Project on "Topics in AI"

GROUP 10

ARPIT YADAV	BT21CSE055
AYUSH NAGAR	BT21CSE025
MAYANK RAJ SINGH	BT21CSE043
ASHISH KUMAR	BT21CSE044

Workflow

Our web application follows a structured workflow:

- **User Interaction:** Users visit the application via URL and upload an image.
- **Image Processing:** The uploaded image is stored locally and resized to match the model's input shape using Pillow, converting it into a vector.
- **Model Inference:** The vectorized image is passed to our model for classification.
- **Label Mapping:** The predicted class ID is mapped to the corresponding label.
- **Calorie Retrieval:** The system scrapes the web for the calories associated with the predicted object.
- **Result Display:** The application presents the classification result along with the retrieved calorie information. This workflow ensures seamless interaction for users and efficient processing of image data for classification and information retrieval.

Topic 3

Machine Learning Project On "Potato Disease Detector"

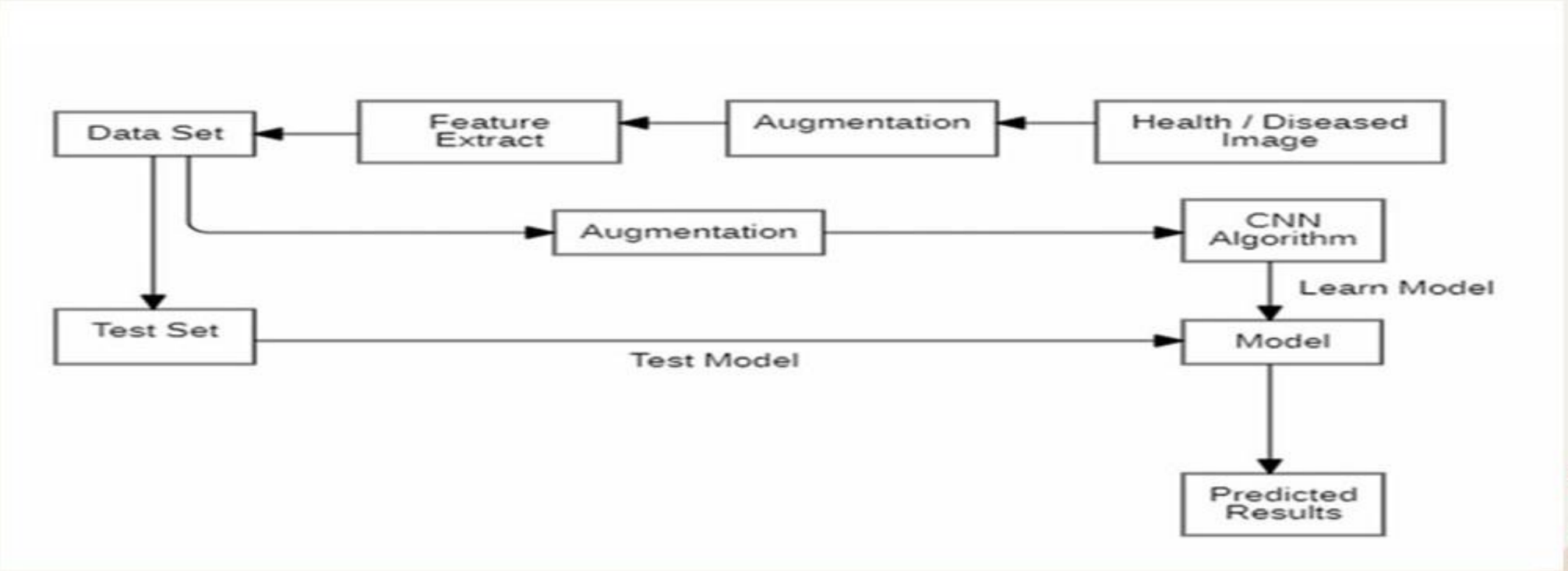
Introduction

Our potato disease detection system leverages Convolutional Neural Networks (CNNs). Traditionally, disease detection in potato crops relies heavily on manual inspection by farmers or agricultural experts. This approach can be highly subjective, error-prone, and inefficient, particularly given the subtle and often visually similar symptoms of different plant diseases. As global agricultural practices move towards more sustainable and efficient techniques, there is a pressing need to innovate and improve the methods by which these critical disease assessments are made.

Dataset

The dataset, sourced from Kaggle, consists of 3000 images in total, with 1000 images each for late blight, early blight, and healthy potato plants. In the dataset, early blight is characterized by yellow patches on the leaves, late blight by brown patches, while healthy plants exhibit no such spots.

