



Smart Irrigation System with Sensor Fault Detection using Scilab

Sanyam Bhavsar

Int. M.Tech Student in Data Science and Computation VIT Bhopal University

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Abstract

Water management is a very important part of modern agriculture, and smart irrigation systems can help use water more efficiently. This project focuses on developing a Scilab-based smart irrigation system that uses sensor readings such as soil moisture, temperature, and humidity to decide whether irrigation should be turned ON or OFF. The main aim is to simulate how automated irrigation can improve decision-making compared to manual monitoring.

Along with irrigation control, this project will also include sensor fault detection. In real systems, sensors may sometimes give incorrect readings because of malfunction, noise, or abnormal changes in values. Such faulty readings can lead to wrong irrigation decisions. To solve this, simple fault detection methods such as checking out-of-range values, sudden jumps, and inconsistent readings will be used in the simulation.

The complete system will be modeled in Scilab using simulated sensor data over time. The results will be shown using graphs of soil moisture, temperature, humidity, irrigation status, and detected faults. This project will help demonstrate how Scilab can be used to simulate an intelligent agricultural system and improve its reliability through basic sensor fault detection.

References

Automatic Irrigation System using Soil Moisture Sensor

ResearchGate:

https://www.researchgate.net/publication/362701179_Automatic_Irrigation_System_using_Soil_Moisture_Sensor

Sensor fault detection and isolation for smart irrigation using parity space approach

Pdf: <https://pdfs.semanticscholar.org/240a/bf4b9733b62074dd2a54bcbcb89190f7a179.pdf>