Project Proposal

Automated Plant Seedling Classification Using Deep Learning

Objective:

The objective of this project is to build a deep learning model that can accurately classify various species of plant seedlings using image data. The model aims to assist in automating the identification process, which is essential in optimizing agricultural practices and improving crop management.

An automated solution can help farmers and researchers quickly identify plant species to optimize resources, detect diseases early, and increase agricultural efficiency..

Dataset:

- Source: V2 Plant Seedlings Dataset (from Kaggle)
- Total Images: 5,533 images after cleaning

Approach:

1. **Data Preprocessing**: Resize images, apply transformations (cropping, flipping), and normalize pixel values.
2. **Model Architecture**: Transfer learning using a pre-trained ResNet18 model to classify 12 plant species.
3. **Training**: Train the model using a combination of training and validation datasets.
4. **Evaluation**: Assess model performance using accuracy, precision, recall, and F1-score.

Expected Outcome:

The automated classification system is expected to achieve high accuracy (above 90%) in classifying plant seedlings, reducing the need for manual identification and improving the efficiency of agricultural processes.