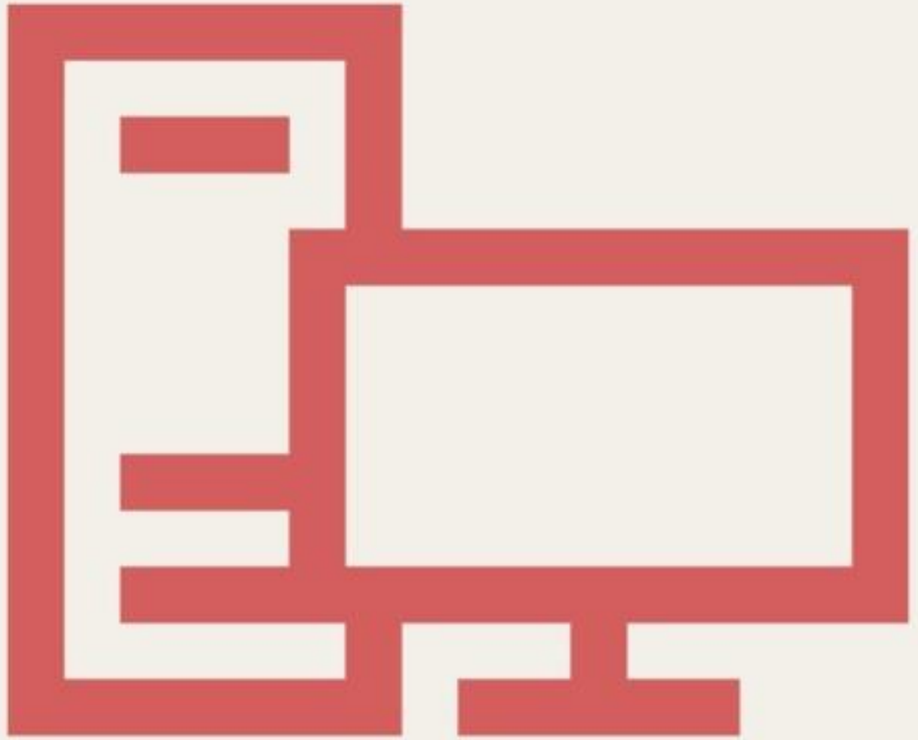
Workflow


Data Set
Feature Extract
Augmentation
Health / Diseased Image
Augmentation
CNN Algorithm
Learn Model
Test Set
Test Model
Model
Predicted Results

THANK YOU

Topic 1

Project On
“Teacher’s Assistant"



Introduction

The "Teacher's Assistant" project aims to revolutionize the classroom experience by integrating **advanced computer vision techniques** and **natural language processing** into everyday teaching tools. This system combines **hand gesture recognition** for interactive whiteboard usage and PowerPoint navigation with features like lecture recording, **automatic transcript generation**, and **dynamic content summaries**. The software also allows real-time annotations and organizes them for future reference, creating an intuitive and comprehensive solution for enhancing teaching efficiency and student engagement.

Technologies Used-

1. **OpenCV** (for computer vision and hand gesture recognition)
2. **CNN (Convolutional Neural Networks)** for gesture classification
3. **MediaPipe** (for hand pose estimation)
4. **TensorFlow and Keras** (for building custom models)
5. **ASR model** (for transcript generation)
6. **NLP model** (for dynamic summary generation)

