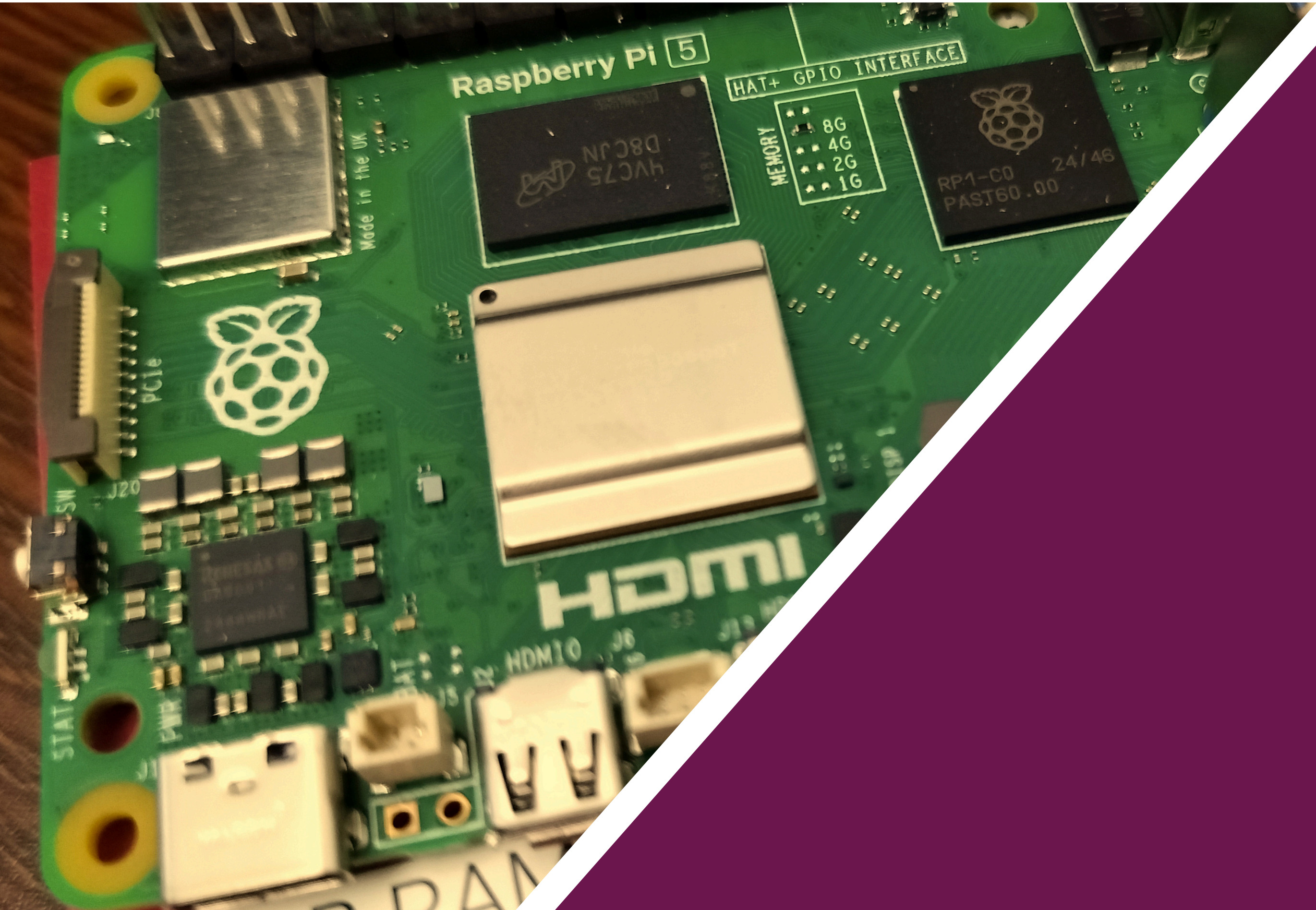




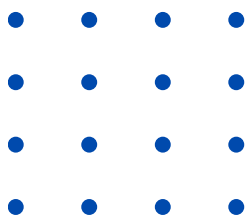
اَوْنُو تِكْنُوْلُوجِي مَارَا
UNIVERSITI
TEKNOLOGI
MARA

