Project Initialization and Planning Phase

Date	4 June 2024
Team ID	SWTID1720109344
Project Title	Rice Type Classification Using CNN
Maximum Marks	3 Marks

Project Proposal (Proposed Solution)

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

Project Overview	
Objective	- Develop a Convolutional Neural Network (CNN) based model to classify 5 different rice varieties. - Evaluate the model's performance using relevant metrics to assess its accuracy and reliability
Scope	- Developing a CNN model specifically tailored for rice grain classification. - Collecting and preprocessing a high-quality dataset of rice grain images. - Implementing and testing the model to ensure high accuracy and reliability. - Integrating the model into a user-friendly application for use by rice mills and quality control managers.
Problem Statement	
Description	Current rice classification methods are often manual, time-consuming, and prone to errors, which leads to inefficiencies and inconsistencies in quality. An autonomous solution is required to classify the rice grains. It should be reliable, accurate and efficient.
Impact	Solving the problem of rice classification has a range of benefits: - - Improve the accuracy and efficiency of rice classification. - Reduce labor costs and human error in the classification process.

	• Enhance the overall quality control in rice production, leading to higher market standards and customer satisfaction.
Proposed Solution	
Approach	We will tackle the project in 5 phases: - • Data Collection: Gathering a large dataset of rice grain images. This is taken from the Kaggle dataset mentioned below • Data Preprocessing: Cleaning, augmenting, denoising, labelling the dataset. • Model Development: Designing and training a CNN model for rice classification. • Model Optimization and Fine Tuning: Fine tuning the model to improve it's performance. • Model Evaluation: Testing the model for accuracy and reliability. • Application Integration: Developing a user-friendly interface using Flask for deploying the model in real-world scenarios.
Key Features	• High Accuracy: Leveraging CNN's capabilities to ensure precise classification. • Efficiency: Automating the classification process to save time and reduce manual labor. • User-Friendly Interface: Providing an easy-to-use application for non-technical users.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	T4 GPU
Memory	RAM specifications	8 GB
Storage	Disk space for data, models, and logs	1 TB SSD

Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	tensorflow, numpy, pandas, keras, scikit-learn, cv2, matplotlib
Development Environment	IDE, version control	Jupyter Notebook
Data		
Data	Source, size, format	Kaggle dataset. This dataset contains 75,000 images of 5 types of rice – Arborio, Basmati, Ipsala, Jasmine, Karacadag 230MB