IC design and fabrication and project.

DIPLOMA IN ELECTRICAL ENGINEERING

The Diploma in Electrical Engineering programme covers the broad discipline of electrical engineering which includes electrical and electronic principles, computer fundamental and programming, computeraided design, semiconductor devices, wiring installation, power system, electrical machine and programmable logic controller. The green technology elements are also incorporated in the curriculum to provide awareness toward the importance of the sustainable energy.

DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING

The Diploma in Electrical and Electronic Engineering programme is designed to cover the broad discipline of electrical and electronic engineering which includes electrical and electronic principles, computer fundamental and programming, computer aided design, semiconductor devices, communication systems, wiring installation, power system, electrical machine and programmable logic controller. The green technology elements are also incorporate in the curriculum to provide awareness towards the importance of sustainable energy

DIPLOMA IN ELECTRONIC ENGINEERING (COMMUNICATION)

The Diploma in Electronic Engineering (Communication) covers broad discipline of electronics engineering, with specialization in communication technology which includes, electrical and electronic fundamentals, computer fundamentals and programming, communication system fundamentals, semiconductor devices, and computer aided design, while emphasizing the area of specialization. The specialization courses include telecommunication network, fibre optic communication system, data communication and networking, wireless communication and microwave devices.

JOB PROSPECT

This programmed provides the knowledges and skills in electrical engineering that can be applied in the broad range of careers in electrical field. The knowledge and skills that the students acquire from the programmed will enable them to participate in the job market as:

DET

Technical Assistant /Specialist
Technical Designer
Production Technician
Self Employed/ Entrepreneur
Electric/Electronic Technician
Assistant Engineer
Electrical/Electronic
Engineering Supervisor
Process Control Technician

DEE

Technical Assistant /Technical Specialist
Self Employed/ Entrepreneur
Production Technician
Network Planner
Electric/Electronic Technician
Assistant Engineer Electrical/Electronic
Engineering Supervisor
Technical Designer
Assistant Network Engineer

DEP

Technical Assistant/ Technical Specialist
Self Employed/ Entrepreneur
Production Technician
RF Engineer Assistant
Network Planner
Electric/Electronic Technician
Assistant Engineer Electrical/Electronic
Engineering Supervisor
Computer Service Technician
Technical Designer
Assistant Network Engineer

DTK

Technical Assistant / Technical Specialist
Self Employed/ Entrepreneur
Programmer/Developer
Production Technician
Network Planner
Electric/Electronic Technician
Assistant Engineer Electrical/Electronic
Engineering Supervisor
Computer Service Technician
Technical Designer Assistant Network
Engineer

2022

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WATER QUALITY MONITORING SYSTEM USING IoT IN AQUARIUM

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Abstract – A project using IoT is a management system to control water quality control in an aquarium. The project was designed as manual cleaning, and maintaining water in an aquarium must be inconvenient for the aquatic breeders. A water filter, as well as a water pump system, will be employed. A pH level sensor and a water sensor will also be employed. Aquatic breeders can save on electricity bills by running the water pump. This project uses the ESP32, which has Bluetooth and Wi-Fi capabilities.

Keywords: ESP 32, Water Quality, pH level, Internet of Things.

INTRODUCTION

Using IoT to manage water quality in an aquarium is a profitable and acceptable approach. The purpose of this project is to deliver a better cleaning experience as well as water quality maintenance. Conventional cleaning methods, such as changing the water every two weeks, require manual energy and time. In addition, users can reduce high water or electricity bills. An ESP32, a pH water sensor, and a water sensor are among the components of this project. [1]

METHODOLOGY

Aquarium water quality has three elements to investigate: input, microprocessor, and output. Two sensors were applied for the input part: sensor PH and water levels. The output components are the LCD, relay, and water pump. The ESP32 is the microcontroller which will control the project system, including the IoT.
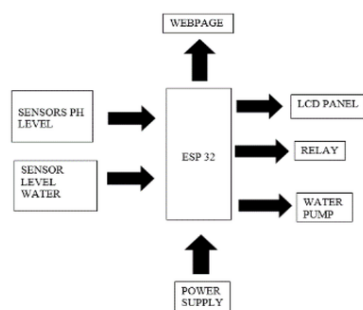
Figure 1: Concept of System Diagram

RESULTS AND DISCUSSION

With this aquarium water quality system utilising IoT, the aquatic breeders may utilise the systems to monitor the water quality in their aquarium daily, monthly, or yearly to keep the fish safe in the water. This solution also significantly simplifies the task of users, particularly those who want a simple method to monitor the water quality without consuming much energy.
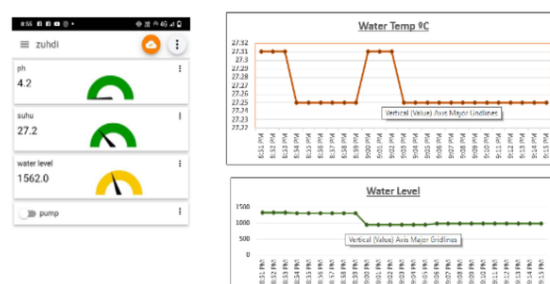
Figure 2: The Result Analysis for MQTT, Temperature Sensor and Water Level Sensor in a day

CONCLUSION

Finally, the water quality monitoring system can read an aquarium's water temperature and pH levels. The project can assist aquatic breeders in resolving the issue of water quality control in an aquarium.

ACKNOWLEDGEMENTS

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UPGRADABLE AND INNOVATIVE BIOLOID PREMIUM

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Abstract – This project is about upgrading the current humanoid robot that is Bioloid Premium. This robot can be controlled using the default controller, CM-530; thus, its movement is limited. Therefore, the problem needed a modern solution by inserting a webcam and microcomputer for the robot to analyze the surrounding area. Raspberry Pi 4+ was used to send and collect data and feedback to the controller and webcam. Supply of 12V and 5A were used to power up the robot.

Keywords: Raspberry Pi 4, Bioloid Premium, CAM

INTRODUCTION

Bioloid Premium was one of the coolest humanoid robots made by ROBOTIS [1]. This robot could walk, be customizable, and be built into various types of robots through a versatile expansion mechanism [2]. However, the robot was built with limited technology; thus, small changes are needed, such as adding a camera, microcomputer, long-lasting battery, etcetera. Raspberry Pi 4+ was used to send and collect data and feedback to the controller and webcam [3]. With new technologies that will be added up, this robot can be created into a low-end AI robot that can be helpful for education and competition. OpenCV was needed to help the robot to analyze the surrounding area so it could transmit and receive data from the robot. With the help of OpenCV, this robot can determine different data and help the robot to walk, avoid obstacles, climb stairs, etcetera. Py serial library and a serial connection were used for sending data between the microcomputer and controller.

METHODOLOGY

Raspberry PI 4 was used for receiving and transmitting data from the webcam and CM-530 controller. Moreover, this robot only has one input and output, which can be added more for future development. Webcam is the input, and the servos as the output for moving the robot.

RESULTS AND DISCUSSION

Table 1 shows how the project uses different colours to run different movements. If the camera detects red colour, the robot will perform a pushup. While blue colour, the result will be a handstand movement. Finally, green colour the robot will bow. With this data that had been received, the conclusion is that this project was working perfectly, and each colour has a different value from the others.

Table 1: Serial Data Value

WEBCAM	SERVOS	SERIAL DATA
RED COLOUR	PUSH UP	\xFF\x55\x14\xEB\x00\Xff
BLUE COLOUR	HANDSTAND	\xFF\x55\x18\xE7\x00\xFF
GREEN COLOUR	BOW	\xFF\x55\x28\xD7\x00\xFF

CONCLUSIONS

This project can help the students learn how robots are made and what is needed to create a humanoid robot. Other than education, this robot was helpful for competition and innovation. In conclusion, this robot can be helpful for the future generation in education.

ACKNOWLEDGEMENTS

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[3]   What is a Raspberry Pi? (2012). Opensource.com. https://opensource.com/resources/raspberry-pi

TROLLEY (ROBOT) LINE FOLLOWER

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Abstract - This project is based on observations and aims to improve the current manual system, which involves using grocery trolleys. The goal of this project is to create a device that can push a trolley and can be used in households or industries. Furthermore, this project has several research objectives, such as designing the trolley's ability to detect whether it should operate autonomously based on a dark line on a white background or a white line on a dark background. All of these goals are intended to address some of the issues associated with conventional methods, such as the high energy required to push a heavy trolley and the difficulty in controlling its movement.

Keyword: trolley line follower

INTRODUCTION

The main aim of this project is to design a self-moving trolley that can assist senior citizens and disabled individuals who may have difficulty pushing or lifting objects Additionally, this trolley will also assist workers in lifting products in industries.

METHODOLOGY

The Arduino Nano is used as the main controller in this project. It controls the full circuit in various ways. Additionally, an infrared sensor is used to detect the line. To make the tires and the trolley move, two DC motors must be connected with a motor driver and the main controller. [1]

RESULTS AND DISCUSSION

Figure 1 shows the prototype of a trolley (robot) that follows a line. The operation of this project starts with the infrared sensors detecting the black line and sending the data to the Arduino Nano. Next, the Arduino Nano will give an order to the motor driver, and the DC motor will move accordingly. The same concept applies to the ultrasonic sensor, which will make the DC motor stop moving when it detects an object in front of the trolley.

Figure 1: Trolley following line

CONCLUSIONS

When the infrared sensor detects a black line, the trolley will start moving. Similarly, the trolley will stop moving when the ultrasonic sensor detects any object in front of it

ACKNOWLEDGEMENTS

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TRAFFIC LIGHT POWERED BY SOLAR SYSTEM

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Abstract – A project was conducted to use sunlight to power up traffic lights to save electricity costs. The system uses solar power, which is very useful nowadays. A user can manage power consumption by knowing daily energy consumption. If there is no electrical energy source from the solar panel, the electrical power connection from a 9V battery can be routed to support the traffic lights.

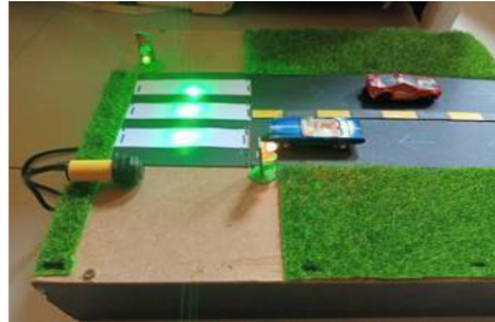***Keywords***: ***Traffic Light Power Solar Systems, Renewable sources, Energy***

INTRODUCTION

Solar energy technology, which harnesses the sun's energy to generate electrical power, is one of the fastest-growing renewable energy sources today. The use of solar energy is increasing as people are more aware of the environmental impact of producing electrical power using non-renewable sources and lack knowledge about how to save electricity. The traffic light uses only solar energy. In addition, using solar energy removes the hassle of calculating electricity consumption. The project also looks at the effectiveness of the systematic traffic system that facilitates the movement of vehicles and pedestrians. [1]

METHODOLOGY

This project used Arduino Nano to be the main controller. The project had three inputs and five outputs. The input was a solar panel, battery and E18-D80NK sensor, while the output was a buzzer, LED, timer, traffic light module and servo motor.

RESULTS AND DISCUSSION

When the sensor detects movement, the pedestrian light will turn green, and the streetlight will also turn green. In addition, road barriers will be lowered to prevent cars from passing through. Figure 1 shows the project result and data analysis.

Figure 1: Project prototype

CONCLUSION

The idea to create this project arose when the widespread wastage of electricity hit Malaysians without us realising it [2]. Our proposed traffic system will be more suitable for all cities to protect and save the environment and the people.

ACKNOWLEDGEMENTS

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SOIL MOISTURE MONITORING AND WATERING CONTROL OF AQUAPONIC PLANTS USING THE MQTT PROTOCOL

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Abstract – Project soil moisture monitoring and watering control of aquaponic plants using the MQTT protocol is one of the projects that can monitor the condition of the soil if it is wet or dry and can control the watering rate of plants. The main component of this project is ESP32 because ESP32 has WIFI and Bluetooth access. Next, this project uses a soil moisture sensor to detect the condition of the soil moisture, if it is dry or moist. This information will be sent to the ESP32 as a microcontroller, then to the MQTT application system and then to the smartphone.

Keywords: ESP32, MQTT, Soil moisture sensor

INTRODUCTION

As of now, we know the importance of Irrigation in the agricultural sector. So, to provide better Irrigation to
every farmer, we should ensure that the management of water all over the country for this purpose is used in a proper manner [1]. Likewise, this project starts with the care of planting plants, where they do plant care as usual, which is not using advanced technology to plant plants. A Message Queue Telemetry Transport protocol is used for transmitting and receiving sensor information. Depending on the status of soil moisture content, ESP32 controls a water pump action and displays the soil moisture sensor data and water pump status on a web page or mobile application [2]. With this method, they will be given information about the condition of the soil if the soil is dry or moist, and they can also control the watering rate of their plants by using a smartphone through the MQTT application [3]. Therefore, this project can help those with plants and make it easier to manage the plants.

METHODOLOGY

ESP 32 has been used in this project as the main controller. It has controlled the entire circuit in many ways. Also, there is one input and three outputs in this project. The soil moisture sensor is the input in this project, and the output is LCD, relay, and water pump.

RESULTS AND DISCUSSION

Table 1 shows the soil condition value. For normal soil conditions, if the soil moisture sensor detects a value of more than 1500, then the soil condition is moist. The soil condition is dry if it is less than that value. For the condition of fertilizer soil, if the soil moisture sensor detects a value of more than 1000, then the value of the soil condition is moist. If it is less than that value, then the condition of the soil is dry.

Table 1: Soil Condition Value

Type of Soil	Dry	Moist
Normal soil	800 - 1400	1600 - 2000
Fertilizer soil	400 - 600	1200 - 1900

CONCLUSIONS

The conclusion for the entire project this time is that this project has also positively impacted users because this project functions as a monitoring of soil moisture and control of watering by using the MQTT protocol. Finally, this project can also solve the problem that users often experience to water trees at the right time.

ACKNOWLEDGEMENTS

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SOLAR TRACKER WITH UPS SYSTEM FOR FACTORY AND CLINIC EMERGENCY SUPPLIES

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Abstract *– This paper presents a study on a UPS system for emergency supplies in factories and clinics that utilizes solar energy and incorporates a solar tracking system. The growing demand for electricity and the need to reduce carbon emissions in the atmosphere have led to the rapid development of both solar energy and UPS technology. The main advantage of this system is that the UPS can invert and rectify the solar power for delivery to the DC part of the system, which eliminates the need for excessive inverters. The solar tracker is also employed to optimize the energy output of the system, thus increasing power generation efficiency.*

Keywords: Arduino Nano, UPS, LDR Sensor, Solar Tracker

INTRODUCTION

Solar and wind energy are the two most abundant useful sources of renewable energy that are available on the Earth. However, the inconsistent availability of solar power, however, has a negative impact on the efficiency and reliability of the power system. To eliminate this a problem, a power electronic converter and a solar tracking system are installed and can be used to interface the photovoltaic (PV). The aim of this project is to design a UPS system to meet the electricity needs of clinics or factories in the event of a power outage. The project aims to provide reliable electricity supply to these facilities.

METHODOLOGY

In this project, the main controller used is Arduino Nano which has controlled the entire circuit in various ways. There are four inputs and three outputs incorporated in this project. The inputs are the Solar Panel, Sensor LDR module, Battery, and inverter, while the outputs are LED lamp, Relay MK3P, and servo motor SG90 [1].

RESULTS AND DISCUSSION

Table 1 depicts the time vs percentage battery. The sensor can read and detect the light of the lamp to produce energy. The power supply used is 5V. The solar output power is 2W, the output voltage is 12V, and the output current is 167mA. For the connection of the servomotor, the red wire is connected to VIN/5V, while the brown wire is connected to GND, and the orange wire is connected to D9/D7. The LDR sensor is connected to the 5V. The sensor LDR module connects the wire to pin A1 and pin A3. The movement of the solar panel depends on the sensor that detects the light

above and below. When the sensor detects the light, the servomotor starts moving 180 degrees. The solar panel can be charged from 8.00 a.m. to 8.00 p.m. When the battery is fully charged, the UPS system can operate fully.

Table 1: The table shows the time vs percentage battery

Time (Hours)	Lamp	Battery percentage
1 HOURS	Lit up brightly	100%
2 HOURS.	Lit up brightly	90%
3 HOURS	Lit up brightly	80%
4 HOURS	Lit up brightly	70%
5 HOURS	Lit up	60%
6 HOURS	Lit up	50%
7 HOURS.	Lit up	40%
8 HOURS	Dimly lit	30%
9 HOURS	Dimly lit	20%
10 HOURS	Dimly lit	10%
11 HOURS.	Not lit	0%
12 HOURS	Not lit	0%

CONCLUSIONS

This project aims to generate electricity during sudden power outages, particularly at night. Additionally, it can help save costs as it uses solar panels to convert sunlight into electric current, eliminating the need for gasoline or diesel oil.

ACKNOWLEDGEMENTS

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AUTOMATIC MAILBOX DETECT WITH IOT SYSTEM

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Abstract – Automatic Mailbox Detect with IOT system is designed to overcome the absentmindedness of a person. Users will be notified of the incoming mail via mobile phones. ESP 32 connects the sensors and the LCD. Sensors are used to detect the presence of the mail. The sensors will detect the received mail, and sign the ESP 32 to notify the user via TELEGRAM application. In conclusion, the sophistication of this Automatic Mailbox Detect is that it can help many people, communities and countries in the process of sending and receiving the mail. The mailbox is equipped with a keypad for mailbox security. The proposed improvement of this project is to use quality components to avoid the discontinuity of the mail receiving process.
Keyword: ESP32 and LCD

INTRODUCTION

The objective of this project is to develop and verify the effectiveness of a problem solving project. Automatic Mailbox Detect with IOT system is a hardware system that operates using ESP 32, IOT system and Infra Module Sensor that will notify the user when a mail is received in the mailbox. When a mail crosses the infrared sensor alignment, it will send a trigger to ESP 32. It operates by notifying the user with a short message. This project is very useful because the system uses an IOT system [1].

METHODOLOGY

Automatic Mailbox Detect with IOT Notification System is a box that will notify the user when a mail is received using the tracking devices. This project comprises several important components namely an IR sensor that detects the passing objects, a keypad to access the mailbox door for security purposes and two LED lights. The IOT concept applied in this project is; when the mailbox receives mail, a signal will be sent to the user's smartphone to notify that the mailbox is activated.

RESULTS AND DISCUSSION

Figure 1 shows the output generated by the IR sensor when detecting a crossing mail. When the sensor detects the mail, a message will be sent to ESP 32, where then a message will be sent to Telegram. A notification will be sent to the user when a mail is received in the mailbox. The mailbox is also equipped with a keyboard to access the mailbox door for security purposes with two LED lights. The green light indicates that the mails received is less than 5, while the red light indicates that the mails received is more than 5.

Figure 1: Output in Telegram application

CONCLUSIONS

In conclusion, Automatic Mailbox Detect with IOT will help the users in reducing the loss of important parcels or mails. The presence of sensors in the Automatic Mailbox will help users to be more aware with the bill or mails received.

ACKNOWLEDGEMENTS

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AUTOMATIC HAND SANITIZER WITH TEMPERATURE SCANNER

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Abstract *–* The COVID pandemic has affected human life in various sectors. Many efforts have been made to reduce virus transmission through work from home, social incarceration and even include hand hygiene and body temperature scanning. So far, most of the hand sanitizers available do not operate automatically. This article aims to create an automatic hand cleaner where sanitize liquid dispense automatically and scans body temperature. The electronic part was the Arduino Nano, MLX90614 (Temperature scanner), infrared sensor, relay and water pump. A 7.4V battery is used as the power source for the temperature scanner and 9V battery is used for pumping the sanitizer. If MLX90614 detects body temperature and the body temperature is less or equal to 36 C, the relay will activate and IR for sanitizer will automatically scan and the pump will pump out the sanitizer. The whole process for this project was controlled by Arduino Nano.

Keyword: Arduino Nano,MLX90614(Temperature Scanner), Infrared Sensor

INTRODUCTION

To invent an automatic hand sanitizer with a temperature scanner that makes many people safe and able to know their body temperature immediately. [1]

METHODOLOGY

Arduino Nano has been used in this project as a main controller. It controls the full circuit in various ways. Moreover, PCB board has been used to overcome the lack of power supply in Arduino Nano. Then, these connections were merged with the MLX90614 and IR sensor to run the LED and the pump to pump the sanitizer out.[2]

RESULTS AND DISCUSSION

MLX90614 and IR sensor was a major part of this project. Once MLX90614 detects the body temperature and the temperature is less or equal to 36, the relay will activate and IR for sanitizer can automatically scan the hand and the pump will pump out the sanitizer. If the hand was not removed, the sanitizer will keep flowing out.
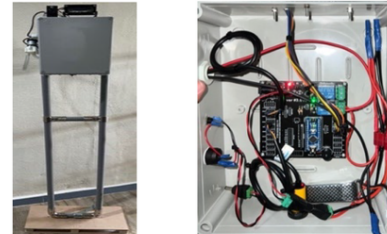
Figure 1: Prototype Layout

Figure 1 shows the complete automatic hand sanitizer with the temperature scanner. When the temperature scanner detects the body temperature, the relay and water pump will be activated to pump the hand sanitizer out. The operation of whole project is shown in Table 1.

Table 1: The results of body temperature and hand sanitizer

BODY	LCD	CELCIUS	HAND	PUMP
DETECT	ON	< = 36 C	DETECT	ON
	ON	> = 37 C	NOT DETECT	OFF
NOT DETECT	OFF	OFF	NOT DETECT	OFF

CONCLUSIONS

The sensor will detect body temperature and detect the hand to pump the sanitizer based on coding that is set in the program.

ACKNOWLEDGEMENTS

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AUTOMATED SMART GARDEN USING ARDUINO NANO

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Abstract – The mission of this project is to ease the people's routine for watering plants. This project uses Microcontroller Arduino Nano as its main controller to control the whole circuit through the program given. 5VDC is supplied to the Arduino to control the Ultrasonic sensor, Soil Moisture sensor LCD display and others. The maximum resistance value of soil for the plant to be watered is 750. The information of water tank level and soil moisture value will be displayed on the LCD display.

INTRODUCTION

A smart garden that calculates the amount of moisture present in soil which will control the water input for the plant [1]. This project will help care for the plant with ease and efficiently for people who are busy with daily tasks.

METHODOLOGY

The main controller in this project is an Arduino Nano. The main controller receives a 5 VDC supply voltage to control the entire circuit, which includes an ultrasonic sensor to measure the water tank level, a soil moisture sensor to detect soil moisturization, and an LCD display to show the soil resistance reading. [2].

RESULTS AND DISCUSSION

In detecting the soil behavior, the value of the soil moisturization is very important in this watering plant system. The system will water the plant if the required value is fulfilled. A soil that is in dry condition will make the soil resistance value increase. Based on Figure 1, the resistance value shown is 765 which means the soil is dry. If the resistance value reaches 750 and above. The water pump will be activated to water the plant.

Figure 1: Soil value in dry condition is 765

When there is presence of water in the soil, the resistance value of soil will decrease to 369 as shown in Figure 2 because electricity flows well from the Soil Moisture sensor.

Figure 2: Soil value after watered

CONCLUSIONS

The minimum resistance value for the plant to be watered is 750. If the value is 749 or less, it means the soil is in good condition which means it has got enough water.

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AUTOMATED LITTER BOX FOR CAT

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Abstract - The concept behind this project is to observe everyday life. The cat litter box is one of the products that has piqued our interest; this product has produced various types of cat litter boxes with varying characteristics. However, we discovered that there are some issues with manually used cat litter boxes, such as cat owners not having enough time to remove faces because they are busy working, faeces removal being inefficient, and cat safety during the cleaning process for automatic cat litter boxes being quite dangerous. As a result, this project is an automatic cat excrement collection station, with an infrared sensor detecting the cat's movement into the excrement disposal area. The Blynk app will then notify the cat owner's smartphone.

Keywords : Blynk app, DC electric motor r, buzzer

INTRODUCTION

Caring for a cat's litter box can be a constant concern for cat owners. Unfortunately, many cat owners are busy and do not always have time to remove cat feces or change the litter. Currently, the process for disposing of cat waste is manual and requires human effort. This can be time-consuming, with the process of cleaning the litter taking up to half an hour and involving multiple steps. To address these challenges, this project utilizes an ESP32, which can function as a complete stand-alone system and automate the litter box cleaning process

METHODOLOGY

The sensor in this project is used to detect the movement of the cat. Specifically, the IR sensor will detect when a cat enters the litter box. Once the cat is detected, the DC gear motor will rotate to turn the litter. Additionally, an alarm will sound to signal that the process of removing the cat's excrement has been completed.

RESULT AND DISCUSSIONS

According to Figure 1, the infrared sensor detects cat movement in and out of the litter box. After the cat finishes defecating, the DC electric motor, equipped with a brush, rotates to move the feces into the designated area. This action triggers the buzzer and the LED, signaling that the process of removing the feces is complete.

The Blynk app will also notify you that a "CLEANING CAT CASE IN PROGRESS" is currently under way.
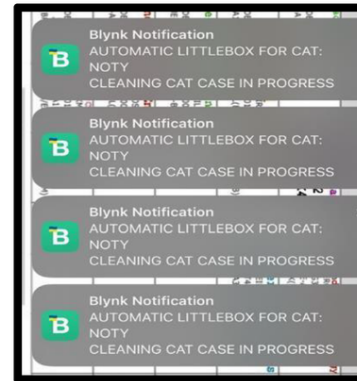
Figure 1: Blynk Application give a notification

CONCLUSION

The main objective of this project is to automate the disposal of cat waste, while also supporting Bluetooth and Wi-Fi. This makes it easier for cat owners to implement this technology and increases the efficiency of their time. To ensure proper disposal of cat feces, the motor gears are carefully rotated, promoting clean ventilation and eliminating odors. As a result, both cat owners and the surrounding community can benefit from this technology

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ATTENDANCE MONITORING SYSTEM USING FINGERPRINT

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Abstract – The purpose of this project is to overcome the student attendance automatically. Based on the results of the analysis data collected, this prototype is much needed in the market. This project is using IFTTT application as connector prototype to google spread sheet meanwhile the prototype is using LED, buzzer and LCD as end-node. In addition, a wireless identification system based on fingerprint detectors provide a lot of benefit because it provides an accurate identification.

Keywords –*Attendance, fingerprint, ESP32.*

INTRODUCTION

It was created to overcome problems in recording attendance especially at the office. Besides, the project will give the office advantage as it facilitates the recording of attendance. In addition, this project can make the presence system more systematic and organized.

METHODOLOGY

ESP32 will receive the data and send it to cloud. ESP32 as microcontroller will control other component as instructed as code given. The fingerprint sensor is used as input in this project. It's will detect fingerprint user. The data from fingerprint will sent to cloud through ESP32[1-2].

RESULTS AND DISCUSSION

The red LED will blink if the Wifi connection is not connected and the orange LED will blink when the Wifi connection is succesfully connected as shown in Figure 1. After the wifi is connected the user can put the finger on fingerprint sensor. If the fingerprint is valid the LCD will display ID number such as "16DTK19F1053" as shown in Figure 2. The buzzer and LED green also switch on in 3 seconds. If the connection is failed, the prototype still can verify the user data but cannot store the data in google spreadsheet because no connection. The LCD also will display the "Connection Failed" and the buzzer also will switch on in 1 second.

Figure 1: The different LED will blinking according the process sequences.

Figure 2: The data attendance display

CONCLUSIONS

The benefit from the project will reduce wastage of papers. In addition, time for the attendance marking is reduced much than the traditional attendance marking system. Lastly, the attendance system can operate with systematic and orderly with this system.

ACKNOWLEDGEMENTS

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ATTENDANCE MANAGEMENT SYSTEM (ATTENDAR)

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Abstract – The development of software technology is very rapid at present, especially in the field of software engineering. This paper focuses on a Polytechnic Student Grading System. Most importantly, the front end of the Grading System is completely developed in Android Studio IDE. This Grading system is developed using Java Programming Language. This Grading System uses Google Firebase Database to store the Data (Grades, Student Data and Lecturer Data). This is a multi-user Student Grading System where the user can login as Lecturer and Student. The Administrator rights for the Lecturer's and The User rights for the students. This Grading System is designed to help school, college, and university students to better get track of them continues assessment grades and lab grades using the developed application. Beside that this project will also help lecturers to keep their student's grades in a systematical view without losing any data.
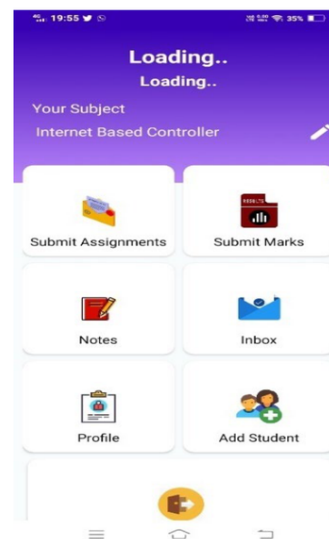
Keywords - Grading System, Android IDE, Application.

Figure 1: Teacher Panel

INTRODUCTION

This application allows the Administrator (Lecturer) to login, submit assignments to students and View and Add Student Grades manually. The total marks of each student and the eligibility of the student is automatically calculated when the marks are given as the input. The Lecturer is supposed to key in the marks for the Assessment (Quiz, Test, Practical Test and Final Exam) when they are adding a new student. [1]

METHODOLOGY

Android Studio is used to develop console and graphical user interface of this application. Android Studio is a strong code editor and developer tools, includes additional capabilities that improve efficiency when developing android apps. Google Firebase is used in this project as the online database of this application. Google Firebase is a Google-backed app development platform that allows developers to create apps for iOS, Android, and the web. [2]

RESULT AND DISCUSSION

Figure 1 shows the teacher panel of Polytechnic Student Grading Android Application (PTSB MOODLE). This application capable the lecturer to manage the student assignment automatically in well manner without losing any data.

CONCLUSION

This Polytechnic Student Grading Android Application is developed to make the Lecturer's Teaching life and Students Educational Life easier and simpler. The world is evolving digitally into Smartphones, and Internet. Lecturer can assign all kind of Assignments while student can submit the assignments assigned by the lecturer digitally. This means we are also going eco-friendly. It is fully paperless.

ACKNOWLEDGEMENT

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GSM BASED CALLING AND SMS ALERT FIRE ALARM SYSTEM

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Abstract – Among many disasters, fires have become the most recurring, destructive and impact disaster compared with other disasters. The purpose of the project is for house safety, with the focus on avoiding fire accidents among residents and properties in the house. Therefore, it is particularly important to install intelligent fire alarm systems in buildings, especially in buildings with more people or more valuables. Through this system, it can help users improve their safety standards and protect their property from disasters.

Keywords: house safety, intelligent fire alarm system

INTRODUCTION

This project is a fire alarm with a call and send SMS system. This project will use a flame sensor to sense the flame of a certain environment. Once the flame is detected within the detection range, the buzzer will be triggered to sound an alarm, and the LED will continue to flash. It will also send information via GSM and dial the contact's mobile phone number as a notification signal.

METHODOLOGY

The circuit connection of the project is to use a 12V, 2A adapter to pass the circuit of the whole board. Then connect the buzzer to pin D4 of Aduino nano, and connect the LED to pin D8. Also, connect the flame sensor to pin A1, and finally connect the Tx and Rx of the GSM module to D9 and D10. After that use the program to make the project work.

RESULTS AND DISCUSSION

One sensor is used in this research; the flame sensor. In order to test the fire alarm in different places and situations, a lighter is used to simulate the fire to facilitate the research of the project. As Figure 1 shows, the fire alarm will only sound an alarm and turn on a red light when a fire occurs, if the fire alarm system does not detect the source of the fire it will just remain in its original state.

Figure 1: The difference in results between detected fire and undetected fire
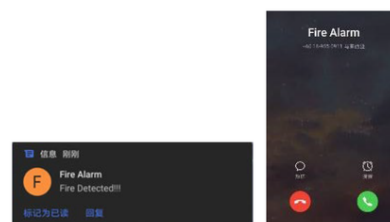
Figure 2: Result of communication via GSM module when a fire is detected

Figure 2 shows the result of sending a text message to the owner through the GSM (Global System for Mobile Communications) module after detecting the fire source, and the result of making a call.

CONCLUSION

GSM is a technology that can use coding commands to automatically transmit information. Especially for fire alarm systems, with this system, people can be more at ease so that users can prevent any serious damage.

ACKNOWLEDGEMENT

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SOLAR ULTRASONIC GRASS MOWER

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Abstract – This paper presents the Solar Ultrasonic Grass Mower for cutting grass in large areas automatically to reduce the risk of injury during the process. The use of ESP32 as an IOT element in this innovation, helps the user to control the mower from a distance through the smartphone by using Blynk apps. It fully operates using electricity from the battery with a capacity of 12V and can be rechargeable from the solar panels on top of the mower. The ultrasonic sensor is used to detect the obstacles or objects near the mower track to automatically avoid it and send the notification to the user 's smartphone on Blynk apps.

Keywords –Solar, ultrasonic, mower, IoT, ESP32.

INTRODUCTION

A grass mower is a tool or machine for cutting grass on flat areas such as school fields, residential areas, etc. Most mowers have been used, using fuel that can pollute the air and affect human health. Thus this Solar Ultrasonic Grass Mower was developed to replace the conventional mower that is more environmental and user friendly. In addition to solar panels in the project, it plays a significant role in generating electricity from the sunshine as it is a renewable energy source and reduces carbon emissions. By using the Internet Of Thing (IOT) elements and ESP32 as microcontroller the system can be control through a smartphone in Blynk apps such to 'ON' and 'OFF' the mower cutting knife, the direction and display the obstacles that was detected by the ultrasonic sensor.

METHODOLOGY

This project system uses a 5V DC usb power supply connected to the solar panel controller to turn on the ESP32 and the entire circuit. The ultrasonic sensor is implemented to detect the obstacles in front and send the notification to Blynk apps in the user 's smartphone. While, the microcontroller will change the direction of mower to other direction or reverse to other path which is clear from the hindrance.
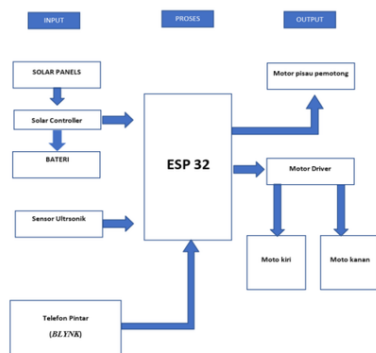

Figure 1: Project Block Diagram

RESULTS AND DISCUSSION

This project prototype comes with two 12V DC motors with 66RPM and a pair of heavy duty tires and a pair of swivel tires as the moving element. While another 3000RPM motor is for rotation of the cutting blade to perform the mower job. A solar panel is equipped on top of the mower with a lithium battery to act as an energy source.

Figure 2: Prototype/Model Project (a) Front View (b) Side View (c) Back View
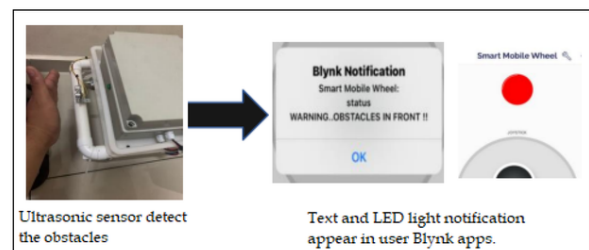
Figure 3: Notification in Blynk Apps

The project was tested by connecting Wifi to ESP32 and connect to the Blynk apps as remote control. There are four direction that can be control which is forward, backward, to the left and right. During the cutting process, ultrasonic sensor will detect the obstacles within 7cm and automatically send the notification in form of text and LED light directly to the smartphone user on Blynk apps as figure 2 below. Not just the user got the notification, the mower itself will reverse and avoid the crash.

CONCLUSIONS

Overall, this project achieved its objectives to facilitate manpower to perform the grass cutting task without using so much energy compares to manual mower. In the same time, the injury risk can be avoided during the handling.

ACKNOWLEDGEMENTS

The authors would like to thank everyone who involved directly or indirectly in this project development.

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SMART FARM MONITORING SYSTEM

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Abstract – Smart Farm Monitoring System is one of the IOT projects equipped with various sensors aimed at upgrading the agricultural system more effectively that can facilitate agricultural work. The system is equipped with temperature sensors, soil moisture detector sensors, safety cameras and rain sensors to facilitate the maintenance of crops in the greenhouse. Watering system also operates automatically depending on the temperature and humidity level of the soil. The water is also equipped with sensors to ensure that the water level is always in good condition and the watering process can be done according to the set time setting. In addition, the project also uses solar panels for energy sources and uses ESP32 microcontrollers and Blynk apps for data

Keywords: IOT, ESP32, Blynk Apps, Temperature Sensors, Soil Moisture Detector Sensors, Safety cameras, Rain Sensor

INTRODUCTION

Smart Farm Monitoring System is one of the projects developed in line with the government's goal to build Smart City based on Green Technology. This system was developed to make it easier for the community to better manage their cultivation system without interfering with their daily work even nowhere. Therefore, the IOT concept project in tandem with the 4.0 revolution can help the community to manage their crops more systematically for everyday use or to generate additional income.

METHODOLOGY

ESP 32 has been used in this project as a main controller. It has controlled the full circuit in the various ways. Moreover, there is a six input and six output in this project. Temperature sensor, Soil Moisture Detector Sensor, Rain Sensor, Solar Panel, Ultrasonic Sensor, and Safety Camera are the input in this project and the output are water pump, LCD, fan, video and Blynk App.

RESULTS AND DISCUSSION

Table 1 shows the analysis of the data made for this project according to the function of the sensors used. Ultrasonic sensors are used to ensure that the water level is in good condition with three indicators used as warning signs i.e., high, medium, and low water levels. This warning indicator is also displayed using Blynk Apps which we can monitor via mobile phone or computer/laptop. As for the rain sensors, when rain is detected, the green LED will be ignited. While for the soil moisture detector, when the humidity decreases,

ESP 32 will give the water pump command to water. Meanwhile, temperature detector, on the other hand, will activate the fan if the temperature exceeds 32 degrees Celsius. All displays of this data can be viewed in the LCD and Blynk applied

Table 1: Summary Function of Sensors

SENSOR	INSTRUCTION	RESPONSE
Ultrasonic Sensor	Distance<=10	LED Green ON (Water level high)
	Distance>=11 & Distance<=2	LED Yellow ON (Water level high)
	Distance>=21	LED Red ON (Water level high)
Rain Sensor	Rain detected	LED Rain Indicator LIT
Soil moisture detector sensor	Reduced humidity	Water pump turned ON The indicator LED will be LIT
Temperature Sensor	Temperature > 32°C	Cooling fan turned ON The indicator LED will be LIT

CONCLUSIONS

In conclusion, Smart Farm Monitoring System was developed to facilitate various plantation matters especially to those who are busy and always outside the area. In addition, as the world evolves today, the use of borderless networks such as the internet should be used to facilitate daily affairs. The project is part of the use of the Internet of Think (IOT) which is used to display data such as temperature, water level in the tank, percentage of soil moisture, security camera and rain detector. In addition, this system will ensure that the scheduled watering of trees is carried out according to the data obtained by each available sensor. The system also features green technology because it uses solar energy as an energy source and ESP32 as its microcontroller.

ACKNOWLEDGEMENTS

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EMERGENCY TRAFFIC LIGHTS

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Abstract − The aim of this study was to design a smart traffic light system for emergency purposes. The goal of this study is to facilitate emergency vehicles to pass through busy intersections without causing any new accidents due to misunderstanding among road users, especially when special routes are not provided for emergency vehicles such as ambulances, police, and firefighters during red traffic lights. To overcome this problem, a traffic light control system for emergency vehicles was designed using the Arduino method. The system operates to facilitate traffic control and the movement of other road users during emergency situations.

Keywords: Arduino Nano , Bluetooth HC-05, and MIT App, Module Traffic lights

INTRODUCTION

The Emergency Traffic Lights project aims to provide easier traffic light control for emergency vehicles, such as ambulances, during an emergency situation. Research has been conducted, and the project has been approved by the supervisor to proceed. The main microcontroller used for this project is the Arduino Nano, and a pulse component is utilized to control the traffic lights smoothly. To achieve success with this Internet of Things - Emergency Traffic Lights project, several programming applications are necessary, such as Proteus 8 for schematic circuits and PCB layout. Additionally, The MIT App Inventor is used to create an application that allows an ambulance to control the traffic lights using a smartphone.

METHODOLOGY

In this project, the main controller used is the Arduino Nano, which is responsible for controlling the entire circuit in various ways. The project has two inputs, Bluetooth HC-05 and Power supply, and one output, which is the traffic lights.

RESULTS AND DISCUSSION

Table 1 shows the connection of Input/Output and Pin. This model utilizes Arduino Nano to activate the traffic lights, as usual, which are red for 5 seconds, yellow for 3 seconds, and green for 8 seconds. The HC-05 Bluetooth module plays an important role in the emergency traffic lights system to control the usage requirements to change the color of the lights from a red signal to green in an emergency. To control the traffic lights, we use the MIT app that we made ourselves from the MIT App Inventor web. The first button on the top is called "Choose Bluetooth device," which works to access the app on the model. The next button is for traffic lights 1, 2, 3, and 4, and this button has the same function for each traffic light.

Table 1: The table shows Connection of Input/Output Pin

Number	Input/Output	Pin	Pin Mode	Notes
1	Bluetooth HC-05	Vcc	Input	To connect handphone and traffic lights
2	Traffic light A	D4 D5 D6	Output	Lights on
3	Traffic light B	D7 D8 D9	Output	Lights on
4	Traffic light C	D10 D11 D12	Output	Lights on
5	Traffic light D	A0 A1 A2	Output	Lights on

CONCLUSIONS

This project aims to facilitate emergency vehicles in passing through busy intersections without causing new accidents due to misunderstandings among road users. The Bluetooth HC-05 module is used to detect the Traffic Module, which triggers all the outputs based on the programming.

