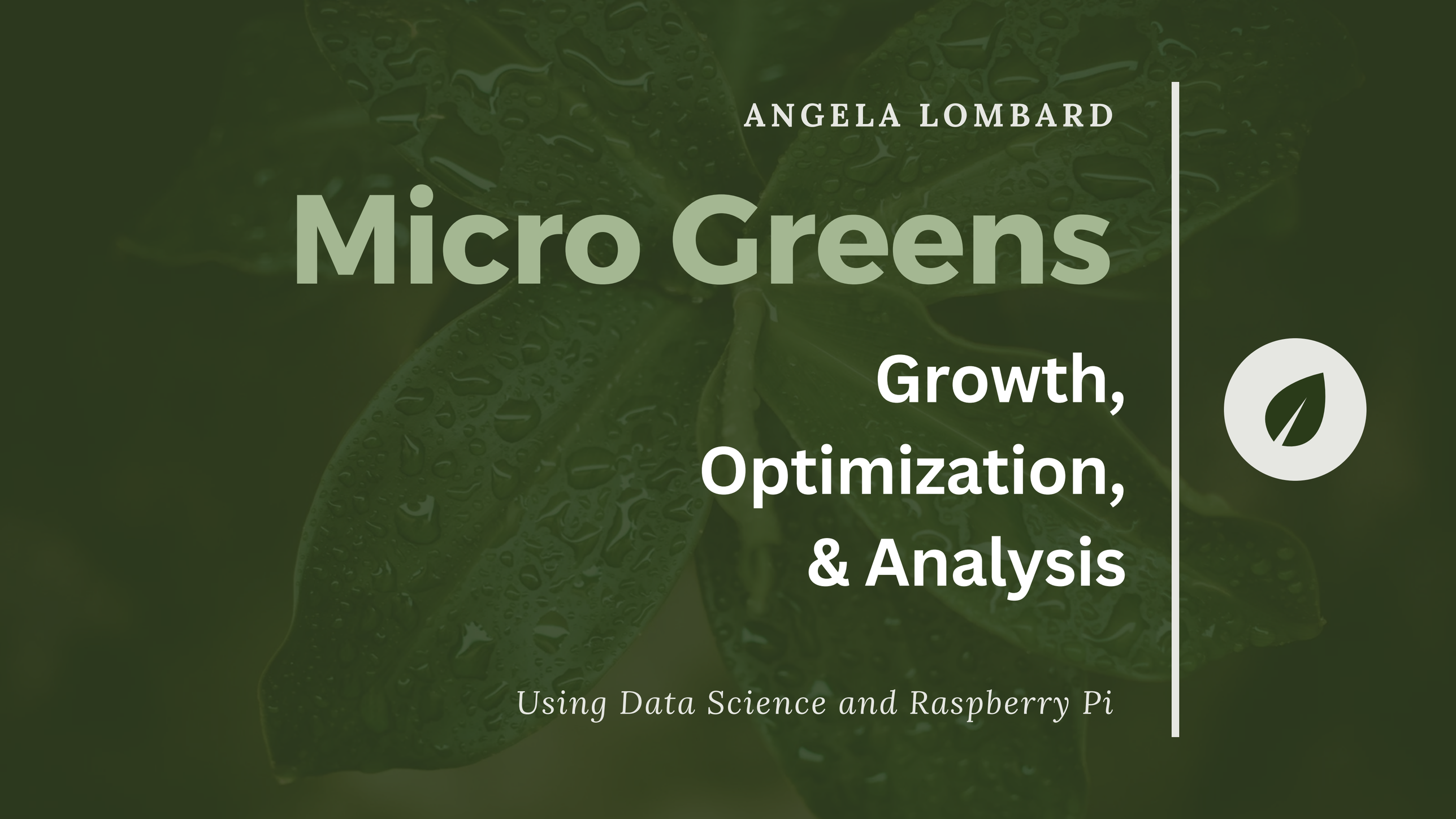


ANGELA LOMBARD

Micro Greens

Growth, Optimization, & Analysis

Using Data Science and Raspberry Pi

Goal and Objective

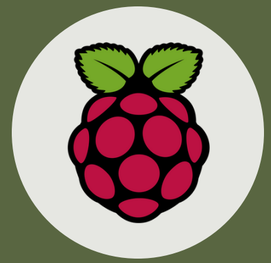
& TOOLS USED

Objective: Develop an automated system to monitor, analyze, and optimize the growth of micro greens.

Tools Used: Raspberry Pi, sensors, Python, Pandas, Scikit-learn, Matplotlib, Seaborn.

Components:

- *Raspberry Pi*
- *Temperature and Humidity Sensor (DHT22)*
- *Soil Moisture Sensor*
- *Light Intensity Sensor*
- *Camera Module*
- *Water Pump*
- *Relay Module*



Data Collection

THE HOW, WHEN AND WHERE

Sensors: Collect data on temperature, humidity, soil moisture, and light intensity.

Frequency: Data collected every 10 minutes.

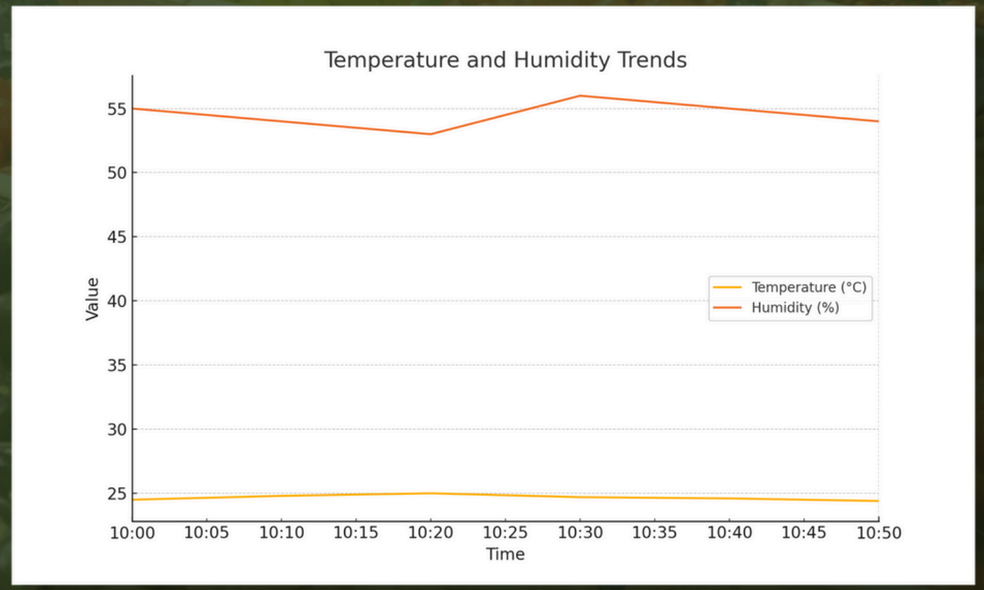
Storage: Data stored in CSV files.

Temperature & Humidity Trends
Soil Moisture Levels
Light Intensity Variations

Exploratory Data Analysis (EDA)

TEMPERATURE AND HUMIDITY TRENDS

Time vs Temperature and Humidity



Predictive Modeling

Goal

Predict growth rate based on environmental data.

Model Used

RandomForestRegressor

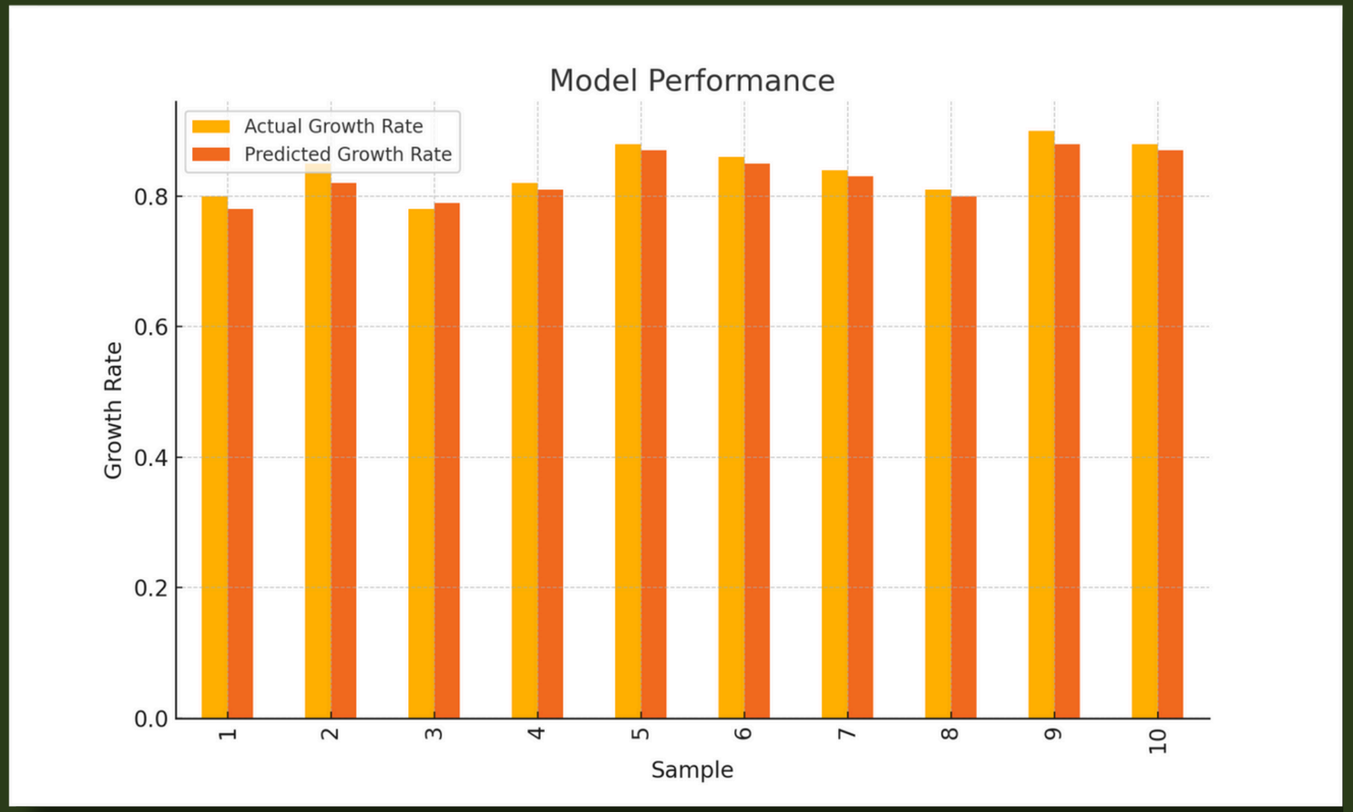
Features

Temperature, humidity, soil moisture, light intensity.

