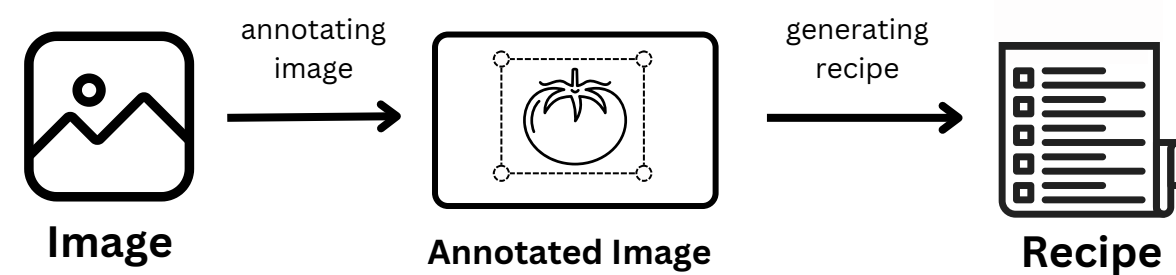




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## Overview of the Project

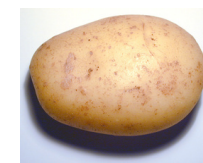


### Introduction

- Contributing to ease the work of people who prepare food.
- Research on generating **recipes** from **ingredients image data**.
- A deep neural network model (**YOLO**) which takes an image input and generates recipes.

### Dataset

- Ingredients of Turkish foods dataset
- Around 38 classes of the mostly used ingredients in Turkish foods.
- Obtained from the Internet resources and images taken by us.

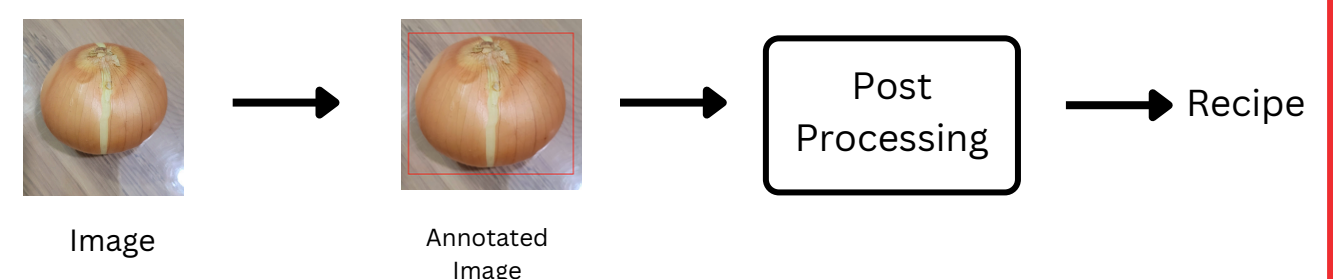


### Methodology

- We used **YOLOv8** as the object detection algorithm. The reason we chose this algorithm was that it is an effective, up-to-date detection algorithm with high detection accuracy.
- We trained **YOLOv8** on 38 classes that we determined them according to their most common use in Turkish foods.
- We made observations by freezing and not freezing the backbone layers of YOLO and evaluated in which case the model gave better results, taking into account **mAP** values per class.
- We observed some determined **data augmentation parameters** and values used in YOLO detection processes, which is one of the important parts of training the model, and used them in the code to make the training process more efficient.
- The model was tested both with single ingredient images and multiple ingredient images.

### Data Preprocessing

#### Recipe generation



#### Image Annotation

- Used **CVAT** due to its convenience for annotating images.

### Results

- The **decreasing of loss function** shows that the model is learning and improving over time.
- The results of the model indicate **favorable outcomes**. However, although it performs promising performance in overall, it cannot perform well enough in some classes.
- With continued training, it is expected that the model is going to achieve even better performance.

### Acknowledgements

This project is completed within the context of BBM479-480 Design Project courses in Department of Computer Engineering, Faculty of Engineering, Hacettepe University.

### Future Work

We are planning to deploy our application in various platform after increasing our model's performance with enriching the dataset.