# DR V: YOUR VEGI DOCTOR

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INTRODUCTION

The disease in the plant affect the leaves, stems, roots and fruits; It also affects the crop quality and quantity, which causes food deprivation and insecurity throughout the world.

The estimated Annual Crop yield loss due to crop disease is about 16% globally, which is the primary cause of food shortage and increased food production costs.

In this project, we have tried to find a way to detect if the plant is healthy or not. This will help us to recognise the plant before it could infect more.

This project is a multi-level deep learning model used for recognising diseases in potato leaf.

At the first level, we have extracted the image of potato leaves from the potato plant. Then disease detection convolutional neural network of the leaves is developed at the second level to detect whether the plant is healthy or not.

EXPERIMENTAL DETAILS

We have used the technique of machine learning to recognise the plant's disease.

For this experiment, we have created a website in which a person can post the image of the plant's leaf and our model could predict the disease associated with the leaf.

This experiment will help anyone in order to recognise whether the plant is healthy or is suffering from a disease.
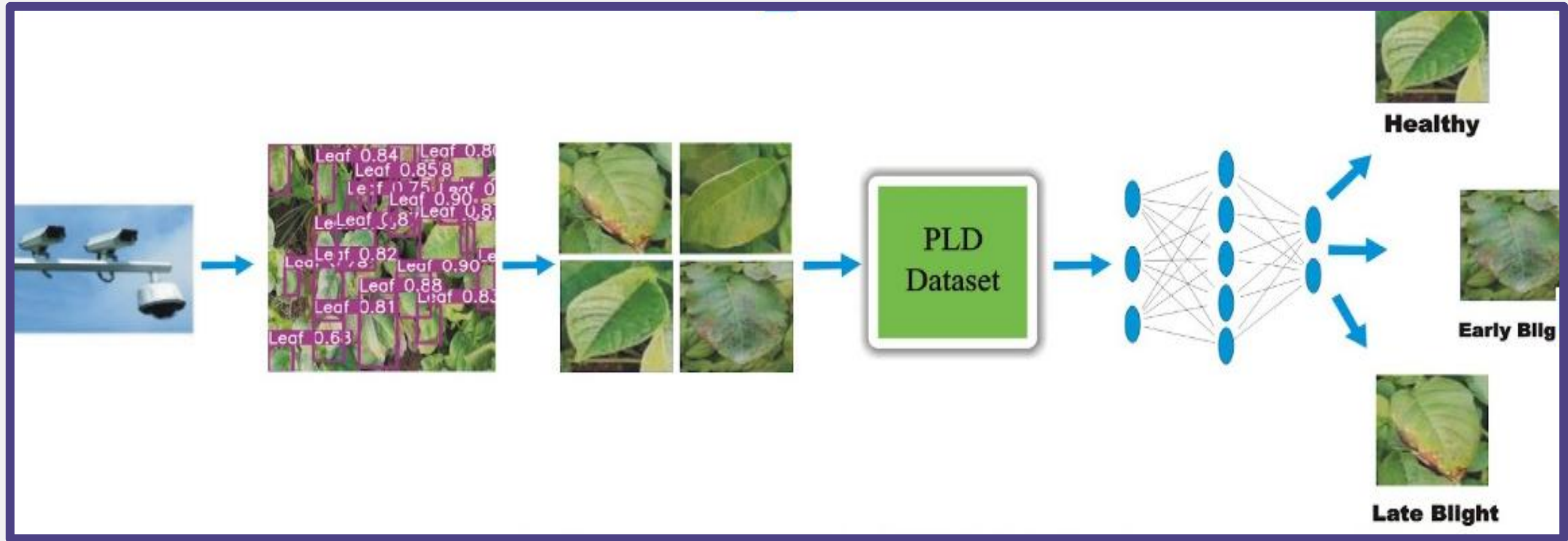

RESULTS AND DISCUSSION

The Model

We have solved the problem using CNN to create our model. We used the images of more than two thousand potato leaf to train our model. The following graph shows our model accuracy which comes to be around 98%. In the image below, it is prediction on sample models.

