Plant Disease Classifier: Detection of Multi-Crop Diseases Using Self made Deep learning Model and a Smart Android Application

Tomatoes are the most widely grown crop in the world. Cotton is another essential cash crops However, many diseases reduce the quality and quantity of tomato and cotton crops, resulting in a significant loss in production and productivity. It is critical to detect these disorders at an early stage of diagnosis. The project is developed with a view to detect 14 types of diseases for both cotton and tomato crops using a Deep Learning/Artificial Intelligence based self developed model and implementation of the model in an android application named “Plant Disease Classifier” for smartphone-assisted plant disease diagnosis system. The application can correcly detect the disease by taking a leaf picture, shows the detection accuracy and detection time. This is user friendly as only need is to put a picture from the gallary and then an automated processing is done based on deep learning and this application acts like a virtual plant doctor. Also, Gradient Weighted Class Activation Mapping (Grad-CAM) technique is used to visually explain the disease detected region, and a heatmap is produced to indicate the responsible region for disease. The app works very impressively and classified the correct disease in a shorter period of average time of about 4.84 ms due to the lightweight nature of the model. This android application can help the farmers economoically and can help them to take necessary steps against the diseases for cotton & tomato plants which can save crops and save money.