e-Fresh: Computer Vision and IOT based system for food industry

Group No: 10

Akshata Gawas   18104039

Krishita Tolia   18104021

Siddhesh Gaikwad   18104069

Guided by

Prof. Kaushiki Upadhyaya

Co Guide

Prof. Sonal Jain

Contents

- Introduction

- Objectives

- Problem Definition

- Technological Stack

- Review Suggestions (Given in Last meeting)

- Proposed System Architecture/Working

- Prototype Design Demonstration

- Implementation Status

- Status of Paper Draft & Targeted Conference

1. Introduction

- Problem Identified:

  Detection of defected fruits and the classification of fresh and rotten fruits represent one of the major challenges in the agricultural fields. Rotten fruits may cause damage to the other fresh fruits if not classified properly. Traditionally this classification is done by men, which was labour-intensive, time taking, and not efficient procedure. Thus, factories need human intervention for segregation of fruits

- Solution Proposed :

  Hence, we need an automated system which can reduce the efforts of humans and time of production. Our system will automatically do that with help of CNN classification Algorithm. The proposed idea will create a segregation model which would need no human intervention for classifying and segregating fruits.

2. Objectives

- To create a model to classify fresh and rotten fruits.

- To preprocess images before sending them to the model.

- To achieve efficient model considering the cost.

- To train a model with high accuracy.

- To develop a hardware system considering the Industry 4.0 standards.

- To program NodeMCU for collecting and sending images to server.

- To program NodeMCU for segregation.

- To host data analysis dashboard on AWS cloud.

3. Problem Definition

To accurately classify fruits using Deep Learning algorithm i.e. CNN, segregate them with the help of required hardware considering the Industry 4.0 standards and hosting a dashboard displaying the data visualization.

4. Technology Stack

Hardware Requirements:

- NodeMCU ESP8266

- Cameras: 3

- Motor/ Rotator(for conveyor belt)

- Wi-Fi module

- Flaps

- Servo-motor

- Alcohol Sensor(MQ3), Methane Sensor(MQ4)

Software Requirements:

- Google Colab

- Tensorflow, Keras, Pandas, Numpy.

- AWS Cloud.

5. Review Suggestions (Given in Last meeting)

- Changing project name: Done

- Increasing Dataset: Done

- Deciding Architecture: Done

- Finalizing Sensors: Done

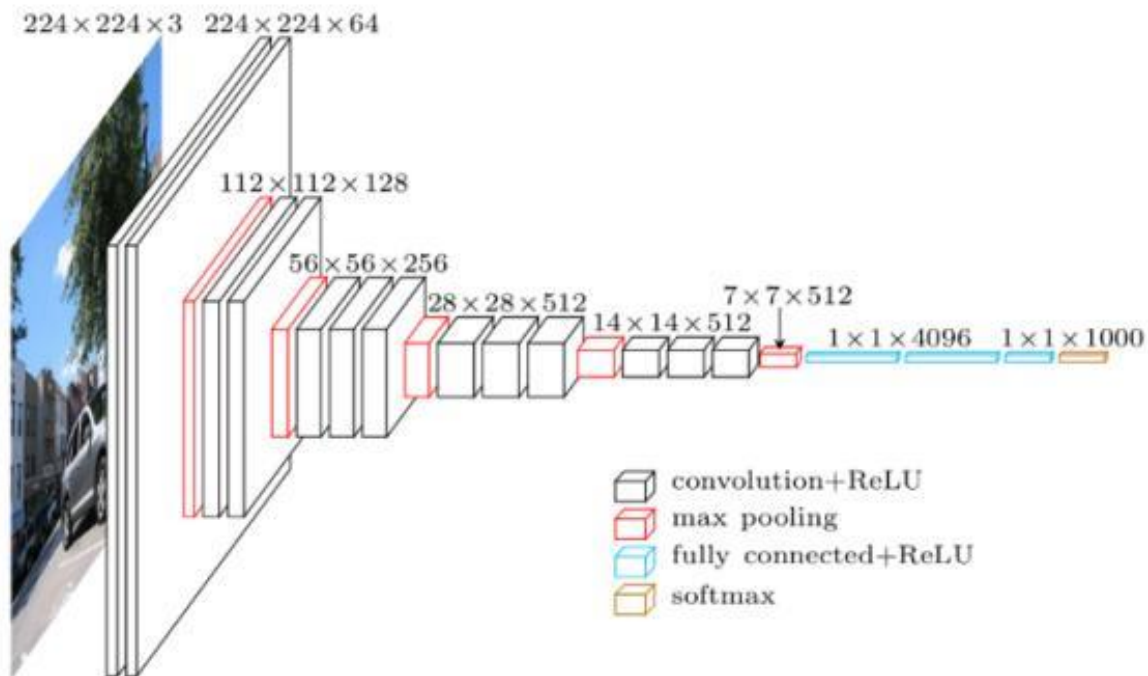- Finding parameters for Data Analysis: Done

