Intelligent Model Design using AI (Even Sem-23-24)

Milestone 1: Problem Statement Submission

**Title: Plant diseases Detection System**

**Statement of the problem:**

Plant diseases are a serious threat to global food security, causing significant economic losses and endangering the sustainability of agriculture. Current methods for disease diagnosis and management suffer from inefficiencies, delays, and limited scalability. To address these challenges, we propose the development of an integrated plant disease diagnosis and management system that combines the strengths of artificial intelligence (AI), Internet of Things (IoT), and remote sensing technologies.

The project aims to seamlessly integrate data collection, analysis and decision-making to create a comprehensive solution that enables preventive disease management strategies. The main components of the system are:

**Data collection and annotation:**

1. Collect diverse datasets including high-quality imagery, IoT sensor data, and remote sensing images covering a variety of plant species and disease scenarios.

2. Annotate datasets with labels indicating disease presence, environmental parameters, and spatial information.

**Image processing and feature extraction:**

1. It uses advanced image processing techniques to improve image quality, remove noise and standardize data in different sources.

2. Computer vision algorithms are used to extract relevant features from images, recording texture, color and shape features that indicate plant disease.

**Machine learning and deep learning models:**

1. Develop machine learning and deep learning models, such as convolutional neural networks (CNN) and recurrent neural networks (RNN), to analyze image data and diagnose disease symptoms.

2. Train models on annotated datasets to accurately classify diseases, predict disease progression, and recommend appropriate management strategies.

**IoT sensor network and real-time monitoring:**

1. Design and deployment of IoT sensor networks in the agricultural sector to monitor environmental parameters such as temperature, humidity, soil moisture and light intensity in real time.

2. Integrate sensor data and image analysis results to provide timely disease insights.

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