



AI-BASED FOOD RECOGNITION FOR THE VISUALLY IMPAIRED

PROBLEM STATEMENT

Visually impaired individuals encounter substantial obstacles when it comes to identifying and choosing their meals, whether at home or in public dining settings. Current solutions, including manual assistance and specialized devices, present shortcomings in terms of their ability to recognize a broad range of food items, provide real-time feedback, and remain cost-effective. This project is a simple solution to tackle this problem.

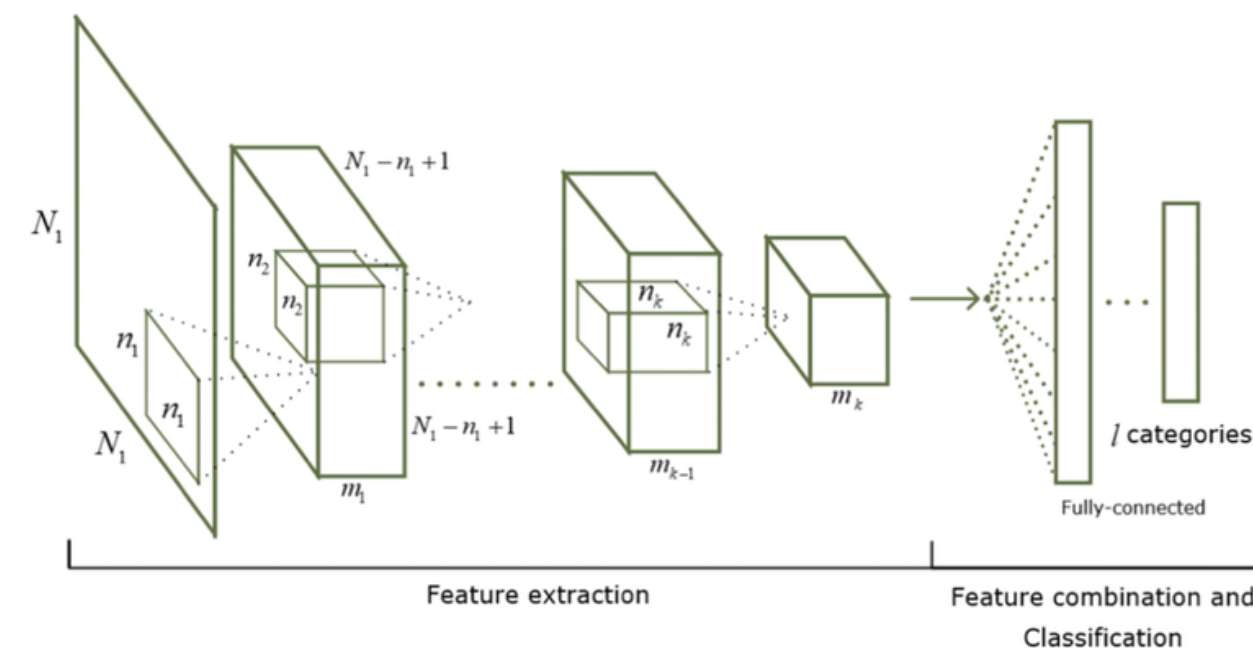
DATA SOURCE

This project uses the Kaggle dataset 'Food 101' which has 101 different food classes.

ANALYSIS

- I. Download data and extract it to folder
- II. Model training
- III. Visualization
- IV. Model evaluation
- V. Audio-Based Prediction

