



UNIVERSITI TEKNOLOGI MARA **Cawangan Perak**

PROGRAM PROCEEDINGS ABSTRACTS BOOK The 9th International Innovation, Invention & Design Competition INDES2O2O

17th May - 10th October 2020

HOME SECURITY ALARM SYSTEM

Muhammad Bazli Bin Zulkefli¹, Ahmad Saufi Bin Lokman Fikry¹ and Siti Azura Binti Ramlan²

¹Faculty of Electrical Engineering, Universiti Teknologi MARA, MALAYSIA

E-mail: muhammadbazli6451@gmail.com

²Faculty of Electrical Engineering, Universiti Teknologi MARA Cawangan Pulau Pinang, MALAYSIA

ABSTRACT

Nowadays, house burglary has become one of the concern issues in our community. These criminal acts lead to devastating consequences for the people. Due to the current situation, this project has proposed to overcome the problem by implemented technology innovation. Many people who in the situation had face loss stuff especially when it comes to their valuable belongings. It is troubling for them to face that terrible consequence. This project has focused on developing a home security alarm system in which detection occurs when there is a burglar or theft try to break in into a house or building. This project has designed by using a Passive Infrared Sensor (PIR), Arduino, and WiFi module ESP 8266 as the main component. The sensor will detect the infrared light radiating from intruders and send the information to Arduino. Then, Arduino will process the information received. This project also constructed with alarm, LED, and WiFi module ESP 8266. The alarm and the LED will activate if there is an intruder. Next, WiFi module will send a notification to the owner of the house when there is an intruder. The project is successful developed an affordable home security alarm system with applying the Internet of Things (IoT) concepts and embed a WiFi module (ESP 8266) into Arduino. At the end of this project, the system successfully functions to act as a security alarm and shows the motion detected within five meters distance. In conclusion, this project will help people be aware of burglar activity and make them alert and care about their neighbourhood. It is crucial to keep the community secure, and this product is useful for the future.

Keywords: arduino uno, esp8266, pir sensor, smart home, home security

1. INTRODUCTION

Burglary is an unlawful entry into a building or other location for purposes of committing an offense [1]. Usually, that offense is theft. Fortunately, modern technology has a high potential to solve this issue by using a security alarm system. Home security is an important feature of home automation and becoming the most crucial one to overcome burglary crime [2]. A security alarm is a system designed to detect intruders or unauthorized entry into a building or area. Usually, security alarms are utilized in residential, commercial, and industrial for assurance against thievery. Therefore, this project has developed a home security system to detect intruders that are trying to break into a building or area and thus can improve the security of a house throughout notify the information to the homeowner by implementing the Internet of Things (IoT) framework.

2. SYSTEM OVERVIEW

Figure 2.1 shows the block diagram of the home security alarm system. The PIR sensor will measure infrared light emitted from objects that generate heat. For this project, the mini PIR sensor is used to detect the intruder. There are three pins connected from PIR sensor to the Arduino Uno, which is Ground-Ground,

Power-5.5V and Out-pin 11. The output of this project is LED which is an indicator to show there is an intruder, a mobile phone is used to display to the homeowner that there is an intruder, and finally buzzer or alarm to alert the users and make the intruder run away. The mobile phone also will act as a remote control for the whole system. The ESP 8266 (WiFi Module) is used to act as the bridge that connects between Arduino Uno and the mobile of the users. There will be five pins that will connected from ESP 8266 to the Arduino Uno which is pin Vcc and CH_PD-3.3V, Ground-Ground, RXD pin-pin 3 but for Ground and RXD pin will connected to 1k Ω and 2k Ω resistors and lastly RXD pin-pin 11. Next, the other output is a red colour LED, which will light up when the input detects the intruder. The red colour of a LED is used to imply a hazardous situation. For LED, it will be connected in series with a 220 Ω resistor as to limit the current through the LED and to prevent it become damage. There are two connection between LED and Arduino Uno which are from Anode-pin 13 and Cathode-Ground. Lastly, the buzzer is a device that makes a buzzing or beeping noise. The buzzer is functioning as a signal to terrify the intruder by producing a loud noise and the buzzer is connected to pin 13 and pin Ground from Arduino Uno. This output will operate when the PIR Sensor detects a change of heat temperature emitted by the human body. It will light up an LED, buzzer up, and send a notification to the homeowner by using the Blynk app. Meanwhile, in a safe situation, the homeowner will turn off the alarm by simply using a switch on the alarm or infrared remote control.



Figure 1. Block Diagram of home security alarm

Table	1.	Data	anal	lysis

PIR Sensor	Condition	Output			
I IN SCUSU	Condition	Buzzer	WiFi Module	LED	
Motion detected	Intruder Alert!	ON	ON	ON	
No Motion	Safe	OFF	OFF	OFF	

Based on Table 1, it shows a summary of how the input and output work when in a certain condition. For the input, this system has PIR sensor and digital turn on and turns off button. For the output, this system has LED, buzzer, and notification using the Blynk application. When PIR sensor detects motion, the LED, the buzzer will turn on and it will send a notification to the user through the Blynk application. The homeowner will get "Intruder Alert" notification on their phone.

Lastly, when there is no motion detected from the PIR sensor after several minutes, the buzzer and LED will turn off. "Safe" notification will be sent to the homeowner mobile through the Blynk application.

REFERENCES

- 1. Fox, B. H., & Farrington, D. P. (2012). Creating burglary profiles using latent class analysis: A new approach to offender profiling. Criminal Justice and Behavior, 39(12), 1582-1611.
- 2. Anitha, A. (2017, November). Home security system using internet of things. In IOP Conference Series: Materials Science and Engineering (Vol. 263, No. 4, pp. 1-11).

Pejabat Perpustakaan Librarian Office

Universiti Teknologi MARA Cawangan Perak Kampus Seri Iskandar 32610 Bandar Baru Seri Iskandar, " Perak Darul Ridzuan, MALAYSIA 1 Tel: (+605) 374 2093/2453 Faks: (+605) 374 2299

S

Ц Ц

Z



UNIVERSITI TEKNOLOGI

700-KPK (PRP.UP.1/20/1) Surat kami Tarikh 30 Ogos 2022

NOLOGI

3 0 AUG 2022

Universiti Teknologi MARA Per

Tindakan

RIMA

YBhg. Profesor Ts Sr Dr Md Yusof Hamid, PMP, AMP Rektor Universiti Teknologi MARA

Cawangan Perak

YBhg. Profesor

PERMOHONAN KELULUSAN MEMUAT NAIK PENERBITAN UITM CAWANGAN PERAK **MELALUI REPOSITORI INSTITUSI UITM (IR)**

Perkara di atas adalah dirujuk.

Pihak Perpustakaan ingin memohon kelulusan YBhg. Profesor untuk membuat imbasan 2. (digitize) dan memuat naik semua jenis penerbitan di bawah UiTM Cawangan Perak melalui Repositori Institusi UiTM, PTAR.

Tujuan permohonan ini adalah bagi membolehkan akses yang lebih meluas oleh 3. pengguna Perpustakaan terhadap semua bahan penerbitan UiTM melalui laman Web PTAR UiTM Cawangan Perak.

Kelulusan daripada pihak YBhg. Profesor dalam perkara ini amat dihargai.

Sekian, terima kasih.

"WAWASAN KEMAKMURAN BERSAMA 2030"

"BERKHIDMAT UNTUK NEGARA"

Yang benar