EESEE 2025

10TH ELECTRICAL ELECTRONICS SYSTEMS
ENGINEERING EXHIBITION 2025
VOLUME 1



FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
JOHOR BRANCH
PASIR GUDANG CAMPUS



Authors

Noor Hafizah Khairul Anuar, Fazlinashatul Suhaidah binti Zahid, Nor Diyana Binti Md Sin, Zakariah Yusuf, Siti Musliha Ajmal Binti Mokhtar, Hanunah Binti Othman, Khairul Kamarudin Hasan, Masmaria Binti Abdul Majid, Siti Aminah Binti Nordin, Muhammad Asraf Bin Hairuddin, Muhammad Zairil Bin Mohd Nor, Nor Affida Binti M.Zin, Nur Asfahani Binti Ismail, Zahari Abu Bakar, Kamaru Adzha Bin Kadiran, Ezril Hisham Bin Mat Saat, Muhammad Rajaei Dzulkifli, Nur Amalina binti Muhamad, Norbaiti binti Sidik, Rozi Bin Rifin, Zatul Iffah Binti Abd Latiff, Sufian bin Mohamad, Norhalida Binti Othman, Nurul Nadia Binti Mohamad, Norlee Husnafa Binti Ahmad, Fatimah Khairiah Abdul Hamid, Wan Suhaifiza Binti W. Ibrahim, Fadila Binti Mohd Atan, Siti Aliyah Binti Mohd Saleh, Mastura Omar, Rijalul Fahmi Bin Mustapa, Atiqah Hamizah Binti Mohd Nordin, Muhammad Zairil Bin Muhammad Nor, Shakira Azeehan Binti Azli, Siti Hazurah Binti Indera Putra, Suhaili Binti Beeran Kutty.

Editors

Sufian bin Mohamad
Kamaru Adzha Bin Kadiran

Book Graphic Designer

Kamaru Adzha Bin Kadiran



EESEE 2025 10TH ELECTRICAL ELECTRONICS SYSTEMS ENGINEERING EXHIBITION
2025

e ISBN 978-967-0033-28-0



Universiti Teknologi MARA, Cawangan Johor Kampus Pasir Gudang
(Online)



Copyright © 2024 Universiti Teknologi MARA Cawangan Johor, Kampus Pasir Gudang, Jalan Purnama, Bandar Seri Alam, 81780 Masai Johor.

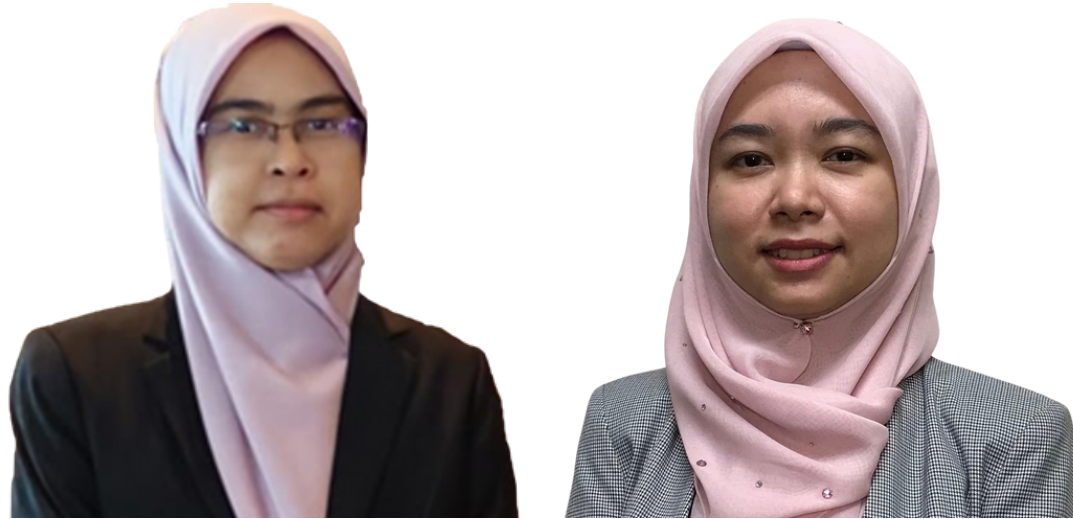
All extended abstracts published in this e-book have not been subject to EESEE 2025 peer review or check. The authors are responsible for the contents of their extended abstracts and warrant that their extended abstract is original, has not been previously published, and has not been simultaneously submitted elsewhere. The views expressed in the abstracts in this publication are those of the individual authors and are not necessarily shared by the editor.

