**PLANT LEAF DISEASE DETECTOR**

**Abstract**

Plant diseases continue to pose a major challenge to global agriculture, causing substantial losses in crop production and threatening food security. Detecting these diseases early can help farmers take preventive actions, reduce the need for excessive pesticide use, and minimize economic loss. In this project, an accessible and automated solution has been developed that uses deep learning to identify plant leaf diseases from photographs.

By training a powerful neural network on an extensive collection of labeled images, the system is able to accurately distinguish between healthy leaves and various types of diseases, achieving a performance level above 97% accuracy. To make the technology convenient and practical for real-world use, the model has been deployed as a web application using Flask, allowing farmers and agricultural professionals to simply upload a photo of a leaf and receive rapid, reliable predictions about its health. This easy-to-use tool supports quicker decision-making, improves crop management practices, and helps secure better harvests.

The entire process from collecting and preparing data to model training and deployment—has been designed with scalability in mind, so that it can be implemented in diverse agricultural settings, from local devices to cloud services. This project demonstrates how modern artificial intelligence can be tailored to address practical challenges in agriculture, offering an effective strategy for managing plant health at scale.