TEAM BOTANICBRAINS

PLANT PULSE: A PLANT DISEASE DETECTOR

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Content

Problem

As anticipated, 70% to 80% of the Indian economy relies on agribusiness. With a growing population increasingly dependent on agricultural yield, the ultimate aim is to foster progressive development. To achieve this, early disease examination becomes paramount. Utilizing various image processing techniques for investigation and diagnosis is essential, empowering farmers, botanists and plant enthusiasts to overcome yield and potential losses.

Abstract

- Plant diseases caused many significant damages and losses in crop around the world. Appropriate measures on disease identification should be introduced to prevent the problem and minimise the losses

- Technical approach using machine learning and computer vision are actively research to achieve intelligence farming by early detection on plant disease

- An application is obviously desirable to aid the farmers or garden enthusiasts in diagnosing what sort of diseases a plant has. Although some similar application exist most of them achieve the function by submitting the image to a team of plant pathologist or expert garden advisers to get possible identification result and some advice

Annual crop loss of 147 million kg due to attacks: Tea research body

The Tea Research Association said the revenue loss due to pest infestation in tea plantati ₹2,865 crore per year

maize is known as the queen of cereals because it has the highest genetic yield potential among the cereals. It is cultivated on nearly 190 m ha in about 165 countries having wider diversity of soil, climate, biodiversity and management practices that contributes to 39 % of the global grain production. The United States of America (USA) is the largest producer of maize contributes nearly 30.99% of the total production in the world in 2020 and maize is the driver of the US economy. In India, Maize is grown throughout the year. It is predominantly a Kharif crop with 85 percent of the area under cultivation during the season. Maize is the third most important cereal crop in India after rice and wheat. It accounts for around 10 percent of total food grain production in the country. India is also the fifth largest producer of Maize in 2020 as per FAO data and India's share in world production accounted to be 2.59 per cent in the same year. In addition to staple food for human being and quality feed for animals, maize serves as a basic raw material as an ingredient in thousands of industrial products that includes starch, oil, protein, alcoholic beverages, food sweeteners, pharmaceutical, cosmetic, film, textile, gum, package and paper industries, etc.

