Object Detection App

This is an Object Detection application built using Streamlit, OpenCV, and MediaPipe. The app allows users to upload an image, and it will detect objects in the image using a pre-trained model.

Requirements

- Python 3.12.3
- Streamlit
- OpenCV
- NumPy
- MediaPipe

Installation

1. Clone the repository:

```
git clone <repository-url>
cd <repository-directory>
```

2. Install the required packages:

```
pip install streamlit opencv-python-headless numpy mediapipe
```

3. Download the pre-trained model efficientdet_lite0.tflite and place it in the project directory.

Usage

1. Run the Streamlit app:

```
streamlit run Object_detection.py
```

2. Open your web browser and go to http://localhost:8501.

3. Upload an image (jpg, jpeg, or png) using the file uploader.

4. The app will display the uploaded image and the image with detected objects.

File Structure

- app.ipynb: Jupyter notebook used to create the Object_detection.py script.
- efficientdet_lite0.tflite: Pre-trained model for object detection.
- Object_detection.py: Main script for the Streamlit app.

Code Overview

Object Detection

The object detection functionality is implemented using MediaPipe's Object Detector. The model is loaded using the following code:

```python
base_options = python.BaseOptions(model_asset_path="efficientdet_lite0.tflite")
options = vision.ObjectDetectorOptions(base_options=base_options,
score_threshold=0.5)
detector = vision.ObjectDetector.create_from_options(options)
```