Object Detection Project Using YOLOV8

Table Of Contents (TOC)

Aim of the Project

Object Detection.
To Detect : Aged Person
Application : Can be deployed in hospitals to give preference to old age peoples through automatic tokening systems, also in public places where tokening system is available.

Process Went Through

1. Setting Up the Environment & Installing Packages
2. Data Collection (Images)
3. Annotating the Data (Images)
4. Training the Model & Evaluating
5. Testing Our Model

Setting Up the Environment

Created the new environment and installed the required libraries namely Ultralytics, Numpy, Opencv-python, Matplotlib.

Data Collection (Images)

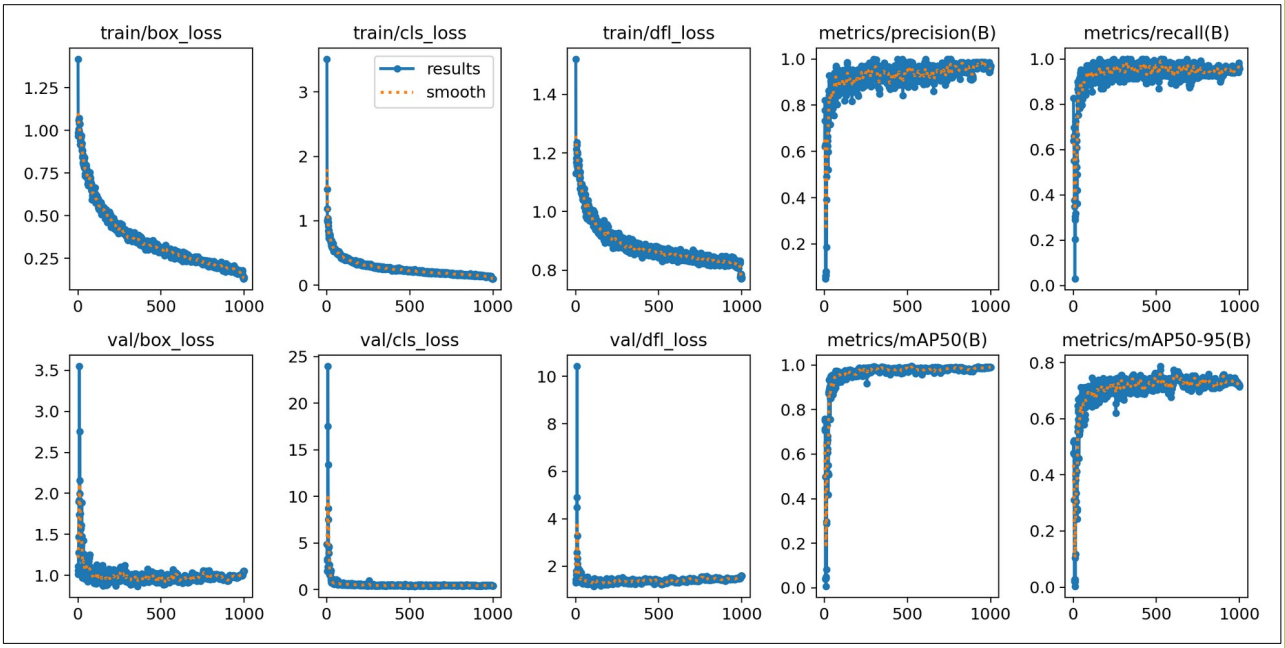
Collected images from the sources google & unsplash with high quality. Split the images in the ratio as 70% of image data for training 20% of image data for validation & remaining 10% of image data for testing.

Annotating the Data (Images)

Data annotation was carried out through the site named makesense.ai & exported the labels in format compatible for YOLO.

Training & Evaluating the Model

Trained the model via google colab since it provides free gpu which accelerates training process. Carried out the training process with all pre-trained models namely, yolov8n, yolov8s, yolov8m, yolov8l, yolov8x on the custom dataset for 1000 epochs. Among all the pre- trained models, pre-trained model=yolov8s.pt gave the best result for object detection, based on the evaluation metrics such as precision (P), recall (R), mean Average Precision at 50 (mAP50) and mean Average Precision at 50-95 (mAP50-95) when compared to rest of the models. Extracted the trained model's best weight (in my case I renamed it as bestS_ap_final.pt). Evaluated the model from results.png file which consist of graphs of loss & metrics as shown below.



From the graph it is very obvious that the loss graph keeps on decreasing metrics keeps on increasing which is a good sign that the model has learnt pretty good. Rest details, will be located in the folder Yv8_APD_Proj under location: Creating & training custom model/runs/detect/train4

Testing Our Model

Tested the created model's weight to perform detection on images, videos & on web cam using python script. For details, refer folder Yv8_APD_Proj under location: Testing Model

For more details kindly see the folder named Yv8_APD_Proj

For details regarding to training process carried out kindly refer link as below.
Link :
https://drive.google.com/drive/folders/1Gw8hs1C8kQqVx4IIQxcErgCXtaVuiDll?usp=sharing

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