The Website

We created a website for our project that will help predict the disease associated with the potato plant. This website includes drag and drop window in which image of the plant leaf can be dropped. One can easily know about the level of disease in potato plant by using just one image with the help of this webpage.

The Results

We were able to create the model that could predict the potato disease with the accuracy of 87%. The website created by us will provide an easy interface between the user and the model to recognize the disease. Here is the screenshot of the prediction made by our model.
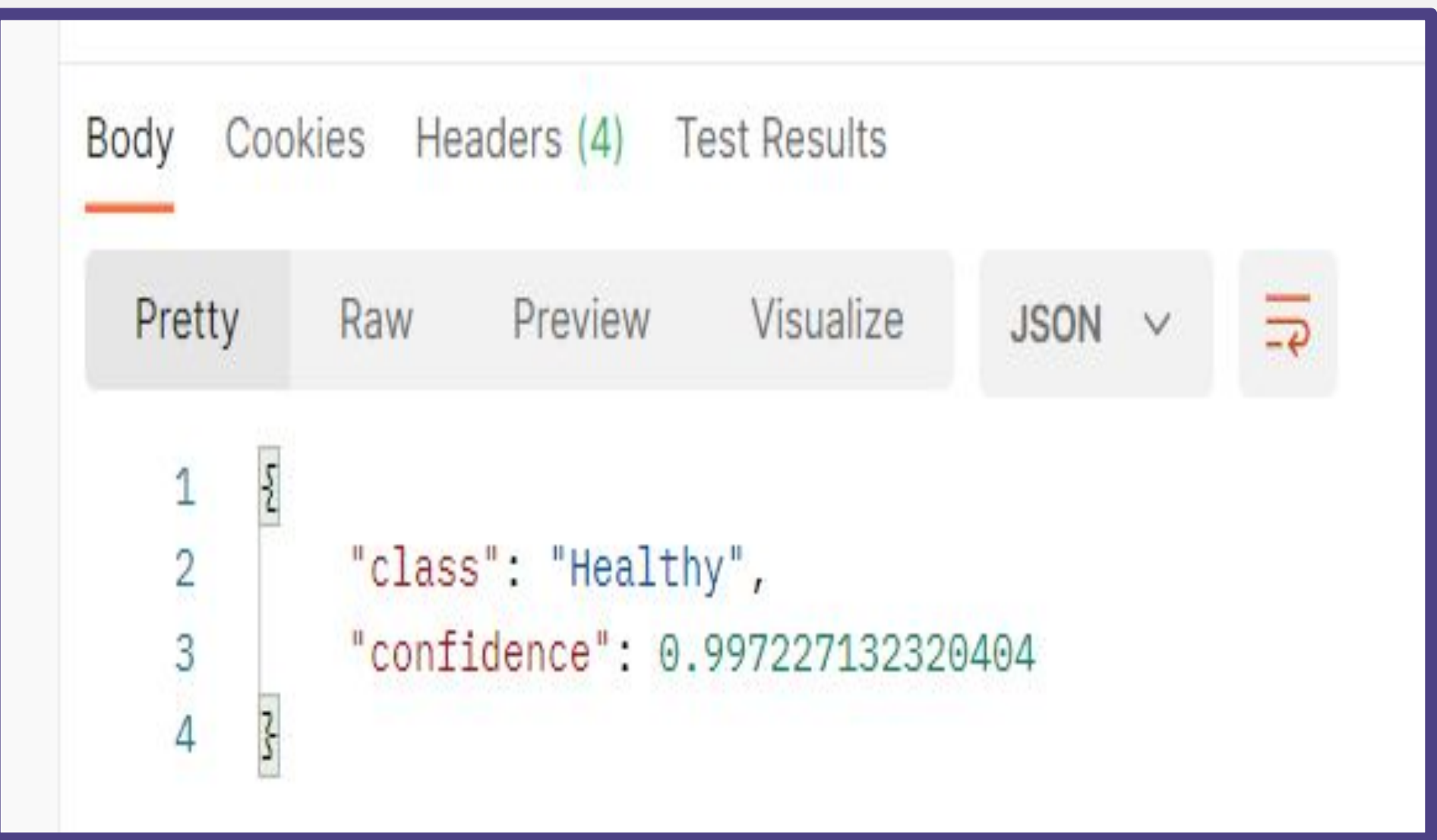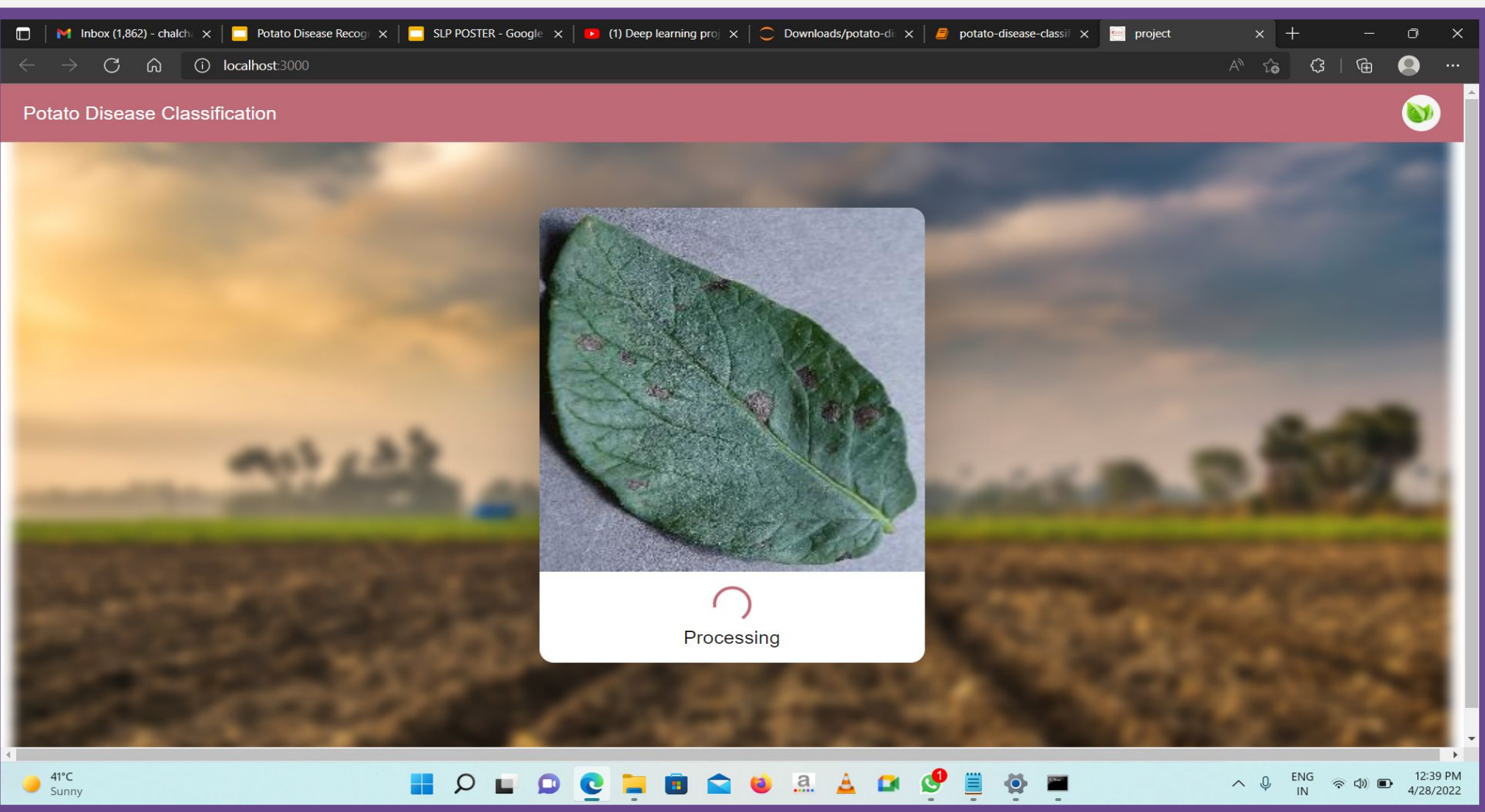