Study on common rust in Karnataka in 2012

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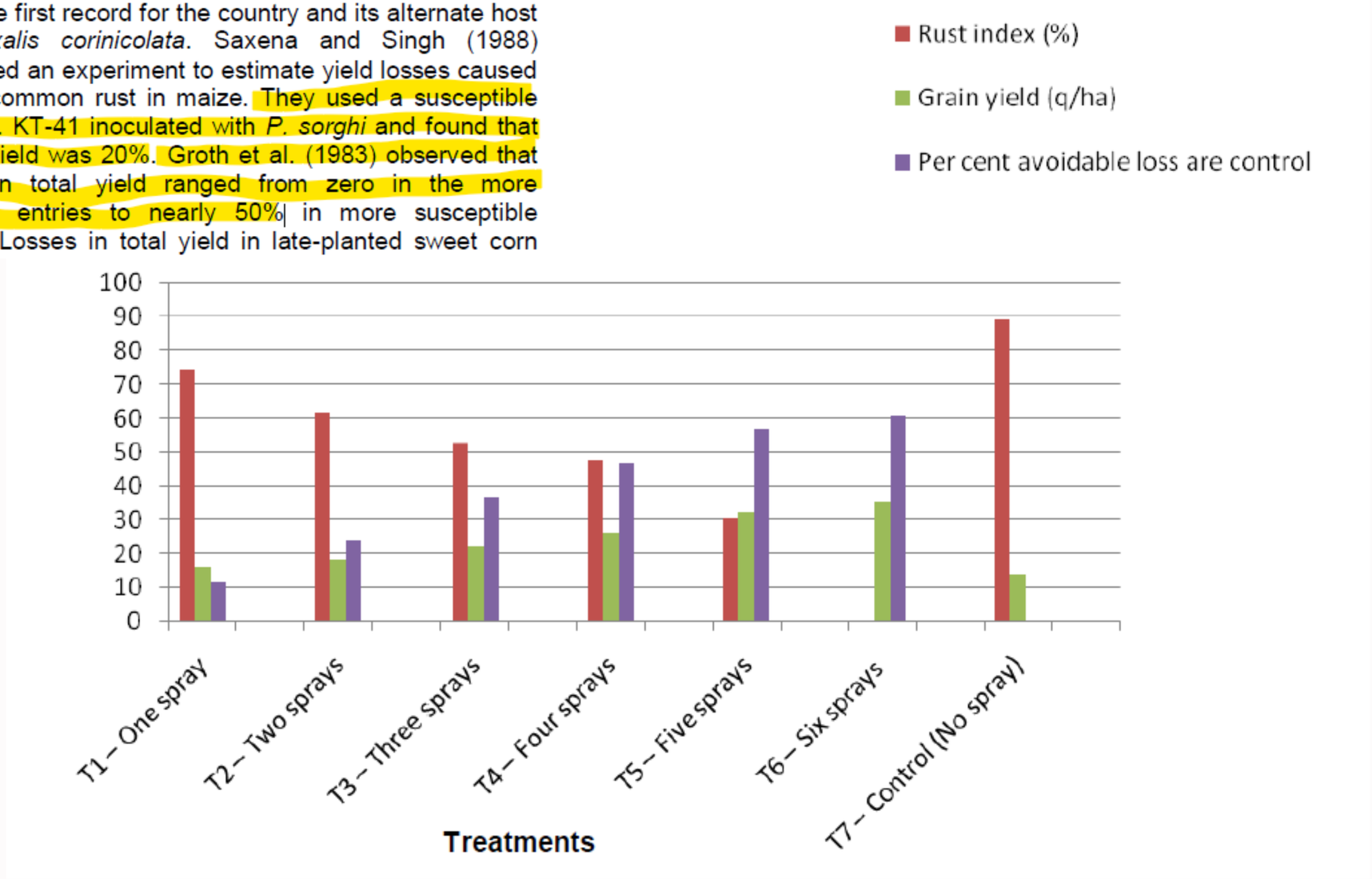
observed in Cankiri in the central plateau of Turkey. This being the first record for the country and its alternate host was *Oxalis corinicolata*. Saxena and Singh (1988) conducted an experiment to estimate yield losses caused due to common rust in maize. They used a susceptible local Cv. KT-41 inoculated with *P. sorghi* and found that loss in yield was 20%. Groth et al. (1983) observed that losses in total yield ranged from zero in the more resistant entries to nearly 50% in more susceptible entries. Losses in total yield in late-planted sweet corn



Overview

Creating a ML model for plant disease detection which can be used on the Web or Mobile App and get disease name and its info

01

Analyzing the needs of the plant enthusiasts and why a tool is required for plant disease detection. Creating a roadmap for this project.

