

## **PRIOR KNOWLEDGE**

<b>Team ID</b>	<b>PNT2022TMID53297</b>
<b>Project Name</b>	<b>Fertilizers Recommendation System for Disease Prediction</b>

### **Fertilizer Recommendation System for Disease Prediction:**

#### **Prior Knowledge:**

The early identification of disease signs is made possible by the detection and recognition of plant diseases using machine learning. To identify plant diseases, plant pathologists can use digital image processing to evaluate digital photos. Farmers in all agricultural regions benefit from the application of computer vision and image processing techniques. In most cases, aberrant physiological functioning of plants is what causes plant diseases. The difference between the plants' regular physiological functions and aberrant physiological functionalities leads to the generation of the specific symptoms. Pathogens found on the stems of plants are mostly responsible for plant leaf diseases. These many leaf signs and illnesses are predicted using a variety of image processing techniques. These many approaches make use of several core techniques including segmentation, feature extraction, and classification, among others. Segmentation, such as separating healthy tissues from sick tissues of leaves, is crucial for the prediction and diagnosis of leaf diseases.

The following steps comprise the suggested picture categorization method.

#### **1. Image acquisition**

The goal of picture preprocessing is to increase image statistics, decrease unwanted distortions, and image capabilities that are likely are highlighted as pertinent for comparable processing. Preprocessing takes a picture as input and outputs a grayscale, inverted, and smoothed version Segmentation.

Implements Method of guided active contouring. Active contours with no constraints were applied to tough nature photos. Dealing with disappointing shapes that tried to find their way through every conceivable grab cut in the leaf's border. The suggested approach employs the polygonal model created in the first stage not only as an initial leaf contour, but also as a shape prior that guides its evolution toward the true leaf border.

## **2. Disease Prediction**

Bacteria, fungus, viruses, and other insects attack leaves. The Support Vector Machine (SVM) algorithm determines if the leaf picture is normal or impacted. Vectors are created using leaf characteristics such as color, shape, and texture. The hyperplane is then built with criteria to categorize the preprocessed leaves, and a multiclass classifier is used to forecast illnesses in leaf images with more accuracy.

## **3. Fertilizer Recommendation**

Based on the severity degree, recommend a fertilizer for the afflicted leaves. Organic and inorganic fertilizers are both available. Admin can categorize and store fertilizers depending on disease severity levels. The fertilizer measurements recommended based on illness severity