ASL Letter Detector: Object Detection

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Problem Statement

- ASL (American Sign Language)
- Object Detection
- Learning App for Practicing
- Real Time Detection

Dataset (ASL Images)

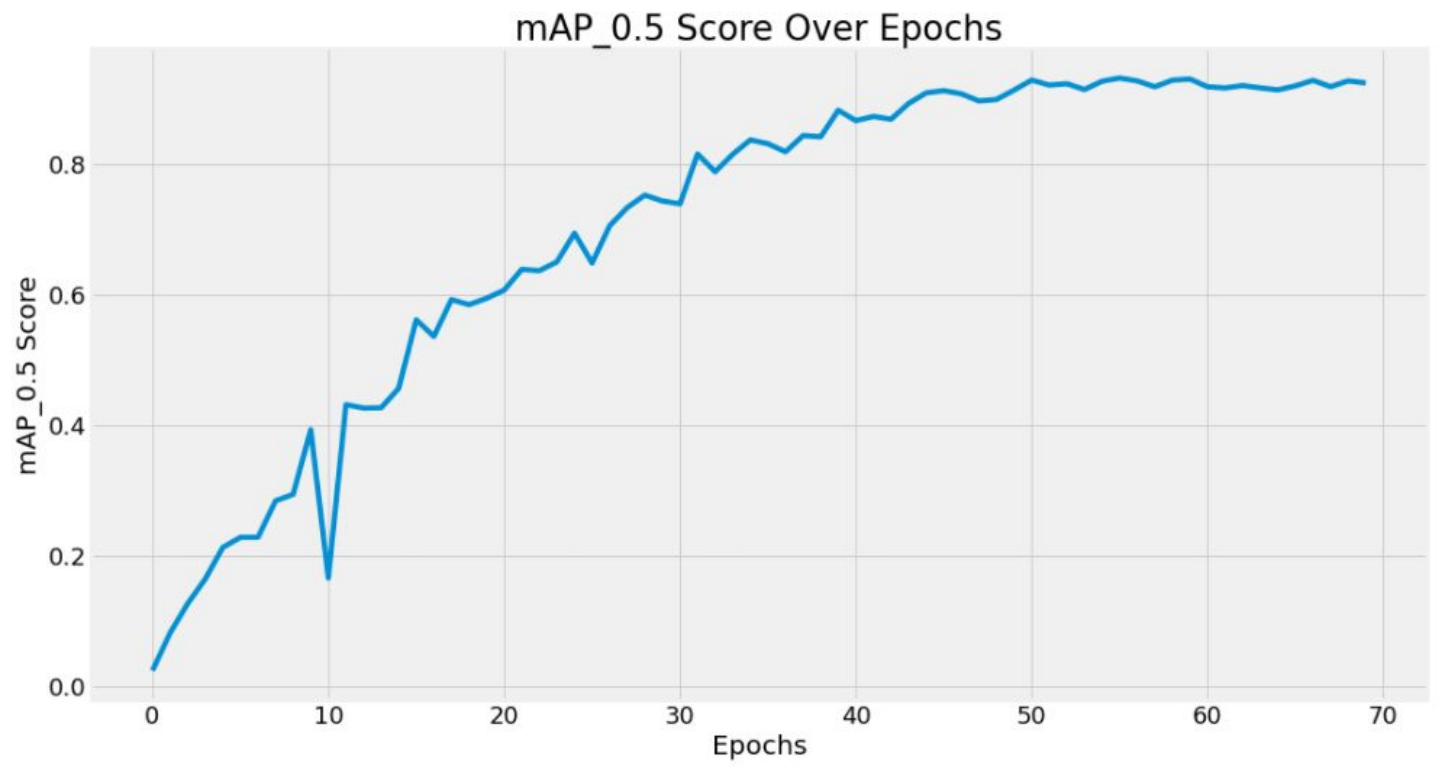
- RoboFlow
- 1728 Images
- 416 x 416 pixels
- Some of the Augmentations:
  - Flip (Horizontal)
  - Crop
  - Rotation (-5° to +5°)
  - Blur (Up to 1.25px)

Image Examples from Dataset

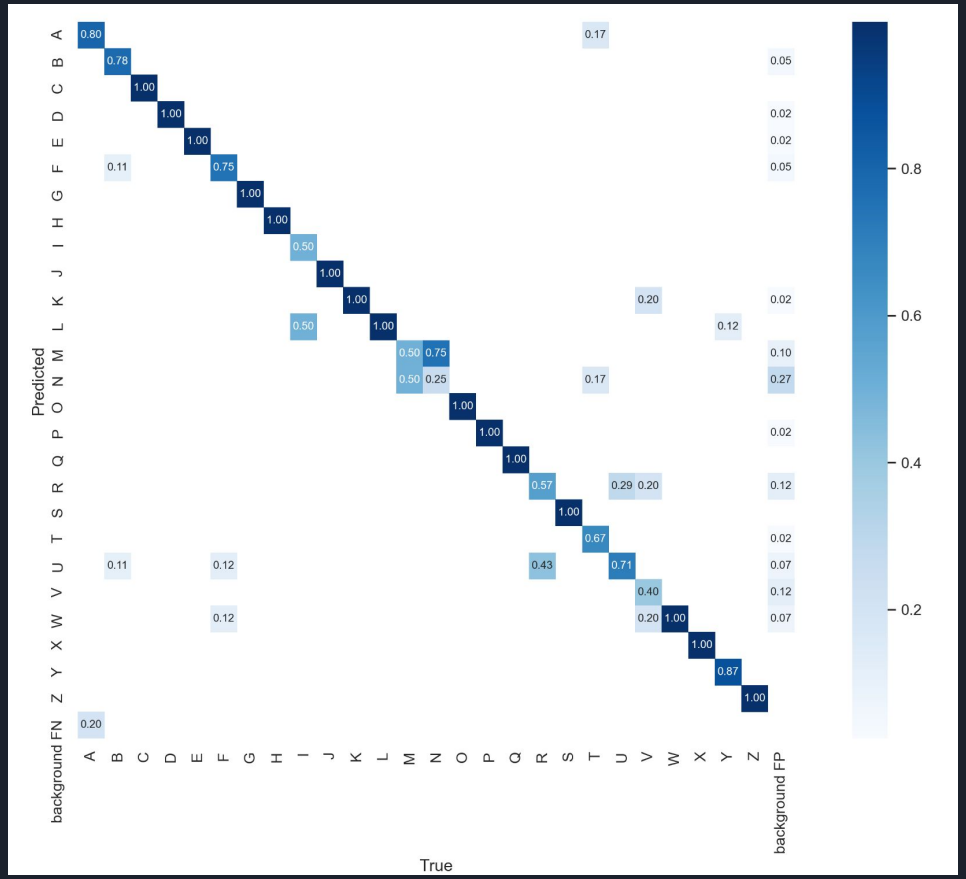
Yolov5 - Modeling

- Yolov5s
  - Small Model
  - Good for Smaller Datasets
  - Efficient for Model Size
- Open-Source Object Detection
- Trained on COCO dataset
- Great for Model Refinement

Model Evaluation



Correlation Matrix



Conclusion & Recommendations

- Final Metrics:
  - mAP_0.5 : 0.925
  - Precision : 0.793
  - Recall : 0.937
- Two Model Solution
  - Object Detection
  - Classification (resNet)
- Improved Dataset

Streamlit