02

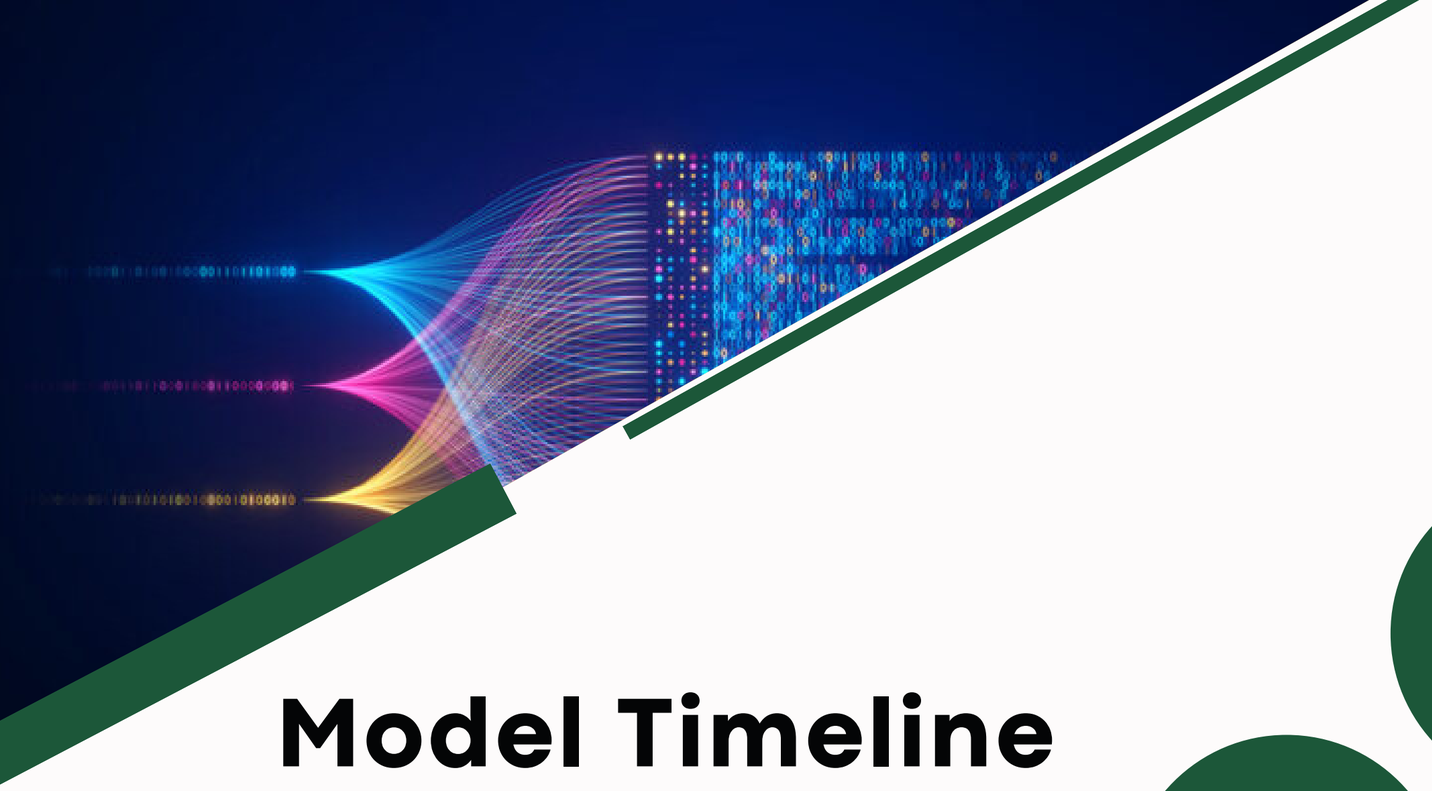
Collecting valuable assets and open source datasets for this project and brainstorming ideas within the group

03

Executing the development of the model and website simultaneously and constantly communicating the problems and solutions

04

Integrate the model into Node JS (backend) and supplying appropriate data to the model from the user. Then thoroughly testing the project.



