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## Extended Abstract FYP projects

### Volume 1 (A1 – A13) 2019

**A1**

#### **VACUUM CLEANER ROBOTIC CAR**

*Nor Ainun Syafiqah Mohd Sazidin, Muhammad Adib Abd Halim, Muhammad Azri Firdaus Mohd Zulkifli*

**page 2**

**A2**

#### **SAFF STRAIGHT LINE DETECTOR**

*Muhammad Anas B. Mohd Rosli, 'Iffah Athirah Bt. Zaidi, Akmal Najihah Bt. Ibrahim, Dr. Mohd Aziz B. Aris*

**page 4**

**A4**

#### **CLOUD CONTROLLED WATERING SYSTEM USING BLYNK APPLICATION**

*Mohamad Amirul Farhan Bin Abu Bakar, Luqman Amar Bin Abdul Nasir, Nur Afifah Binti Ali, Wan Ahmad Khusiari Bin Wan Chek*

**page 6**

**A6**

#### **FOOTSTEP POWER GENERATION**

*Adriana Bt Noh, Muhammad Amir Syakir bin Mohammad Nor, Muhammad Arif bin Rosli, Dr. Mohd Aziz bin Aris*

**page 8**

**A7**

#### **MOVEMENT SENSOR FAUCET**

*Muhammad Idham Bin Kamarulzaman, Zulhanif Bin Rozali,, Muhammad Iqmal Bin Rosely*

**page 10**

**A10**

#### **AUTOMATIC WHITEBOARD CLEANER**

*Muhammad Idham Bin Abd Aziz, Muhammad Huzairi Bin Zainuddin, Nur Maizatul Ashikin Bt Mohamed Sukor Mazratul Firdaus Bt Mohd Zain*

**page 12**

**A11**

#### **SMART CONVEYOR**

*W. M. W. I. W. Ramli, N. A. Bharu, N. F. Zulkefli*

**page 14**

**A13**

#### **SMART GRASS CUTTER**

*Muhammad Hifzhan Bin Ruslan, Muhammad Ammar Irfan Bin Maznan, Yusri Aizat Bin Mohd Yasir Afkam*

**page 16**

# CLOUD CONTROLLED WATERING SYSTEM USING BLYNK APPLICATION

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**Abstract:** Gardening is an activity that people do to make their house or place become more beautiful. The most important part of gardening is watering the plants as to maintain the soil humidity. During plant watering, the excessive use of water still the main problem that still exists. This project proposed a watering system that can be controlled using internet so user can water the plants anytime and anywhere. The objectives of this research are to design a watering system consists of water pump, relay, soil moisture sensor and NodeMCU microcontroller. Next is to control the watering system using Blynk application and also to interface the NodeMCU microcontroller with Arduino Controller (IDE). Other than that, this project also uses soil moisture sensor to detect the moisture level of plants and also uses ultrasonic sensor to detect the water level of the watering tank. All of the reading of both soil moisture sensor and ultrasonic sensor will be send to the Blynk application on smartphone or PC via Internet.

**Keyword:** *NodeMCU microcontroller, Arduino IDE, Blynk Application*

## INTRODUCTION

Malaysia is ranked 9th in the world for tourist arrivals [1]. The Travel and Tourism Competitiveness Report 2017 ranks Malaysia 25th out of 141 countries overall, which was the fifth best in Asia. In an effort to diversify the economy and make Malaysia's economy less dependent on exports, the government pushed to increase tourism in Malaysia. As a result, tourism has become Malaysia's third largest source of foreign exchange income and accounted for 7% of Malaysia's economy as of 2005. One of factors that make Malaysia famous among tourist is because of its agritourism. Agritourism started in 1991 in Malaysia as one of tourism diversity activity to improve country income. The agritourism activities are runs by private's sectors and also local communities. As many of agritourism activities are relate to rural areas, the involvement of local village communities is important to ensure the success of a program and to get returns from the investment. Although tourism has become the second source of income from foreign exchange in the country, the percentage of agritourism contribution is still low compared to other tourism sectors. Plants are very important in our daily life, either for humans, animals or even our planet itself. Plants provide us oxygen by absorbing carbon dioxide through the proses called photosynthesis. Oxygen is important for cellular respiration for all living organism. It also maintains the ozone layer to keep our planet safe from the Ultraviolet (UV) radiation. So, as a consumer of oxygen, it is our duty to keep the Earth ecosystem so younger generation can also consume it to in the future.

## METHODOLOGY

According to the block diagram and flowchart for this project, the soil sensor detects the amount of water in the soil of the surrounding area. The other sensor used is the ultrasonic sensor which detects the level of water in the tank. NodeMCU was chosen as a microcontroller to collect data from the sensors. NodeMCU will collect the data from the soil moisture sensor and ultrasonic sensor and send to cloud. Then, the information is available to the users through the internet. Microcontroller will also send signal to the water motor and tank motor to operate. The Blynk application is used as a control board to control the dc water pumps operation and to observe the readings of the sensors.

As the soil moisture sensor detects the moisture of soils, notification will be sent to user through the Blynk application if the soil is dry. If the soil moisture level is wet, notification will not be sent to the user. The user can simply turn the watering pump ON and OFF simply by using the Blynk application to water the plant. For the ultrasonic sensor, it will detect the water level in the watering and the water level will be shown in the Blynk application. If the water level is low, it will send notification to the user to refill the watering tank. The user can simply turn ON the refill water pump to refill the watering tank. If the level of water in the watering tank is enough, user can turn OFF the refill water pump using the Blynk application.

## RESULT AND DISCUSSION

The effectiveness of the proposed project was measured by conducting several experiments. The motors were the first tested at the beginning of this project. Throughout the result gained, both of the motors were effectively controlled using the Blynk application. Next, the soil moisture sensor was tested by placing the sensor into a dry soil. The sensor managed to send the notification to the Blynk application. After that, the sensor was placed on a wet soil and no notification was send to the Blynk application. For the ultrasonic sensor, it was tested by placing it on top of a tank full with water. At first, the sensor was not able to send the water level to the Blynk application accurately. After some fixing was made for its coding, the sensor managed to send the water level fast and accurate. The sensor than was added notification to it so the user will receive notification to refill the tank when the tank is almost empty. All of the components than was installed into one prototype and was tested several times until the result is accurate and satisfying.

## CONCLUSIONS

As for the outcome of this project, the plants in the gardens will receive the suitable amount of water and minerals. The contract workers can also water the plants remotely using PC or smartphone through WIFI. The water overflow can also be avoided. This system can also be used by anyone that is interested in gardening. There are many positive outcomes from using this system such as, knowing the different amount of water required from different plants, causing plants to grow well and pique the new generation's interest towards plants.

## REFERENCES

- [1] En.wikipedia.org 'Tourism in Malaysia', 2018. [Online]. Available: [https://en.wikipedia.org/wiki/Tourism\\_in\\_Malaysia](https://en.wikipedia.org/wiki/Tourism_in_Malaysia) . [Accessed: 7- October - 2018].