All rights reserved. No part of this publication may be reproduced in any form or by electronic or mechanical means, including information storage and retrieval systems, or transmitted in any form or by any means, without the prior permission in writing from the Course Coordinator of Electrical Engineering Faculty, Universiti Teknologi MARA Cawangan Johor, Kampus Pasir Gudang.

Published in Malaysia by Universiti Teknologi MARA Cawangan Johor
Kampus Pasir Gudang 81750 Masai



FOREWORD BY THE PROGRAM CHAIR



Greetings from the Electrical, Electronics, and Systems Engineering Exhibition 2025 (EESEE 2025).

As the Program Chairs, it is our great pleasure to present this compilation of extended abstracts, showcasing the remarkable projects developed by our final-semester students from the Diploma in Electrical Engineering (Power) and Diploma in Electrical Engineering (Electronics) programs at Universiti Teknologi MARA, Cawangan Johor, Pasir Gudang Campus.

This exhibition marks a significant milestone in our students' academic journey, representing the culmination of years of dedication, perseverance, and learning. It also serves as an essential step toward the successful completion of their diploma studies. The projects featured this year are centered on the theme *Engineering Excellence: Bridging Technology and Life*, reflecting current trends and innovations in the engineering field.

This extended abstract book highlights not only the students' technical expertise but also their creativity, problem-solving skills, and ability to engage meaningfully with peers and industry professionals. Within these pages, you will find a diverse range of projects that embody a unique blend of knowledge, innovation, and practical application.

We warmly invite you to explore this collection, which celebrates the achievements of our aspiring engineers. Welcome once again to the Electrical, Electronics, and Systems Engineering Exhibition 2025. May the insights shared here inspire and pave the way for the next generation of innovative engineers.

Warm regards,

Dr. Fatimah Khairiah binti Abd Hamid

Dr. Atiqah Hamizah binti Mohd Nordin

Program Chairs

Electrical, Electronics, and Systems Engineering Exhibition 2025 (EESEE 2025)



Solar-Powered Visitor Counting System with Infrared Technology

Muhammad Azaim bin Kamarul Zaman¹, Norhalida Binti Othman² ^{1,2}Electrical Engineering Studies,
College of Engineering, Universiti Teknologi MARA, Pasir Gudang, Johor.

* 2022617416@isiswa.uitm.edu.my

ABSTRACT

Solar-powered visitor counting-system with infrared technology is an improved visitor counting system that uses a lithium battery powered by a solar panel and an infrared sensor integration to communicate information in real time. For motion detection, the system uses sensors such as an infrared (IR) sensor. In addition, it includes a Real-Time Clock (RTC). The system may react dynamically to the presence of a vehicle or person via these components. While LCD is used to send information to the person in charge of the system, LEDs and buzzers are utilized to act as a signal for information detection, enabling it to notify them and ensure everything functions properly. The system is easy to install anywhere due to its solar-powered source. Then, an ESP8266 is used to relay information to telegram in real time. Lastly, an Arduino UNO is used as the microcontroller for the whole system.

