IOT Irrigation Monitoring and Controller System

Submitted in the partial fulfillment for the award of the

degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE WITH SPECIALIZATION IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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Outline

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Introduction to Project

- Our Project focuses on building a smart solution to the old irrigation and crop monitoring process revolutionized with the help of modern technologies like IOT and various different sensors.

- our project leverages innovative Internet of Things (IoT)-based smart water supply system designed to revolutionize agricultural practices. Addressing the inherent challenges of traditional irrigation methods, the system leverages the computational capabilities of Raspberry Pi units and strategically deployed moisture sensors.

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- The primary objective is to enable farmers to remotely monitor and control water supply in real-time, fostering precision agriculture and sustainable water management.

- The experimental setup involves deploying Raspberry Pi units with GPIO pins across the farm, interfacing with moisture sensors strategically placed for comprehensive coverage. Utilizing wireless communication protocols, such as MQTT, the system ensures seamless data transmission between sensors and a central server.

Problem Formulation

- In the contemporary landscape of technological advancements, the convergence of innovation and agriculture has become increasingly pivotal. This project responds to the pressing need for modernized agricultural practices, specifically addressing the challenges associated with water management.

- Our Project will enable the user to monitor and control the water supply and monitor crop features from a remote location.

Objectives of the Work

- To create a robust system capable of monitoring and controlling a smart farm from a remote location enabling users to easily control and reduce the overall overhead of a traditional system.

- Improving crop yield and reduce water wastage

- Reducing operational costs and ensure sustainability while also facilitating data driven decision to maximize output

Methodology used

- systematic approach employed to achieve the defined research objectives. Leveraging a combination of practical and technological strategies.

- Strategically placing moisture sensors across the farm to ensure comprehensive coverage and accurate soil moisture measurement.

- employing web and mobile application development technologies to create an intuitive and user-friendly interface, allowing farmers to monitor and control water supply remotely

- Integrating actuators into the system to enable responsive adjustments to water supply based on the real- time moisture data received from the sensors.

Conclusion

- Our IoT-based smart water supply system presents a pioneering solution to the challenges associated with traditional agricultural irrigation practices. By leveraging the computational capabilities of Raspberry Pi units, strategically deployed moisture sensors, and a robust communication infrastructure, the system enables real-time monitoring and control of water supply in agricultural settings.

- The experimental setup has been meticulously designed and implemented to validate the system's functionality across various agricultural scenarios. Initial results indicate promising outcomes in terms of enhanced water usage efficiency, reduced operational costs, and improved crop yields.

Future Scope

- Integrating with AI and ML to predict crop requirements and optimize outputs

- Implement interconnected smart irrigation networks that enable communication and collaboration between individual systems.

- Incorporation of sensor fusion technology and adoption of edge computing

References

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