ACKNOWLEDGEMENTS

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SMART DUSTBIN WITH E-MAIL NOTIFICATIONS

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Abstract – Smart Dustbin with E-Mail Notifications is a project created to facilitate garbage disposal. In this season of infectious diseases most of us are expose to viruses and bacteria. Therefore, the use of Smart Dustbin is very suitable because it can reduce physical contact on the trash can. The project uses an ESP32 controller microchip with a combination of ultrasonic sensor, IR sensor, servo motor and LCD as well as connection to user email. The ultrasonic sensor will read the volume level in the bin and will be displayed on the LCD. The IR sensor will detect the presence of humans and will be assisted by a servo motor to open and close the lid of the bin. This project is also a project that uses the Internet of Things (IOT) application that can be accessed via smartphones and computers to make it easier for users to know the volume level in the bin without having to open the bin lid and more sensitive if the bin volume is full with the help of notifications via the user's e-mail

Keyword: Ultrasonic Sensor, Internet of Things, LCD.

INTRODUCTION

Smart Dustbin with email notifications is an IoT-based project that works to notify the volume level in a particular trash can via LCD display and user email notifications. The LCD display and IoT website will show us the current volume level of the bin which will facilitate us in the process where we can monitor the volume level of the bin via internet connection. [1]

METHODOLOGY

Smart dustbin with e-mail notifications uses an ESP32 micro controller for encoding purposes. Ultrasonic sensors are used to detect the volume level inside the bin and IR sensors to detect the presence of humans to open and close the bin lid. The bin volume data will be displayed on the LCD and can be accessed via computers and smartphones. A full Trash Can will send an email to the user as a notification. The buzzer will also sound if the volume level of the trash can is leveled to the maximum. [2]

RESULTS AND DISCUSSION

The display on the LCD will show the reading value from the ultrasonic sensor which detects the volume level reading in the bin. While the IR Sensor will detect the presence of humans and assisted by

servo motor to open and close the bin lid. Users can access the bin volume level using a smartphone or computer through the IoT application and will receive an email if the trash bin is at full level as shown in Figure 1.

Figure 1: Dustbin volume readings on LCD and IOT applications.
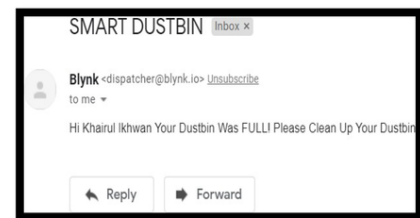
Figure 2: Email notifications that users will receive.

Figure 2 shows the display of emails that users will receive when the trash can is at full level.

CONCLUSIONS

The ultrasonic sensor will read the volume level of the bin and an email will be received if the bin is at full level.

ACKNOWLEDGEMENTS

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PARKING GUIDANCE SYSTEM

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Abstract *–Parking Guidance System can help drivers to park their cars more easily with the help of sensors and web camera. Electronic parts are Arduino UNO, ESP32CAM, ultrasonic sensor, LCD and buzzer. The ultrasonic sensor will measure the distance of the back of the car and the obstacle and display on the LCD. When the sensor reaches a certain distance, the buzzer will start to produce sound to give warning to the driver to stop. The purpose of the webcam using ESP32 is to show the driver the view from the back of the car. Driver can easily adjust their car to be in the parking lot.*

Keywords: ESP32 CAM, LCD, Arduino Uno

INTRODUCTION

Parking problem is an issue that will always happen when we visit public places such as shopping complex, hospitals and others. Usually we have to go through several parking lots to find an empty parking space and it will take times. The problems become more tedious if the parking lots are multi-storey building. To solve this situation it requires an automatic parking system that is more effective and saves times .

METHODOLOGY

This project is designed with the Arduino UNO, ultrasonic sensor and ESP32 webcam. The parking sensor used the principle of ultrasonic waves. The ultrasonic sensor was installed on the back of the car and it will send ultrasonic waves to the obstacle and reflects the sound wave back into the sensor. The sensor then calculates the actual distance between the car body and the obstacle, and then prompts the driver to stop when it reaches a certain distance by making a loud noise. While the webcam were programmed to display the view from the back of the car. When the car is in reverse and in gear R, the parking sensors will be activated automatically.

RESULTS AND DISCUSSION

The closer the distance between the car and the barrier, the less the distance detected by the sensor and shown on the LCD. This theory is proven based on the results of the value obtained in the table 1. The distance detected from the sensor will be shown on the LCD and the buzzer will produce sounds when the car reaches a certain distance.

Table 1: Sensor reading

ACTUAL DISTANCE (CM)	SENSOR READINGS (CM)	TEXT SHOWN ON LCD
30 cm	30 cm	
25 cm	25 cm	
20 cm	20 cm	

CONCLUSIONS

This project helps everyone to park their car easily using ultrasonic sensor and webcam as a guidance. The ESP32CAM have to be working as the camera to display the view from the back side of the car. The camera view can be display either on the phone or laptop or any device that can connect to WIFI.

ACKNOWLEDGEMENTS

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MOTORCYCLE FINGERPRINT STARTER

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Abstract – This project is about the Motorcycle Safety Fingerprint Starter. The Motorcycle fingerprint starter use Arduino Nano and fingerprint sensor. This project is designed to be used or developed on every motorcycle which focuses on the motorcycle college parking area. The idea came after researching the growing number of motorcycle theft cases, so the project was developed and created.

Keyword: Arduino Nano, Fingerprint Sensor

INTRODUCTION

Fingerprints have become an ideal means of identification. Fingerprint scanners are security systems of biometrics. They are used in police stations, security industries, smart phones. Therefore, fingerprint security is applied to this project that is motorcycle. Fingerprint security on motorcycles can reduce the risk of motorcycle theft because only the owner can start the motorcycle

METHODOLOGY

Arduino Nano acts as the main controller and the finger print as the input in this project. This circuit was supplied with 9VDC supply voltage. The output consists of 1 channel relay for motorcycle to make the circuit become either normally open or normally close.

RESULTS AND DISCUSSION

Figure 1: Wrong Fingerprint.

Figure 2: Right Fingerprint

Figure 1 shows the wrong finger is place on the fingerprint sensor and the light bulb does not function. On the other hand, figure 2 shows that when the correct finger placed on the fingerprint sensor, the light bulb starts to light up.

CONCLUSIONS

The Motorcycle Safety Fingerprint Starter system can reduce the criminal cases of motorcycle theft. Besides that, if the thief wants to steal, this project can also slow down the process of theft. This fingerprint recognition system is arguably the best so far, because the fingerprints found in humans are different.

ACKNOWLEDGEMENTS

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IOT CONTROL AGRICULTURE SYSTEM

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Abstract – Project IOT Control Agriculture System is one of the devices that can reduce the risk of crop soil drying and use a solar system to reduce the use of electricity. The 12v battery which is the cycle charging voltage of the battery that has been charged through solar is used to provide power to the ESP32.The main component is the ESP32 in this project. ESP32 is WIFI connected, it will provide power supply to sensor of soil moisture, temperature and raindrop. The soil moisture sensor will get a reading and state that the soil moisture level for a certain plant. If the soil moisture sensor detects soil moisture conditions, the notification is sent to the phone and the OLED screen will indicate the soil moisture percentage. In addition, the temperature sensor will get a reading value at the ambient temperature. The temperature reading value will be sent to the phone and displayed through the OLED screen based on the received percentage. As for the raindrop sensor, it detects the presence of rain and stores the data by week.

Keyword: ESP32, Soil Moisture Sensor, Temperature Sensor, Raindrop Sensor

INTRODUCTION

In this modern age, agriculture now uses technology that makes it easier to water, plant, and so on related crops. This project produces an automatic watering system and takes environmental temperature and rainfall data. then all the data will be displayed to node-red and can also be seen through the OLED screen

METHODOLOGY

ESP 32 has been used in this project as a main controller. It has controlled the full circuit in the various ways. In addition, there is one input and six outputs in this project. Soil moisture, temperature and raindrop are inputs in this project and outputs are water pumps, OLED screen and node-red.

RESULTS AND DISCUSSION

In the figure 1, shown the Soil Moisture Sensor Dashboard. If the soil moisture sensor is less than 2055, the OLED screen will state the percentage of soil moisture than water pump will on and get notification on the phone. While if the soil moisture is more than 2055, the OLED screen will state the percentage of soil moisture than water pump will off.
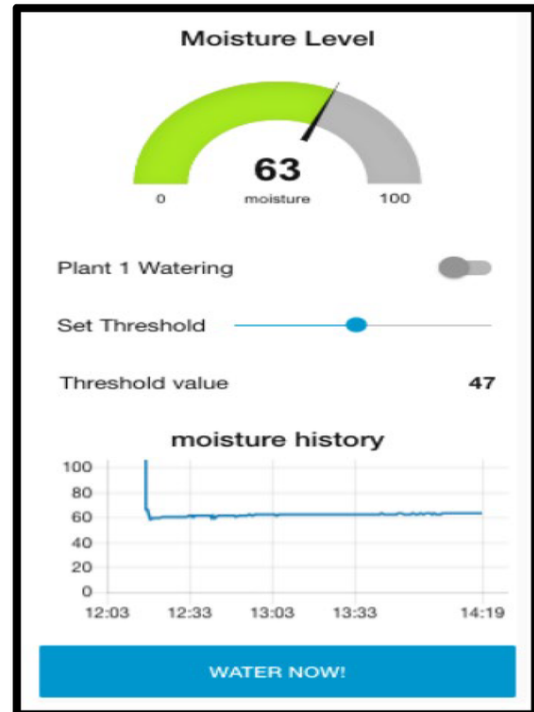
Figure 1: Soil Moisture Sensor Dashboard

CONCLUSIONS

This project helps everyone to make it easier to water plants. The soil moisture sensor will detect soil moisture and all outputs will turn on based on the programming.

ACKNOWLEDGEMENTS

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ARDUINO SMART FAN

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Abstract – Smart Fan basically uses the Arduino Nano as the main component in the production of this project. It is also aided by the use of two sensors that will be in its operation. The Ultrasonic Sensor aims to detect object to turn on the fan. If there is no object, the fan will not turn on. Temperature Sensor aims to detect the ambient temperature as well as the humidity of the air in the environment. When detecting a high temperature, the movement of the fan motor will increase from the original. If it detects a low temperature, then the movement of the fan motor will be reduced. The speed level as well as the temperature heat level will also be displayed on the LCD display. With the creation of this project, it is able to reduce the rate of daily electricity consumption. As a result, the cost of monthly electricity bills will also be reduced. Given the current situation of Covid-19 forcing everyone to stay indoors will further increase the rate of electricity consumption.

Keyword: Ultrasonic Sensor, LCD

INTRODUCTION

To invent a Smart Fan system which make the user most responsible in monthly electricity consumption and can make it looks more sophisticated over time. This system can ease the users to on or off the fan in an effective way of savings. [1-2]

METHODOLOGY

Arduino Nano has been used in this project as a microcontroller that was controlled the full circuit in the various ways. Moreover, this microcontroller was connected with some inputs like Ultrasonic Sensor and Temperature Sensor LM35 to give the signal for make the output.
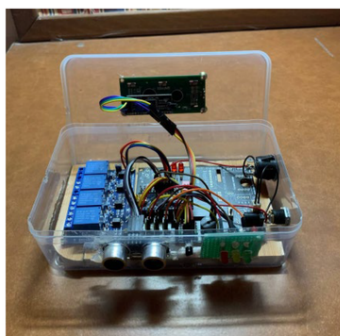
RESULTS AND DISCUSSION

Figure 1: Smart Fan Prototype

Figure 1 shows the prototype of Smart Fan project. By using AC motor as the output, the temperature sensor will control the fan speed depends on the current temperature. Ultrasonic sensor will detect object in front of it to change the fan mode from off to on. In the on mode, motor will be moving at minimum speed at temperature under 34℃. Then, the motor will move at the medium speed if the temperature around 34℃ until 37℃. The motor will turn to maximum speed if the temperature more than 37℃ as shown in Table 1. If it did not detect any object, the motor will not move at any current temperature.

Table 1 Smart Fan Speed Level

No	Motion	Fan ON / OFF	Temperature (℃)	Speed Of The Fan
1.	Undetected Object	Off	-	Speed 0
2.	Detected Object	On	Temperature ≤ 34℃	Speed 1
3.			34℃ >Temperature ≤ 37℃	Speed 2
4.			Temperature > 37℃	Speed 3

CONCLUSIONS

From this Arduino Smart Fan was designed to saving the monthly electric consumption. With this system, it guaranteed to make the user most easy and comfortable to control the mode and the speed depends on the current situations. Motor will be moving at the minimum speed if temperature below 34℃. While the motor will be moving in medium speed if the temperature in range 34℃ until 37℃. Lastly, motor will be moving at the maximum speed if the temperature more than 37℃. It is very user-friendly and meets the human needs.

ACKNOWLEDGEMENTS

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AUTOMATED WATERING AND MONITORING

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***Abstract* –** This project on "Automated watering and monitoring" is intended to create an automated irrigation(watering) mechanism which turns the solenoid valve ON and OFF by detecting the moisture content of the soil. The advantage of using these systems is that they reduce human effort. The project model consists of three stages. Firstly, sensing the land's moisture levels. Second stage is the determination of its status either dry or wet. The last and third stage is solenoid valve control. The purpose of this project is to develop of Automatic Plant Irrigation System (APIS) capable of detecting loss of moisture in soil using the soil moisture sensor Implemented using Esp8226, APIS uses live input data to determine the conditions.

Keyword: ESP8226 +, Soil moisture sensor+, Solenoid valve

INTRODUCTION

To invent automatic plant irrigation system using ESP8226. With this invention farming will be found easy because of less effort applied. Other than that, this project can optimize the plants health because of proper irrigation system. This technique enables the farmers to water their crops without additional labors [1].

METHODOLOGY

ESP8226 is the main component used in this project. It has controlled the full circuit in various ways. Moreover, soil moisture sensor is used to detect water content of soil and solenoid valve is used to supply water if the soil is dry. Additionally, LDR sensor used to turn on UV light with the help of relay [2].

RESULTS AND DISCUSSION

The values of soil moisture play major part in this irrigation system because it will operate the solenoid valve. Two different values can be monitored in Blynk app which are 327 and 1024 are shown in Figure 1. The live status of the soil and the UV light will be showed in LCD screen.
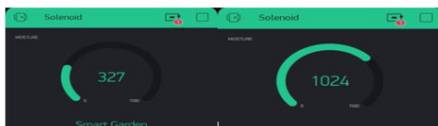

Figure 1: The different soil moisture value between 1024 and 327 for control solenoid valve

Figure 2: Results shown in LCD screen

Figure 2 shows results such as when the soil is dry and wet. Furthermore, the LCD screen also shows the UV light on or off.

CONCLUSIONS

This automated watering and monitoring system was successfully developed. Once this system was put into the desired planting area, it will be able to watering efficiently as well as meet the needs for growing plant.

ACKNOWLEDGEMENTS

We would like to express our sincere thanks and thank you to our project supervisor, for the guidance and discussion given to us during the project period. Acknowledgment is also given to family, friends and lecturers who have helped and assisted us directly or indirectly during the preparation and production of this project.

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ANALYZE THE MOVEMENT OF OMNI THREE WHEEL ROBOT

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Abstract – This analysis of the Three-Wheel Omni Robot aims to understand and deepen the system and movement and function of this robot. This robot uses as many as three omni wheels where these wheels have unique properties in terms of shape and movement. This is because the surface of this omni wheel can give an advantage to an object that uses it to move in any direction without limits and also without taking distance. For example, this wheel can move to the right at the same position as before. In addition, this wheel can also move the robot to rotate locally in the desired place.

Keyword: ESP32, Motor Driver, DC Motor, Battery

INTRODUCTION

In this age of modernity, robotics technology is no stranger to society today. Therefore, in this project I want to produce a robot that uses three omni wheels as a reference to the surrounding community. For example, this omni wheel robot has a unique movement that can move in any direction without limitation or better known as flexible movement. As a result, the community can gain knowledge about the way of movement or the code used to create this omni robot.

METHODOLOGY

ESP 32 has been used in this project as the main controller. It has controlled the full circuit in many ways. Also, there is one input and two outputs in this project. The smartphone is the input in this project and the output is the motor driver and the DC motor.

RESULTS AND DISCUSSION

In the Table 1, shown one of direction of how the projects works. when the user presses the forward button in the smartphone, the robot will immediately move forward and likewise in other directions such as back, left and right. The robot will stop when the user does not press any direction buttons on the application

Table 1: The table shows one of direction of how the project works

FORWARD	MOTOR A (FORWARD)	MOTOR B (RIGHT)	MOTOR C (LEFT)
PIN	PIN 13	PIN 26	PIN 18
DIRECTION	-	FORWARD	FORWARD
PIN PWM	PIN 14	PIN 33	PIN 3
SPEED	0	70	110

CONCLUSIONS

The conclusion for the entire project this time is to be able to analyze the way the three-wheeled robot moves forward, backward, left and right. Therefore, there is no more term for misunderstanding about the movement of this robot. In addition, learning about coding can also be honed more than before. For example, coding for Bluetooth and robot movement direction. On the other hand, the installation of wires in a loop on the DC motor to the motor drive and also the battery as a power supplier is also understandable.

ACKNOWLEDGEMENTS

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DFT SMART SYSTEM

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Abstract – The project aims to upgrade the current method of recording students' entry and exit to the students' residential areas. The parts used in this project are the ESP32, MFRC522, RFID tag and 5V voltage regulator. The microcontroller is supplied with a voltage from an AC socket using a USB plug as a connector. RFID reader (MFRC522) detects the card by transmitting radio waves that activate the tag. The personal data is recorded and sent to the administrator panel through Wireless Local Area Network. As a result, the hostel administrator can monitor the information of all students, send feedback by controlling the LED and track the student's identity in actual date and time.

Keywords: ESP32, MFRC522, RFID, Attendance system.

Figure 1: The value of signal and time stamp record

INTRODUCTION

The data recording system used in the polytechnic hostel currently uses a manual method where students must fill in a logbook to exit and enter students' residential areas. The manual method is unreliable in gathering accurate data. Therefore, a project was developed to improve the method of data storage by using an electronic device called the Smart DFT System. The project aims to increase students' safety in the hostel area and simultaneously enable the hostel staff to monitor students' whereabouts continuously.

METHODOLOGY

The project's development process involved using microcontrollers, detectors, RFID cards, LCDs and other supporting components. Therefore, PROTEUS software was used to sketch a schematic circuit and circuit simulation. ESP32 was used in this project as a main controller. ESP32 controlled the full circuit in various ways. The function of MFRC522 is to read the RFID tag and sends the data to the microcontroller to be processed. An indicator displayed basic information to the user [2].

RESULTS AND DISCUSSION

The value of signal strength plays a major part in attempting MQTT (Message Queuing Telemetry Transport) connection when the system operates, enabling the microcontroller to communicate with the administrator using a server 'broker.hivemq.com' through a Wireless LAN. The signal strength is measured using the 'Open Signal' application, as shown in Figure 1. Two different signal strength values were recorded as 28Mbps for good signal strength and 13Mbps for weak signal strength.
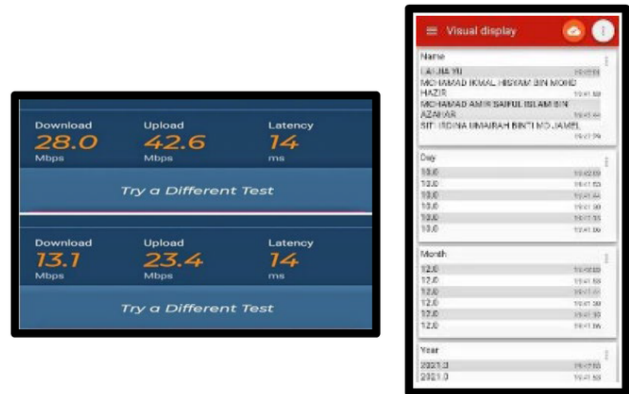
Figure 1 shows the bar panel of students' data with real dates and times. The excellent signal strength took about 500ms for the data to be received by the admin. However, a weak signal strength took one second to be received whenever students scanned their cards.

CONCLUSION

Smart DFT System is a project adapted from the use of RFID technology. The project was designed and developed to assist the hostel management unit in managing the records of students' exit and entry. The system will automatically record data on the date and time of each student's exit and entry process. Each student's records are sent to the hostel management through the IoT MQTT panel application that can be accessed using a smartphone or laptop.

ACKNOWLEDGEMENTS

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BLIND SPOT DETECTION SYSTEM USING ARDUINO NANO

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Abstract – Driving in modern traffic conditions can be hazardous. An accident can occur if a driver is unaware of the presence of another vehicle or an obstacle at a vehicle blind spot. The project aims to improve the safety of drivers when changing lanes on highways. A Blind Spot Detection System (BSD) is based on detection techniques proposed to monitor the blind spot area of a vehicle, such as the presence of obstacles, cars, or other objects. Two parts of the BSD system are mounted on the two side mirrors of a vehicle, while two other parts are mounted at the rear. The BSD system algorithm is based on calculating the distance between objects. An ultrasonic sensor is programmed at a certain distance to detect oncoming vehicles, objects, or obstacles to activate the warning light indicator circuit at different zones. If the blind spot area can be reduced, accident cases will be significantly reduced.

Keywords: Arduino Nano, Ultrasonic sensor, Liquid crystal display (LCD), LED, Buzzer

INTRODUCTION

The invention of a blind spot detection system encourages drivers to be more disciplined when driving. Besides, drivers can react quickly to any sudden situation [1].