KEYWORDS: solar-powered, infrared sensor, RTC, ESP8266, telegram, Arduino UNO,

PRODUCT DESCRIPTION

The Solar-Powered Visitor Counting System with Infrared Technology is an innovative solution designed to efficiently monitor vehicle or pedestrian traffic at entry and exit points. Whether for residential gates, building entrances, or other access points, this system combines sustainability with advanced technology for reliable performance.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

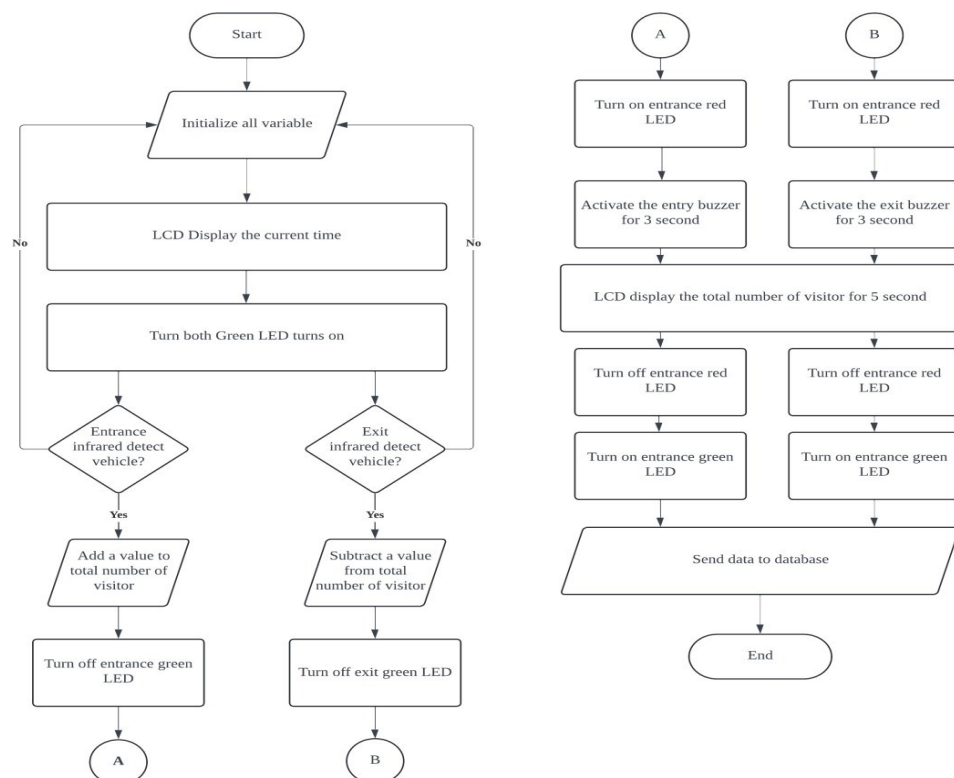


Figure 1: Flowchart of the Solar-Powered Visitor Counting System

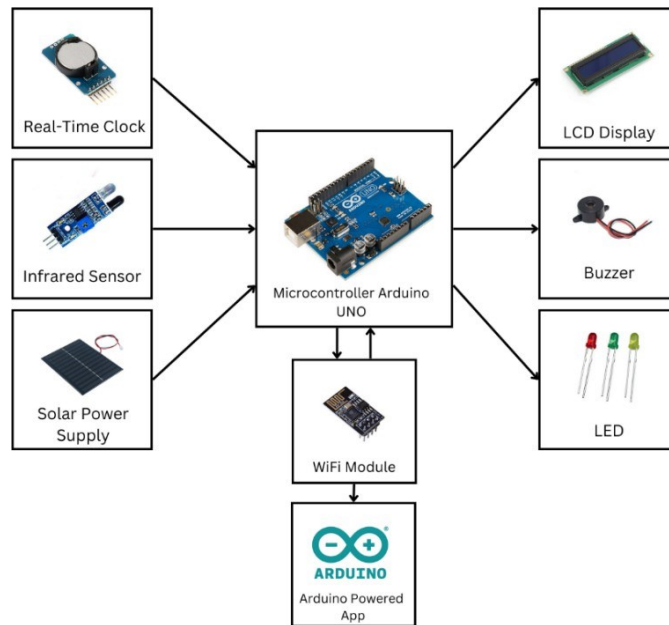


Figure 2 : Block Diagram of Solar-Powered Visitor Counting System

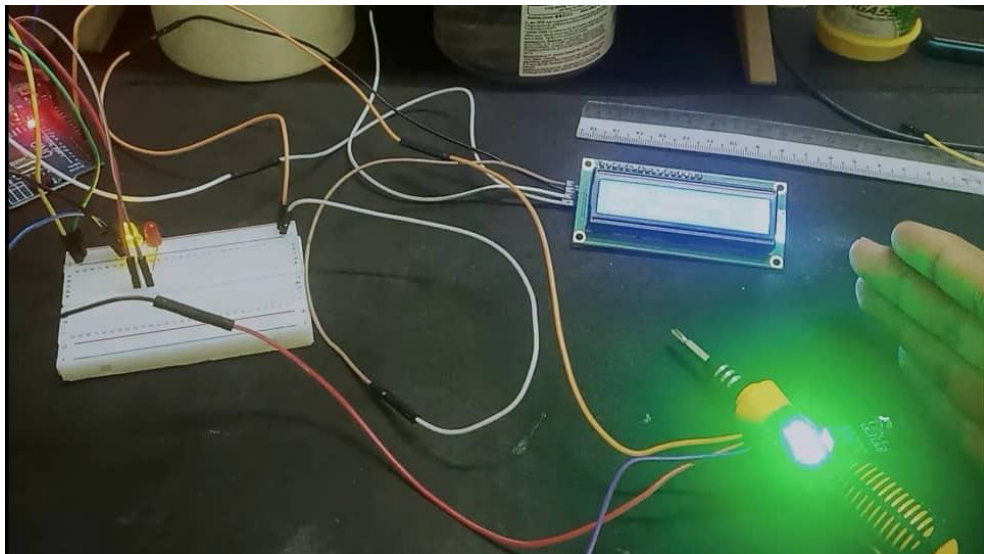


Figure 3 : The prototype of the system on Protoboard

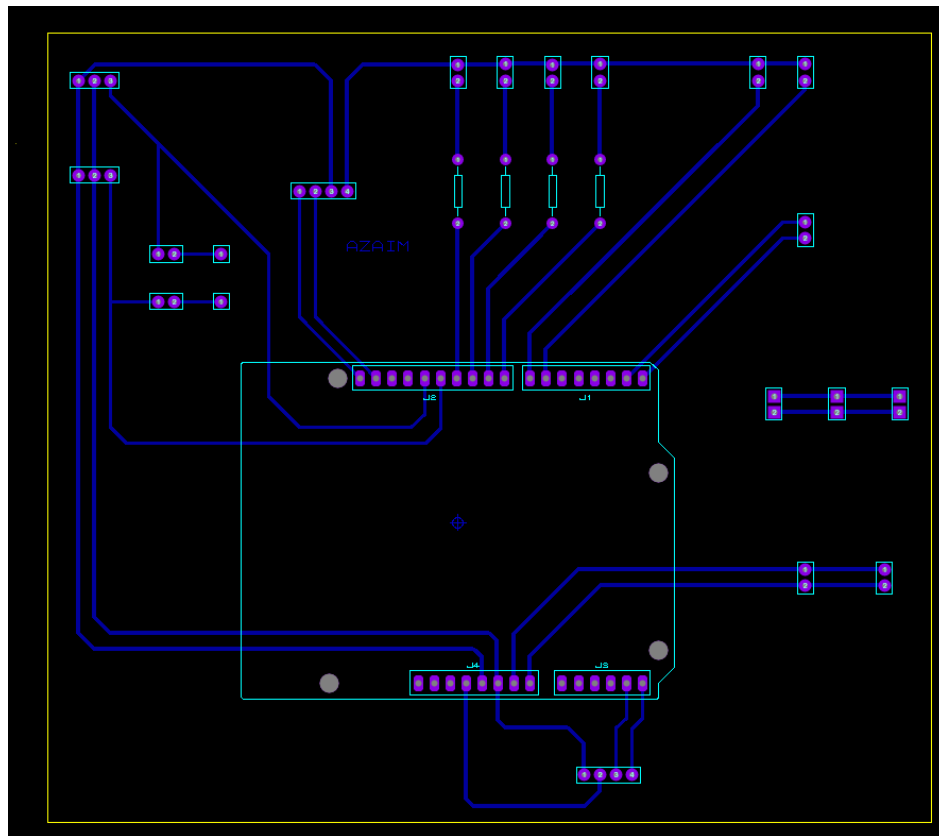


Figure 4 : PCB Layout of the system

NOVELTY AND UNIQUENESS

The Solar-Powered Visitor Counting System is unique in that it sends data straight to users' phones by integrating renewable energy and the Internet of Things. It differs from conventional visitor counting systems due to its special integration of solar power, sensors, and Internet of Things connectivity. With the Arduino UNO microcontroller and ESP8266 serving as its Wi-Fi module, precise control and real-time monitoring become possible. This creative method ensures both long-term energy sustainability and real-time information.

