FreshPredict

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Description

FreshPredict is an AI-powered tool designed to predict the shelf life of fruits and vegetables. By analyzing storage conditions and produce types, it provides accurate estimates of how long items will remain fresh, helping users reduce food waste and optimize inventory management.

Features

- Predictive Shelf Life Estimation: Provides accurate freshness durations based on environmental conditions.
- Multi-Factor Analysis: Factors in storage temperature, humidity, and produce type for better precision.
- Reduce Waste: Helps avoid food spoilage by providing better planning insights.
- User-Friendly: Easily adaptable for both consumers and businesses (e.g., retailers, supply chains).

Dataset

We have procured the images of different fruits from timelapse videos on youtube and other sources to train the model to identify how fresh the fruit uploaded in the picture is.

Neural Networks

Neural networks are a series of algorithms that attempt to recognize underlying relationships in a set of data through a process that mimics the way the human brain operates. They consist of layers of interconnected nodes (neurons).

Convolutional Neural Networks:-CNNs are a type of neural network specifically designed to process and analyze visual data, such as images.

CNN Overview

1. **Convolutional Layers**: Apply filters (kernels) to scan through the image and detect patterns, like edges, textures, or objects.
2. **Pooling Layers**: Reduce the dimensionality of the feature maps while retaining important information, making the network faster and less prone to overfitting.
3. **Fully Connected Layers**: Similar to traditional neural networks, where the processed features are combined to make the final classification.

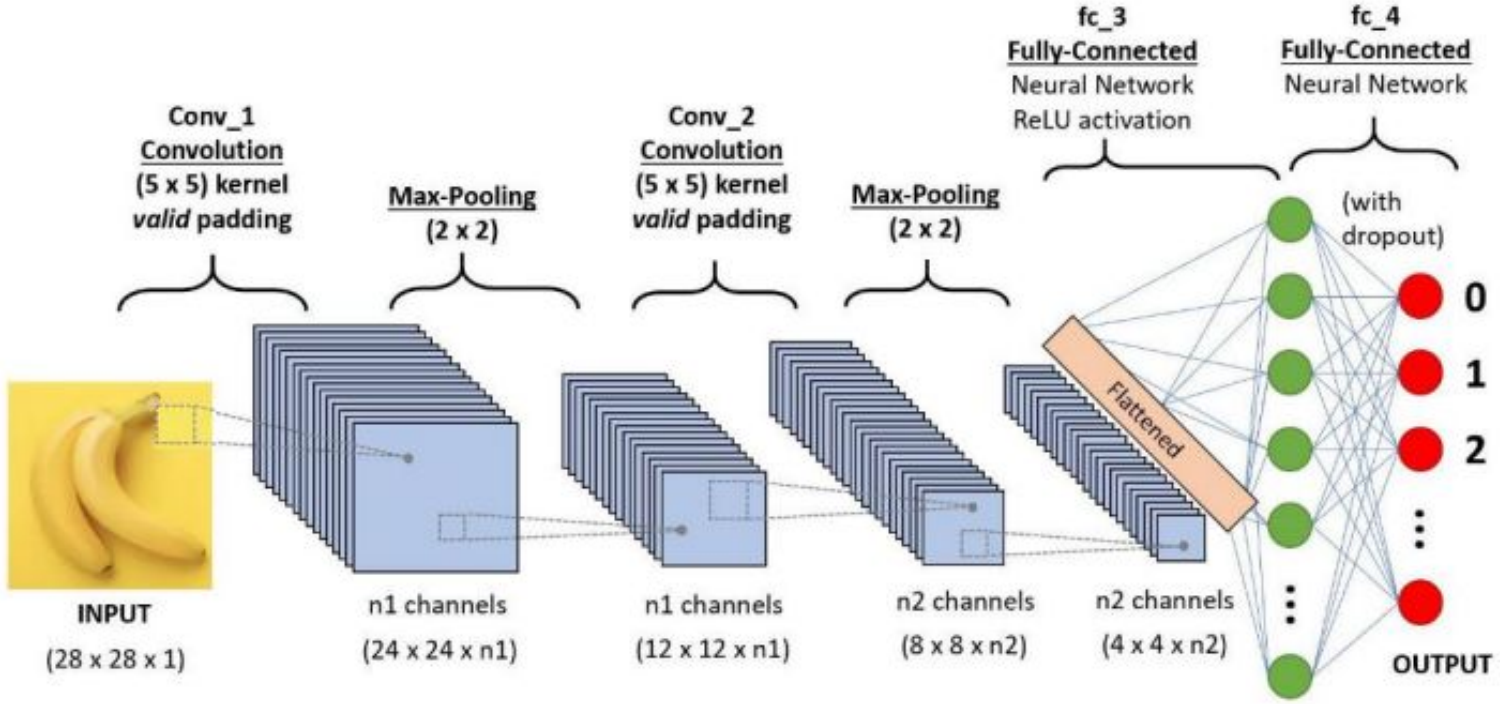

Figure 1.1: Convolutional Neural Network Architecture

Tech Stack

HTML/CSS/JavaScript: For creating the frontend interface.

Teachable Machine: For training and exporting the machine learning model.

TensorFlow.js: To run the machine learning model directly in the browser.

Node.js & npm: For setting up the development environment and running the application.

TypeScript & React : For Setting up web application

Future Scope

Integration with IoT:

Connect your model with Internet of Things (IoT) devices for automated processes. For instance, it could be used in smart homes to identify objects and trigger actions, or in agricultural drones to monitor crops.

User Interface Enhancements:

Improve the user interface to be more interactive and user-friendly, with options to upload multiple images at once, drag-and-drop functionality, or even voice commands.

Dynamic Pricing: Adjust prices based on freshness and shelf life.