Model Timeline

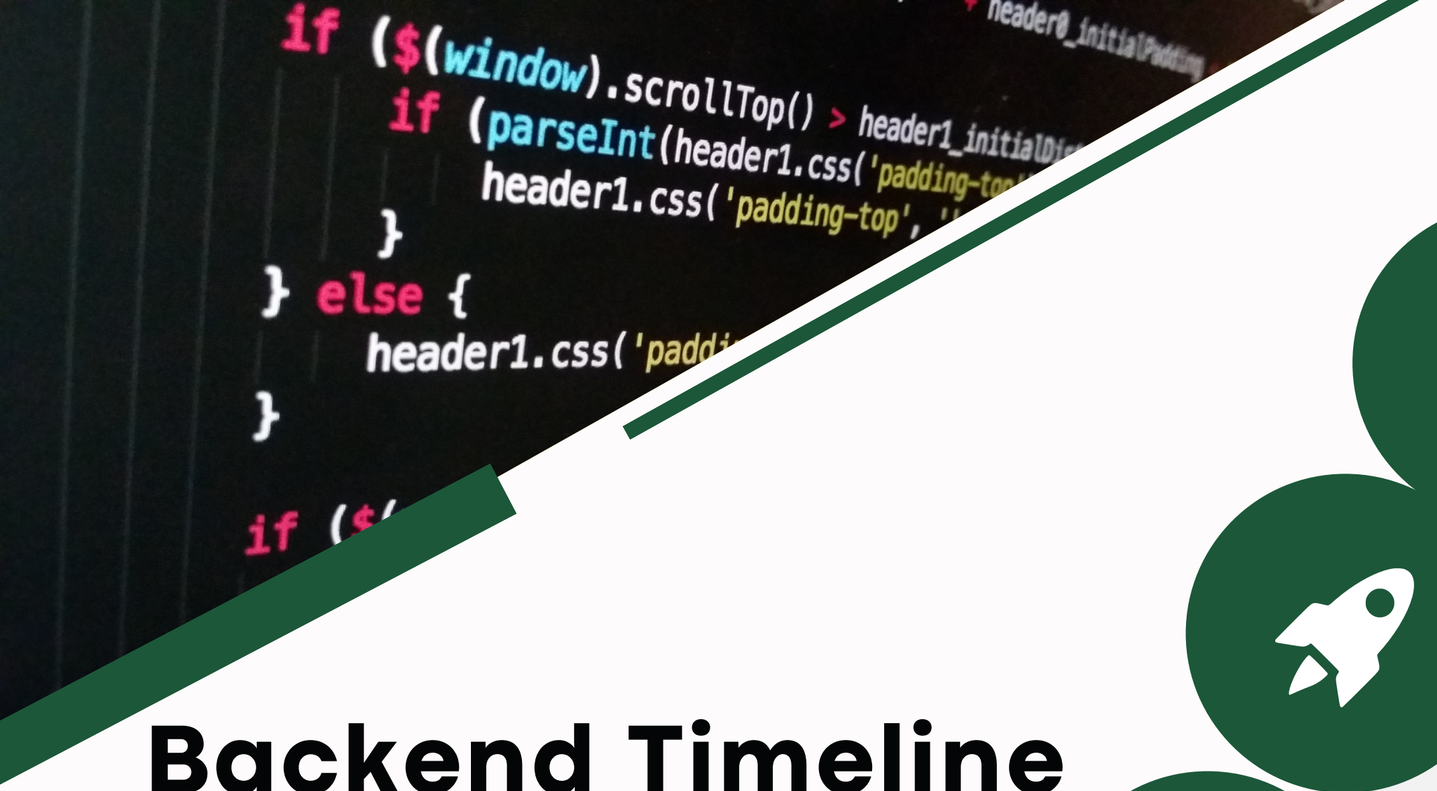
We have used CNN VGG19 for our project and have achieved 75percent of accuracy.
Model is still in developmental process.

4th stage
Calculating the accuracy of the model

3rd stage
Training the VGG19 model with our own datasets

2nd stage
Preprocessing of the images

1st stage
20.6k image dataset of 38 classes.



Backend Timeline

Sending the info & showing results

The user gets the desired info

Getting predictions

Finding max value from predictions and getting the disease info corresponding to that max value

Take image file from user

Taking pixel data from the file and giving it to server. The server converts the pixel data into a 3d Tensor and the tensor is normalized and supplied to the model as input

Load Model.json

Use the converted model and tensorflowjs to load model

Future goals

01

Drone imaging and predictions over acres of land.

02

Using more image processing techniques to enhance the model.

03

Giving access to a dashboard from which the farmers can see insightful information about their crops.

04

By upscaling and connecting to the community of agriculture scientist and helping them in providing useful data.

Our Team

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THANK YOU

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