BENEFIT TO MANKIND

The Solar-Powered Visitor Counting System offers a workable answer for a residential area's or an individual's home's safety. Buzzers and LEDs can be used to help improve security wherever it is required. The user may concentrate on other duties while still maintaining the necessary level of security thanks to the automated functions, which save time and effort. The system's usage of pure solar energy also lowers operating costs and helps to conserve the environment.

COMMERCIALIZATION POTENTIAL

The Solar-Powered Visitor Counting System has a large market potential in home security, especially in luxury residential areas or areas with apparent high crime rates. Its eco-friendly design, scalability, and affordability make it ideal for both major home-building companies and mid-to-high-end individuals. The system is ideally positioned for installation in local as well as global markets, given the growing interest in sustainable solutions and smart security technology. Because of its flexibility, it can be installed anywhere, increasing its commercial potential.

CONCLUSION

The Solar-Powered Visitor Counting System solution integrates renewable energy, automation, and technology to improve security techniques. It is necessary for people since it addresses important problems like information accessibility, energy efficiency, and the highest possible level of security. The Solar-Powered Visitor Counting System is a progressive approach to home security that ensures both environmental protection and economy for the future through increasing safety while promoting sustainability.

REFERENCES

- | Desai, H., & Patel, P. (n.d.). International Journal of Creative Research Thoughts (IJCRT). *A Bidirectional Visitor Counter And Automatic Room Light Controller Using Arduino Uno And IoT Based*, 9(7 July 2021).
- | Siswanto, B., & Widiyanto, M. H. (n.d.). 2023 International Workshop on Artificial Intelligence and Image Processing (IWAIIIP). *Smart Occupancy Rate for Library Visitors Using Integrated Closed Circuit Television*.
- | *Bidirectional Visitor Counter using Arduino and SD Card Module*. (2021, January 5). PCB Way. Retrieved June 23, 2024, from https://www.pcbway.com/blog/Activities/Bidirectional_Visitor_Counter_using_Arduino_and_SD_Card_Module.html
- | Parajuli, A. (2021). An article on creating a visitor counting system with the integration of ESP8266 & Blynk. IoT Based Bidirectional Visitor Counter Using ESP8266 & Blynk. https://iotprojectsideas.com/iot-based-bidirectional-visitor-counter-using-esp8266-blynk/#google_vignette
- | Admin. (2023). An article on creating a visitor counting system with the integration of ESP8266 & MQTT. IoT Bidirectional Visitor Counter Using ESP8266 & MQTT. https://how2electronics.com/iot-bidirectional-visitor-counter-using-esp8266-mqtt/#google_vignette