MODEL ARCHITECTURE

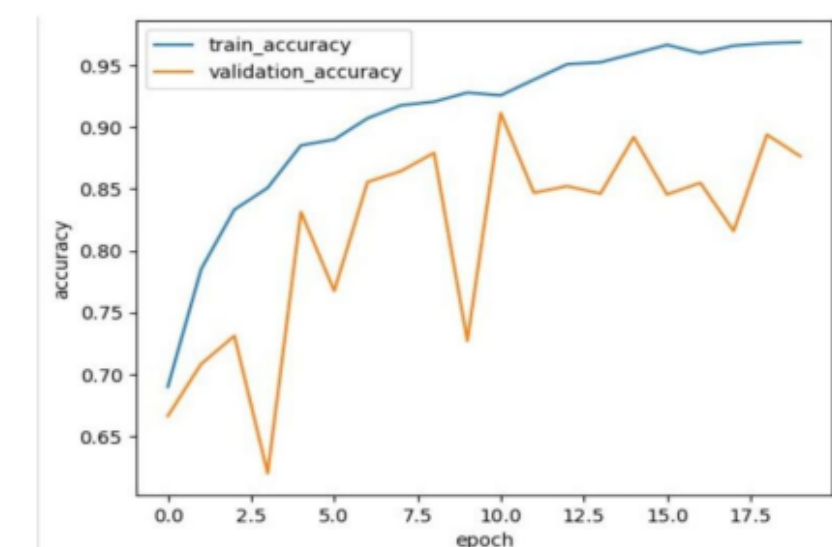
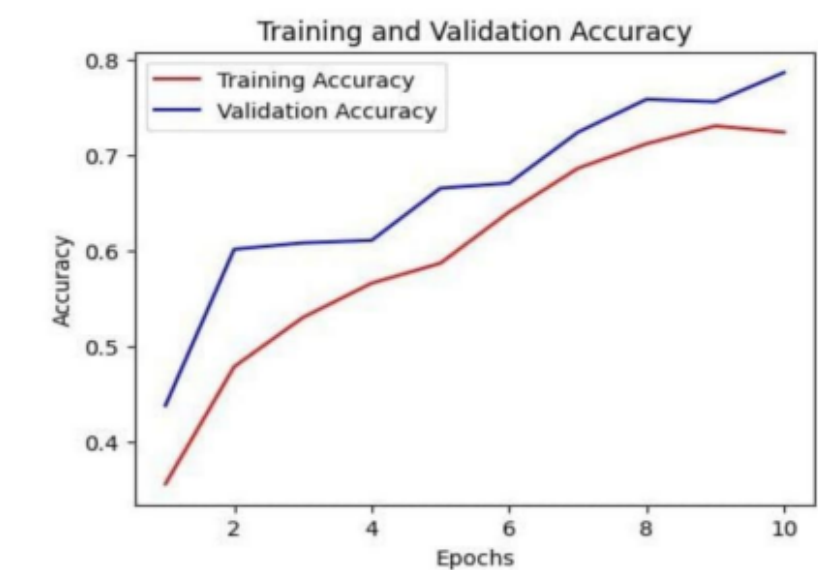


The model used in this project is a Convolutional Neural Network (CNN). It is a deep learning algorithm designed for processing structured grid data, primarily used in image and video analysis. They excel at capturing spatial patterns and hierarchies in data. CNNs are composed of

- Convolutional layers which apply filters across the input data, extracting local features through convolutions.
- Pooling layers which reduce the spatial dimensions while preserving essential information.
- Fully connected layers which make predictions based on the extracted features.

