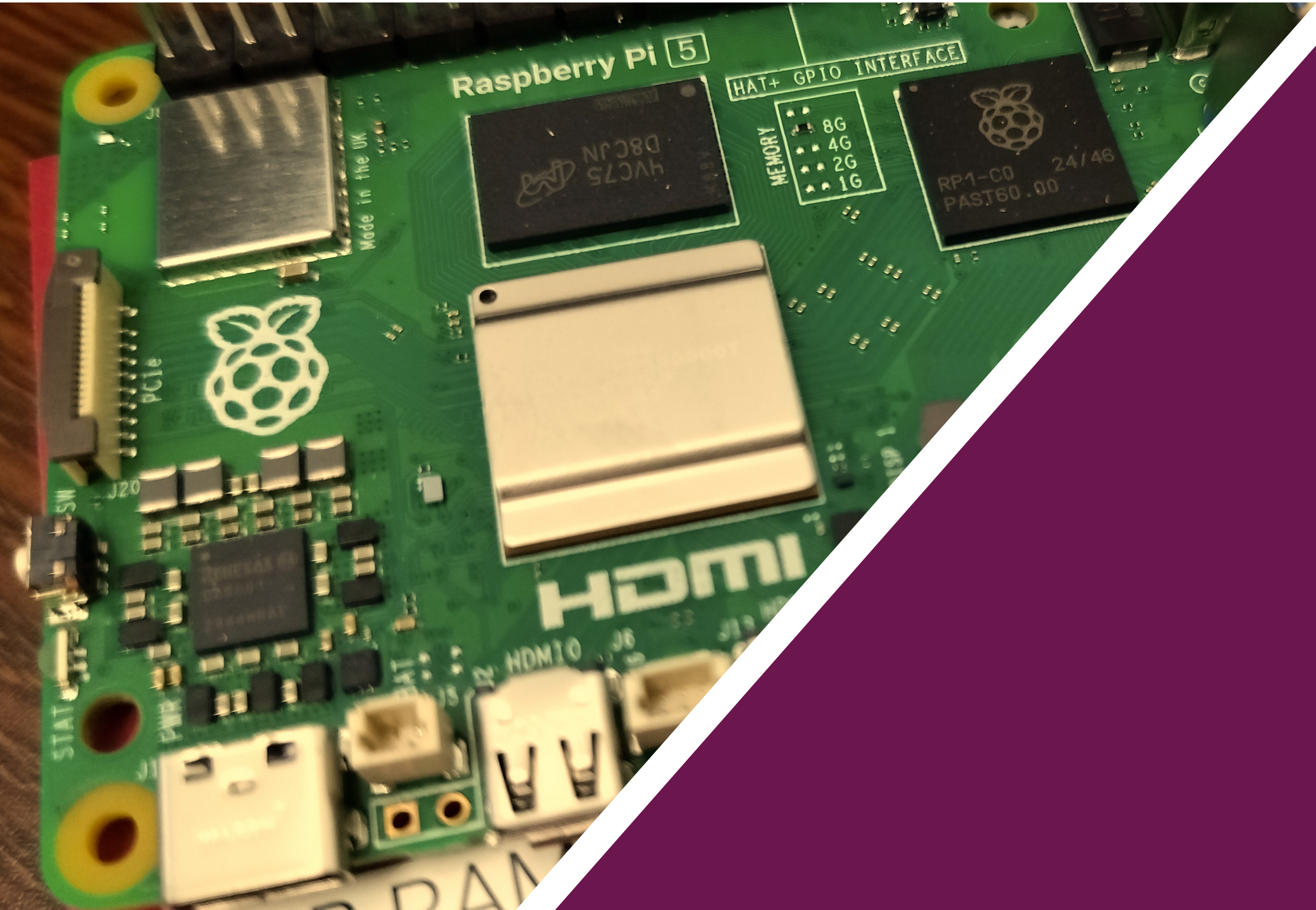




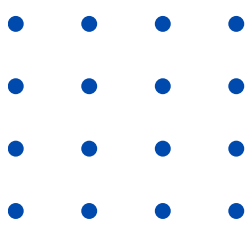
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EESEE 2025

10TH ELECTRICAL ELECTRONICS SYSTEMS
ENGINEERING EXHIBITION 2025
VOLUME 1



FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
JOHOR BRANCH
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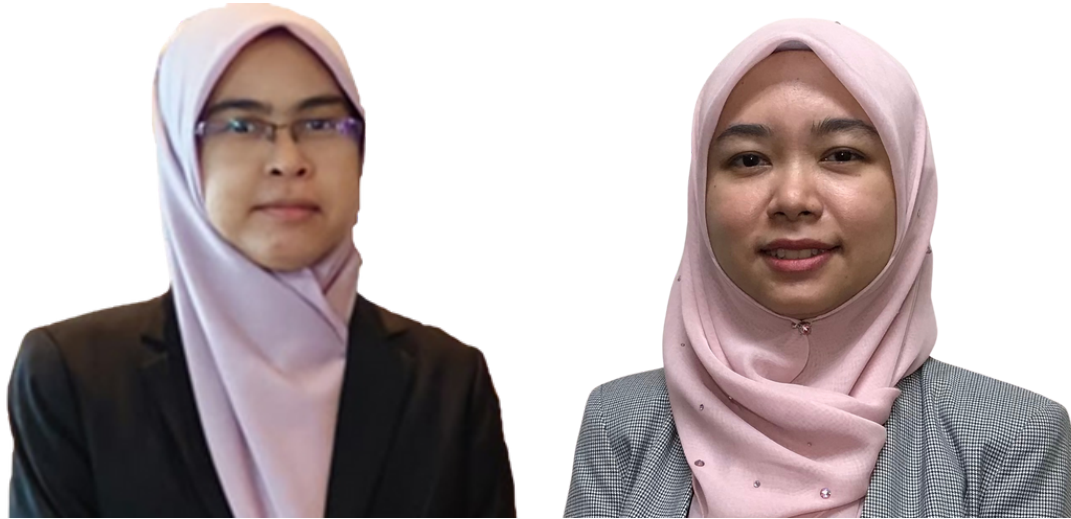
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FOREWORD BY THE PROGRAM CHAIR



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 Automated Irrigation System

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ABSTRACT

Solar-powered Automated Irrigation System presents a solar-powered automated irrigation system designed for efficient water management in agriculture. It utilizes solar panels, DHT22 sensors for temperature and humidity, LDRs for light intensity, soil moisture sensors, an ESP32 microcontroller, LEDs, LCDs, DC water pumps, IoT, and UV lights. The solar panels provide eco-friendly energy, while sensors monitor environmental conditions and soil moisture to optimize irrigation. The microcontroller controls the system based on sensor data, with real-time feedback from LEDs and LCDs. Water pumps deliver water as needed, and UV lights ensure clean water. This system promotes water conservation, crop health, and environmental sustainability.

KEYWORDS: solar-powered, soil moisture sensor, Esp32 Microcontroller, water conservation

PRODUCT DESCRIPTION

The Solar-Powered Automated Irrigation System is a sustainable solution designed to simplify and optimize farming. Powered by solar energy, it uses advanced sensors to monitor temperature, humidity, soil moisture, and light levels, ensuring precise irrigation. Controlled by an ESP32 microcontroller with IoT connectivity, the system enables remote monitoring and efficient water management. Features like UV light for water sterilization and a user-friendly LCD display make it practical and eco-friendly. This system helps save water, reduce costs, and improve crop health, making it ideal for modern agriculture.