Parameters for Data Visualization

- Colour

- Size

- Ethanol level

- Methane level

- Texture

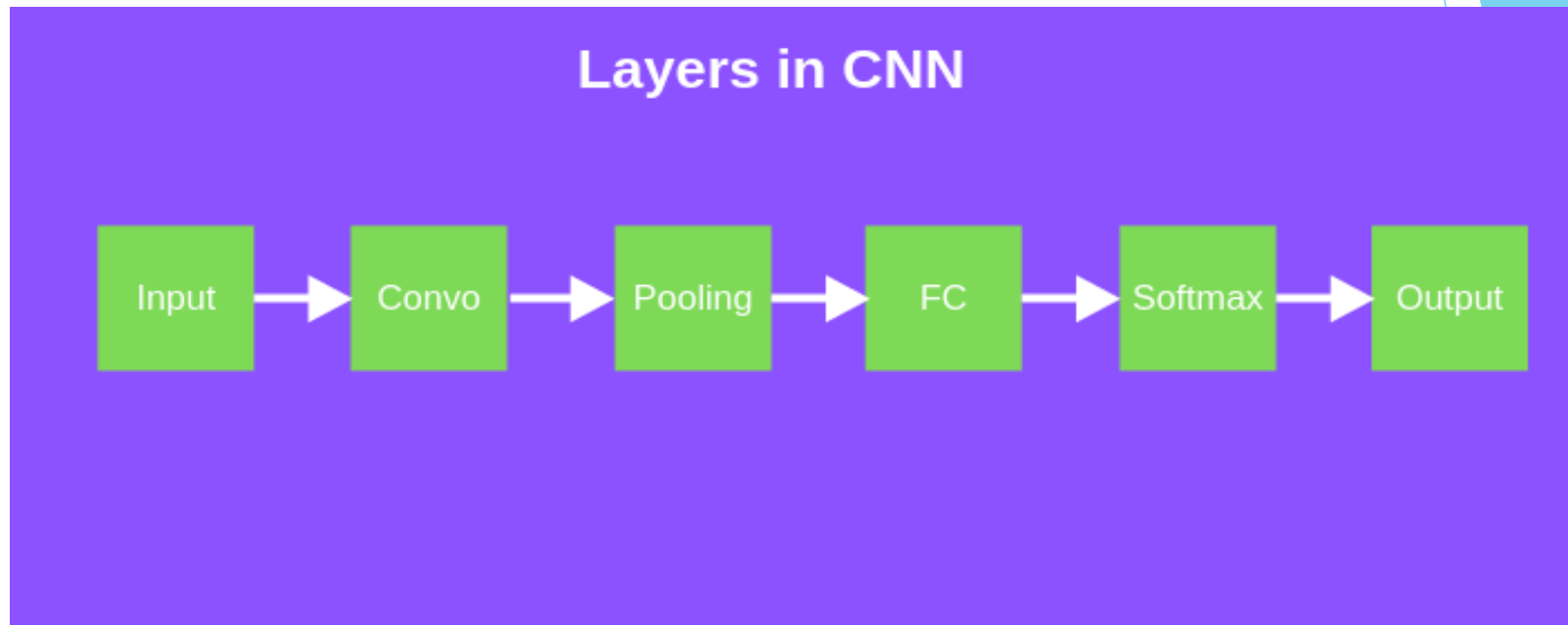- Production Details

6. Block Diagram of Working
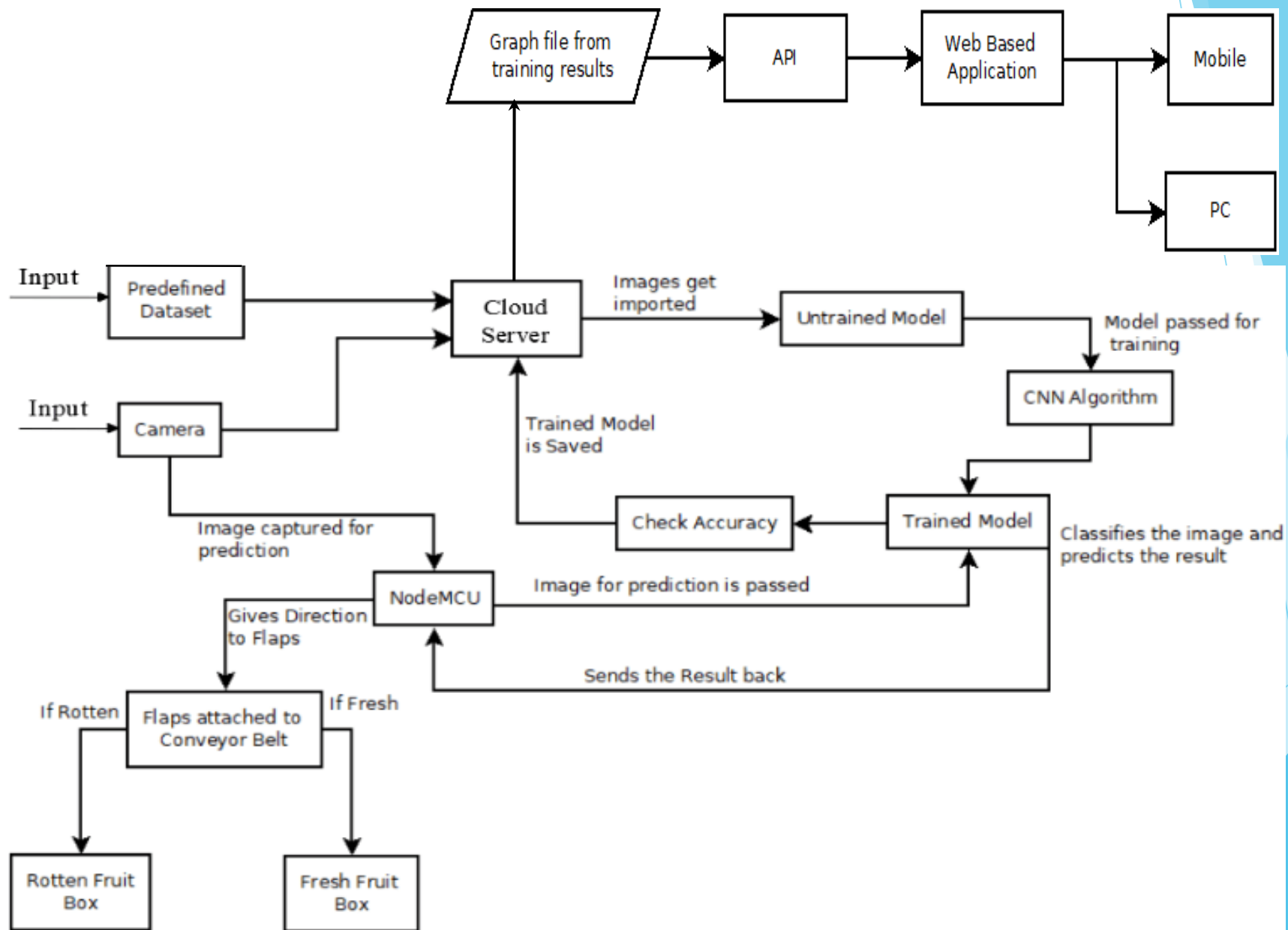