ASR

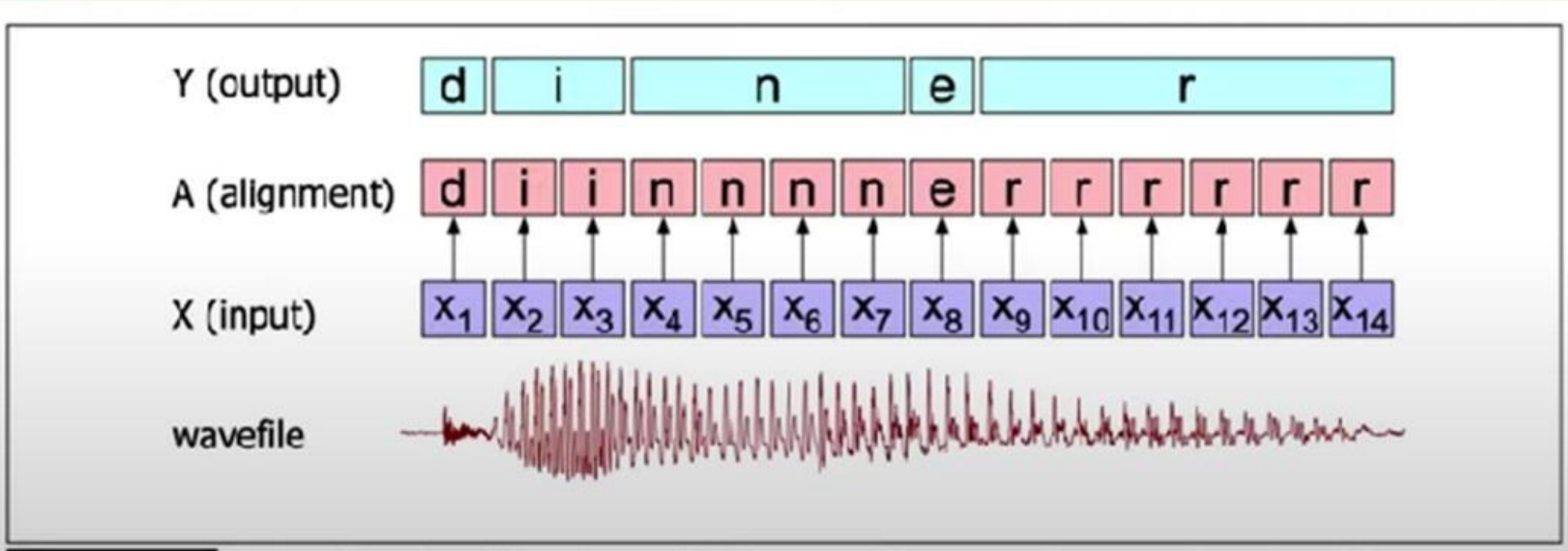
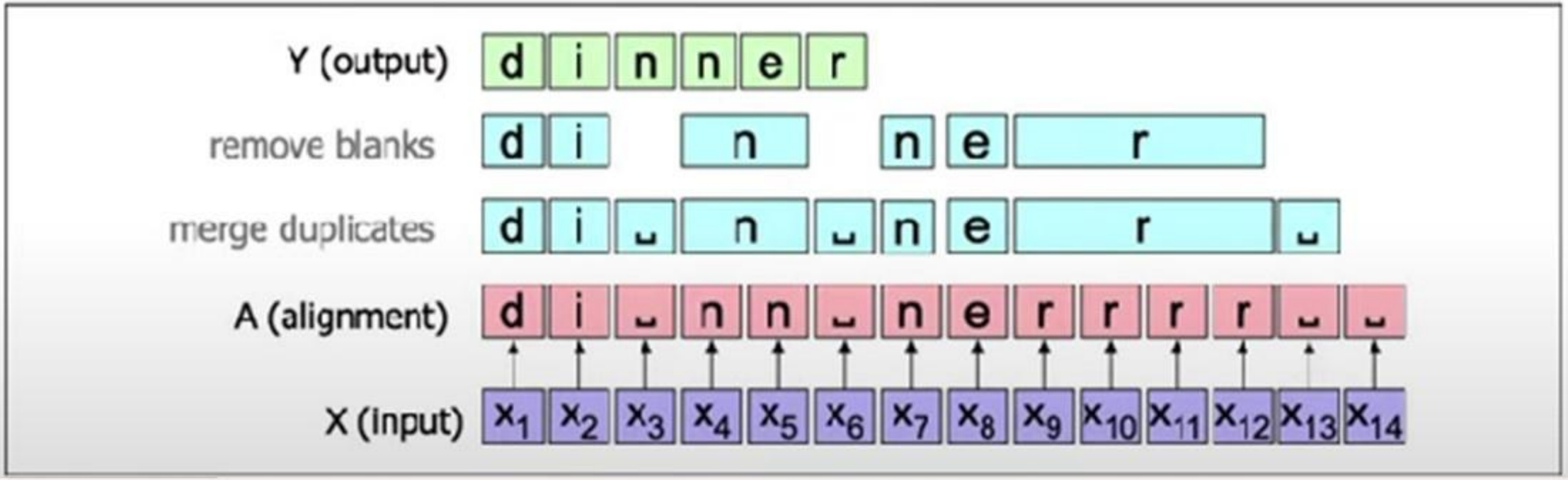


Figure 16.7 A naive algorithm for collapsing an alignment between input and letters.


Y (output)
d i n n e r
remove blanks
d i n n e r
merge duplicates
d i ␣ n ␣ n e r ␣
A (alignment)
d i ␣ n n ␣ n e r r r r ␣ ␣
X (input)
x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 x11 x12 x13 x14

Topic 2

Machine Learning Project On "Fruits and Vegetable Classification"

Using CNN

INTRODUCTION

The project aims to address the need for a convenient and efficient tool to identify and learn about various fruits and vegetables. With the increasing interest in healthy eating and nutrition, having access to accurate information about the food we consume is essential. The motivation behind this work is to leverage machine learning techniques to develop a system that can automatically classify fruits and vegetables from images, providing users with valuable insights into the nutritional content and usage of different food items.

Dataset

We're employing the "Fruit and Vegetable Image Recognition" dataset, which contains 36 classes with approximately 100 images per class, totaling over 3600 training images. For training/validation, we're using 10 images per category