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

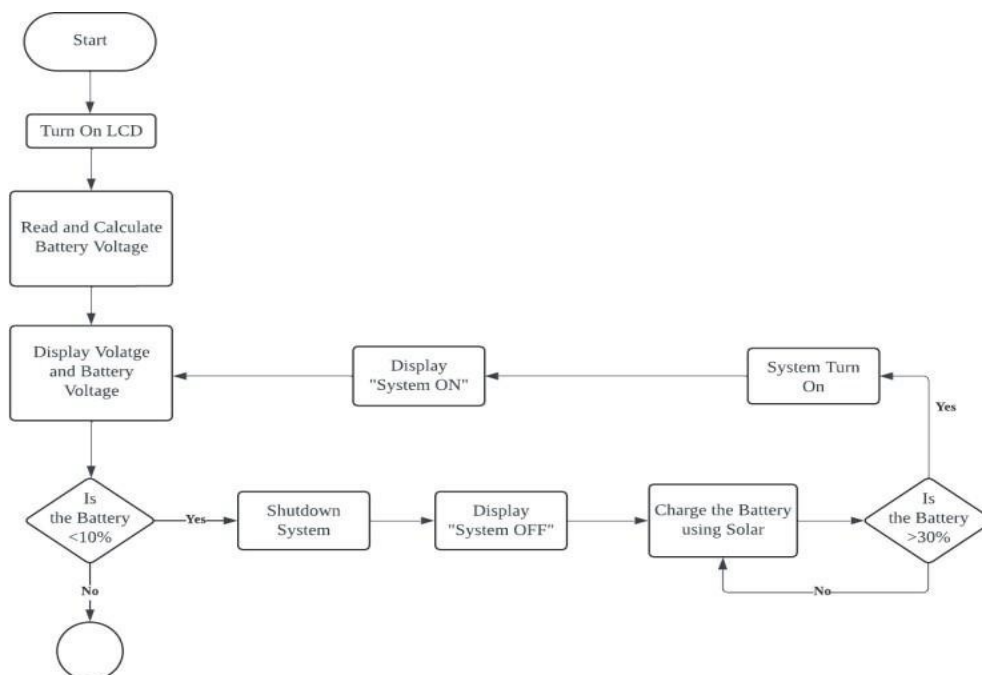


Figure 1a: Flow Chart of the Solar-powered Automated Irrigation System

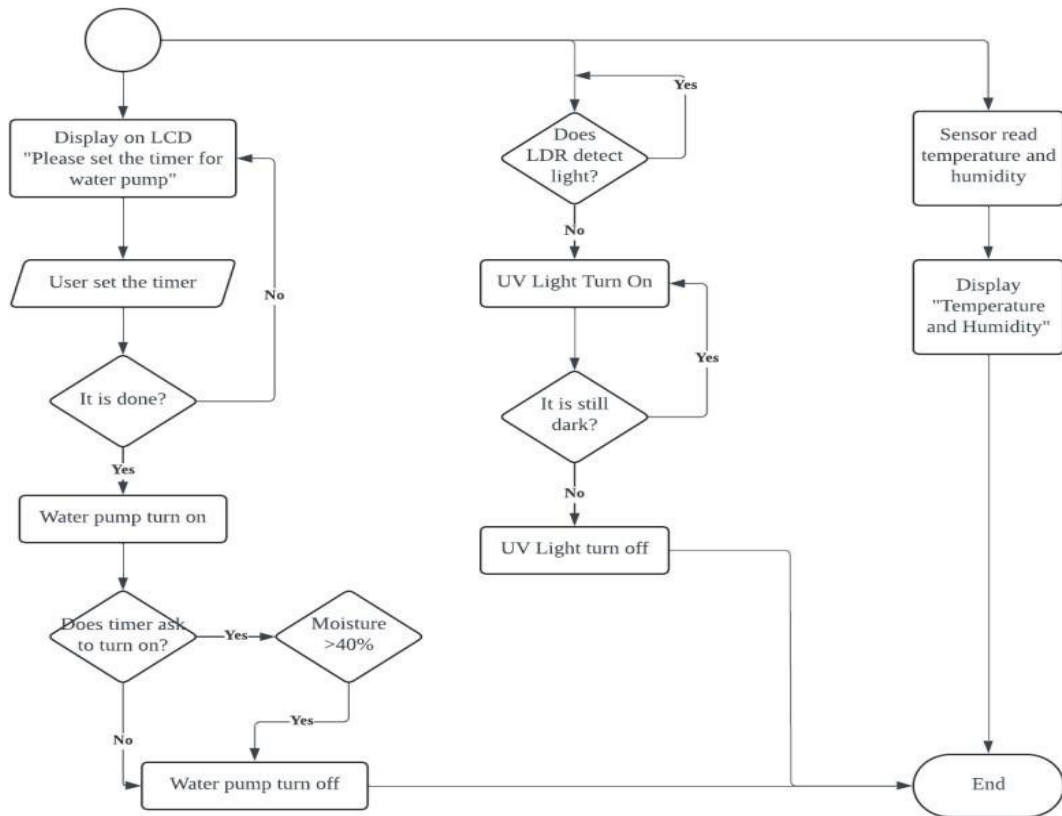


Figure 1b: Flow Chart of the Solar-powered Automated Irrigation System

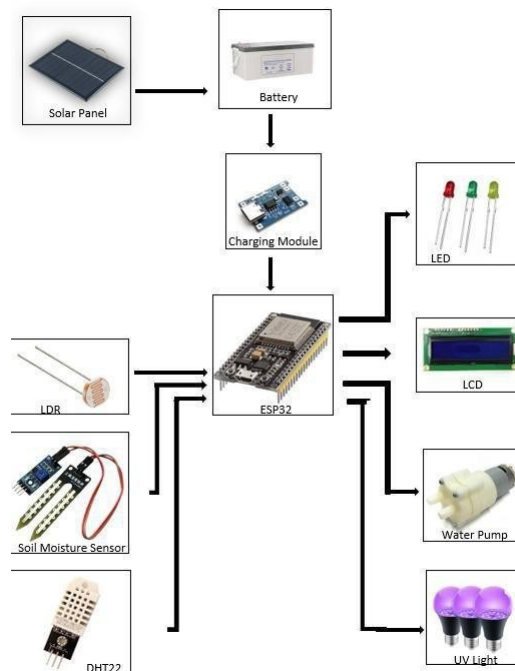
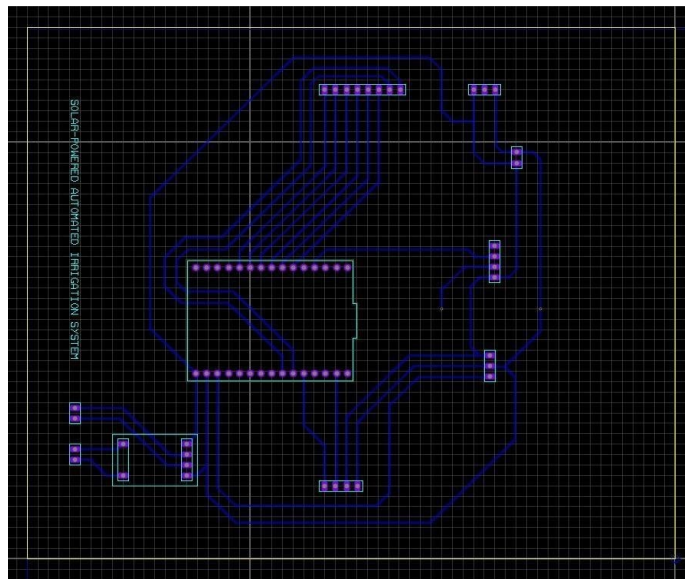
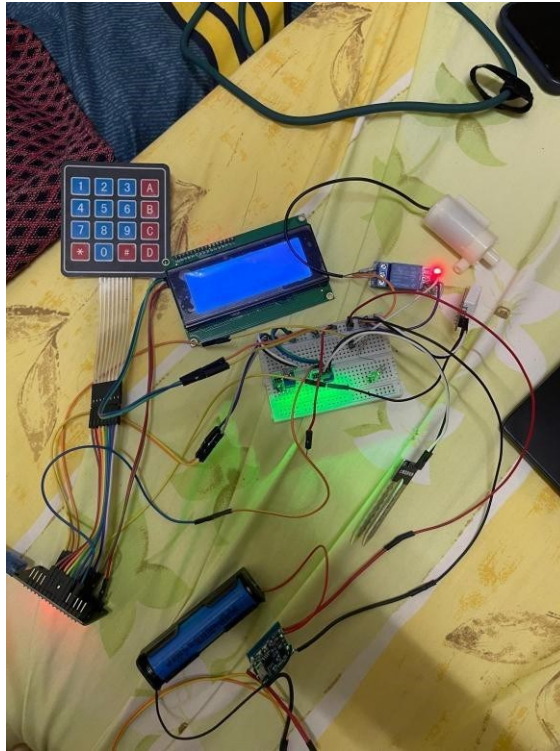


Figure 2: Block diagram of the Solar-powered Automated Irrigation System



NOVELTY AND UNIQUENESS

The Solar-Powered Automated Irrigation System stands out with its integration of renewable energy and smart automation to address water management challenges in agriculture. Its unique combination of solar power, advanced sensors, IoT connectivity, and UV sterilization sets it apart from traditional irrigation systems. The inclusion of the ESP32 microcontroller allows for precise control and real-time monitoring, ensuring optimal irrigation tailored to environmental conditions. This innovative approach reduces water waste and energy consumption, promoting sustainable farming practices.

BENEFIT TO MANKIND

This system provides a practical solution to global challenges like water scarcity and inefficient farming practices. By optimizing water usage and reducing dependency on conventional energy sources, it not only supports sustainable agriculture but also helps farmers lower costs and improve yields. The automated features save time and labor, allowing farmers to focus on other tasks while maintaining healthy crops. Additionally, the system's use of clean solar energy contributes to environmental conservation and addresses climate change concerns.

COMMERCIALIZATION POTENTIAL

The Solar-Powered Automated Irrigation System has significant market potential in agriculture, particularly in regions with water shortages or unreliable electricity access. Its affordability, scalability, and eco-friendly design make it attractive to small-scale farmers and large agricultural enterprises alike. With growing interest in smart farming technologies and sustainable solutions, the system is well-positioned for adoption in both local and global markets. Its adaptability to diverse crops and environmental conditions further enhances its commercial viability.

CONCLUSION

This innovative system combines renewable energy, automation, and modern technology to revolutionize irrigation practices. It addresses critical issues like water conservation, energy efficiency, and crop productivity, making it a valuable tool for farmers worldwide. By promoting sustainability and improving agricultural outcomes, the Solar-Powered Automated Irrigation System represents a forward-thinking solution for the future of farming, ensuring environmental stewardship and economic benefits for generations to come.

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