

Smart Precision Agriculture using IoT Simulation

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Abstract: *With the advent of Internet of Things (IoT) technologies, precision agriculture has emerged as a promising solution to address the challenges of traditional farming practices. This research paper presents a thorough investigation into the implementation of smart precision agriculture using IoT simulation on Tinkercad. The study encompasses the integration of various sensors including temperature, soil moisture, NPK (Nitrogen, Phosphorus, Potassium) values, and humidity sensors within a simulated agricultural environment.*

The paper elaborates on the design and setup of the IoT simulation, detailing the selection and deployment of sensors. Furthermore, it provides insights into the calibration process of sensors to ensure accurate and reliable data acquisition.

A significant aspect of this research is the generation and analysis of a comprehensive dataset spanning a month, capturing crucial parameters such as temperature variations, soil moisture levels, nutrient content, and humidity fluctuations. The dataset serves as a valuable resource for evaluating the performance of the smart precision agriculture system and for deriving actionable insights for optimized crop management.

Through this study, the efficacy of IoT simulation on Tinkercad as a tool for modeling and simulating agricultural environments is demonstrated. The findings contribute to the growing body of research aimed at harnessing IoT technologies for sustainable and efficient farming practices. Moreover, the research underscores the potential of smart precision agriculture in enhancing crop productivity, conserving resources, and mitigating environmental impact.

Keywords: IoT simulation, smart precision agriculture, Tinkercad, sensors, dataset analysis, crop management