METHODOLOGY

Ultrasonic sensors, buzzers, and LED were the major parts of this project. When the ultrasonic sensors detected a motion, the buzzer sounded, and the LCD displayed the result [2]. Arduino Nano was used in this project as a main controller. Arduino Nano controlled the entire circuit in various ways.

RESULTS AND DISCUSSION

Figure 1: Car Present: Right Rear

Table 1 : The results of the BSD system experiment.

BSD position / Car position	Right side		Left side	
	Rear	Front	Rear	Front
No vechicle approaching	🟢	🟢	🟢	🟢
Next to rear sensor	🔴		🔴	
Next to front sensor		🔴		🔴

🟢 = GREEN LED ON

🔴 = RED LED ON

Table 1 shows different parts of the light that will turn on when a vehicle approaches the car. If there is a vehicle approaching from the right or left of the vehicle, the rear sensor will be activated, and the red LED light will turn ON. If a vehicle approaches from the front or rear, the rear front sensor will be activated, and the red LED light will turn ON. However, the sensor is deactivated if no other vehicles are nearby, and the green LED will be turned ON.

CONCLUSION

The blind spot detection system using Arduino Nano will help drivers be aware of their surroundings. The ultrasonic sensor detects a vehicle approaching the car and sends the data to Arduino Nano while the buzzer will sound, green or red LED lights up, and the LCD will display based on coding that is set in the program.

ACKNOWLEDGEMENTS

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COOPERATIVE ATTENDANCE SYSTEM

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Abstract – With the use of Internet-based Radio Frequency Identification (RFID), also referred to as the "Internet of Things" (IoT), the cooperative attendance system presents a new method to track the presence of employees. The existence of unauthorised employees always worries the management or administrators. The RFID-based presence system uses this IoT system. The cooperative attendance system is a new way to monitor the presence of employees using IOT.

Keywords: ESP32, Radio Frequency Identification (RFID), Internet of Things (IOT)

INTRODUCTION

The newest technology in use today is the RFID system. The technology, created in 2019, uses a chip and a scanner to read radio frequencies. RFID readers and RFID Tags are the two main electronic equipment components that assist the increased system efficiency and data accuracy. Different kinds of tags have been created following industry demands. Utilising the internet of things will improve the effectiveness and adaptability of this system.

METHODOLOGY

The cooperative attendance system operated based on RFID Reader, RFID Tag, LCD and ESP32. The purpose of this RFID system was to increase employee attendance. Data was transferred from RFID cards to the reader. Data is transferred to the reader when the tag is placed near the reader due to the induced mutual inductance energy. The reader then transfers data to the ESP32 to check and compare for the data, if any data was received.

RESULTS AND DISCUSSION

Table 1 demonstrates how the project is carried out. After an employee scans the RFID card on the RFID reader, the data will record the attendance. The employee has to register his presence for that day if his name is visible on the LCD panel. If the LCD is blank, the RFID card cannot be identified, so the employee's RFID card must be scanned again. Figure 1 shows the flowchart of how to save the record.

Table 1: Configuration of the ESP32 Pin

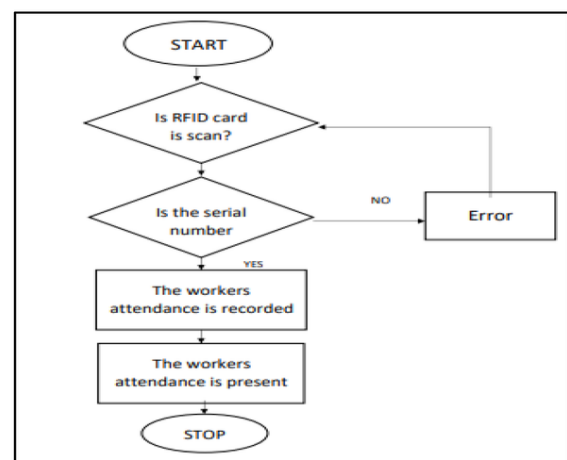|	INPUT/ OUTPUT	ESP32 PIN	PIN MODE	PIN NAME	VARIABLE NAME	FUNCTION
1	RFID Reader	GPIO23,GPIO19,GPIO18,GPIO5,GPIO4	INPUT	MFRC522	digitalWrite	To scan RFID card
2	RTC Clock Time	GPIO22,GPIO21	INPUT	DS3231	digitalWrite	To display real time clock with integrated temperature
3	LCD Display	GPIO21 GPIO22	OUTPUT	12C LCD	-	To display WORK IN PROGRESS

Figure 1: Illustration of attendance's record.

CONCLUSION

Finally, the project aims to use a portable RFID reader with data storage to record workers' attendance. The future improvement is to make our database or software, such as Excel or Word, extract data from ESP serial window and transfer it to the database automatically.

ACKNOWLEDGEMENTS

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IOT - SMART SOIL MOISTURE

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Abstract – The aim of this project is to prevent dead of the plants by using soil moisture sensors. Electronic parts are the ESP 32, ultrasonic sensor, soil moisture sensor, relay, and water pump. A 12V battery is used as the power source for the water pumps, the 12V battery connects on the PCB board to allow 3 water pumps to connect. Soil moisture sensor and ultrasonic sensor will detect the soil moisture value and the height of bucket 1. After it confirms that the soil moisture value is higher than 400 and bucket 1 lower than 60%, water pumps 1, 2 and 3 will start the process to water the plants and fill up bucket 1 with water and nutrients. This whole process is controlled by the ESP 32 as it is the main controller, and the sensors are detectors of the ESP 32.

Keyword: ESP 32, water the plants, fill up bucket 1

INTRODUCTION

To avoid the death of the plants which can let the farmer to reduce losses and bring more profit. Besides, this system automatically farmers can use this system to control the nutrient value to water and fertilize the plants.

METHODOLOGY

ESP 32 has been used in this project as a main controller. It can fully control the circuit in various ways. Moreover, a PCB board has been used to overcome the lack of power supply pins in the ESP 32 PCB board. Then, these connections are merged with an ultrasonic sensor and soil moisture sensor to run the system detecting the height of plants, water, nutrient, and soil moisture value. [1] [2]

RESULTS AND DISCUSSION

Figure 1 shows that the value of the resistive soil moisture is 500, which is higher than 400, the water pump 1 will start to operate to water the plants. Figure 2 shows that the bucket 1 in 59%, which is lower than 60% the water pumps 2 and 3 will operate for 1 second to mix water and nutrients from the bucket 2 and 3.
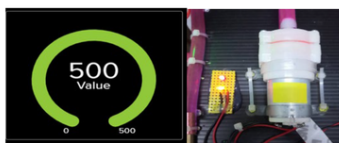

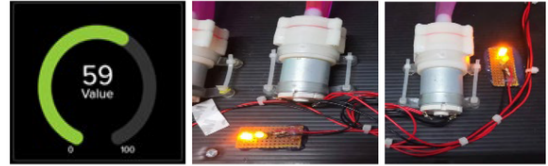Figure 1: The soil moisture value higher than 400, water pump 1 activated.

Figure 2: The bucket 1 lower that 60%, water pumps 2 and 3 activated for 1 second.

Figure 3: Monitoring data based on Adafruit application

Figure 3 shows the monitoring data of height of plants, nutrient, water, and soil moisture value. The graph shows the line graph data in a few days.

CONCLUSIONS

The ultrasonic sensor and soil moisture sensor can detect the soil moisture value and the height of bucket 1 to water the plants and mix nutrient and water to ensure the plants are enough nutrient and water.

ACKNOWLEDGEMENTS

The researchers would like to thank their parents, supervisors, friends and polytechnic lecturers for their financial, mentoring support and comment to enable this project to be completed and successfully done.

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IOT CAR PARKING SYSTEM

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Abstract – This project is based on observations that a parking system has weak points because the system does not indicate how much parking space is still available. This problem arises because, according to the parking system display, the number of parking spaces is only displayed at the entry and exit, making it difficult to find a spot, especially on weekends and during public holidays. Therefore, the IoT car parking system is used to supply information on the remaining available parking spaces to introduce a better parking system. The IR sensor is used to locate available parking, while the ESP32 is the controller. The system uses an LCD and the Blynk IoT application to show the available parking.

Keywords: ESP32, IR Sensor, Blynk IOT

INTRODUCTION

Increasing vehicles in major cities have led to the parking problem. There is a need for more parking spaces, especially in shopping complexes. An effective parking management system is required as a result of this problem. Therefore, the paper shows how to implement an IoT-based parking management system enabling effective parking solutions. The project uses IR sensors to detect parking lot occupancy to illustrate the concept. [1]

METHODOLOGY

The IR sensor and WIFI were the inputs in this project. The presence of parking lot spaces was determined using the IR sensor. The microcontroller processes the input signals to produce outputs indicating whether parking space is available. The output from the microcontroller was viewed on an LCD and using Blynk IoT apps. The remaining parking spots were shown using an app and an LCD. [2]

RESULTS AND DISCUSSION

The laptop served as the power source for this project. The LCD shows parking availability when USB type B is connected to the COMM3. The LCD and Blynk IoT application will update based on the number of cars parked if the IR sensors detect an approaching car in the parking space. The Blynk IoT will notify the smartphone user when the parking space is full by sending a notification.

Table 1: How the Project Work

	Test	Results
1.	No vehicle parked	The LCD and Blynk IoT are on default status (parking left:4)
2.	One car entering a parking space	The LCD and Blynk IoT are on default status (parking left:3)
3.	Two cars were parked in the parking space	The LCD and Blynk IoT are on default status (parking left:2)
4.	Three cars were parked in the parking space	The LCD and Blynk IoT are on default status (parking left:1)
5.	All parking spaces were occupied	The LCD displays that the parking is full, and a notification is sent to a user via Blynk IoT application.

CONCLUSION

In conclusion, the project's goal of developing a car parking system that could detect open spaces using an LCD was effectively met. As the primary means of assisting the user in gaining access to the remaining parking spaces, Blynk IoT is used.

ACKNOWLEDGEMENTS

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IoT-BASED FLOOD MONITORING AND ALERTING SYSTEM

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Abstract – The Project IoT-based Flood Monitoring and Alerting System is one of the technologies that can reduce the risk of property damage during floods and warn users when the water level rises. ESP32 is the essential element of this project. The connected ESP32 supplies electricity to the ultrasonic sensor via Wi-Fi.
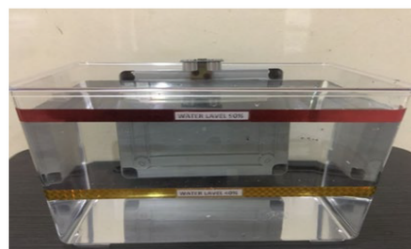
Keywords: ESP32, Ultrasonic Sensor, IoT

Figure 1: Hardware Model

INTRODUCTION

Due to the weather changes that might cause severe flooding, property destruction and loss of lives are increasing yearly. The project is launched to detect floods and warn residents living near the river when it rains heavily. The flood detector is capable of detecting two different flood levels. When the water reaches the first level, at 40%, a buzzer produces a sound for eight seconds to warn of an impending flood. Once the second water level hits 90%, a notification alerting the user to a flood will be sent to their smartphone. [1]

METHODOLOGY

The primary controller in this project was an ESP 32. It performed a variety of circuit control functions. Additionally, the project had two inputs and two outputs. Buzzer, client phone, and blinking applications were examples of output. [2]

RESULTS AND DISCUSSION

Table 1 outlines the project's operation. The buzzer produces a sound for eight seconds if the ultrasonic sensor determines that there is 40% water in the container. In contrast, a notification will be sent to the client's phone if the ultrasonic sensor detects the water level at 90%.

	Test	Result
1.	Water level 20%	The buzzer produces no sound
2.	Water level 40%	The buzzer produces sounds
3.	Water level 90%	Send notification to smartphone

Table 1: How the Project Operates

CONCLUSION

This concept allows everyone to save property and start early preparations during floods and flood warnings. After ultrasonic sensors detect the water level, all outputs will be turned on following the programming.

ACKNOWLEDGEMENTS

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INDOOR AGRICULTURE USING HYDROPONIC METHOD BY ESP32

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Abstract – A sophisticated indoor hydroponic growing system has been developed. It also shows temperature, humidity, and water level in the Arduino IoT Cloud application and on the LCD display. Water, humidity and temperature sensors are used as system inputs, and the cooling fan, buzzer, and water pump are system outputs. An ESP32 microcontroller is utilized in this configuration. The plant temperature is then determined by the humidity and temperature sensors, and the tank's water level is set by the water sensor. The findings demonstrate that it is possible to measure the temperature, humidity, and water level in the tank.

Keywords: ESP32, Moisture Sensor, Water Level Sensors, Humidity & Temperature Sensor

INTRODUCTION

An automated hydroponic layer system or a hydroponic gardening is referred regarded as gardening without dirt. To provide the ideal growing environment, the system makes use of an intelligent water supply, temperature cooler, water level, and artificial sunlight. Plants can be grown hydroponically, a subset of hydroculture, without the use of soil. [1-2]

METHODOLOGY

This mechanism will turn on the water pump when the environment is dry and the moisture content is 4000 or above. A timer can be set to automatically turn on and off artificial sunshine. The temperature sensor will activate the cooling fan if the temperature exceeds 40 degrees Celsius (DHT11). [1] When the system runs out of water, the buzzer is activated based on the water level sensor's measurement of the tank's water level. Temperature, humidity and water level are shown by the system using an IOT cloud application. The solution enables monitoring and shows the outcomes in the IOT cloud application. [2]

RESULTS AND DISCUSSION

The moisture content and water level are shown in Figure 1. The moisture level varies; if it rises above 4000, the plant is considered to be dry, and the pump will activate. The water level varies; if it drops below 500, the condition is low, and the buzzer activates; if it rises over 1000, the condition is high, and the buzzer deactivates. Figure 2 displays the temperature and relative humidity. The humidity level will drop as the temperature rises.
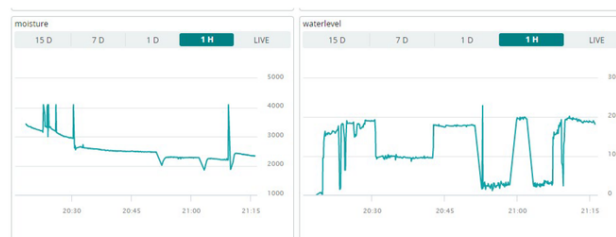

Figure 1: The moisture & water level

Figure 2: The temperature & humidity level

CONCLUSIONS

With the aid of IOT applications, the researcher learned about the status of the facility. Additionally, consumers can use IOT applications to learn about the status of the plant. This system leads to the conclusion that the Internet of Things has the potential to dramatically advance hydroponic farming. The system's conclusion is that using the Internet of Things in agriculture can lead to significant advancement.

ACKNOWLEDGEMENTS

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IOT - SMART HOME SYSTEM

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Abstract – This project aims for people who are in an emergency, not at home but still have the control over the appliances at home from afar and to create an automatic smart home controlled by android using Wi-Fi with a secure and emergency system. It helps handicapped and elderly people by enabling them to control the home appliances and be alert in critical situations. The electronic components used for this project is ESP32 32 bit microcontroller to connect Wi-Fi, 4 led lamps, 4 computer fans, transistor TIP 41 C to control the fan and the lights. Adapter 12V is used for power supply, LM7805 to regulate the supply voltage, input pin for accepting incoming DC voltage and output pin that supplies (+5V) and sensor limit switch at door side to detect the presence of people.

Keyword: ESP32 (Wi-Fi), Sensor Limit Switch Detector

INTRODUCTION

A smart home allows homeowners to control appliances, thermostats, lights, and other devices remotely using a smartphone or tablet via an internet connection. The design and implementation of the system will enable users to automatically control the home appliances and be safe whenever they are not around through the android that is controllable from anywhere and secured [2].

METHODOLOGY

ESP32 is used in this project as the main controller. It controls the full circuit in various ways. Moreover, the function of PCB boards is to overcome the lack of power supply pins by PCB boards. Then, these connections are merged with the transistor TIP41C to run the LED and FAN and sensor limit switch is to detect the presence of people.

RESULTS AND DISCUSSION

Figure 1 shows the visual output of 4 LED lights which were controlled with the ON/OFF switch by android mobile using Wi-Fi while Figure 2 shows the result of the alert notification in mobile when the door gets opened monitored by android phone.
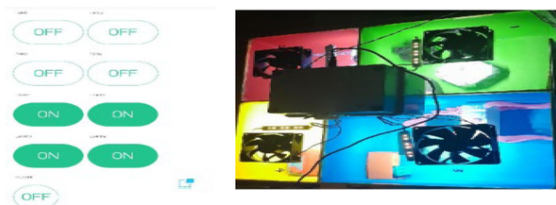

Figure 1: The visual output of LED
when controlled by switch mobile

Figure 2: The alert notification in mobile
when the door is open monitored by android

CONCLUSION

The android application could control the home appliances from any distance using Wi-Fi (ESP32) and the sensor switch limit will detect a presence of people at home based on coding that is set in the program. This will keep the home secure from being broken into without permission.

ACKNOWLEDGEMENTS

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HOME AUTOMATION SYSTEM AND SECURITY SYSTEM USING IOT

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Abstract–Home Automation Home Automation is the automatic control of electronic devices at home. This device usually connected to the Internet, which allow it to be controlled from a certain distance. With the result of Home Automation, it can control the switch automatically using your voice or hand phone without having to control it manually. Smart Home or known as Home Automation use the latest technology to make domestic activities easier, more comfortable, safer and more economical. The main objective of this project is to provide convenience, comfort and safety to the community at a low cost. This project using a microcontroller called ESP32. This project also uses a LM393 detector as a fire detector and a buzzer as an alarm. Therefore, if there is a fire, the buzzer will sound as a warning sign. Next, this project uses three set of 5V Relays to control the current flowing to two bulbs and one fan. In this project, there are two ways to turn on the lights and fans, which is by using voice and smart phone through Alexa software.

Keywords –Home automation, ESP 32, Alexa.

INTRODUCTION

Electricity is one of the important elements in daily life. This is because many things use electricity to help people without using a lot of human energy. The main purpose of this project is to facilitate and help the peoples which ll of us use electricity in daily lives. The idea to innovate this project triggered when there was an increase in electrical wastage that resulted from human negligence such as forgetting and being lazy to switch off the switches. This causes the rate of global warming to increase due to the excessive use of electricity thus causing a carbon footprint. Besides, this project can also increase the level of user safety according to the many cases of house fires caused by short circuits. Therefore the idea to produce a project that can make human life easier was created namely Home Automation Switch and Security System using Internet of Thing (IoT)

METHODOLOGY

This project is divided into 3 main parts which are ESP32 as a microcontroller and there is a flame sensor, switch 1, 2, 3 and power supply as input. Buzzer, light 1, 2 fans are output. Lights and fans can be turned on using voice and smartphone using Alexa software.

RESULTS AND DISCUSSION

Figure 2 shows the display on the Alexa application when being connected to wifi. There are two ways to control the switch automatically through this application, namely by saying "Alexa" (voice) or by pressing the ON and OFF buttons on the smartphone according to the switch user want to use. After calling Alexa the user needs to mention the switch they want to control such as "Alexa turn ON the fan switch". The name of the switch can be changed according to the suitability and preferences of the user.
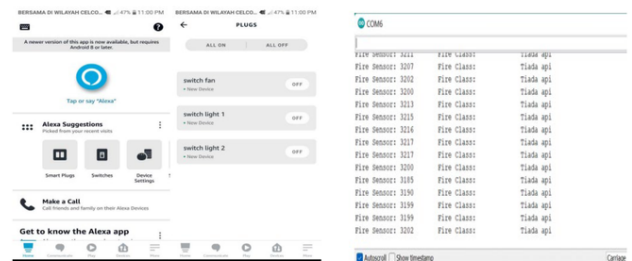

Figure 2: Appearance on Alexa software and flame sensor

CONCLUSIONS

The Home Automation Switch and Security System Using IoT project is very suitable to implement and use by the community according to the rate of electricity consumption in our country increasing year by year. This project also very easy to operate, if users want to use their voice just say "Alexa" to control the switch or control it via smartphone. Users can also monitor the existing of fire in the house using the flame sensor.

ACKNOWLEDGEMENTS

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GSM-BASED HOME SECURITY SYSTEM

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Abstract – This project is based on the security system using a passive infrared sensor (PIR) sensor, Arduino Nano, and GSM module. A PIR sensor is used to detect intruders. A standard PIR sensor has a range of about 6 metres. When the PIR sensor detects a motion, the PIR sensor's output spikes. This is detected by Arduino. Arduino then communicates with the GSM module via serial communication to call the pre-programmed mobile number.

Keywords: GSM Module, Arduino Nano

INTRODUCTION

The project focuses on designing a simple but very efficient home security system to stop theft attempts. The system uses an embedded system based on Global System for Mobile Communication (GSM) technology, which consists of an open hardware microcontroller and a GSM modem. The project is based on Arduino, a PIR motion detection sensor and GSM Module.

METHODOLOGY

Arduino Nano was the primary controller used in this project. It detected the signals from the PIR sensor and accordingly sent commands to GSM Module. The PIR motion detection sensor was attached to pin D3, the buzzer to pin D12 of the Arduino nano, and the GSM module's Tx and Rx to pins D9 and D10. The project's circuit connection used a 12V/2A adaptor to pass the circuit across the board.

