



DEPARTMENT OF APEX INSTITUTE OF TECHNOLOGY

PROJECT PROPOSAL

1. Project Title: -Machine Learning in Real-Time Crop Monitoring and Management.

2. Project Scope: -

Crop detection is an important aspect of agriculture. Early detection of crops allows farmers to take necessary actions to prevent crop damage or disease, which ultimately leads to a higher yield. The objective of this project is to develop a machine learning model that can accurately detect crops at an early stage using data from various sensors and imaging techniques.

Our Focus is solely on early stage prediction of crop disease and crop yield prediction with the help of machine learning. We will be using drones to get a high definition image of the crops and then use the images and feed it into the algorithm to determine whether the crops are healthy or not. We will be using computer vision and other algorithms to detect the disease and classify them accordingly.

Our goals and objectives :

- 1.To develop a machine learning model for early stage crop detection.
2. To identify the optimal combination of sensors and imaging techniques for crop detection.
3. To evaluate the accuracy of the model using a validation dataset.
4. Classify crops : Healthy/ Unhealthy.
5. To create a GUI for Farmers.

Our Scope and methodology:

1.Data Collection: The first step is to collect data from various sensors and imaging techniques such as thermal imaging, near-infrared, hyperspectral imaging, and RGB cameras. Data will be collected from various crops, including corn, soybeans, wheat, and rice. Data will be collected at different times of the day and in various weather conditions to ensure the model's robustness and to obtain more datasets.

2.Data Pre-processing: The collected data will be pre-processed to remove any noise and normalize the data. Data augmentation techniques will be applied to increase the size of the dataset.

3.Feature Extraction: Various feature extraction techniques will be used to extract relevant features from the pre-processed data. These features will be used to train the machine learning model.

4.Machine Learning: All the dataset collected by the sensors and images will be fed into the algorithms which will then classify the crops on the basis of healthy/unhealthy crops.The algorithm with the highest accuracy will be determined on the basis of the output given by it.

5. Model Test : The best performing algorithm will be used with different datasets to evaluate the performance of the model.

3. Requirements: -

○ Hardware Requirements

1. Intel i5/i7/i9 8 Core CPU or equivalent. 2.

Dedicated GPU (Nvidia/AMD)

3. 16GB Ram.

○ Software Requirements

1.Python

2.Computer Vision

3.Visual Studio Code

STUDENTS DETAILS

Name	UID	Signature
Abhay Vershwal	21BCS6347	
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APPROVAL AND AUTHORITY TO PROCEED

We approve the project as described above and authorize the team to proceed.

Name	Title	Signature (With Date)
Mr. Nirmalya Basu	Supervisor	