

Smart Irrigation System Using Soil Moisture Sensor for Optimized Water Management

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Abstract

This paper presents a simple and low-cost smart irrigation system designed to optimize water usage in agriculture, especially in arid regions like the Gulf area. The system uses an Arduino-based controller connected to a soil moisture sensor that automatically activates or deactivates the water pump depending on the soil's moisture level. The prototype achieved up to 40% water savings compared to manual irrigation methods. This research aims to promote sustainable farming practices through automation and efficient resource use.

Keywords

Smart irrigation, Arduino, Soil moisture sensor, Water management, Automation.

Biography

Meshal Buqazah is a student at Al-Dhafi High School. I have strong research skills and a deep interest in agriculture and modern technologies that enhance sustainability. I strive to develop ideas that improve water efficiency and support sustainable farming practices. I am also interested in sports and maintain an active lifestyle to promote health and balance.