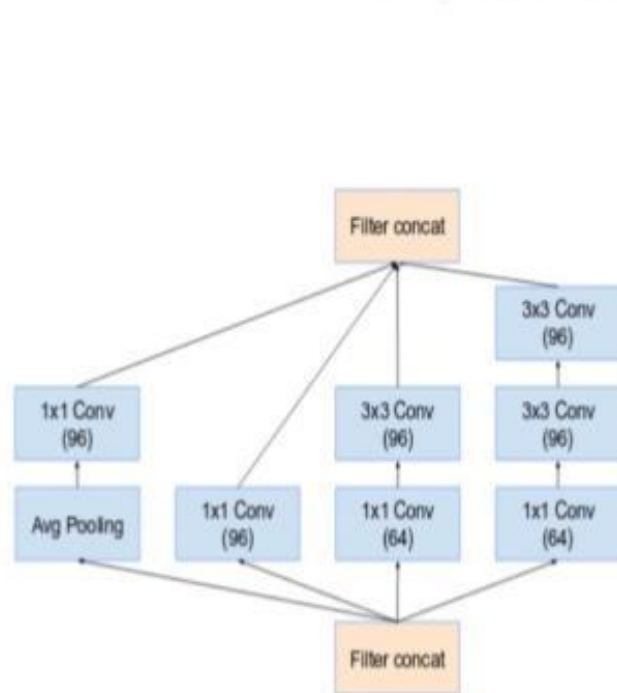# 7. Classification Algorithm
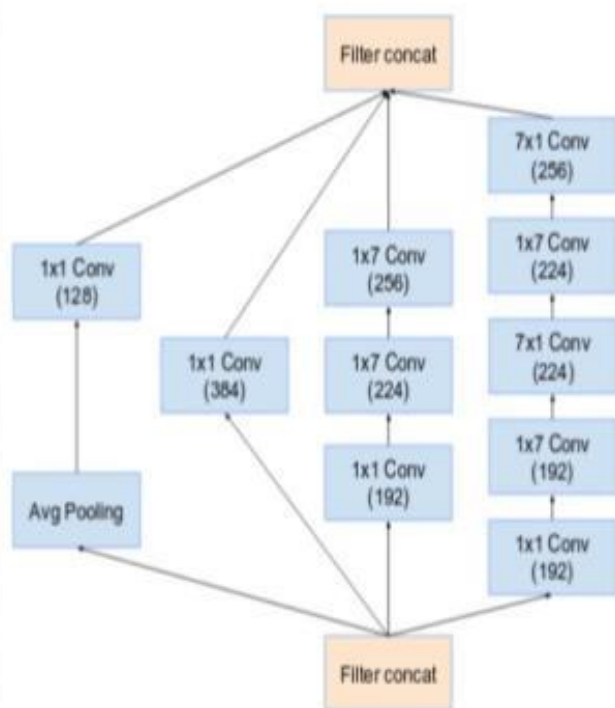