RESULTS AND DISCUSSION

The PIR sensor is the only sensor used in this study. The project's research will be aided by several motions allowing the security system to be tested in various scenarios. According to Figure 1, the buzzer activates and sounds an alarm when motion is detected. If no motion is present, the buzzer will remain off. The GSM notifies the owner and sends a message when a motion is detected to the smartphone.
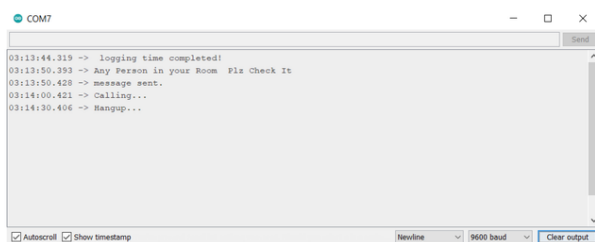

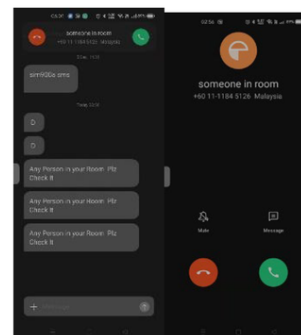Figure 1: The Results of Motion Detection.

Figure 2: Result of Communication via GSM Module when a motion is detected

Figure 2 shows the result of sending a text message to the owner through the GSM module after detecting the motion source and the result of making a call.

CONCLUSION

This project is simple to set up. Additionally, the project may simplify the notification process for users. This project's strength is its development of a GSM module that transmits information to users at the precise moment when someone enters the residence and uses alarm sounds to alert those nearby to ensure the area is safe and minimise user loss. Users can feel more at ease and avoid significant losses to their property.

ACKNOWLEDGEMENTS

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FIRE DETECTOR ALARM WITH AUTOMATIC WATER SPRINKLER

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Abstract - The aim of this project is to develop a fire alarm system that provides early warning of fire, enabling people to evacuate and take immediate action to stop or eliminate the fire as soon as possible. The electronic components used in this system include the Arduino Nano, flame sensor, gas sensor, relay, and water pump. A 7.4V battery is used to power the fire detector alarm and PCB board, while a 9V battery is used for the water pump to allow automatic water sprinkling. Flame and gas sensors detect fire and gas, and when confirmed, the LED will light up and the buzzer will sound. A relay is also connected to the system, which is activated when smoke is detected. This relay switches on the water sprinkler. The Arduino Nano serves as the main controller and sensor detector for the entire system.
Keyword: Arduino Nano, Fire detector, Gas detector, Automatic water sprinkler, LED will light up

INTRODUCTION

To invent a fire detector alarm with an automatic water sprinkler that can ensure the safety of many people and help them deal with fire emergencies effectively. This system will enable users to respond promptly to any fire incidents they may encounter. [1]

METHODOLOGY

In this project, the Arduino Nano has been used as the main controller to control the entire circuit in various ways. Additionally, a PCB board has been used to address the lack of power supply in the Arduino Nano. These connections are then combined with the sensors to operate the fire detector alarm and automatic water sprinkler. [2]

RESULTS AND DISCUSSION

The sensors play a major role in this project. When a fire or gas is detected, the LED will light up and the buzzer will sound. Then, the relay will be activated for the automatic water sprinkler. If a fire or gas is not detected, the LED will not light up and the buzzer will not sound. The relay will also not signal for the automatic water sprinkler to work. The automatic sprinkler works when the buzzer and LED light up, as shown in Figure 1. The table shows the results if fire and gas are detected or not detected.

Figure 1: The sensors detect and automatic water sprinkler is ON.

Figure 1 illustrates that the automatic sprinkler will only activate when the buzzer sounds and the LED lights up. If the buzzer and LED cannot be detected, then the automatic water sprinkler will remain OFF. The table in Table 1 summarizes the operation of the entire circuit.

Table 1: The results of fire and gas detect or not detect

FIRE AND GAS	LED AND BUZZER	AUTOMATIC WATER SPRINKLER
DETECT	ON	ON
NO DETECT	OFF	OFF

CONCLUSIONS

Both sensors will detect fire or gas, and then the LED will light up and the buzzer will sound based on the programmed time. This system can help minimize the loss of lives and property, and it can also be more time-efficient compared to waiting for the fire department.

ACKNOWLEDGEMENTS

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GAS DETECTOR WITH ALERT SYSTEM

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Abstract – Project Gas Detector with Alert System is one of the devices that can reduce the risk of burning and explosion in the home and warn users when there is a gas leakage. The 12v adapter gives power supply to the ESP. The main component is ESP32 in this project. ESP32 is a WIFI connected, it will give a power supply to the MQ-2 gas sensor. The MQ-2 gas sensor will get the reading and state whether the LPG gas detects or not detect. If the gas sensor detects, a notification will be sent to the phone and the buzzer will alert, the led red gets on, the LCD will state the level of gas and the CPU fan will absorb the gas.

Keyword: ESP32, MQ2 GAS SENSOR, LPG GAS

INTRODUCTION

Liquefied petroleum gas (LPG, LP gas, or condensate), is a flammable mixture of hydrocarbon gases, most commonly propane, butane, and propylene. However, the latter two typically comprise 5% or less of the mixture. LPG is used as fuel gas in heating appliances, cooking equipment, and vehicles. It is increasingly used as an aerosol propellant and a refrigerant replacing chlorofluorocarbons in an effort to reduce damage to the ozone layer. Gas This project aims to help provide information on LPG gas leakage in the consumer kitchen and also reduce the risk factor of fire. In this system, gas sensors detect leakage gas and note their owners on leakage by sending notifications (messages or notifications), next led red will be turned on and also buzzers will be coated as a warning and CPU fan absorbs gas. Lately, gas leakage problem is highly become current issue that is the main cause of fire burning. This project is produced to detect any leakage of cooking gas and it will alert the user about leakage. Users will get the alert in blink app as notification. By using this project, it will reduce the accident of fire and explosion.

METHODOLOGY

ESP 32 has been used in this project as a main controller. It has controlled the full circuit in various ways. Moreover, there is one input and six outputs in this project. MQ2 gas sensor is the input in this project and the output is buzzer, LCD, CPU fan, motor driver, blynk app and led.

RESULTS AND DISCUSSION

Table 1, shows that the projects how the project works. If the gas detection is more than 300, the LCD will state the level of LPG gas detection the red led will on, buzzer will alert, get notification on the phone and CPU fan will absorb the gas. While if the gas detection is less than 300, the led green will turn on, the buzzer will turn off, notification off and CPU fan will turn off. The LCD will state the level of gas detection.

MQ2 GAS SENSOR	LCD	LED	BUZZER	CPU FAN	NOTIFICATION ON THE PHONE
DETECT >300	STATE LEVEL OF LPG DETECTION	RED ON	ON	ON	ON
DETECT <300	NOT STATE	GREEN ON	OFF	OFF	OFF

Table 1: The table shows how the project works

CONCLUSIONS

This project helps everyone who is using the stove and warns the user when there is gas leakage. The mq2 gas sensor will detect the lpg gas and then all the outputs will turn on based on programming.

ACKNOWLEDGEMENTS

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FACE RECOGNITION TO UNLOCK DOOR USING RASPBERRY PI

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Abstract - *The* project aims to reduce burglary cases at home or factory. The raspberry pi B 3+ is the main controller with a Wi-Fi connection via a USB modem and camera. The system takes pictures and saves them on the SD card daily. The outputs of this system are LCD, relay and solenoid. The Raspberry Pi uses a camera to analyse signals, send commands, and record daily pictures of people or movements.

Keyword: Raspberry Pi B 3+, Face Recognition, Smart Home System

INTRODUCTION

The system's goal is to recognise faces using a camera system. This system is intended to lower the number of burglary cases in a home or factory. This system raises the security bar to stop people from unlocking the device without authorisation. Users can use this method to unlock doors in their homes, factories, and shops without locking them first. Because the lock will not be opened if the system cannot identify the same face, the owner does not need to worry about the house. [1-2]

METHODOLOGY

The camera captures people's faces and sends a signal to the raspberry pi to make a confirmation. The name of the face will appear beside the image of the face. The solenoid door will open if the face presented matches the face that has been registered; else, the solenoid will not open. Figure 1 depicts the project's designed system design flowchart.

RESULTS AND DISCUSSION

The camera captures people's faces and sends a signal to the raspberry pi to make a confirmation. The name of the face will appear beside the image of the face. The solenoid door will open if the face presented matches the face that has been registered; else, the solenoid will not open. Figure 1 depicts the project's designed system design flowchart.
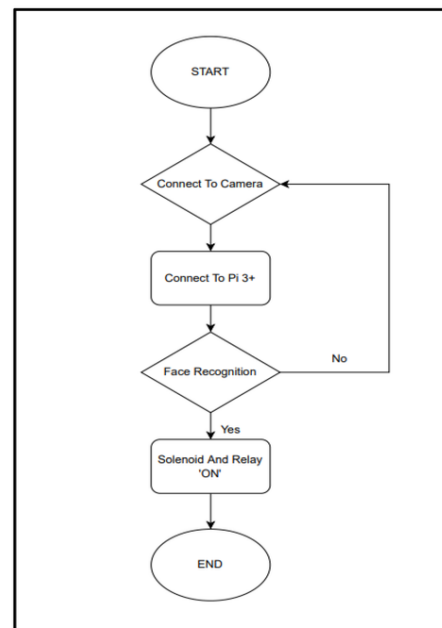

Figure 1: System Design Flowchart

CONCLUSION

In conclusion, there is no denying that today's technology can improve the standard of human life. Today's most cutting-edge technology has allowed people to create beneficial and practical Smart Home Systems. The comfort and safety of residential houses and factories will benefit thanks to this technology.

ACKNOWLEDGEMENTS

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FINGERPRINT DOOR UNLOCK SYSTEM

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Abstract – The purpose of this project is to unlock the door using the fingerprint. Electronic parts used are Arduino Nano, Fingerprint sensor, LCD display and solenoid valve. The project is supplied with 12 VDC supply. The fingerprint sensor identifies the fingerprint of the user and forwards it to the microcontroller to match with its records. If the fingerprint matches one of the fingerprints in the microcontroller's memory, the microcontroller will lock or unlock the latch, based on its current state. If other people with their fingerprints which are not in the microcontroller memory try to unlock the door, the door will not open. The door will be unlocked when it receives the authorized fingerprint only.

Keyword: Arduino Nano controller,Fingerprint sensor,LCD display

INTRODUCTION

Recognition of the fingerprint is a process of verifying the fingerprint image to open the electronic lock. This project highlights the development of fingerprint verification. Verification is completed by comparing the data of authorized fingerprint image with incoming fingerprint image. [1].

METHODOLOGY

Arduino Nano is used in this project as the main controller. It controls the full circuit in various ways. Moreover, a microchip is used to overcome the lack of I/O pin in Arduino. Then, these connections are merged with the fingerprint sensor in order to detect the fingerprint [2].

RESULTS AND DISCUSSION

This project works when an authorized fingerprint image is scanned at the fingerprint sensor and the door will be unlocked and finally the buzzer will produce a sound until the door is locked back. The door will open for 5 seconds and it will be locked automatically. The LCD will show "Welcome to Smart Door" before unlocking the door and after unlocking the door LCD shows "Welcome". If it detects an unregistered fingerprint the door will not be unlocked.

Figure 1: Unlocking the door using the fingerprint

Table 1: Data of unlocking door

Fingerprint	Door lock	Buzzer and LCD
Detect	Open	ON for 5 sec (Smart Door Open"welcome")
No Detect	Close	OFF("Welcome to Smart Door")

Figure 1 shows that the door will unlock when the fingerprint is accessed and the LCD will show the smart door open "welcome". Besides that, the buzzer also will produce a sound when the door is unlocked. When the fingerprint is not detected the door will not unlock. This is concluded in Table 1.

CONCLUSIONS

Avoid home theft with the fingerprint door unlock system. It will reduce the cost to hire a security guard in front of the house and the key loss problem will be solved. This project will be a demand in this modern world to avoid home theft and key loss.

ACKNOWLEDGEMENTS

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SMART ADAPTER AC STAND FAN

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Abstract – Devices called Smart Adapter AC Stand Fan can controlled an AC stand fan automatically. Its primary component is an ESP 32 with a PIR sensor, humidity sensor and temperature sensor and connected to WIFI to operate. This project use 240v as a main power supply. The primary power source for this project is 240 volts. Its also used relay to convert a 240 V supply to a 12 V DC in order to operate ESP 32 with the sensor on this project.

Keywords: ESP 32, Fan, Temperature, Relay, Speed Control

INTRODUCTION

Applications are created for devices to aid in the operation of the tool by people. With a little effort, these application tools can assist or lighten their labour. Most frequently, fans and air conditioners are useful in many places. Air conditioning is the most recent advancement in air conditioning technology, however due to its high price, not everyone can afford it. Although the fan is less expensive than air conditioning, it cannot be said to facilitate human work because it still relies on human effort to operate and operates in a typical manner [1]. As a result, innovation of this projects continues to advance and electrical gadget development improves. One of the methods uses two sensors that can detect the movement of persons around and second sensors that can read the temperature of the immediate region. For monitoring temperature changes. The operation used on the fan is based on a microcontroller. Then the data is changed be an input on the ESP32 microcontroller which is useful for determining On Off and the speed of the fan. So that it can produce a tool with a working system intelligent and able to work automatically which can help or alleviate human work without expending any energy [2].

METHODOLOGY

Smart Adapter AC Stand Fan used ESP 32 as a main controller with connected to temperature sensor and PIR sensor. It has controlled the full circuit in the various ways. The speed of the fan is referring to the temperature. Other controller for AC circuit by using relay. DC serves as the controller's power source for electronic parts. While the fan requires AC as a power source to switch on and run, the relay is utilised to control the fan's speed. There are 3 types of speed classified to this project. Relay for AC supply will connected to fan regulator and operate the fan.
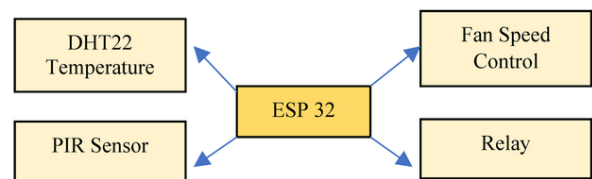

Figure 1: Concept of System Diagram

RESULTS AND DISCUSSION

This project had adhered to the notion of social responsibility in order to use current knowledge to simplify things for consumers. This project also substantially simplifies the job of users, especially for those who find it difficult to regulate the fan's speed without using a lot of energy. Additionally, the social obligation that needs to be fulfilled is to lessen the burden on the user. With this Smart Adapter AC Stand Fan, the user may utilise their existing fan without having to purchase a new smart fan, which saves money.

CONCLUSIONS

This development of this Smart Fan Adapter has the least negative impact on the ecology and does not contaminate the environment. This is because no chemicals are used in this project; only dry materials are used. Additionally, because it doesn't contribute to noise, air, or other environmental problems, this smart fan adapter doesn't disrupt the area. Because it poses no risk to both man and nature, this project can be employed without a doubt.

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AUTOMATED HYDROPONIC SYSTEM

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***Abstract* –** The hydroponic plants require sufficient nutrients, temperature, humidity, and pH level to grow healthily. Maintaining the correct pH level is crucial to ensure that the plants absorb the maximum amount of nutrients. This project presents an automated hydroponic system that controls the pH value. To begin with, a storage container is filled with a nutrient water mixture of AB Fertilizer and water in the ratio of 10L Water + 50ml A Fertilizer + 50ml B Fertilizer. A tube is then used to circulate the nutrient water in a plastic container, while the pH sensor detects the pH value. The pH range should be maintained between 5.2 to 6.2. In case the controller detects a pH value greater than 6.2, the ESP32 controller will activate the peristaltic pump to pump in pH down solution (Phosphoric Acid). Similarly, when the pH value is below 5.8, it will activate the peristaltic pump to pump in pH up solution (Potassium Hydroxide). The results demonstrated that the automated monitoring and controlling of pH levels was successfully developed, and the functionality was tested and confirmed as desired.

Keywords : ESP32, hydroponics, pH sensor

INTRODUCTION

The Automated Hydroponics System is a project aimed at growing crops without using soil, with the plant roots instead placed in a nutrient solution [1]. Sweet basil will be used as the vegetable in this project, and the pH sensor will be used to monitor the pH value. By controlling the pH value within the correct range, the crop will grow faster and healthier.

METHODOLOGY

In this project, the ESP32 microcontroller is used as the main controller to monitor and control the pH value of the water. The pH sensor is used as an input to monitor the pH value, while the output consists of two peristaltic pumps and an LCD display. If the pH value of the water is high, a signal is sent to activate the peristaltic pump to add the pH down solution and adjust the pH value to below 6.2. On the other hand, if the pH value is lower than 5.8, a signal is sent to activate the peristaltic pump to add the pH up solution and adjust the pH value. The LCD display is used to show the pH value and pump activity, and the system checks the pH value at 3-minute intervals. The project flow chart is shown in Figure 1.

RESULTS AND DISCUSSION

Based on analysis, it was found that the controller is capable of pumping the pH up solution (Potassium Hydroxide) or the pH down solution (Phosphoric Acid) to stabilize the pH value until it becomes between 5.8 – 6.2. This desired pH range is suitable for the healthy and faster growth of sweet basil. The nutrient water, which is a combination of AB fertilizer, is also crucial for the plant's growth. Table 1 shows the pH sensor readings and the operation of the peristaltic pumps. If the pH value is between the range of 5.2-6.2, no solution is pumped into the water tank. However, if the pH value is less than 5.8, the peristaltic pump will pump in pH up solution. Moreover, when the controller detects a pH value greater than 6.2, it will pump in pH down solution into the water container. The results of the test are shown in Table 1, and a prototype of the project is shown in Figure 2.

Table 1: The table shown how the project works

pH	Action	Result
5.8 – 6.2	No solution pump in	Yes
>5.8	pH down solution pump in	Yes
<6.2	pH up solution pump in	Yes

CONCLUSIONS

The project has the potential to provide opportunities for individuals who are interested in growing vegetables at home but have a busy daily schedule. It can aid in plant care at home by automatically providing the necessary nutrients without requiring much attention from the user. In conclusion, this project is suitable for users who wish to cultivate vegetables but are occupied with work and unable to tend to their plants on a daily basis.

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IoT SMART CAR PARKING

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Abstract – This IOT Smart Car Parking aims to determine how much parking space is available in a parking area by measuring the number of cars coming and exiting on smartphones without involving human interactions. Finding a parking spot takes longer, which is more time-consuming for drivers. Drivers' annoyance can be decreased by implementing an IoT smart car parking system to reduce users' time to locate empty lots before beginning their journey. The "MQTT" platform delivers parking lot availability information to the user's smartphone. This design's IOT-based Smart Car Parking system provides an effectual visual output.

Keywords: RFID, Infrared Sensor, ESP32, LED, Servo Motor

INTRODUCTION

In the present day around us, we see so many excess automobiles and the ineffectiveness of managing them in the correct order. This 'IOT Smart Car Parking' project proposes an effective way of identifying empty spaces and managing the large number of vehicles moving in and out in shopping malls and private car areas by detecting a vehicle using IR PROXIMITY sensors and RFID cards connected to Microcontroller ESP32. It is a simple circuit built to save users time finding empty slots before setting their journey and prevent drivers' frustration. Imagine getting the parking slot availability information on the phone and not having to roam around to check the availability. [1]

METHODOLOGY

In this Smart Parking System using IOT, one RFID reader, five IR Sensors, and two servo motors were used. RFID reader sensors, IR sensors, LCD_I2C, and Servo motors are connected to the ESP 32 Wi-Fi Module to control the complete process and send the parking availability information to MQTT. Two IR sensors are used at the entry and exit gate to detect the cars at the entry and exit gate and automatically open and close the gate. Two servo motors are used as entry and exit gates, so whenever the RFID sensor reader is, the entry servo motor automatically rotates from 0° to 90°, and the entry IR sensor detects a car, it will return its initial position. Another three IR sensors detect if the parking slot is available or occupied and send the data to ESP 32. The parking availability slot will be displayed in the I2C_LCD display. [2]

RESULTS AND DISCUSSION

Figure 1 shows that the IR sensor's slot is used to detect the presence of a car. Once the IR Sensor slot is detected, LED lights on the ceiling will turn ON to indicate that the slot is full. The result will also be displayed on LCD, as it gives us visual outputs on the phone and LCD.
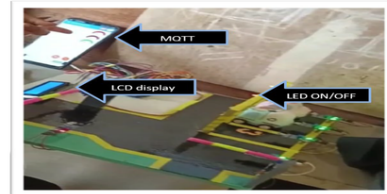

Figure 1: Infrared Sensor

Figure 2: IOT dashboard

Figure 2 shows that the parking slot availability will be published on smartphones through the "MQTT" platform. Therefore, users get to know the details of parking slot availability and can be monitored from anywhere in the world.

CONCLUSIONS

This IoT system can benefit from smart car parking well beyond avoiding needless roaming around to check the availability of parking slots. The IoT-based parking system can easily access the availability of the parking slot over the internet. This system can completely automate car parking to support government initiatives on digital transformation programs.

