Grainpalette: A Deep Learning Odyssey in Rice Type Classification through Transfer Learning

Abstract

This project presents Grainpalette, a deep learning-based approach for classifying different rice types using transfer learning. Rice classification is a vital task in agricultural quality control, yet traditional methods are time-consuming and prone to error. By leveraging pre-trained Convolutional Neural Networks (CNNs), this project enhances classification accuracy while reducing the need for extensive manual data labeling. The implementation demonstrates the potential of AI to streamline agricultural processes and promote precision farming.

1. Introduction

Rice is a staple food consumed globally, with numerous varieties such as Basmati, Jasmine, Brown, and Arborio. Accurate classification of rice types is crucial for quality assurance, market pricing, and export processes. Manual classification is labor-intensive and error-prone. This project uses deep learning, specifically transfer learning with a CNN model, to automate rice type classification using image data.

2. Objectives

- To develop an image-based classification model for different rice types.
- To implement transfer learning using a pre-trained CNN.
- To evaluate the performance and accuracy of the model.
- To create a scalable solution for agricultural quality control.