Research as much as possible→Gather all the info→List the Models and their functionality→Make a note of accuracy for all existing models→gather the datasets(what they exactly contain) → Keep the doc clean and clear so that everyone can understand.

1) **Plant Disease Detection(Leaves) :**

Plant disease prediction system using advance computational Technique :

- **Problem:** Manual inspection of plant leaves for disease identification is time-consuming and less accurate.
- **Solution:** Proposed a deep CNN model called DTComp for plant disease classification, using transfer learning with ResNet50 architecture.
- **Methodology**: Utilized class decomposition approach to handle anomalies in images and examine class boundaries.
- **Results**: Achieved high accuracy of 98.30% in identifying plant diseases from images, based on experimental findings from a dataset gathered from multiple villages.
  DATA SET mentioned: gathered from multiple villages using the Kaggle Open Source platform

Recommendation System For Disease Prediction In Tree Leave

R. Neela, P. Nithya

Detecting leaf diseases early.
Methodology Overview:

- Pre-processing: Images of affected leaves are first filtered to enhance quality.
- Segmentation: A method called Guided Active Contour is used to outline leaf boundaries accurately.
- Disease Prediction: Support Vector Machine (SVM) is employed to classify leaves as normal or affected by diseases.
- Fertilizer Recommendation: Based on disease severity, fertilizers are recommended.

SVM Classification Algorithm: SVM is explained as a binary classifier used to separate data points into different classes by designing a hyperplane. The algorithm is applied to classify leaves as healthy or diseased based on features like color and shape.
Results:

- Comparison with CNN: The proposed SVM method outperforms a CNN-based approach in terms of True Positive (TP), False Positive (FP), True Negative (TN), and False Negative (FN) rates.
- The proposed SVM technique gives a better result when compared to existing CNN. For the same set of images, F-Measure for CNN is 0.7and 0.8 for SVM, the accuracy of identification of leaf disease of CNN is 0.6 and SVM is 0.8.

2) Plant Age/Growth Calculation/Detection :

A new approach to prediction of the age-age correlation for use in tree breeding Deogratias M. Rweyongeza

- Regression models such as Linear Regression or Support Vector Regression can be used to predict plant age based on features such as plant size, leaf morphology, or growth patterns. Also time-series analysis methods to model plant growth over time.

3) Plant Disease Stage/State Detection (severity) :

- Decision Trees or Random Forests can be effective for classifying disease stages based on features extracted from images or other relevant data.
- Time-series analysis techniques to identify temporal patterns indicative of disease progression.
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4) Pesticide Detection Considering Disease Stage and Plant Growth :

- Collaborative Filtering or Content-Based Filtering techniques from recommender systems can be adapted to recommend pesticides based on disease type, disease stage, and other relevant factors.
- develop rule-based systems or knowledge graphs to encode expert knowledge about pesticide-disease relationships.
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5) **Calculation of Quantity of Medicine/Pesticide by Considering Disease Stage and Plant Growth :**

- Regression models, such as Linear Regression, can be used to predict pesticide quantity based on disease severity, disease stage, and plant age. Ensemble methods like Gradient Boosting Regressors or Neural Networks can also be effective for capturing complex relationships.

Dataset : PlantVillage Disease Classification Dataset → Kaggle

Description of dataset:

54,305 images of diseased and healthy plant leaves → The images cover 14 species of crops, including: apple, blueberry, cherry, grape, orange, peach, pepper, potato, raspberry, soy, squash, strawberry and tomato.

1. **Images:** The dataset consists of a large number of images depicting different plant diseases as well as healthy plants. Each image represents a leaf, stem, or other plant part affected by a specific disease or condition.
2. **Labels**: Each image is associated with one or more disease labels indicating the type(s) of disease(s) present in the plant.
3. **Disease Classes**: The dataset typically includes a wide range of disease classes, such as fungal diseases, bacterial infections, viral diseases, nutrient deficiencies, and pest damage. Each class represents a distinct type of plant pathology that can be identified from the images.
4. **Metadata:** Some versions of the dataset may include additional metadata such as plant growth stage, environmental conditions, geographic location, and severity of the disease.