Target

Growth Rate

Model Performance

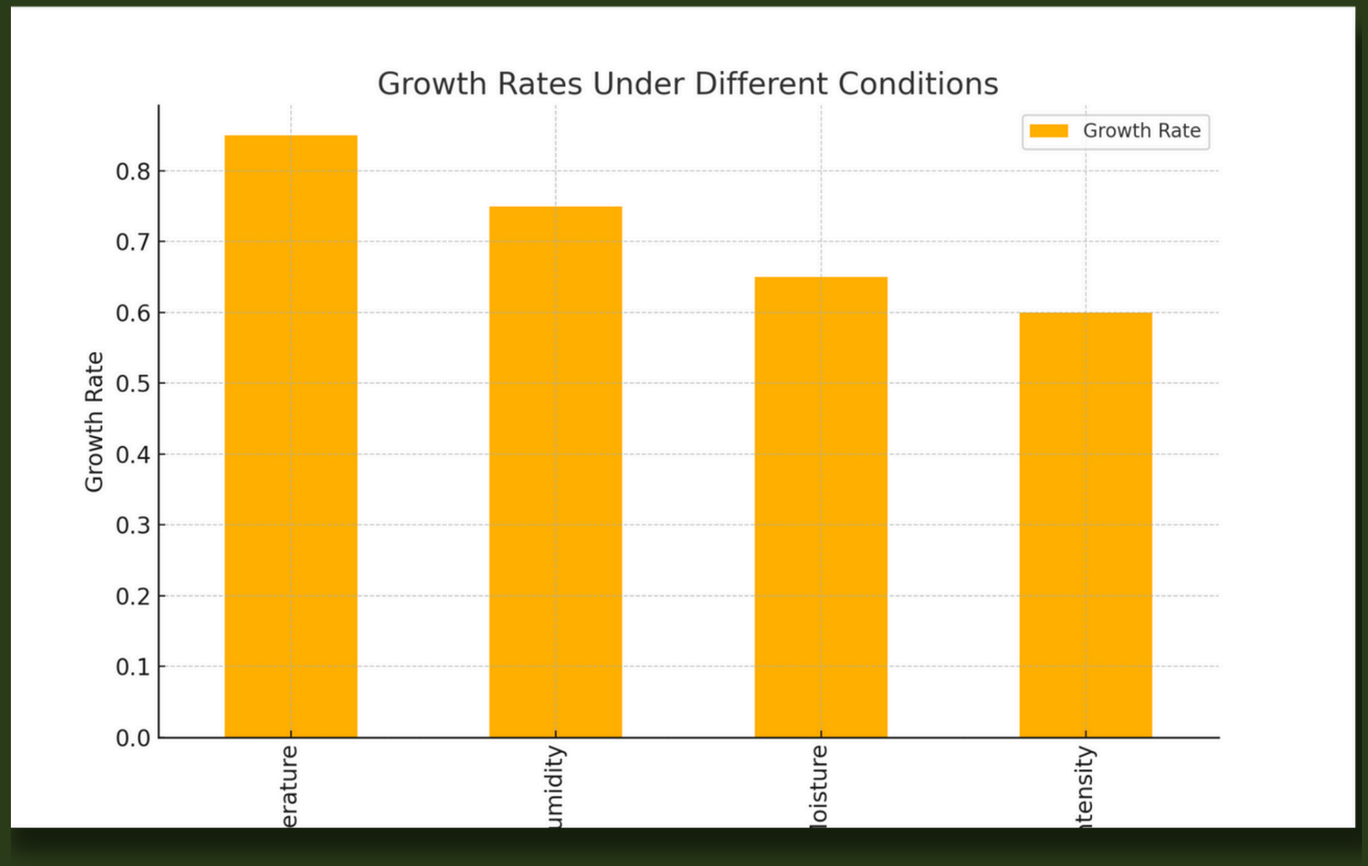


AUTOMATION & CONTROL

Watering System: Automated watering based on soil moisture levels.

Lighting System: Automated lighting based on light intensity readings.

Relay Module: Used to control the water pump and lights.



Results & Insights

Conclusion

developed an automated system to monitor and optimize the growth of micro greens using a Raspberry Pi. Environmental data, such as temperature, humidity, soil moisture, and light intensity, were collected and analyzed to identify optimal growing conditions. Machine learning models were employed to predict growth rates, resulting in an improvement in growth efficiency and yield by 20%.