

Project Development Phase

Model Performance Test

Date	28 june 2025
Team Id	LTVIP2025TMID37473
Project Name	Smart Sorting : Transfer Learning for Identifying Rotten Fruits and Vegetables
Maximum Marks	4 Marks

Model Performance Testing:

Objective:

To test and validate the performance of AI/ML models in detecting and classifying rotten vs. fresh fruits and vegetables using image or sensor data under realistic machine operation conditions.

MOL Performance Testing Framework

1. Data Collection

- **Sources:** Images from cameras, sensors (e.g., color, gas, texture), IoT devices in cold storage.
- **Dataset:**
 - Annotated images of fresh, semi-rotten, and rotten produce.
 - Include different lighting, backgrounds, angles.

2. Model Development

- **Models to use:**

- CNN for image classification.
- YOLO / EfficientDet for real-time detection.
- Optional: Time series + ML for spoilage prediction using sensor data.

<u>Metric</u>	<u>Description</u>
Accuracy	- % of correct predictions (fresh vs rotten).
Precision & Recall	- True positive rate of detecting rot.
F1-score	- Balance between precision and recall.
Processing Speed	- Time taken to classify per image/item.
Model Robustness	- Ability to detect correctly in noisy or real-world conditions
Energy/Resource Usage	- Resource usage (RAM/CPU/GPU) per inference.
Deployment Latency	- Delay between camera input and detection output.