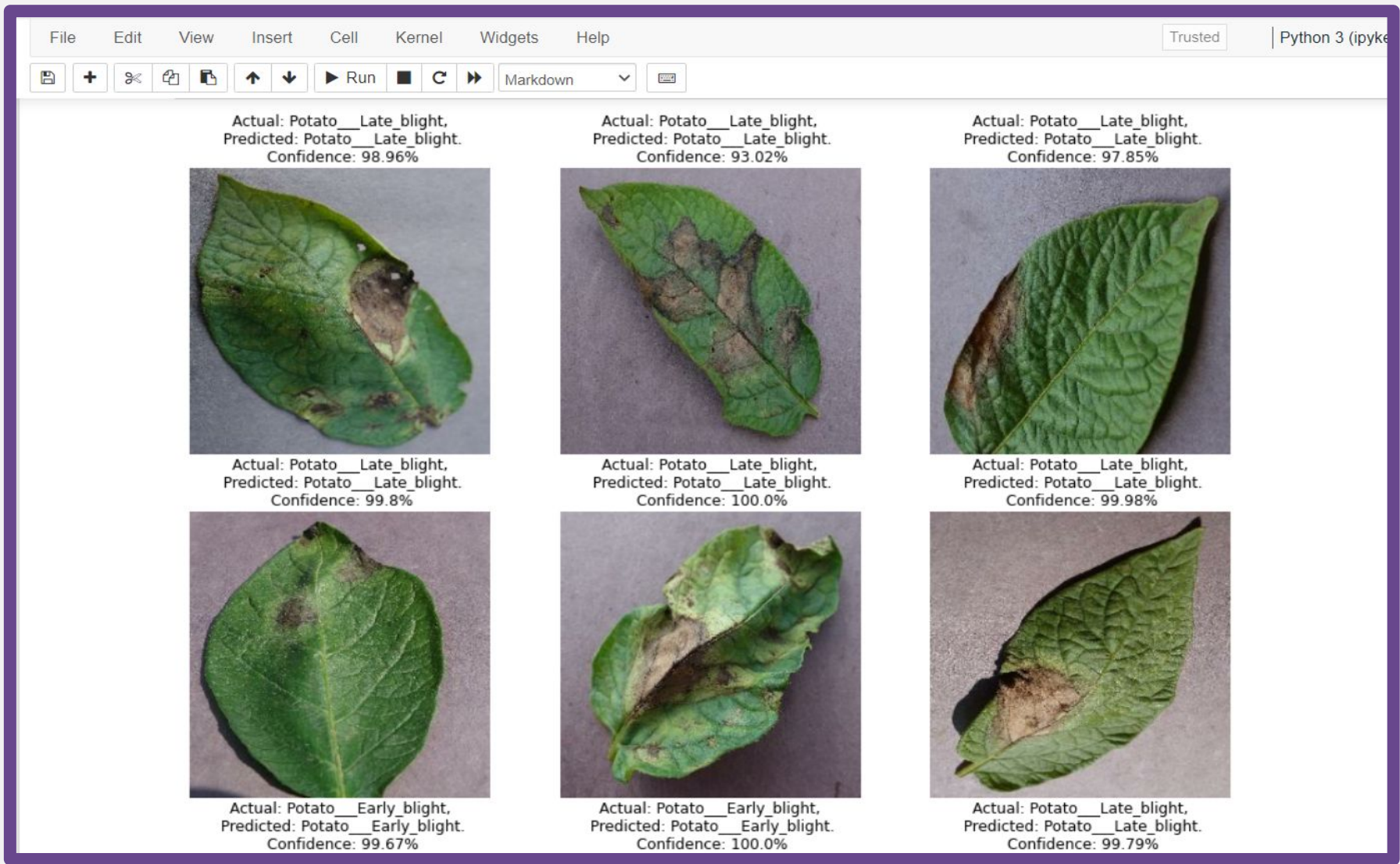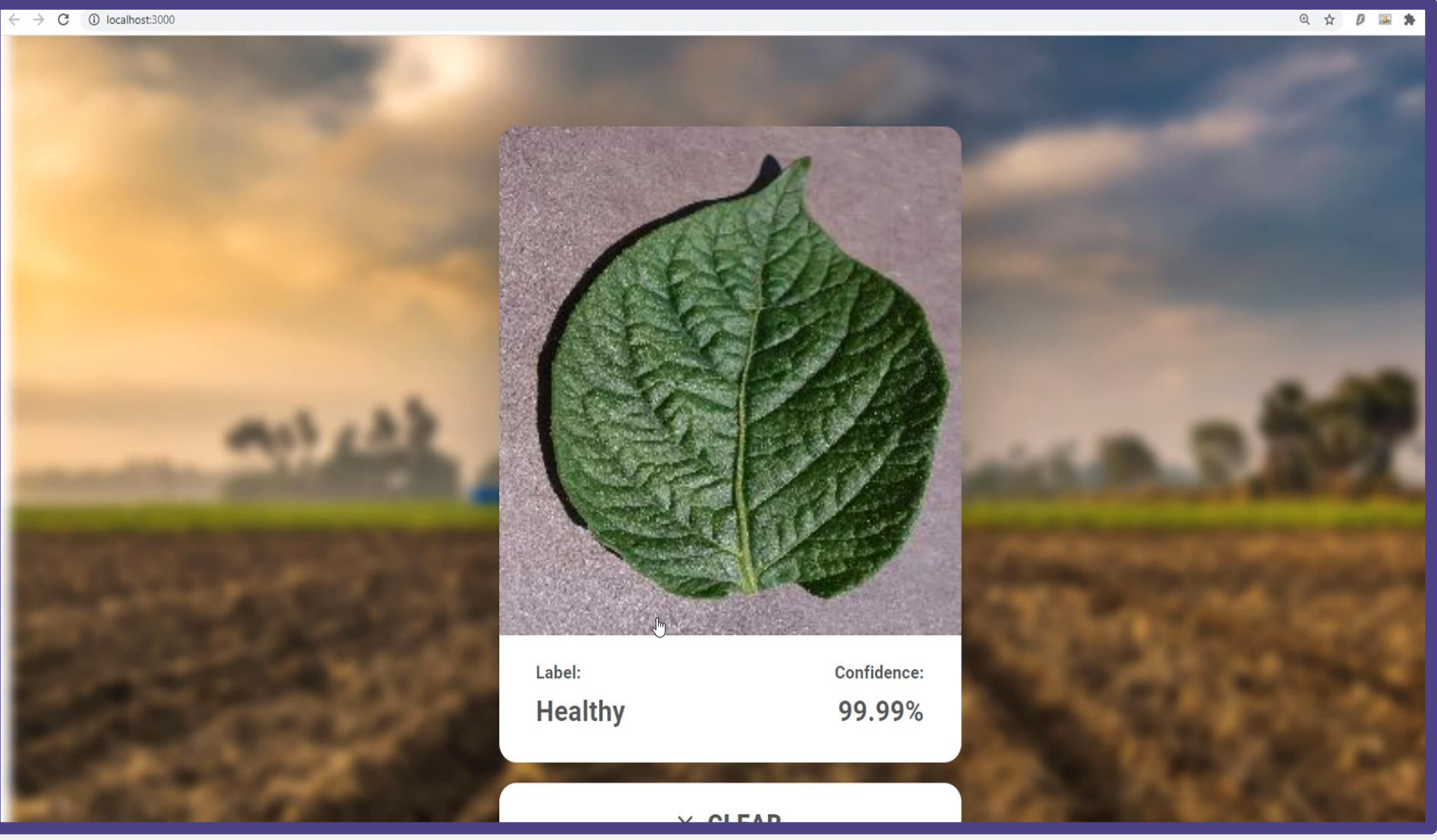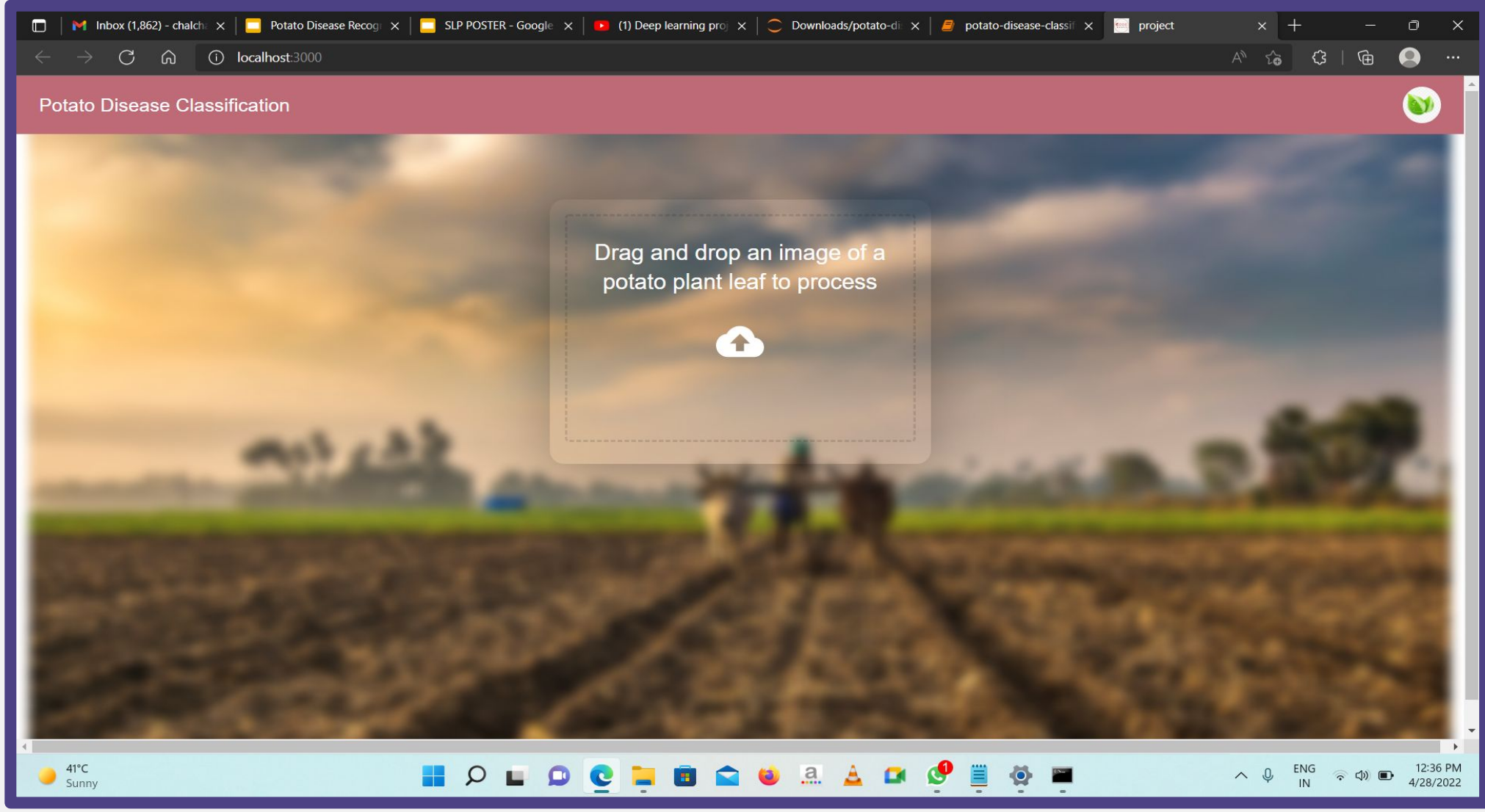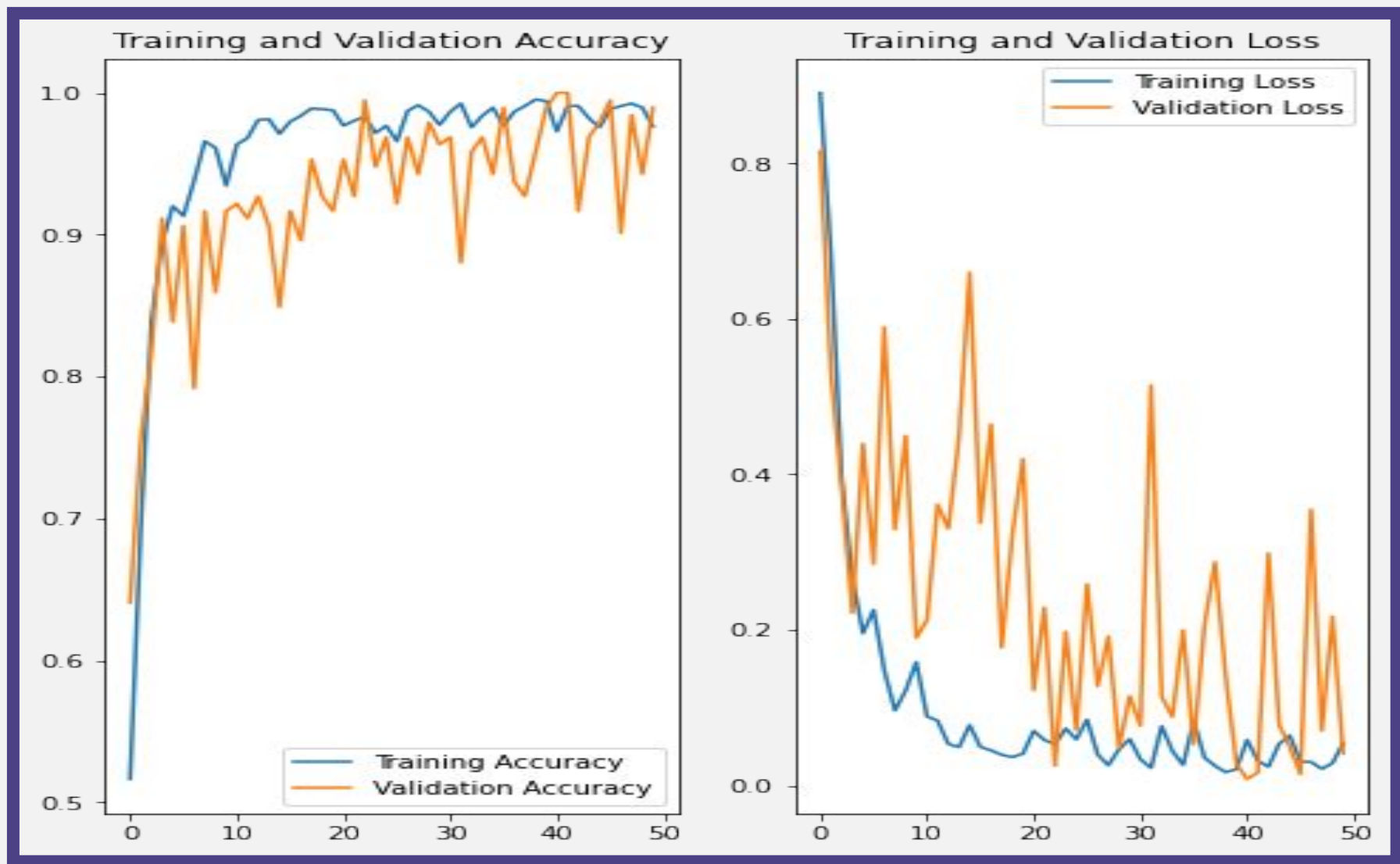
Methodology

For this Project, we used the Convolutional Neural Networks. We collected the data from Kaggle. Then we have processed the data with the help of Tensor Flow dataset and data augmentation.

We used the CNN for our model training as CNN is standard way of doing Image Classification. We then created a website using the ReactJS. The website is linked with our model through FastAPI Server and TF Serving.

In the Website we have have called the FastAPI Backend to Perform the Inference and show the Results provided by our model.

Conclusion

Deep learning Techniques significantly detects disease in plant's leaf and helps to improve crop productivity and quality by controlling the biotic variables that cause severe crop yield losses. In this project, a fast and straight forward multi-level deep learning model for recognising disease in potato's leaf was proposed to classify the stage of disease in potato's leaf.

Future Work

We will try to make this classification for more plants other than just potato. Also we are planning to create an app instead of a website that one can use to click picture and recognize the plant disease. With the help of an application, one could just scan the potato leaf with mobile camera and know the level of disease in the leaves.