Convolution Neural Network

8. Layers of CNN

Layers in CNN

Input → Convo → Pooling → FC → Softmax → Output

9. Architecture of CNN
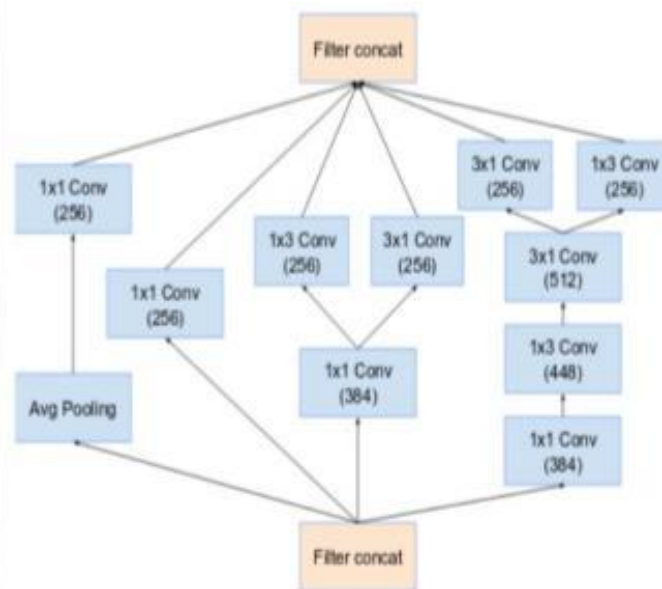
10. InceptionV3

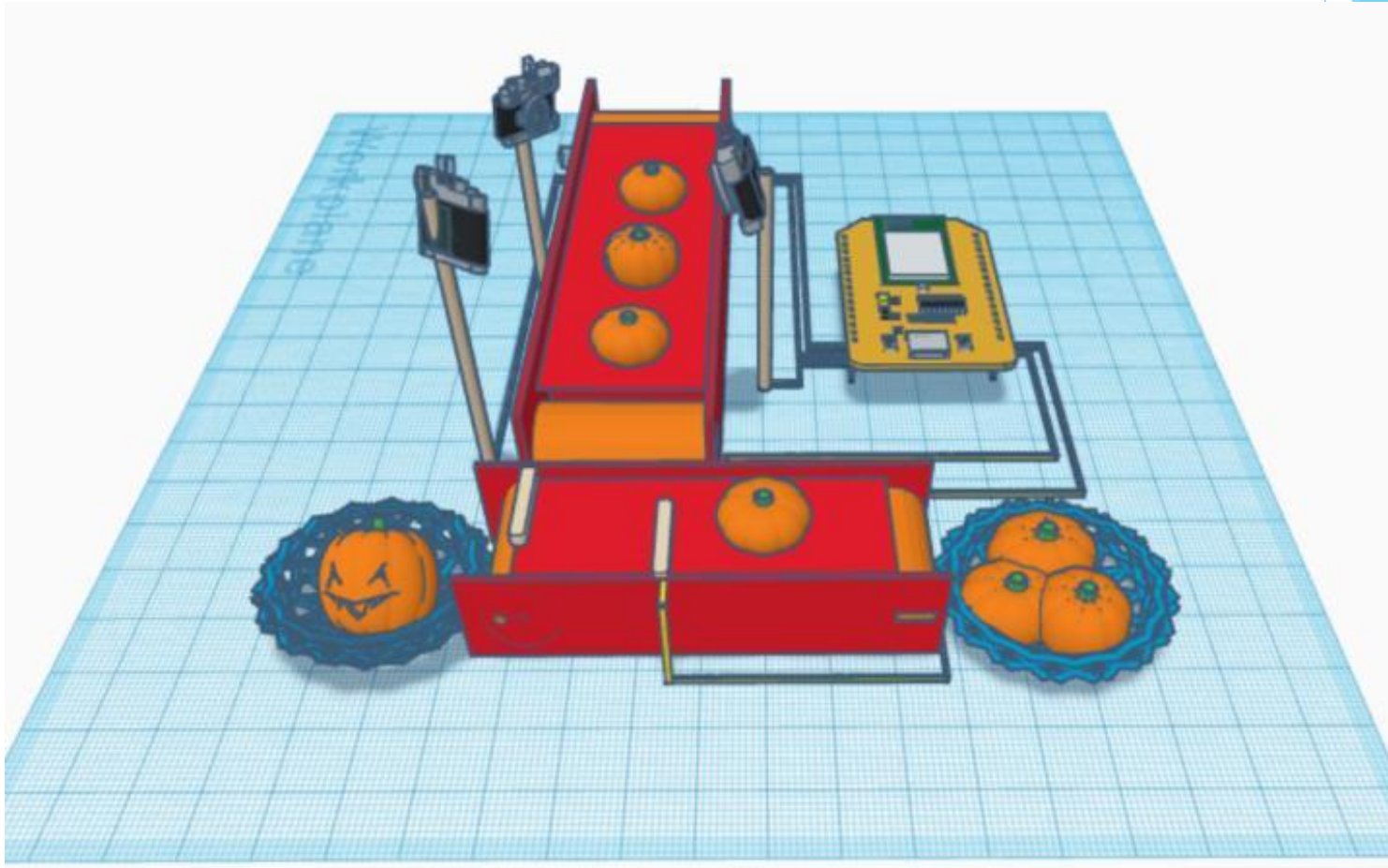Block A   Block B   Block C

11. Demonstration Model

12. Implementation Status

- Successfully implemented CNN model with Inception V3 architecture.

- Achieved accuracy of 98.5% .

- Finalized the architecture required but might need some changes ,since we are in testing phase.

13. Status of Paper Draft & Targeted Conference

Status of paper: Completed writing Abstract and Introduction. Listed all the necessary keywords.

Targeted Conference:

- IEEE 2021 Conference on Advances in Computing, Communication and Control - (20th September)

- International Conference On Big Data, Machine Learning and Applications - (25th September)

Thank You...!!