ACKNOWLEDGEMENTS

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IOT LOCKER SECURITY USING RFID

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Abstract – This project is designed to solve problems arising in conventional lock systems. The project covers two methods to open the locker door: first, using the Blynk application connected to the ESP8266 WeMos D1 to signal the Arduino Nano. Then the Arduino Nano signals the solenoid to open the locker door, which is controlled by a relay. Second, the input from the RFID tag works to open the locker door when the RFID tag is brought close to the programmed RFID reader. Then, the Arduino Nano will process the RFID. If the RFID tag matches, a green LED will light up, and a solenoid will open the locker door controlled by the relay. The microcontroller will direct the output (alarm) if the RFID tag does not match. The alarm sounds, and the red LED lights up as a warning sign. This RFID system allows only authorised users to open the locker door.
Keywords : Arduino Nano, RFID, Blynk application

INTRODUCTION

The issue of security has long existed in office areas, and various efforts have been made to reduce theft. A place to store goods or lockers has benefited users. Lockers are found in locker rooms, dormitories, workplaces, mosques and other places that require storage. Lockers not only store items but ensure that the items placed inside are protected from theft, loss or damage. Lockers are available in various shapes, sizes and materials. Most lockers are made from iron, wood, plastics, and other materials. Most lockers do not have an additional security system. Therefore, the lock system needs to be upgraded and modernised to guarantee the contents in the lockers.

METHODOLOGY

Arduino Nano was used in this project as the main controller. It has controlled the full circuit in many ways. Also, there are two inputs and four outputs in this project. RFID and Blynk applications are the input in this project, while the outputs are a relay, buzzer, led and solenoid.

RESULTS AND DISCUSSION

Table 1 shows the alarm testing, which aims to determine whether the alarm can be sounded when someone uses a registered or unregistered RFID tag. The testing is done with registered RFID tags and unregistered RFID tags. Table 2 shows that an RFID reader can detect RFID tags from 1cm to 2cm but cannot read an RFID tag if the distance is over 3cm.

Table 1: The table shows alarm testing against registered and unregistered RFID tags.

Activities	Alarm Response
Registered RFID tag (AE 5C FA B0)	No Beep
Unregistered FRID tag (83 67 3B AA)	Beep Sound

Table 2: The table shows RFID response to the measurement of distance

RFID Tag Distance (cm)	Response
1	Detected
2	Detected
3	Not Detected

CONCLUSION

The project helps to keep important items and documents safe in the office and warns users when an unauthorised RFID tag tries to access the security locker.

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MONITORING ENVIRONMENT TEMPERATURE AND WATERING OF CHILI PLANTATION USING MQTT PROTOCOL

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Abstract – The existence of this project will make it easier for users to monitor the temperature and irrigation of crops using the MQTT Protocol. The main component in this project is ESP32. ESP32 is a WIFI connected, it provides power supply to the sensors. This project includes DHT11, DS18B20 as well as water level sensors. The data will be sent through the ESP32 microcontroller to the MQTT application system that will be sent to the device we are using.

Keyword: Esp32, Environmental Temperature Sensor, Water Temperature Sensor, Water Level Sensor

INTRODUCTION

Currently, we are increasingly exposed to planting trees in our homes. Nevertheless, many do not know how to take good care of their crops. There are some problems in plant care which are in terms of irregular temperature. It will affect the quality of the plant. Therefore, the existence of this project will make it easier for its users to monitor their crops. The project uses the ESP32 Do It Dev Kit V1 microcontroller as the main component. In addition, there are also DHT11, DS18B20 and water level sensors. The data will be sent through the ESP32 microcontroller to the MQTT application system that will be sent to the device we are using. The ambient temperature can affect the germination and growth of trees. The ideal temperature for seed germination of chili crops is at 25°C - 30°C. In the seed germination stage, the humidity of the nursery medium is very much taken care of. This is to prevent the seeds from germinating due to the drying medium. Meanwhile, the appropriate temperature at the planting stage is between 24°C - 28°C. If it is too damp and cold, the growth of the chili tree will become slow. If the temperature is too high, the tree will quickly wither and the fruit produced also deteriorates in size.

METHODOLOGY

ESP 32 is used in this project as the main controller. It controls the full circuit in various ways. Moreover, there are three inputs and one output in this project. Environmental temperature sensor, water temperature sensor and water level sensor are the input in this project and the output is LCD.

RESULTS AND DISCUSSION

Table 1 shows how the project works. The three sensors will collect the data. Then, the data will be sent through the ESP32 to the MQTT application system that will send the data to the device we are using.
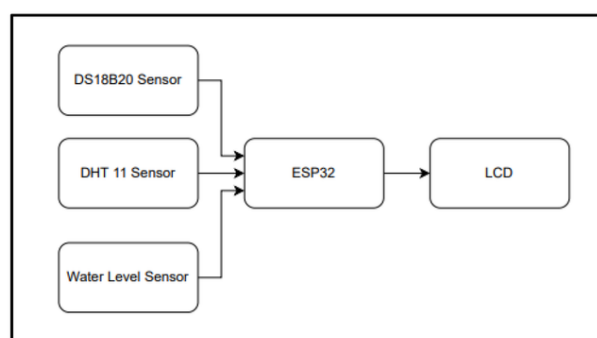

Figure 1: Block Diagram

CONCLUSIONS

This project can help users of different age, race, nationality and religion. It's perfect for anyone with desire. It is highly recommended to anyone who does not know how to take care of their crops well.

ACKNOWLEDGEMENTS

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IoT SMART MAILBOX

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Abstract – A project was conducted after observing apartment residents who had trouble checking their mails. A mailbox called IoT Smart Mailbox intends to alert users via their smartphones when mail arrives in the mailbox. Apartment residents who do not have a mailbox in front of their apartments might find the project practical. The project uses an Arduino mailbox controller and Telegram to send notifications when the mail arrives. In addition, the project uses ESP32 as a microcontroller, LCD, LED, buzzer, and two different kinds of detectors: infrared and ultrasonic.

Keywords: Telegram, Arduino, ESP32

INTRODUCTION

A mailbox called IoT Smart Mailbox intends to alert users via a smartphone when mail arrives in the mailbox. Apartment residents who do not have a mailbox in front of their apartments might find the project practical. In addition, the project can prevent late payment issues with utility bills and bank statements [1].

METHODOLOGY

The project used an ESP32 as the primary controller. It used a variety of methods to regulate the entire circuit. To operate the mailbox system, these connections were combined with LCD, LED, buzzer, infrared, and ultrasound [2]. A microchip was utilised to work around the ESP 32's lack of an I/O pin.

RESULTS AND DISCUSSION

The availability of the IoT Smart MailBox in Figure 1 helps apartment residents by minimising the loss of important mail. The mailbox's infrared sensor makes the user aware of letters or bills, and the ultrasonic sensor determines whether the mailbox is full based on the letter's height. The mailbox's LED turns red if it is full and green if not. With a strong Wi-Fi connection, a smart mailbox will function and then use the "Telegram" app to transmit notifications. The apartment residents of a particular mailbox will receive reminders through the app reminding them of their letters or bill.

Table 1 compares the variation in LED colour changes and the number of letters the sensor can detect. A maximum letter value of 10 is permitted for mailbox LED green detection. The LED will turn red when the number of letters value is at 11.
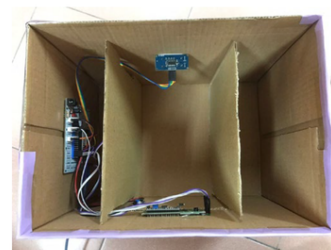

Figure 1: Smart Mailbox Prototype

Table 1: Difference number of letters

No.	Number of Letters	Infrared	Ultrasonic	Led green	Led Red
1.	1-10	Detect	Undetect	ON	OFF
2.	11	Detect	Detect	OFF	ON

CONCLUSION

Ten letters are the most that an LED green can detect. The colour of the LED changes to red as the number of letters increases to 11.

ACKNOWLEDGEMENTS

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OVERLOAD CURRENT DETECTOR ELECTRIC ON SOCKET WITH IOT

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Abstract *–* The recent increase in electricity tariffs and the introduction of feed-in tariffs from renewable sources have increased consumers' interest in energy as found in commercial and residential buildings to reduce their energy consumption. The aim of this project is to design and develop intelligent power sockets and central control systems using an electrical maximum setting system to control electrical energy. The system is designed in such a way that the smart socket provides the necessary data to the central controller. Then, the system analyzes the data to generate control commands to either to turn on or to turn off the device plugged into the smart socket. The results of the analysis of the project prototype results show that the developed smart socket can correctly display the total current, power consumption & electrical energy on the LCD and send the overload current value if excessive through the telegram notification.

Keyword: Raspberry Pi 3 B+, blinking LED

INTRODUCTION

Nowadays, there are many applications that make systems work effectively. With the development of human life today, a lot is related to the advancement of technology. The rapid development of advanced technology allows today's life to evolve quickly and accurately. Therefore, it is a golden opportunity for the public to expand their knowledge related to advanced technology as the generation is growing from time to time. [1].

METHODOLOGY

The smart socket is designed to provide the necessary data to the central controller. Then, the system analyzes the data to generate control commands either to turn on or to turn off the device plugged into the smart socket. The method is expected to meet the objectives of the project and achieve a satisfactory result.

RESULTS AND DISCUSSION

The function of this project is to decide the overcurrent that has been set by the user. Users can specify the current they want to use through the telegram application. At the same time, it can also warn of excessive currents used via telegram as shown in Figure 1. For example, by providing two light bulbs worth 100watts at a maximum level of 1A current setting, the prototype will break the circuit for the energy

consumption proposed.
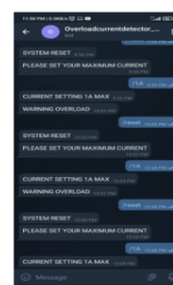

Figure 1: Intelligent power socket

Figure 2: Telegram notification

Figure 2 shows how the user can get the notification through telegram when the overload current is excessive.

CONCLUSIONS

The Overload Current Electric Detector on Socket with Iot is a project that needs to be focused because it is very much needed by the community, especially in residential areas. This is because in residential areas, the electricity bills are often high and can cause damage to electrical goods due to excessive electricity.

ACKNOWLEDGEMENTS

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OVERLOAD CURRENT MONITORING AND CONTROL USING IoT

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Abstract – The project aims to develop an Internet of Things (IoT) electricity meter that will capture meter data and send it to the consumer via the internet. ESP32 and YHDC SCT 013-000 current sensors are used for this project. All the meter data are displayed inside the apps, and the necessary selections are made using the main application. The main application notifies the user if there is excessive electrical load and can decide whether or not to take action. This whole process is controlled by the ESP 32 as it is the main controller.

Keywords: ESP 32, electricity meter

INTRODUCTION

The project aims to develop an overload current monitoring and control system that makes it more manageable for the occupants to deal with problems in the event of an overload current. In addition, they can respond quickly to the desperate situations they face [1].

METHODOLOGY

ESP32 is a microcontroller which controls the system. ESP 32 was used in this project as a main controller. Figure 1 shows how this project works.
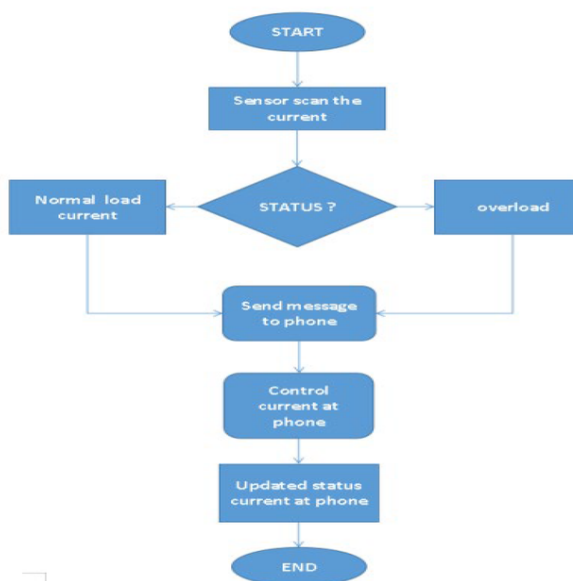

Figure 1: Project Flowchart

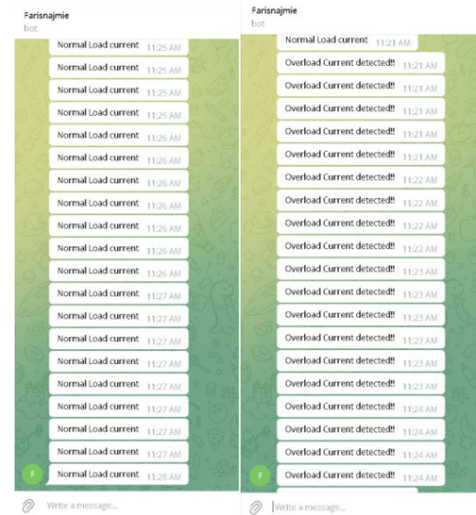## RESULTS AND DISCUSSION

Figure 2: Normal and Overload Current

Figure 2 shows the Telegram display on whether the overload current happens. Telegram sends a notification 'Normal Load Current' if the current is not overloaded or 'Overload Current detected' if the current is overloaded.

CONCLUSION

The overload current monitoring and control using IoT for electricity metres will help reduce undesirable incidents in residential areas. The project allows a homeowner to monitor the amount of current flowing and, in the event of an overload, control the situation using a smartphone.

ACKNOWLEDGEMENTS

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PHONE CHARGING STATION

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Abstract – Phone Charging Station is a mobile phone charging system when a coin is inserted. This system is used by shop owners and compatriots and can be implemented in public places such as railway stations, bus stations as well as airports to provide mobile charging facilities. The coin receiver recognizes the valid coin then signals the arduino for further action. If valid coins are detected, it signals the arduino to start charging a 5V supply to the mobile phone. The Arduino displays a countdown timer for the mobile phone. If another coin is added, the charging time will also be increased. This system can be used to charge smart mobile phones in public places. This coin-based mobile charging system will supply a sufficient amount of charger to mobile phones and is available based on demands in public places.

Keywords: *Phone, Charging station, Arduino, Coin detector*

INTRODUCTION

Phone charging stations are useful to be placed in public places such as shopping malls, grocery stores, airports, train stations and tourist destinations. The design is safe and made for waiting areas or high traffic areas and needs a consistent use of a charging system. The design is adapted to the modern social media world and the needs of people to own their mobile phones and other devices that need frequent charging. This product can increase customers' satisfaction when using it. Furthermore, phone charging stations are useful to charge the phone quickly and to reduce phone charging duration.

METHODOLOGY

Arduino Uno is used in this project as the main controller. It controls the full circuit in various ways. There are one input and three outputs in this project. Coin sensor/detector is the input and the output is LCD, buzzer and relay that are connected to the multi pin-charging unit [1].

RESULTS AND DISCUSSION

Table 1 shows the project's analysis of battery charging by phone brands. When the Coin Sensor detects the coin, it sends a signal to the microcontroller. The microcontroller turns on the relay to provide 230V, signaling the charging socket. Then the user can charge his mobile phone from the socket. The relay is connected to the LCD that shows the duration of charging on the display. When the time expires, the display shows 'please insert a coin' and the relay stops.

supplying power to the socket. The prototype of this project is shown in Figure 1.

Table 1: Analysis of Battery charging by Phone Brands

Phone Brands	Max Charging Voltage,V	Max Charging Current (mAh)	Time Charging (Minute)
Iphone	5.0	3240	30
Samsung	5.7	3400	40
One Plus	5.7	4000	45
Xiomi/ Realme	5.0	4000	50
Oppo	5.0	3500	40
Huawei	5.0	3000	35
Vivo	5.0	4500	40

Figure 1: Phone Charging Station Prototype

CONCLUSIONS

This project helps people who need to charge their device, especially phones in public areas or waiting areas. The mq2 gas sensor will detect the lpg gas and then all the output will turn on based on the programming.

ACKNOWLEDGEMENTS

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PET FEEDER

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Abstract – Pet lovers usually face problems when they leave their pets for long periods, like going on a holiday or vacation. This project aims to ensure our pets are fed at the right time and to know whether the animal is eating. Moreover, the project is designed to save users time feeding their pets. ESP32 controller and Telegram notifications are used for the project. The pet feeder distributes kibbles automatically according to the timer and dispenses the appropriate quantity of kibbles. Thus, pet owners do not have to worry about leaving their pets.

Keywords: Esp32, Telegram

INTRODUCTION

A pet feeder is an automatic machine to feed pets a predetermined quantity of kibbles**.** It is crucial because pet keeping is a time-consuming responsibility. The project aims to help pet owners feed their pets on time, even when not at home. Moreover, it helps the owner know their pet's eating habits to ensure their pet is healthy. The project is convenient as it helps owners by feeding their pets efficiently. The system acts in two ways: feeding the pet and sending the feeding notification to the owner.

METHODOLOGY

ESP32 was used as the central controller on this project. It has complete control over the entire circuit. The project was equipped with infrared sensors, force sensors, LEDs, and water pumps (motor). At the food section, a servo motor works to pour kibbles into the pet food container, and the message will be sent to the owner via Telegram [1]. After it dispensed the kibbles, the system stopped for a specific time until the next feeding [2].

RESULTS AND DISCUSSION

Telegrams played a vital role in this project. LED is used as an indicator for the infrared sensors because the infrared sensors scan the kibbles in food containers. If the kibbles do not exceed the infrared sensor, the red led will light up and send a 'low food level' signal in the Telegram, as shown in Figure 1. When the green led is lit, it is marked that the feed level exceeds the level set on the sensor. A force sensor receives pressure from the animal's weight, and then a signal is sent to the servo motor and water pump. Then, kibbles and water will come from the storage tank into the food container. Figure 1 shows that low kibble levels appear in the Telegram when kibbles in a container are empty or low.

Figure 1: Notification in Telegram showing low food level

Table 1: Result sensor for pet detection

Sensor	Operation	LED Red	Led Green	Servo motor and water pump	Telegram
Infrared sensor	Detect	off	Light up	off	No notification send
	No detect	Light up	off	off	'low food level'
Force sensor	Detect weight	-	-	on	-
	No detect	-	-	off	-

CONCLUSION

In conclusion, the project achieved the objectives of helping pet owners to feed their pets and notifying them of the level of kibbles inside the container.

ACKNOWLEDGEMENTS

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POST-BOX SYSTEM WITH BUZZER ALERT

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Abstract – This project was implemented based on monitoring of current methods of mailboxes, mail sent and placed in mailboxes is often lost and abandoned by users. The objective of this project is to design a handy mailbox to help solve this problem. The scope of the research that has been set for this project is condominiums, apartments, high-rise office buildings and shopping mall lot. This project uses " ESP 32 " material as a connector between sensors and the battery. The sensor alerts the Arduino cloud to send the user a message through the application – GMAIL on the user's phone. Based on the survey that has been conducted, the Post-Box helps users to solve the problems stated.

Keyword: ESP32, IR SENSOR

INTRODUCTION

To invent an emergency detecting traffic light system which makes the driver to be more disciplined and tactful in their problems in case of an emergency and due to human errors. Besides, they will able to react quickly to the desperate situation they face.

METHODOLOGY

This report describes the design and analysis involved in developing the Post-Box System with Buzzer Alert to help users to be more alert or sensitive to the presence of important notices and mail in the existing mailbox especially the centralized mailbox. The purposes of this project are to design, assist users and test the effectiveness of this project in solving problems.

RESULTS AND DISCUSSION

Testing is an important stage after the assembling process, because we didn't know the performance of the product (Mail Box) without testing. To achieve the study objective, simplify for users to know the presence of mail in the mailbox, we designed a mailbox with a sensor to determine the presence. The sensor will detect the presence of the letter and send the notification.
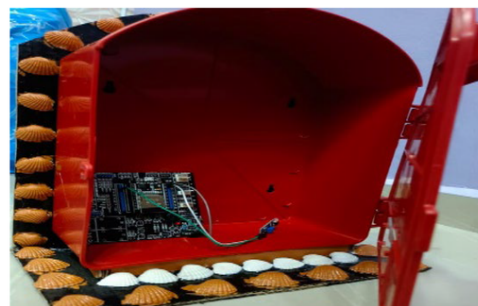

Figure 1: ESP32 DETECTION WITH IR SENSOR

Table 1: Data Collection

IR SENSOR	SENT MAIL	TIMING
DETECT	RECEIVED	AFTER 10S
NO DETECT	DECLINED	NEVER

CONCLUSIONS

The objectives discussed prove that this project gives a positive result and due to the survey that has been conducted, this project is well accepted. By proposing Post-Box System With Buzzer Alert project, this mailbox will help users to reduce the loss of important parcels or letters. The assembly of the sensor in the postbox will help users to be more alert with the presence of bills or letters. So, we know that IoT is a very important thing to all of us and based to this project, it will help us in our future one day.

