

Project Design Phase-I Solution Architecture

Date	23 October 2023
Team ID	PNT2022TMID592713
Project Name	Project - Safeguarding Agriculture: AI-Enabled Prognostication of Farm Insect Threats
Maximum Marks	5 Marks

Solution Architecture:

Structure:

Web Interface: The system's user interface is accessible through web browsers. It is designed with a clean and intuitive layout, prominently featuring an "Upload" button for users to submit insect images.

Web Application (Backend): The backend of the web application is responsible for handling image uploads, image preprocessing, communication with the machine learning model, and displaying the results. It is implemented using a web framework like Django, Flask, or a similar technology.

Image Preprocessing: The system includes a preprocessing module that ensures uploaded images are in the required format for the machine learning model. It resizes images, converts them to the appropriate color mode (e.g., RGB), and normalizes pixel values.

Machine Learning Model: The heart of the system is a deep learning model that has been trained for insect classification. This model is capable of processing preprocessed images and generating a probability distribution over different insect classes.

Data Flow for Model Inference: When a farmer uploads an insect image, the system forwards the image to the trained machine learning model. The model performs inference and predicts the insect's class based on the image.

Result Display: The model's predictions are returned to the web application (backend), which then displays the results on the web interface. Users receive information about the predicted insect class, a confidence score, and a brief description of the insect.

Characteristics:

User-Friendly: The software is designed with a user-centric approach, making it easy for farmers to interact with and obtain pest identification results.

Scalable: The system is built with scalability in mind, allowing it to accommodate a growing user base and increasing data volumes.

Cloud-Based: The system's components can be deployed in the cloud, ensuring accessibility and scalability.

Behavior:

User Interaction: Users access the web interface, upload insect images, and receive prompt identification results.

Real-Time Processing: The system provides real-time processing, enabling farmers to receive instant feedback on the type of insect threat detected.

Feedback Loop: Users can provide feedback on the model's predictions, contributing to ongoing improvements in model accuracy.

Other Aspects:

Deployment: The system can be deployed using cloud services, a dedicated server, or a hosting platform.

Maintenance: Continuous monitoring and maintenance are essential to ensure optimal system performance.

Machine Learning Model: The choice of pre-trained models or custom models depends on the complexity of the classification task.

Solution Architecture Diagram:

