

## Data Collection and Preprocessing Phase

Date	22 April 2024
Team ID	<b>738194</b>
Project Title	RIPE-SENSE: MANGO QUALITY GRADING WITH IMAGE ANALYSIS AND DEEP LEARNING.
Maximum Marks	6 Marks

### Preprocessing Template

The images will be preprocessed by resizing, normalizing, augmenting, denoising, adjusting contrast, detecting edges, converting color space, cropping, batch normalizing, and whitening data. These steps will enhance data quality, promote model generalization, and improve convergence during neural network training, ensuring robust and efficient performance across various computer vision tasks.

Section	Description
Data Overview	Our project leverages a dataset obtained from Kaggle, named 'grading_Data'. This dataset comprises 1100 images featuring mangoes at various stages of ripeness: under-ripen, perfectly ripe, and over-ripen.
Resizing	<i>ImageDataGenerator</i> resizes images to a standard size (e.g., 128x128 pixels) during training for consistency and potentially improved model performance. This helps the model learn features effectively regardless of slight variations in original image sizes.
Normalization	<i>ImageDataGenerator</i> (rescale=1./255) already normalizes the pixel values to the specific range of 0 to 1
Data Augmentation	<i>ImageDataGenerator</i> to artificially create variations of mango images during training. This includes techniques like random rotations and horizontal flipping. This helps the model learn robust features and improve its generalizability to unseen mango images.

Denoising	NA
Edge Detection	NA
Color Space Conversion	NA
Image Cropping	NA
Batch Normalization	-
<b>Data Preprocessing Code Screenshots</b>	
Loading Data	<pre> 1: import tensorflow as tf 3]: import numpy as np 4]: import pandas as pd 5]: data = "Grading_dataset" 7]: data 1: 'Grading_dataset' </pre>
Resizing	<pre> "Grading_dataset", target_size = (128,128), </pre>
Normalization	<pre> from tensorflow.keras.preprocessing.image import ImageDataGenerator  train_datagen = ImageDataGenerator(     rescale= 1./255,     rotation_range = 20,     width_shift_range= 0.0,     height_shift_range= 0.0,     shear_range= 0.0,     zoom_range=0.0,     horizontal_flip = True,     validation_split=0.2 ) </pre>

Data Augmentation	<pre>from tensorflow.keras.preprocessing.image import ImageDataGenerator  train_datagen = ImageDataGenerator(     rescale= 1./255,     rotation_range = 20,     width_shift_range= 0.0,     height_shift_range= 0.0,     shear_range= 0.0,     zoom_range=0.0,     horizontal_flip = True,     validation_split=0.2 )</pre>
Denoising	NA
Edge Detection	NA
Color Space Conversion	NA
Image Cropping	NA
Batch Normalization	<pre>from tensorflow.keras.preprocessing.image import ImageDataGenerator  train_datagen = ImageDataGenerator(     rescale= 1./255,     rotation_range = 20,     width_shift_range= 0.0,     height_shift_range= 0.0,     shear_range= 0.0,     zoom_range=0.0,     horizontal_flip = True,     validation_split=0.2 )</pre>