WEATHER FORECASTING SYSTEM FOR AGRICULTURAL APPLICATIONS USING MICROCONTROLLER AND MACHINE LEARNING

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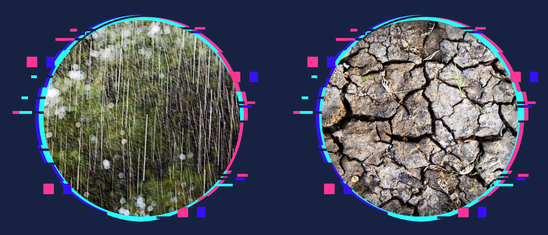
PROBLEM?

Did you know? When should I water



It is raining or drought

INTRODUCTION

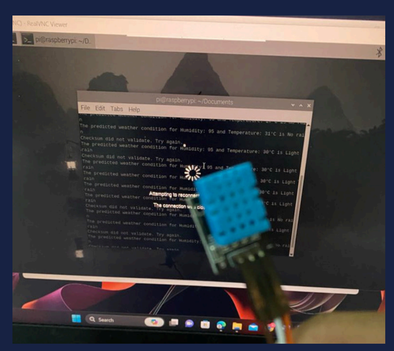
Water plays a crucial role in determining crop production and quality in agriculture, as each season impacts water resources and weather conditions significantly. Unpredictable weather, such as off-season droughts, poses challenges for farmers, who often need to use water from external sources to irrigate crops, increasing operational costs. However, farmers typically lack real-time weather updates, leading to unnecessary expenses—for instance, watering crops right before unexpected rainfall. To address this issue, this project introduces a Smart Agricultural Weather Forecasting System, designed to use Machine Learning to predict weather conditions in specific agricultural areas. The system will alert users about impending rain, allowing farmers to make informed irrigation decisions. This tool aims to help farmers reduce costs, conserve resources, and optimize crop production, with the potential for further development into a comprehensive garden water management system.

METHODS

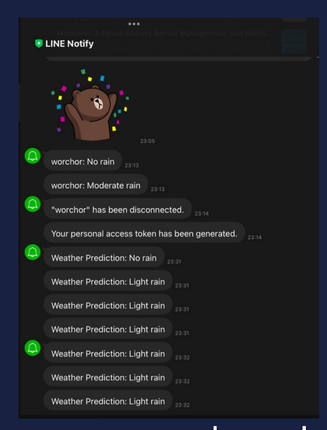
Datasets

Using dataset from the Water Resources Information Institute
MOU131
Kuan Nang Heuan Forest Protection Unit,

Designing a machine learning program using the sklearn (Scikit-learn)



Test the efficiency of the program Machine Learning



Designing a machine learning program using the sklearn (Scikit-learn)

CONCLUSION AND FUTURE IMPROVEMENTS

The Smart Agricultural Weather Forecasting System offers a promising approach to helping farmers manage water resources and make informed decisions based on weather forecasts. Despite an accuracy of approximately 80%, the system's performance can improve through several adjustments.

INCLUDING

- Enhanced Data Quality: Using higher-precision sensors and expanding the dataset with additional meteorological variables (such as wind speed and atmospheric pressure) could improve forecasting accuracy.
- Better Connectivity Solutions: To mitigate data loss from Wi-Fi disruptions, alternative data transfer methods or offline data storage solutions could be explored.
- Long-Term Data Collection: Gathering data across different seasons would allow for a more robust model capable of handling varied weather conditions.

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