ACKNOWLEDGEMENTS

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RADIO MODULATION TECHNIQUE (LORA) FOR TRANSMISSION OF ENVIRONMENTAL TEMPERATURE AND HUMIDITY DATA

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Abstract *–* Radio Modulation Technique (LoRa) for Transmission of Environmental Temperature and Humidity Data project is a long-distance data transmission using long range (LoRa) with an antenna that can be sent as far as 15km without obstacles. This project focuses on the areas with no internet coverage for long-distance data. This project uses two microcontrollers which are Arduino Nano for transmitting and esp32 for receiving. To turn on the device, the DHT11 sensor is used for temperature and humidity. In the transmitting side, the sensor will take a reading and transfer it to the Arduino Nano, where it is then transmitted to the receiver side. When the data is received, esp32 will accept the data and display it through the serial monitor, LCD and IoT MQTT application.

Keyword: ESP32, Arduino Nano, DHT11 Sensor, LCD, MQTT application

INTRODUCTION

This project uses two microcontrollers which are Arduino Nano and esp32 to apply the long range (LoRa) device SX1278 with antenna as a support system. The priority of the project is the use of the sensor which is DHT11 to turn on the device. Also, data of the sensor will be transmitted to the receiver. After the data is received by the receiver, it will be automatically displayed at the serial monitor, LCD and IoT MQTT.

METHODOLOGY

Arduino Nano and ESP32 are used in this project as main controllers. So, there are two blocks of diagrams in this project. Each controller will show the full circuit in different ways. Moreover, for the transmitting side, there is one input and one output. The input is dht11 and the output is LoRa transmitting. On the receiving side, there is one input and three output; the input is LoRa transmitting and the output are serial monitor, LCD and IoT MQTT application.

RESULTS AND DISCUSSION

Figure 1 shows how the project works and the distance of data transmission that can be sent through LoRa sx1278. Once the data is received, it will be displayed and the MQTT will also change according to the receiving reading. It needs internet connection to access the data.
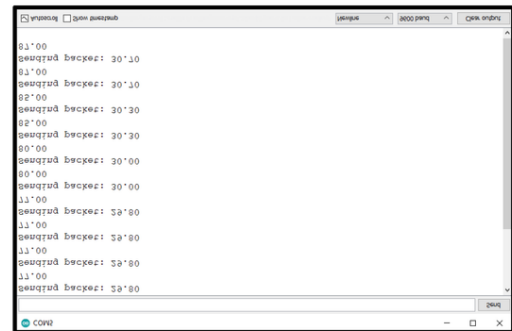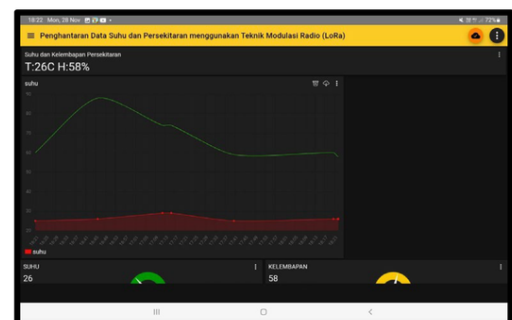

Figure 1: Data in Serial Monitor

Figure 2: IoT MQTT Dashboard

CONCLUSIONS

This project aims to help people who are using the LoRa device to take care of everything within a long distance. It is also helpful to anyone who wants to keep a closed area by using a sensor as an implementation.

ACKNOWLEDGEMENTS

The researchers would like to thank their parents and supervisor for financial and guidance support. The researchers would also like to thank friends and Polytechnic Lecturers who have intentionally or unintentionally gotten involved and helped in various ways to complete this project.

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RFID SMART SHOPPING CART

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Abstract – The **RFID SMART SHOPPING CART** project gives a solution to reduce the shopping time at supermarkets. Every supermarket employs shopping trolley in order to aid customers to select the products which they intend to purchase. At the billing counter, customers may face many problems like waiting and don't know even if they have sufficient money for the products they purchase. The billing process at the counter is time consuming and also need more human resource in the billing section. It has RFID scanner and LCD display, which can be used to scan the products and display the product information, cost and total bill. This solution will increase the consumer experience and reduces shopping time. The aim of this project is to design a Smart Shopping Cart at shopping malls. In my project, I propose an IoT based shopping system in which a Radio Frequency Identification (RFID) technology is used.

Keywords: Smart shopping cart, RFID, IOT, LCD Display, Shopping mall.

INTRODUCTION

A huge amount of rush plus cashier preparing the bill with a barcode scanner is too time consuming and results in long queues. This innovative project consists of an RFID system that can be placed within the shopping trolley which is controlled by ESP32. So, whenever the customers scan the product themselves, it is detected by the RFID module and is displayed on LCD along with the price of the product. As the shopper goes on adding products, all products are detected by the module and therefore the price will increase accordingly. The details of the purchased items such as the item's name, price and quantity also can see through the smartphone by web hosting. In case if customer changes his/her mind and doesn't want any product added to the trolley he/she can remove it by rescanning the item and then it will be deducted automatically. At the end of shopping the customers can see the product along with their price and gives the total amount to be paid

METHODOLOGY

Smart Cart using NodeMCU and RFID is an efficient system when it comes to scanning products. It uses a NodeMCU, a RFID reader, an LCD, LED, etc. All the products in the shopping malls or supermarkets are provided with a unique RFID tag instead of a barcode. The RFID reader shall be used to scan the RFID tags present on the product and all the information received from the tags shall be stored in the NodeMCU. Each shopping trolley has its own setup which contains an RFID reader, a push button to make payments and an LCD screen to display all information related to the item. The product can be directly scanned by the reader and if the customer wishes to remove any product, they just have to again scan and press the push button, then the product should be deleted.

RESULTS AND DISCUSSION

Table 1, shows that the components are attached to the shopping trolley. This project is capable to be upgraded in the near future.

Table 1: The table shows how the project works

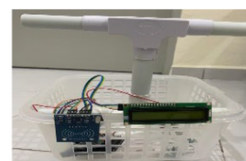| No. RFID Tag	Product	UID Number
Tag 3	Rice (1kg)	5825254128
Tag 4	Tea (50g)	9714315039
Tag 1	Biscuit	5519063180
Tag 2	Soap	1472987167

Figure 1: Project Prototype

CONCLUSIONS

As a conclusion, this paper is about designing and developing a RFID smart shopping cart system that will simplify shopping experience of customers in supermarkets, reducing their waiting time and reducing human swarms in front of cashiers. RFID is the key of the technology required for the implementation of this project.

ACKNOWLEDGEMENTS

The researchers would like to thank their parents and supervisor for guidance and support. The researchers would also like to thank friends for helping in various ways to complete this project.

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SALAD MOISTURE SYSTEM USING ESP32

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Abstract – The "Salad Moisture System Using ESP32" project is an automatic tree watering system. The 12V adapter gives a power supply to the ESP. This project uses ESP32 as the main component. There is also IOT in this project to read the value of the sensor. Next, this project can improve the plant system to get sufficient water for the plants. This project also can save water from being wasted.

Keywords: ESP32, IOT, Moisture System

INTRODUCTION

The "Salad Moisture System Using ESP32" project is an automatic tree watering system. This idea was sparked when researchers saw the problem of green plants, such as dry or dead lettuce, prevalent among farmers in Malaysia. The idea of developing this project is essential for Malaysians, especially for farmers. According to observations, the average farmer suffered high losses due to the problem. This is caused by the dry season weather that occurs in Malaysia yearly.

METHODOLOGY

This project used ESP 32 to be the main control. Another is that this project has three inputs and four outputs. The input is a soil moisture sensor, humidity sensor and temperature sensor, while the output is a buzzer, LCD Display, water pump and IOT connection. [1]

RESULTS AND DISCUSSION

Table 1 shows the project's result and data value. If the soil sensor detects the soil dry, the buzzer will be activated, and the LCD will display, "The soil is DRY!!!" If the soil sensor detects the soil wet, the buzzer will be off, and the LCD will display "The soil is WET". The data value can be read from the application IoT CLOUD REMOTE.
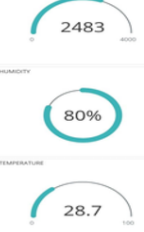

Figure 1: The table shows the result and data value

CONCLUSIONS

This project will help farmers facilitate their work. The soil moisture sensor will detect the current state of the soil, and then all the outputs will turn on based on the programming which has been made. [2]

ACKNOWLEDGEMENTS

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SMART BICYCLE LOCK

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Abstract – This project aims to upgrade the current bicycle lock to a more sensitive alarm system. This project study has been developed titled "Smart Bicycle Lock". This project has been created and designed for bicycle users to be more aware of using ESP32. The vibration sensor will detect the interruption or hold the lock. By having a siren or buzzer in this project, people surrounding will be more sensitive and alert to the presence of thieves. The user will receive a notification when it is damaged and touched by other people through the MQTT panel apps. The MQTT can also control the on and off buttons for the lock to open or close.

Keywords: ESP 32, Vibration sensor and MQTT panel apps.

INTRODUCTION

To prevent theft of the bicycle and other things. Smart locks offer consumers a convenient way of handling locks and access to their phones. The system's cost-effective implementation with advanced functionality and easy-to-use interface is advantageous. It is easier because it can be controlled by the MQTT panel apps [1].

METHODOLOGY

This project has used an ESP32 microcontroller as a main component. It has controlled the full circuit in various ways. When an unauthorised person tries to break or interrupt the lock, a notification will arrive to the owner, and at the same time, the buzzer will turn on.

RESULTS AND DISCUSSION

This project uses an ESP32 microcontroller as a main component. Apart from that, this project as well using other components, such as a Vibration sensor and servo motor. This project also uses the IoT system, which is the MQTT panel.
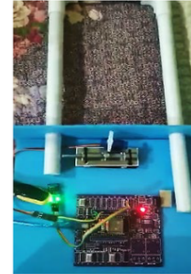

Figure 1: The sensor detects an interrupt, and its lock is OFF

Figure 1 shows the image obtained of the smart bicycle lock. Throughout the project, the vibration sensor will detect the interruption at the shackle, which is the PVC. The lock will turn on when the user unlocks it at the MQTT panel on the smartphone. The operation of the whole circuit is shown in Table 1.

Table 1: Smart IoT bicycle lock

Interruption and broke	Vibration sensor and buzzer	Notification MQTT panel
Detect	On	On
No detect	Off	Off

CONCLUSIONS

This project is to make people more aware of losing one's own belongings, even if it is just a bicycle. Creating this bicycle lock will help users reduce the case of theft.

ACKNOWLEDGEMENTS

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SMART BLIND STICK

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Abstract – Technological advances require the innovation of devices that can be used to help the blind people for their daily routine life. The aim of this project is to help blind people to detect the obstacles or signs at their surroundings area. The device is equipped with an ultrasonic sensor and a water sensor. Ultrasonic sensors are used to detect entry barriers ahead by using ultrasonic wave reflections, water detection sensors to find out if there are puddles or floods ahead, while switches are used to signal or notify users to their caretakers if they get lost or in danger. Motor vibrators and buzzers are used as the outputs. The motor vibrator will vibrate if there is an obstacle in front and the buzzer will sound if there are puddles of water or watery areas.

Keyword: ESP32, ultrasonic sensor, moisture sensor

INTRODUCTION

The aim of this project is to create a smart cane device for blind individuals that promotes their mobility and enhances their ability to engage in daily activities. This device has the potential to reduce the risk of injury to the user [1].

METHODOLOGY

The ESP32 was used as the microcontroller in this project, responsible for controlling the entire circuit in various ways. Ultrasonic sensors were utilized to detect obstacles in front of the user, while moisture sensors were used to detect wet areas. When an obstacle is detected, the motor vibrator is activated, and when a wet area is detected, the buzzer emits a sound.

RESULTS AND DISCUSSION

Figure 1 shows the connections of the main circuit. The LED lights up immediately after the project is connected to the 5V supply. As soon as the ultrasonic sensor detects an obstacle or object in front, the motor vibrator turns on, while if the moisture sensor detects a watery area, the buzzer sounds, indicating the presence of water. The switch is used to send a notification to the user's guardian if the user is in trouble or needs assistance.
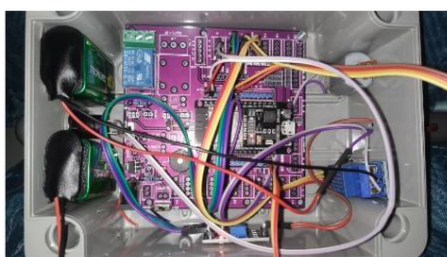

Figure 1: The circuit connection in casing box

Table 1 : The result for smart blind stick

Input	Vibration motor	Moist sensor	Telegram
Ultrasonic sensor	Detect > 50cm, it will ON.	Not detect	Not detect
Moist Sensor	Not detect	Detect water > 5% buzzer will ON.	Not detect
Switch	Not detect	Not detect	Buzzer will ON and send notification to Telegram.

Table 1 shows the results displayed on the serial monitor in the Arduino IDE. If the ultrasonic sensor detects an obstacle more than 50cm away, the motor vibrator will turn on. If the moist sensor detects water more than 5%, the buzzer will turn on to indicate a watery area. When the switch is pressed, the buzzer will turn on and a notification will be sent to Telegram.

CONCLUSIONS

This system offers a low-cost, reliable, portable, low-power consumption and robust solution for navigation with obvious short response time. Though the system is hard-wired with sensors and other components, it's light in weight.

ACKNOWLEDGEMENTS

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SMART DOOR LOCK SYSTEM

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Abstract – The goal of this project is to eliminate the need for traditional keys by providing an automated and convenient method for locking and unlocking a door with security system based on ESP32 microcontroller which it can be unlocked by using Telegram on mobile phones and 4x3 Matrix Keypad with PIN code. A great deal of research and information has been gathered to ensure the success of this project. The study objectives have also been presented, and initiatives to achieve these goals will be undertaken.

Keyword: Esp32, 4X3 Matrix Keypad, Telegram.

INTRODUCTION

To invent a smart door lock that can be remotely turned on by any device that is connected to the Smart Door Lock System which makes it easier for a person to monitor and control from anywhere. Other than that, it can help to reduce crime rates. [1]

METHODOLOGY

The ESP32 has been used as the main controller in this project, enabling complete control of the circuit in various ways. A keypad has been incorporated for entering the PIN code, and a solenoid door lock serves as the door lock output. The connections are configured to allow remote control via Telegram [2].

RESULTS AND DISCUSSION

This project utilizes an ESP32 microcontroller as the main component. Additionally, other components such as a 4x3 Matrix Keypad, Buzzer, I2C LCD display, and a 12V solenoid door lock are also used. Furthermore, this project implements an IoT system through Telegram. A Telegram bot is used to issue commands and receive notifications.

Figure 1: Shows the password that has been entered by the keypad to unlock the door.

Table 1: Difference between normal door lock and Smart Door Lock System

Normal door lock	Smart Door Lock System
Use key to unlock	Keyless
	Use PIN passcode as security
	Automatic lock
	Telegram lock command

Table 1 shows the difference / different functions of the Normal Door Lock and Smart Door Lock System. The advantages / advantage of Smart Door Lock system is the Smart Door Lock System uses PIN passcode as security and Telegram for lock command.

CONCLUSIONS

The Smart Door Lock System uses a 9V battery. It has 4X3 Matrix keypad to unlock the door by using a PIN code. Solenoid door lock is acting as the door lock output./ The solenoid door lock serves as the door lock output. Other than that, it also can be unlocked by using the Telegram app./ Additionally, the door can also be unlocked remotely through the Telegram app.

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SMART FARMING SYSTEM

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Abstract – The objective of this project is to develop an automatic fertilizer mix and irrigate system to crops based on soil humidity. Electronic parts used are relays, voltage regulator, 12V water pumps, mixer motor, soil humidity sensor and a 12V battery with coding compiled in Arduino IDE software. A 12v rechargeable battery is used as the power supply for the water pump and mixer motor. Humidity sensor will detect the condition of current soil moisture and send the notification saying "I need water" through Blynk apps. When it is confirmed that the soil is not moist enough, the mixing process will be started by turning on the water pump, fertilizer pump and motor mixer that have been arranged on the Blynk dashboard. Once the mixing process is completed, the 10 litres of AB fertilizer mixture and water can be irrigated to the crops. The whole process is controlled by the ESP32 as the main controller and the humidity sensor as the determiner whether the mixing and irrigating is needed.

Keyword: ESP32, notifications, Blynk apps, 10 litres

INTRODUCTION

The aim of this project is to create an AB fertilizer mix and irrigate system that is time, energy and cost effective for gardeners and to attract Malaysians to be involved in agriculture. In addition, gardeners will know the soil moisture conditions of their current crops. [1]

METHODOLOGY

ESP32 is used in this project as the main controller. It controls the circuit that connects the water pump and the mixer motor. These connections are then merged with the humidity sensor to run the moisture detecting system. [2]

RESULTS AND DISCUSSION

Figure 1 shows a prototype arrangement of the water supply and the power supply from the 12v battery. 4 barrels are required; A and B fertilizer barrels, fertilizer and water mixture barrel and water supply barrel.

Figure 1: Smart Farming System

Figure 2 shows the Blynk dashboard to control the ON and OFF of the water pump, the fertilizer pump and the mixer motor button.
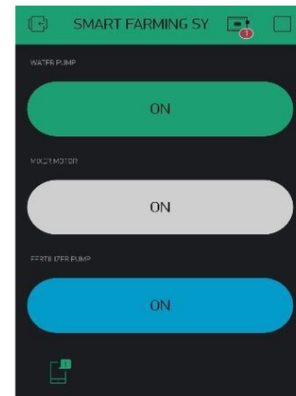

Figure 2: Blynk Dashboard

CONCLUSIONS

The notification will be displayed if the soil is detected not moist enough. If the soil is dry, the mixing process will start. If the soil is still moist then the process will not be done.

ACKNOWLEDGEMENTS

The researchers would like to thank their parents and supervisor for financial and guidance support. The researchers would also like to thank friends and Polytechnic Lecturers for helping as well as all people who were directly and indirectly involved in this project.

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SMART SOCKET

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Abstract – The aim of this project is to turn a normal socket into a smart socket. Electronic parts are the NodeMCU ESP32, relay, Ac to Dc converter. A 3 pin socket is the power source for the PCB board. The ESP32 will receive a command from telegram. After it received the command, it will be sent to the relay. After that, the relay will turn on or off the device connected to the socket. This whole process is controlled by the ESP32 as it is the main controller and the telegram as a switch.

Keyword: ESP32, Telegram

INTRODUCTION

To invent a smart socket that can be remotely turn on and turn off any device that is connected to the smart socket. Which makes the easier for a person to monitor and control sockets from anywhere . Other than that, it can help to save energy and help avoid electrical fire [1].

METHODOLOGY

ESP32 has been used in this project as a main controller. It has controlled the full circuit in various ways. Moreover, AC to DC converter is used to convert AC power to DC supply voltage which is connected to a relay that is connected to the ESP32. Then, these connections are connected and can be controlled by using telegram [2].

RESULTS AND DISCUSSION

Figure 1 shows the command used in telegram to send the signal to the ESP32. If the command is /socketon the socket will turn on and if the command is /socketoff the socket will turn off.
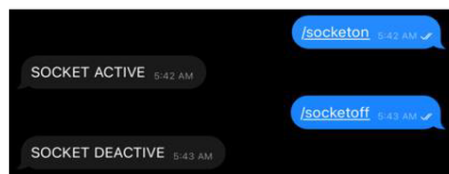

Figure 1: Commands used in telegram

Figure 2: The led indicate the socket is off

Figure 3: The command receive from telegram and led indicate the socket is on

Figure 2 shows when the command is /socketoff was received from the telegram the bulb was not light up. It shows that the current is not flow to the load. On the other hand Figure 3 shows when the command is /socketon was received from telegram the led bulb was lit up.

Table 1: Difference between normal socket and smart socket

Normal Socket	Smart Socket
13 Amp power	13 Amp power
Manual remote	Remotely turn on and off
No monitor	Monitor if it's on or off
Can't avoid electrical fire	Help avoid electrical fire

Table 1 shows the different functions of the normal socket and smart socket. The advantages of this smart socket are it can remotely turn on and turn off the load it can avoid an electrical fire

CONCLUSIONS

The socket is powered by using 3 pin plug. The socket is controlled by using telegram to turn ON and OFF.

ACKNOWLEDGEMENTS

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SMART VACUUM ROBOT

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Abstract – People have become busier due to their increasing work workload. Thus, maintaining cleanliness at home becomes tough and challenging. Most of the time, people will hire a cleaner to clean the house, but they are unsure whether the home is adequately cleaned. The Smart Vacuum Robot can overcome the problem. The electronic parts for this project are Arduino Nano, ultrasonic sensor, relay and 7V battery. When the ultrasonic sensor detects rubbish or dust, the vacuum gathers it.

Keywords: Arduino nano, Relay, Ultrasonic sensor

INTRODUCTION

A smart vacuum robot helps people to clean their homes [1]. Vacuum robots make cleaning jobs more manageable. Robotic vacuum cleaner sales are increasing rapidly due to their capacity to clean an area without human intervention. An intelligent robot vacuum at home can be the first step toward creating a modern smart home.

METHODOLOGY

Arduino Nano was used in the project as the central controller. It controlled the complete circuit in various ways. A PCB was used to overcome the lack of power supply in Arduino Nano. An ultrasonic sensor connected the relay and battery to turn on the vacuum [2].

