Project Initialization and Planning Phase

Date	28 November 2024
Team ID	739771
Project Title	Deep Fruit Veg: Automated Fruit And Veg Identification
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

- Develop a convolutional Neural Network (CNN) using a transfer learning approach (Efficient Net B3) trained on an image dataset of fruits and vegetables.
- Preprocess input images using techniques like resizing, normalization, and augmentation for better model performance.
- Deploy the model via a Flask-based web application for real-time classification and integration into end-user scenarios.

Project Overview	
Objective	To develop an automated system leveraging deep learning to identify and classify fruits and vegetables from images. The system aims to streamline sorting processes, enhance quality control, and enable precision agriculture.
Scope	The project covers the design, development, and deployment of a deep learning-based model capable of classifying fruits and vegetables. It also includes the integration of this model into practical applications for food processing plants, supermarkets, and agricultural settings.
Problem Statement	
Description	Traditional methods for identifying and sorting fruits and vegetables are time-consuming, labor-intensive, and error-prone. These challenges lead to inefficiencies in food processing, inconsistencies in quality control, and suboptimal agricultural management.
Impact	Addressing this problem will improve efficiency in food processing plants, enhance product quality and freshness in supermarkets, and provide actionable insights for farmers to optimize crop health and yiel

Proposed Solution	
Approach	• Develop a convolutional neural network (CNN) using a transfer learning approach (Efficient NetB3) trained on an image dataset of fruits and vegetables. • Preprocess input images using techniques like resizing, normalization, and augmentation for better model performance. • Deploy the model via a Flask-based web application for real time classification and integration into end-user scenarios.
Key Features	• **Automated Image Classification:** High accuracy in identifying fruits and vegetables from diverse backgrounds and lighting conditions. • **Real-time Integration:** Compatible with conveyor belt systems and mobile devices for instant analysis. • **Scalability:** Modular design to add new fruit/vegetable classes without retraining from scratch. • **Precision Agriculture Monitoring:** Ability to detect crop health and provide actionable insights using drone or ground based images.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU for model training	2 x NVIDIA V100 GPUs
Memory	RAM for data handling	8 GB
Storage	Disk space for data, models, and logs	1 TB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	Tensorflow,
Development Environment	IDE, version control	Google Collab, Git
Data		

Data	Source, size, format	Kaggle dataset, 30,000 images