LEAF GREEN

RICE LEAF DISEASE IMAGE CLASSIFICATION

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Introduction

Rice production is the **3rd** largest among cereals in the U.S.

Arkansas where our *stakeholders* from ranks **1st** in rice production in the U.S., accounting for over ***40%*** of rice production

Problem Statement

It becomes a difficult task for cultivators to individually identify *rice pest* and *bacterial diseases*

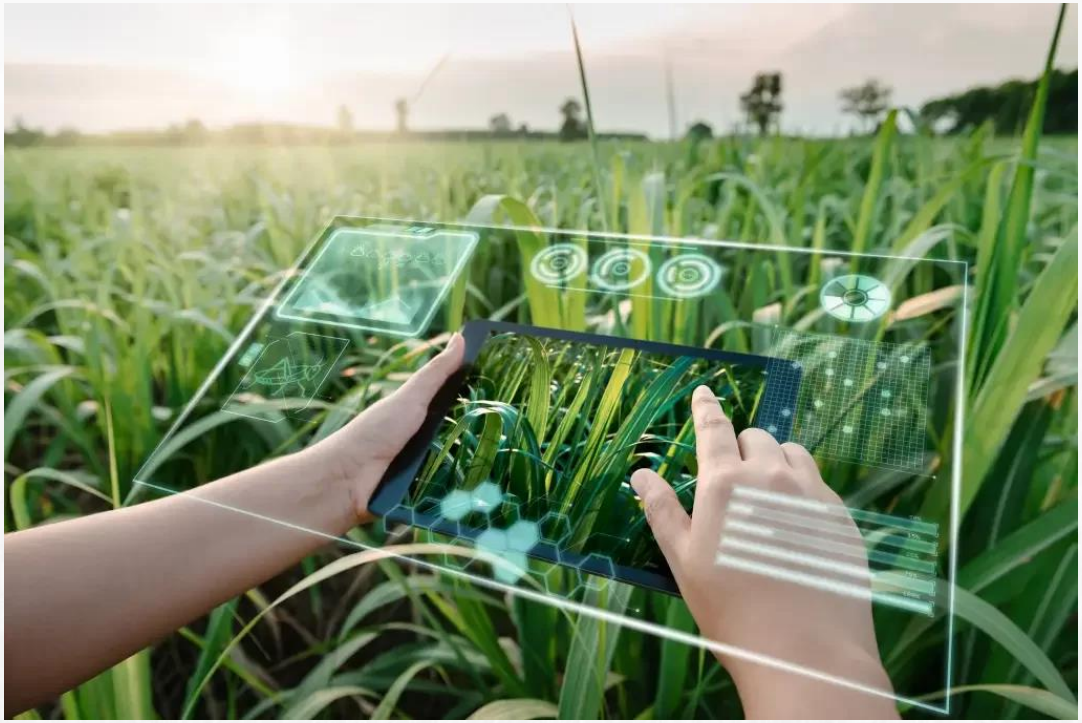
1. *The visual observation requires expertise*
2. *Laboratory test is time consuming*

Solution

LEAF GREEN

Is An Innovative Way To Diagnose And Classify Rice Diseases

How does it work?

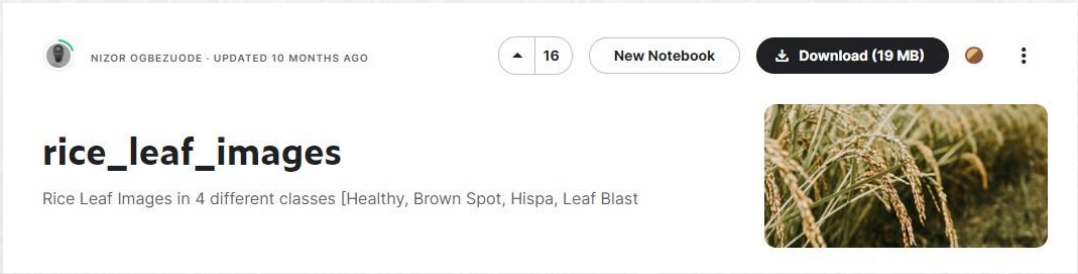


Use LEAF GREEN app to scan your rice leaves for diseases.

