PROJECT REPORT
A COMPARATIVE STUDY OF PLANT DISEASE DETECTION
TRIBHUVAN MISHRA, VAISHNAVI MISHRA, SARANSH CHAUHAN
GUIDED BY MR. AKHILESH KUMAR SRIVASTAVA

Results

Our research focuses on finding the best methodology for classifying the plant leaves into healthy and non- healthy. Plant leaves with pests feeding over are non-healthy and rest are healthy. The accuracy obtained in our first model is currently best in state-of-art.

- **General**

We used deep learning frameworks like TensorFlow, Pytorch and a Pytorch based library Fastai to classify the images. The images were taken from plantvillage dataset which contains 54,303 healthy and unhealthy leaf images divided into 38 categories by species and disease. We also used transfer learning in our model.

- **Technical**

The first model involves use of fastai to classify the images. This model uses the concept of transfer learning which makes it easy to train it and it gives the best state-of-art accuracy. The accuracy obtained is 99.687.

The second model uses TensorFlow to classify the images. This model uses the neural network to detect the disease from the images of the leaf of the plant. The accuracy obtained is 85.27.

The third model uses Py torch to classify the images. This model uses deep learning and convolution neural network that is used to detect pest in the leaf of the plant. A total of 38 categories are predicted by this model. The accuracy obtained is 98.9.

- **Learnings**

The concepts leant while making this project includes creating virtual environments. Leaning frameworks like Pytorch, Tensorflow and fastai. We also learnt to deploy machine learning models as web app. We also learnt about the confusion matrix and correlation matrix. Apart from technical we also learnt about the plant and their pests. We also got to know about the various government schemes which are for the benefit of farmers in India.

Research Work

Studied various research papers and studied about various pest detection techniques used till date. We found that most used techniques involve image processing and sound processing. Image processing is comparatively efficient than Sound processing technique. In our review paper, we provided some suggestions and some improvements in order to make these techniques more efficient and effective.

Even though research is done periodically to predict the disease in plants, accuracy in finding the right disease and diagnosis are still not perfect. In this paper, accuracy is the main performance measure to be concentrated in detecting the right type of disease in plants.

We have performed a comparative analysis on plant village dataset which consists of approx 54,000 images divided into 38 categories by species and disease.