Smart Sorting: Identifying Rotten Fruits & Vegetables

AI + Transfer Learning + Flask Application

1. Introduction

- Smart Sorting is an AI-based system to classify fresh vs. rotten produce using transfer learning. It automates quality checks in food processing.

1.1 Purpose

- To replace manual inspection with a fast, accurate AI solution integrated into a Flask-based web app.

2. Problem Statement

- Manual sorting is labor-intensive and error-prone. Our AI solution improves consistency, efficiency, and scalability.

2.2 Empathy Map

- - Think & Feel: Need speed & accuracy
- - Hear: Complaints about tedium
- - See: Manual efforts
- - Say/Do: Manual checks
- - Pain: Inconsistency
- - Gain: Automation

2.3 Brainstorming

- Ideas: Sensors, AI, Edge Devices. Final: Image-based classification via transfer learning.

3. Requirement Analysis

- - Preprocessed Dataset
- - Trained Model
- - Web UI
- - Flask Backend

3.1 Data Flow & Tech Stack

- Flow: Upload → Flask → Model → Result
- Stack: HTML, Flask, TensorFlow/Keras, OpenCV, NumPy

4. Project Design

- - Problem Solution Fit: Real-time, Accurate
- - Solution: Flask + MobileNetV2
- - Architecture: Upload → Resize → Predict → Display

5. Project Planning

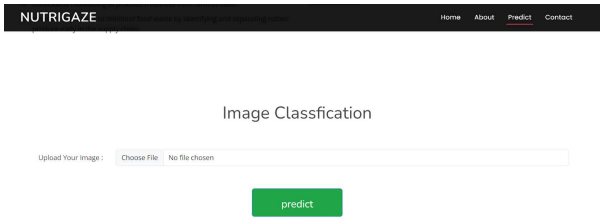
- 1. Research
- 2. Preprocessing
- 3. Training
- 4. Flask Integration
- 5. UI Development
- 6. Testing

6. Performance Testing

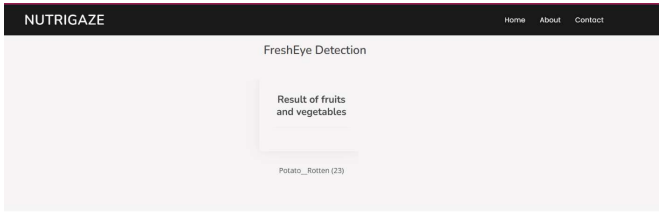
- Model Accuracy: >90%
- Inference Time: <1 second/image
- Tested on unseen data

7. Results

- Includes screenshots:
- - Upload Page



- - Prediction Display



9. Conclusion

- Smart Sorting is practical for real-world deployment in food supply chains, reducing labor and error.

10. Future Scope

- - Add more fruit types
- - Multi-class spoilage
- - Raspberry Pi Deployment
- - Conveyor Sorting

11. Appendix

- Dataset: Kaggle - Fresh & Rotten Fruits
- GitHub:github