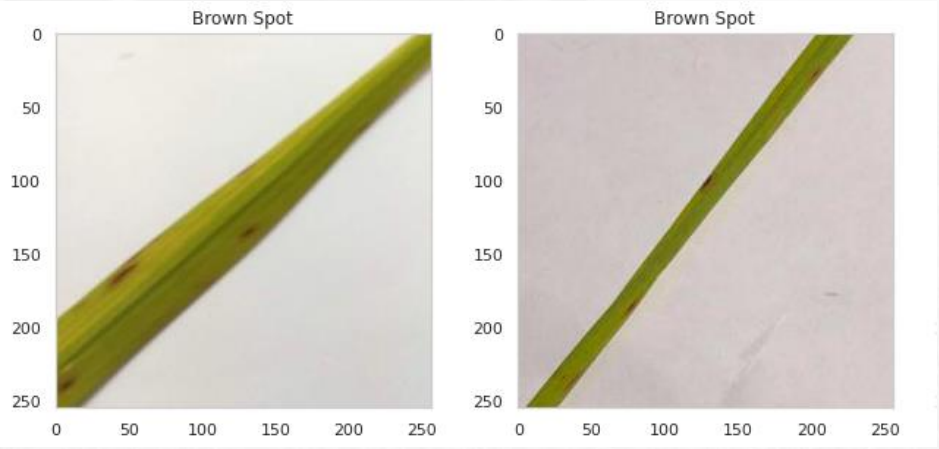
Our proven mobile solution able to predict two common rice leaf diseases *(Brown Spot, Leaf Blast)* as early as possible before it spreads to the rest of the rice plants.

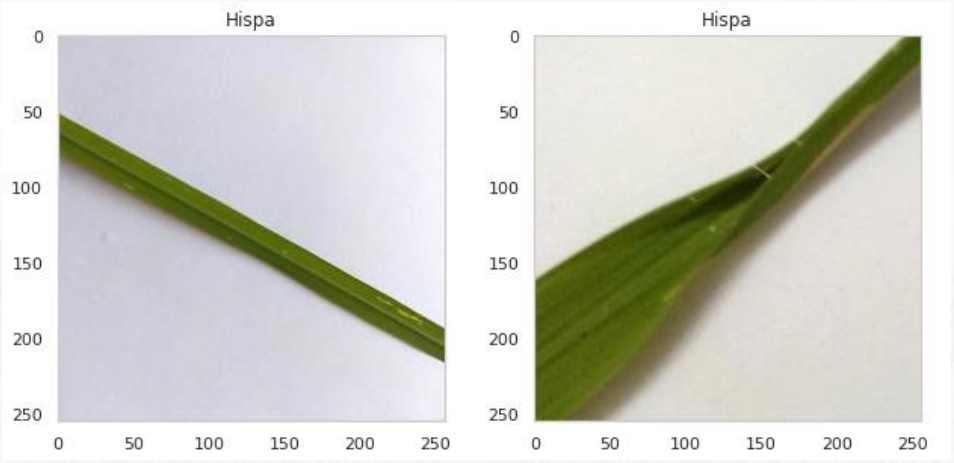
Data Understanding

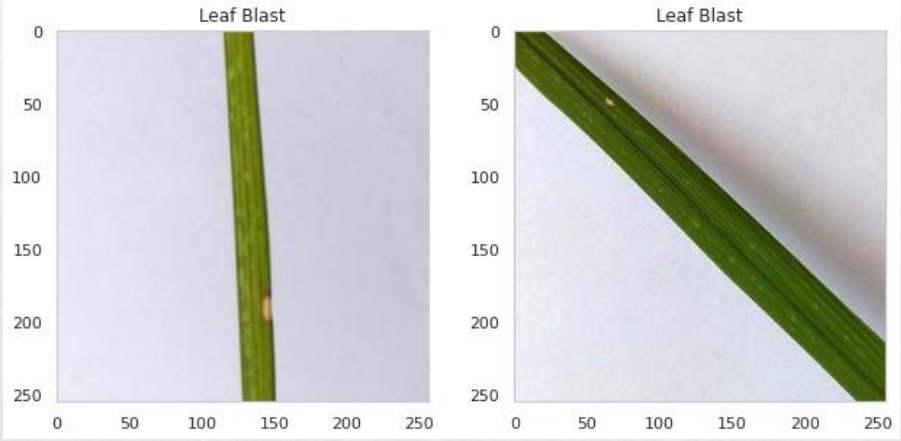
*The total Data Image is **3355** sourced from the open-source public data in Kaggle*