RESULTS AND DISCUSSION

Figure 1 shows the complete prototype of the project. The IR and ultrasonic sensors are turned on if an LED is turned on. When the ultrasonic sensor finds rubbish, the vacuum sucks it around the area until it is clean. The result is shown in table 1.
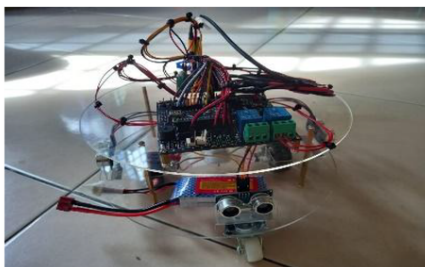

Figure 1: Prototype Layout

Table 1: The result of the project

ULTRASONIC SENSOR	VACUUM
DETECT	ON
NOT DETECT	OFF

CONCLUSION

The project makes it easier for everyone to clean their homes. The ultrasound sensor will detect rubbish or dust and clean it based on the code programmed in the Arduino Nano.

ACKNOWLEDGEMENTS

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SMART STREET LIGHT USING IR SENSOR WITH ARDUINO

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Abstract – The street lighting infrastructure has been developed that makes the road user less dangerous at night and during the rainy season. However, it has been highlighted as a waste of electricity that is activated throughout the night even though there are no vehicles passing through the road. Therefore, Smart Street Light Using IR Sensor with Arduino is proposed to produce a smart street light system that operates automatically by activating the lights when vehicles are crossing the road and deactivating them when no vehicles. This project has two types of sensors which are LDR sensor which is utilized to activate the street lighting system when needed, IR which works to detect the presence of objects and lighting and Arduino ESP 32 to control this smart street lighting system.

Keywords: ESP 32, IR (infrared) Sensor, LDR (light dependent resistor) sensor

INTRODUCTION

One of the safety elements for road users is the presence of street lighting, especially in areas with a high risk of accidents such as residential areas with high population density, intersections and during the rainy season [1][2]. In addition, poor lighting is also one of the factors causing the increase in road accidents at night. This project is to produce an automatic system to detect the movement of vehicles where the lights will be activated if the vehicle crosses the road, otherwise will act the other way around if there is no vehicle. Therefore, modifications to the street lighting control system for weather conditions such as rain and dark weather were also developed and allowing for maximum electricity savings [3].

METHODOLOGY

Two types of sensors that are LDR sensors and IR sensors act as inputs to detect any object that is close to it. In order to activate this circuit and send notifications to the BLYNK application, WIFI is also an input. The Arduino ESP32 (microcontroller) will receive a signal from the LDR to turn on the LED light that serves as an output if the environment is dark or the LDR cannot detect sunlight [4].

RESULTS AND DISCUSSION

The table shows that when the power supply is activated, the IR sensor will detect movement on the road. If there is a vehicle on the road, it will activate the lighting system otherwise the lights will not light up if there is no vehicle. However, if the vehicle passes through a dark or rainy road, the LDR will provide optimal lighting at that time otherwise no lighting is provided when the weather is clear.

Table 1: Table shown how the project works

	Car passes (night)	No Car (night)	Rainy day	Car passes (daytime)
LED & LDR 'on'	x		x	
LED & LDR 'off'				x
LED 'on' & LDR 'off'		x		

CONCLUSIONS

This project has been successfully completed by building a smart street light prototype that is very user-friendly, has an efficient lighting system and saves electricity costs. For improvements in the future, the use of closed-circuit cameras is seen to increase the efficiency of the road system, such as giving early notification of the highway safety control in the case of a traffic collision.

ACKNOWLEDGEMENTS

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SMART WINDOW ALARM

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Abstract *–* The project aims to close or open windows automatically and securely with IoT. Electronic parts used are the ESP 32, PIR Sensor, Touch Sensor, LED, Buzzer, DC Motor and L298. The main microcontroller in this project is ESP 32. A DC motor controls the movement of windows. A PIR sensor detects a person who goes through the window. After the PIR sensor detects an intruder, the LED lights up, and a buzzer functions for about 20 seconds. A touch sensor detects window movements. When a window is closed or opened, the movement of the window will display at MQTT on the smartphone. The results show two different values to show or display the window movement and the PIR Sensor in MQTT that shows the value of 0 and 1.

Keywords: ESP32, Touch Sensor, Pir Sensor

INTRODUCTION

The system consists of ESP 32, touch sensor, PIR sensor, Buzzer, DC motor, L298, LED, Buzzer and mobile app(MQTT). A touch sensor and PIR sensor signal the ESP 32 when that sensor detects a movement. The ESP 32 senses the signal from the touch sensor and sends a signal to the phone. When the ESP 32 senses the signal from the PIR sensor, the signal signals the buzzer and LED (alarm). Whenever the window is open or closed, the situation will send it to the phone. This project can also open or close the window directly with the mobile application [2].

METHODOLOGY

The project used ESP 32 microcontroller as the main microcontroller. It controlled the window and alarm system. The touch sensor detected the window movement, whether opened or closed. PIR sensor detected the person who went through the window [1].

RESULTS AND DISCUSSION

This project results; when the MQTT displays the value 1 = Window Close / Touch Sensor detects, and value 0 = Window Open / Touch Sensor no detect, as in Figure 2. In addition, PIR Sensor is also the same as Touch Sensor. When the value is 1 = PIR Sensor detects, and when the value is 0 = PIR Sensor no detect, as shown in Figure 2. Motion Status displays the condition of the PIR sensor with time, as shown in Figure 1. Next, there are two buttons to control the window close or open show, as shown in Figure 1.
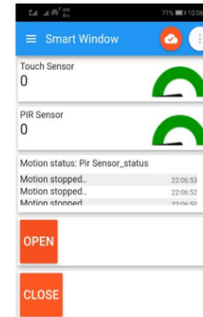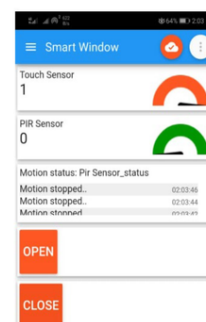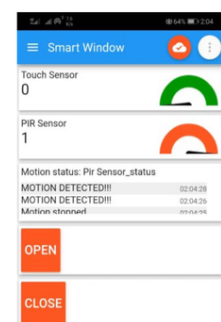

Figure 1: Shows all MQTT design in smartphone

| Window Close and PIR Sensor no detect | Window Open and PIR Sensor detect |

Figure 2: Shows the condition of window and PIR Sensor

CONCLUSION

The smart window alarm is an option for homeowners to safeguard their homes. It provides security for homes and makes it easy to control the windows.

ACKNOWLEDGEMENTS

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        https://www.ijcaonline.org/archives/volume178/number22/guzman-2019-ijca-918941.pdf Rachell V. De Guzman, Rachell V. De Guzman, Rachell V. De Guzman (22, June 2019)

EED ACTIVITIES

35% — Industrial Talk

Benchmark Visit

40% — CSR Program

Invention, Competition, Conference and Exhibition

25% — Training of Trainer (ToT)

10% — Drone Workshop

INDUSTRIAL TALK PROGRAMME : NEXT GENERATION NETWORK AND 5G TECHNOLOGY
BY HASHAMIZA BINTI HARUDDIN

Kulim, 21 September 2022 - This program is held to strengthen the knowledge and confidence of 35 semester three DEP student, especially for DEP 30083 Telecommunication Networking course. The talk was given by En Hazaniar Bin Othman, Manager Service and Network Management Telekom Malaysia Berhad. The program was held at the ULPL lecture hall. The involvement of the industry in the teaching & learning process (P&P) through the activity of the Industrial Visiting Lecturer (PPI) allows students to gain knowledge and share experience and the latest technology directly and as one of the approaches to help the lecturers of the Department of Electrical Engineering diversify P&P methods to improve understanding students in the field of study followed as well as exposure to go through the world of work later.

This program is not only an opportunity for students to gain deeper experience and knowledge about Next Generation Network(NGN) theory but also to give students the opportunity to see for themselves the actual equipment used by Telekom Malaysia during the evolution from PSTN to NGN technology. In addition, the students can see for themselves how the work at Telekom Malaysia is carried out, in addition to knowing the skills that students need to have before venturing into the world of work in the industry. Next, students can become aware of the importance and impact of 5G on communication technology, increase students' knowledge and skills to keep pace with technological changes in communication networks. Students also can understand the concept of Next Generation Network in the 5G era, other technologies such as IoT, Smart Services and Data Analysis (Data Analytic).

BENCHMARK VISIT TO INSTITUT KEMAHIRAN MARA(IKM) SEBERANG PERAI UTARA
BY IDA SAFINAR BINTI AZIZ

Kulim, 25 Januari 2022 - The Department of Electrical Engineering, Tuanku Sultanah Bahiyah Polytechnic (PTSB) held a benchmark visit to the MARA Skills Institute (IKM), Seberang Perai Utara.This visit aims to formulate a strategic collaboration that can be carried out between the two TVET Educational Institutions. Among the discussions that were highlighted was the sharing of equipment, resources and the expertise of teaching staff, especially in the field of electrical engineering.Hopefully this visit can open up better space and opportunities for both institutions in strengthening the country's TVET education.
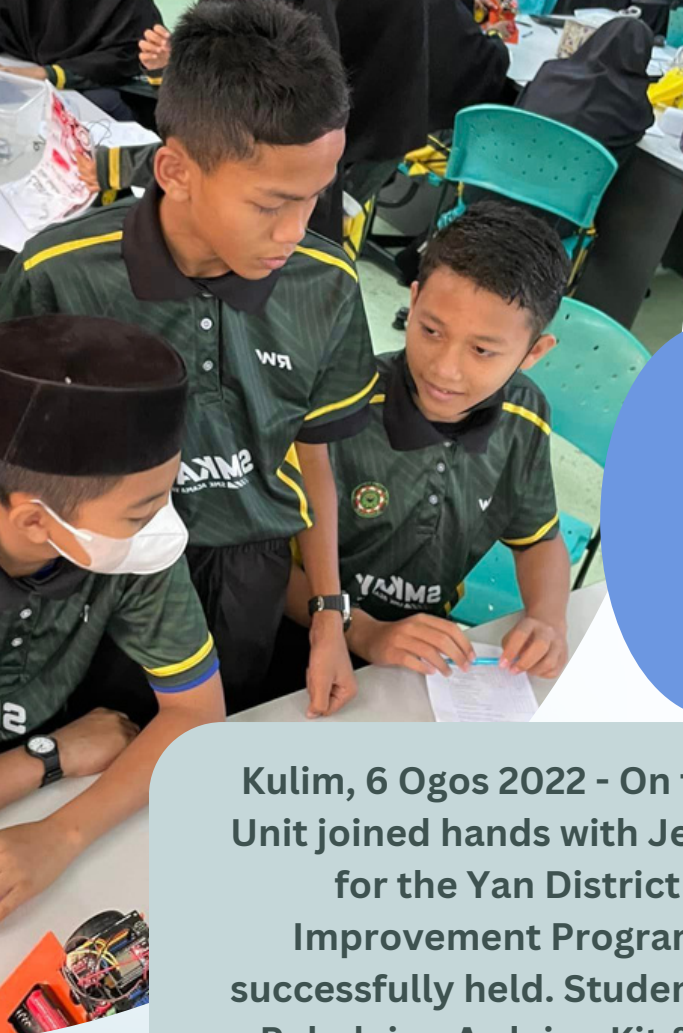
PROGRAM PEMBANGUNAN DAN PENINGKATAN KEMAHIRAN KOMUNITI BERTERASKAN 4IR DALAM BIDANG TVET (POLYDUINO ARDUINO KIT), SEK MEN KEB AGAMA YAN, KEDAH

BY MAHDZIR BIN JAMIAN,
MUHAMAD BIN JAMALUDDIN

Kulim, 6 Ogos 2022 - On the 6th of August 2022, the JKE PTSB CoT Unit joined hands with Jerai Community College 2022 to SMKA Yan for the Yan District Community Skills Development and Improvement Program CSR program. This program has been successfully held. Students were exposed to an introduction to the Polyduino Arduino Kit & the basics of IOT. A total of 34 students have been involved in this program. Topics covered Arduino Basics, Arduino Programming Basics and Arduino Basic Applications. The lecturers involved in this program are Mr Mahdzir bin Jamian as a speaker and Mr Muhamad Bin Jamaluddin acting as a facilitator.

ELECTRICAL ENGINEERING DEPARTMENT STUDENT VISIT PROGRAM TO ILSAS MALIM NAWAR BRANCH

BY NORIZAH BINTI ISHAK

Kulim, 17 May 2022 - This academic visit is held to strengthen the knowledge and confidence of the students of the DEE & DET program, especially about electricity generation as an exposure to enter the world of work later. A total of 20 DEE and DET students were involved in a visit to TNB ILSAS Malim Nawar. This visit is not only an opportunity for students to gain deeper experience and knowledge about what has been learned in class but also to give students the opportunity to see for themselves the actual equipment used in the industry in addition to providing exposure to students majoring in engineering electricity against the "Field of Power Utility Engineering" found in Malaysia. Among the objectives of this program is to reveal the use of drone tools in the process of testing the top line, giving students the opportunity to see for themselves the actual hardware used in the industry. The majority of participants gave positive feedback about the program. Students stated that this kind of program is very beneficial and should be held again in the future because it can provide students with knowledge about the aspects of using electricity wisely and should be expanded to all students.

" Field of Power Utility Engineering "

IINVENTION COMPETITION CONFERENCE AND EXHIBITION (ICCE)

ICCE

By PIMPA A/P SOO WAN

The ICCE program is the final innovation project competition for student that is held every semester. This program provides an opportunity for final semester student who innovate and research to present research papers and compete for their project results.

Through the ICCE program, it provides exposure to students regarding product earnings as well as increasing students' confidence in executing opposition in a competition. In addition, students are also exposed to the latest technological changes that can increase interest in innovation and research. Solar Ultrasonic Grass Mower has won champion in in ICCE Session 1 2022/2023 category E (Electrical and Elctronics) This project is under the supervision of Nurul Malihah Binti Mazuan participate by Phantakarn a/l Ammon

NATIONAL INVENTION & INNOVATION COMPETITION, EXHIBITION AND ROBOT-SUMO 2022

By SHARIPAH BINTI DAUD

The involvement of students of Electrical Engineering Department PTSB in various robotics competitions is no stranger at the Polytechnic and national levels. Students are often invited to join the competition and students are required to use their creativity and various strategies to form and build robots, it is the best approach that combines student expertise and innovation.

On September 11-13, 2022 JKE students will once again participate in the NATIONAL INVENTION & INNOVATION COMPETITION, EXHIBITION AND ROBOT-SUMO 2022 competition. However, students need to be trained to ensure they have these skills. This is aligning with the government's desire to produce more experts who are highly skilled, knowledgeable, dynamic and able to compete in the field of science and technology industry which is experiencing rapid development. As an initial exposure and preparation for JKE students to learn about robots, coding development and how to install Robots.

DEG30013 FUNDAMENTAL OF RENEWABLE ENERGY AND DET50083 POWER SYSTEM PROTECTION TRAINING OF TRAINERS (TOT) COURSE

By SITI MARIAM BINTI HUSSAIN,
NOR ASPALAILI BINTI NORDIN

Electrical Engineering Department, Politeknik Tuanku Sultanah Bahiyah conducted a Training of Trainers (TOT) Course for the course of DEG30013 FUNDAMENTAL OF RENEWABLE ENERGY on October 5, 2022 while for course DET50083 POWER SYSTEM PROTECTION on October 10, 2022. This course is conducted exclusively for Course Supervisors and course lecturer of the Electrical Engineering Department. The Course Supervisor will discuss and provide information regarding the course that have been selected to the course.

This course can develop more expert lecturers, can make it easier for the time schedule/management unit to organize the course if there are many classes in one semester, increase and diversify the lecturer's knowledge and also increase the lecturer's knowledge and confidence to teach the course. This recommended course can also give added value and exposure to all lecturer in terms of teaching and learning at Politeknik Tuanku Sultanah Bahiyah
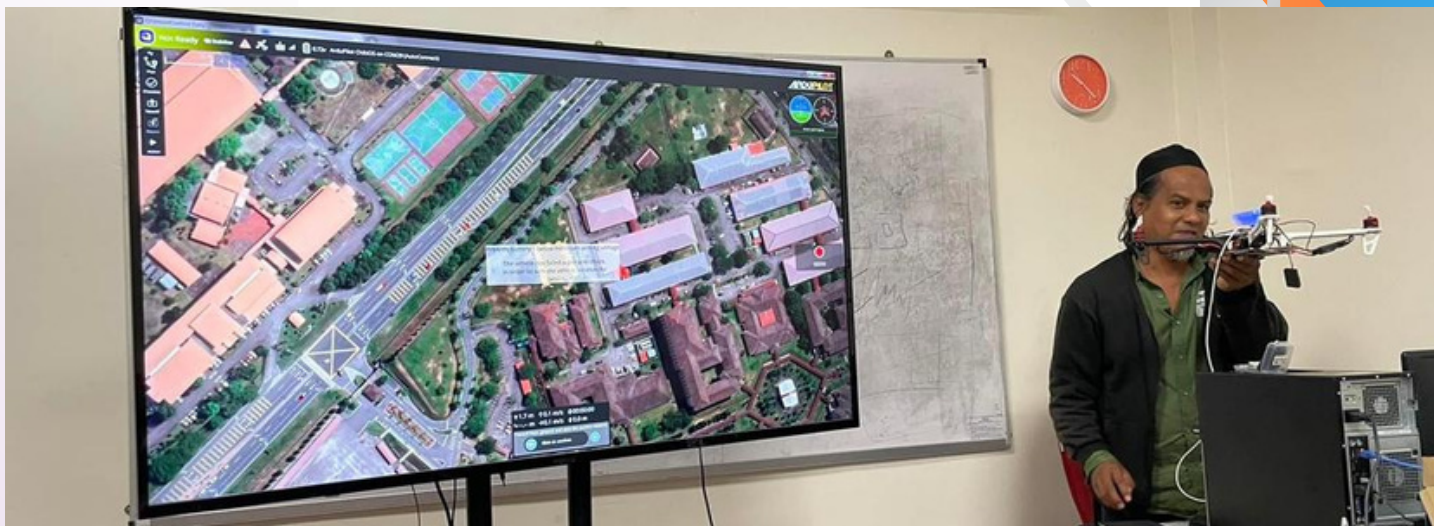
DRONE INTENSIVE WORKSHOP SERIES 1/2022 (INSTALLATION, TESTING & FLIGHT) FOR SKILLS IN THE FIELD OF R&D PTSB
By ZAWIYAH BINTI MOKHTAR

Kulim, 25 September 2022 – This Drone Intensive Course (Installation, testing and flying) was held to follow the current needs of the present time which is the Industrial Revolution(IR4.0) and this platform expected to increase the knowledge of the lecturers in the field of drones. This two days' workshop course covers the electricity and electronics, data communication and also the entrepreneurship syllabus. As a result of the collaboration with Community Colleges and schools, the development in the field of drones was amazing and increasing in demand for sharing knowledge especially in PTSB. The main purpose of this course is to provided our lecturers with the skills in the field of drone testing, as well as, to give an experience to them in drone installation and testing. Besides, this program provides a platform for lecturers to transfer knowledge among students to build up their skills to participate in various competitions in the field of IR 4.0.

PROGRAM #MYDIGITALMAKER FAIR X "MAIREKA" KEDAH 2022 @NORTHERN REGION.

By MUNIRAH BINTI MD. NUJID

Kulim, 23 Ogos 2022 - This program is organized by Kedah Digital Center for the purpose of encouraging the proliferation of creative ideas and innovation among students and to give awareness and foster students interest in career opportunities in the field of digital technology and Industrial Revolution 4.0. Tuanku sultanah Bahiyah Polytechnic under the leadership of COT has been trusted to manage and act as facilitator for this program. A total of 56 facilitators from PTSB were also involved in this program. While, a total of 500 students participate in this program from two nearest schools which is SK Kulim Hi Tech and SMK Kulim, Kedah.

Among the programs held was Sumo Robot, IOT, 3D Printing, Drone, Rero Robot, Canva, Digital Entrepreneurship and Web without coding. At the end of the program, student gain the exposure in the field of Arduino, robotic and scratch programming. They also able, to foster the interest of school students in the field of science and technology in general and the field of robotics in line with the government's goal in improving the standard of education by integrating the world of education with ICT, science, technology and innovation. In addition, through this program it can increase the competency of educators in improving(reskilling) teaching and learning methods. Finally, the impact on the institution in increasing the enrollment of student to further study in PTSB.

PTSB DRONE SKILLS CHALLENGE 2022 (PTSB DSC 2022)

By ZAWIYAH BINTI MOKHTAR

Kulim, 7 December 2022 – This PTSB Drone Skills Challenge 2022 was a drone competition between departments of Electrical Engineering, Mechanical Engineering, Civil Engineering and Commerce in PTSB. PTSB DSC 2022 started with the organization of the Training of Trainers (TOT) Drone course on 25 & 26 September 2022 as a preparation for this competition. This competition involves student representatives and lecturers from each department and divided into two categories which is DIY Drone (Automatic) and Drone Tello (Manual). The purpose of this competition between departments in PTSB was as an exposure platform before participating in various drone competition outside PTSB.

PEECOM 2023
EED EXTENDED ABSTRACT
VOL. 2

POLITEKNIK
MALAYSIA
TUANKU SULTANAH BAHIYAH