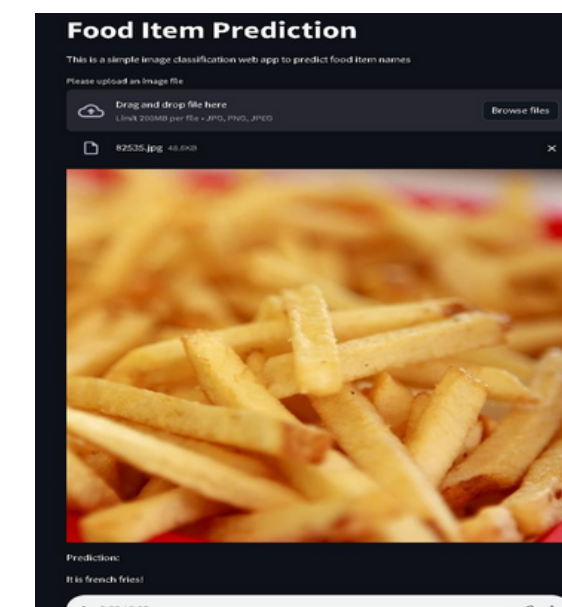
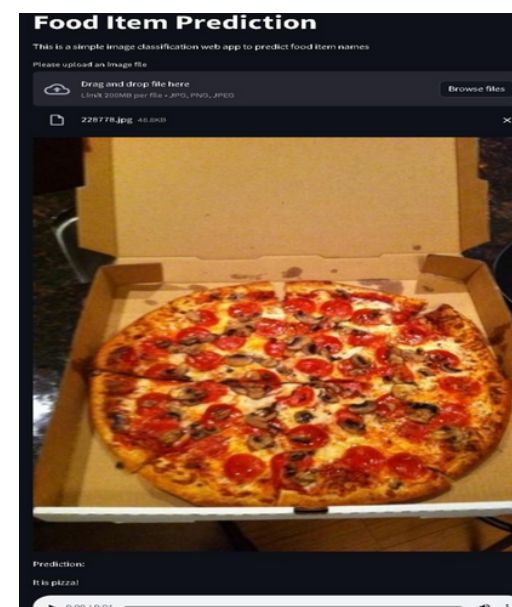
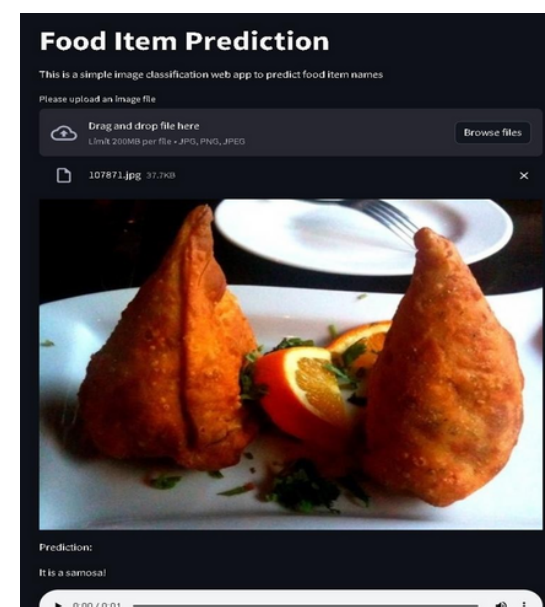
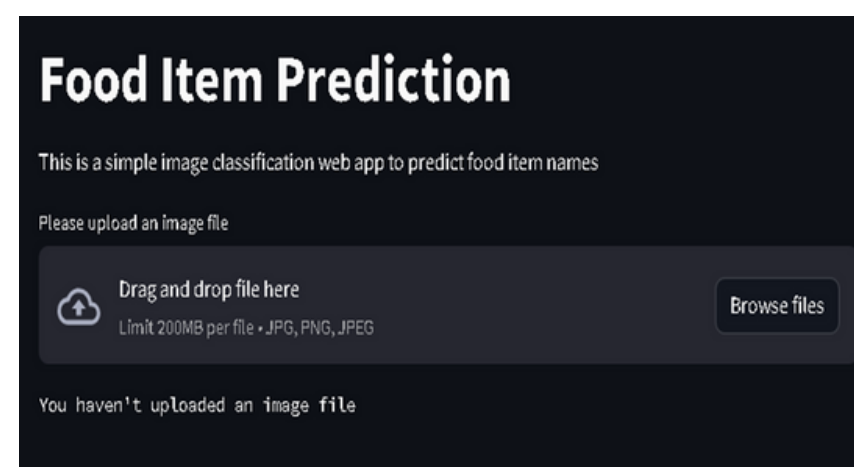
Frontend for this project is developed using Streamlit. It is a an open-source framework to build a GUI for python projects.

RESULTS AND COMPARISON



The custom model (above) has been trained for 20 epochs and it is compared with the pre-trained InceptionV3 model (below) and the accuracy of the custom model is 79.04% while the accuracy of InceptionV3 is 96%.

SNAPSHOTS



CONCLUSION

- In our project, we have developed a food item classification system tailored to assist visually challenged individuals in recognizing diverse food types.
- The inclusion of text-to-speech functionality enhances the overall accessibility of the system, making it a valuable tool for visually challenged individuals seeking food recognition autonomy.
- In this system we get an accuracy of of 79.04% .