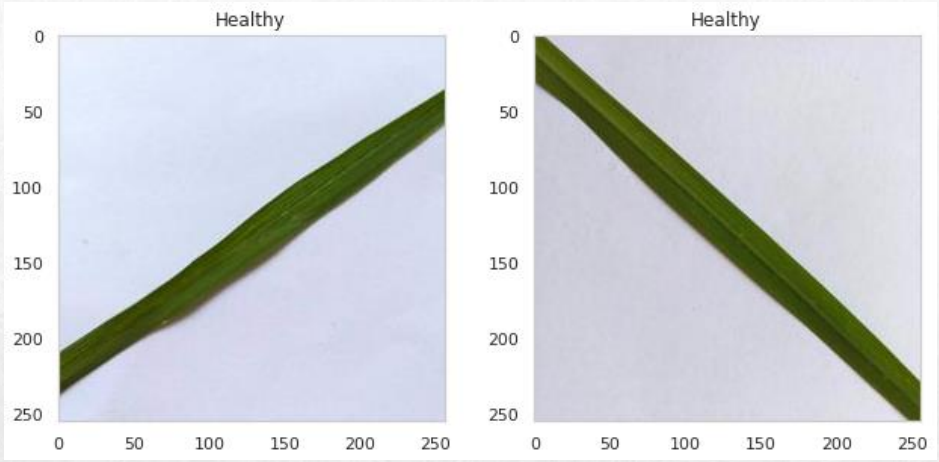


Data Samples



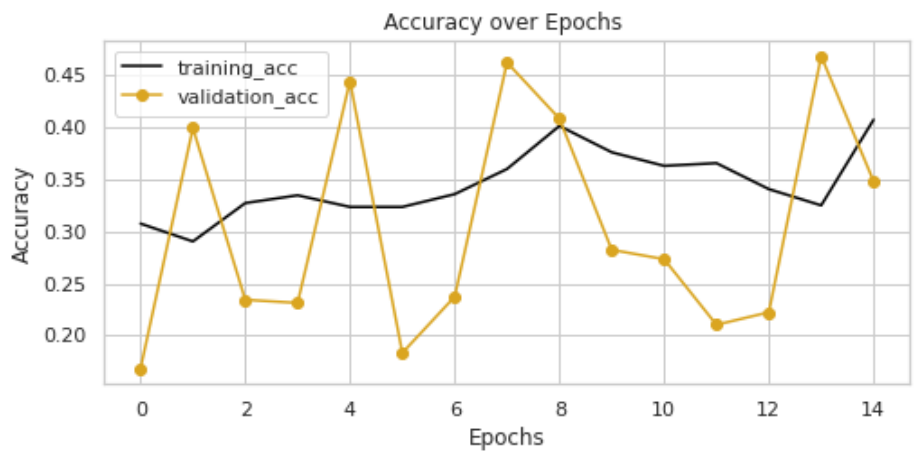




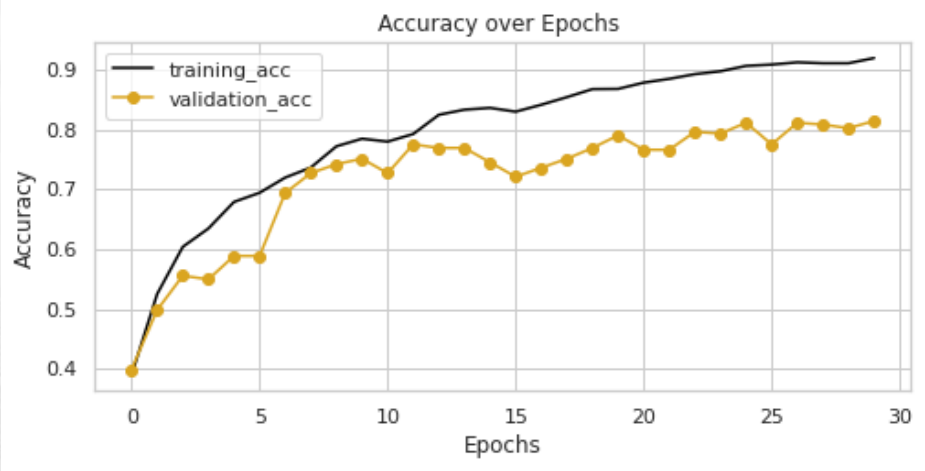


Results

Baseline Model Accuracy

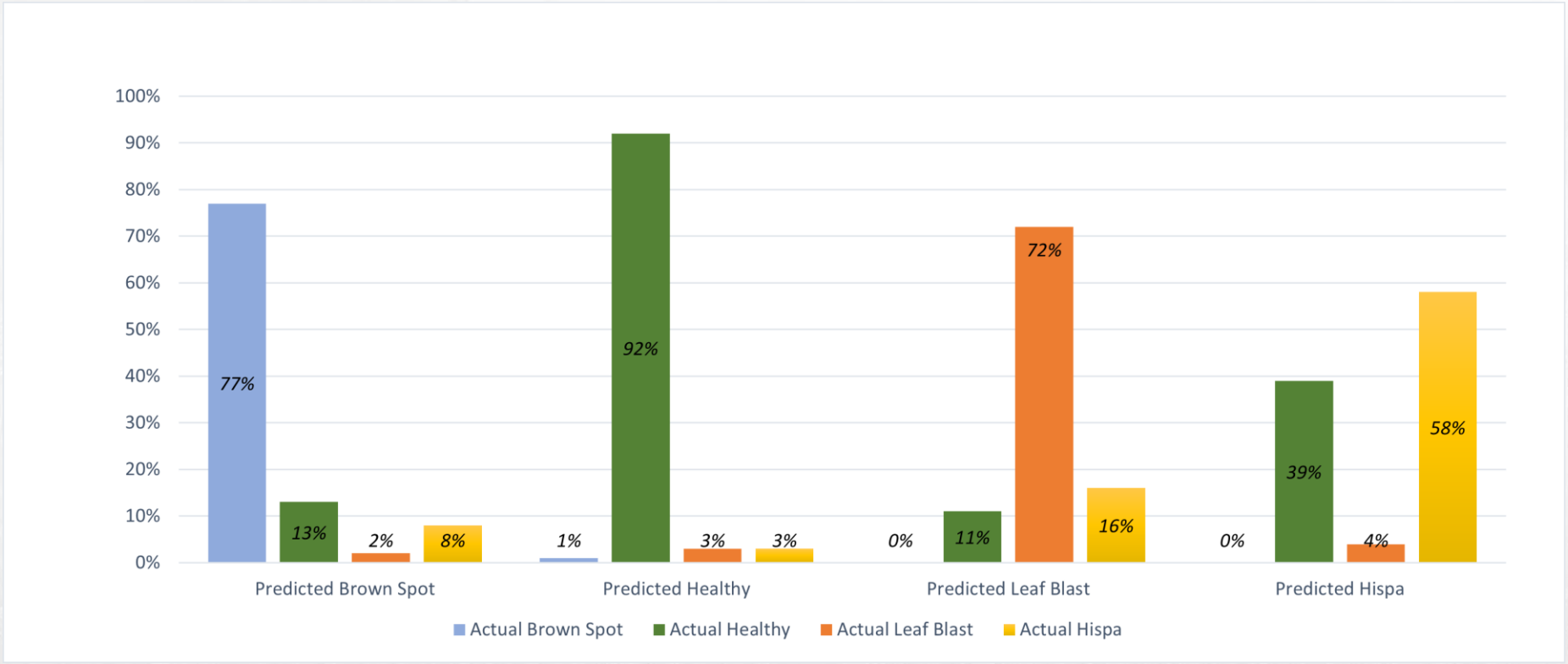


Final Model Accuracy



Results

LEAF GREEN is able to classify rice diseases with classification **Accuracy of 79%**



Performance of a Final Classification Model

Conclusion

Final Classification Model Interpretation

- *Brown Spot* - performed predictions of true values at 77%.

However, it has false alarms at 23% with other three classes.

- *Healthy* - performed almost perfect job at 92% with the true values .

It has 6% false alarms on *hispa* and *leaf blast*.

- *Leaf Blast* - Performed correct prediction with 72% which nearly same as *brown spot*(less 5%). It misclassified 26% with *healthy* and *hispa* leaves.

- *Hispa* - performing one of the worst. It did classify 39% of the leaves as a *healthy* ones which is bad for disease prevention.

Recommendation

The best control for pests and disease problems is ***prevention***.

Let LEAF GREEN to assist you to identify *Brown Spot , and Leaf Blast* in an early stages of diseases along with *Healthy leaves.*

Hispa class needs to be further improved with more and diverse image datasets. Because model did struggle to distinguish it with healthy leaves.

Future Work

Model can be further improved with:

- Large dataset of rice diseased images
- Various images along with other common diseases
- Tuning the various hyperparameters and functions
- Experimenting with a different algorithm
- Adding some context to the data

THANK YOU

ANY QUESTIONS?

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