YOLOv8 Computer Vision Project Report

1. Project Overview

This project demonstrates the implementation of a real-time object detection system using YOLOv8. The model is trained on a custom dataset of ketchup and sauce products and deployed through a Flask web application that utilizes webcam input to make predictions.

2. Dataset Information

The dataset consists of 10 classes of ketchup and sauce products. Each image is annotated using JSON files which were converted into YOLO format. The data was split into training, validation, and test sets with an 80:10:10 ratio.

3. Training Information

The model was trained using Ultralytics YOLOv8 for 100 epochs. The training was performed on Google Colab with GPU acceleration. The training script used was `training.ipynb`.

4. Model Export

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The trained model was exported to ONNX format using the command: `yolo export
model=path/to/best.pt format=onnx`
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5. Deployment using Flask

A simple Flask web application was created which accesses the system's webcam, captures live video feed, and passes it through the trained YOLOv8 model to perform real-time object detection. The application displays the annotated video feed on a webpage.

6. Usage Instructions

Step	Description
1	Run `app.py` to start the Flask server.
2	Open your browser and visit `http://127.0.0.1:5000/`.
3	Allow access to webcam if prompted.
4	Live predictions will be shown in the browser.

7. Conclusion

This project highlights the power and simplicity of YOLOv8 for custom object detection tasks. With an easy-to-use deployment using Flask, this serves as an excellent project for portfolio and freelance showcases on platforms like Upwork or Fiverr.