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DEEP LEARNING – R&AI

**Comparison of Faster R-CNN, YOLO and SSD**

# Introduction:

This report compares the performance metrics of the above mentioned model on a custom dataset. The ipynb files are uploaded on the github repository for access.

# Dataset:

**Label-Studio** was used to label chess images over 2 classes – White Pawn and Black Pawn –

# IDE:

Jupyter-Lab and Google Colab

# Results:

## Faster RCNN:

Performance Metrics:

Mean Average Precision (mAP): 0.7417

Average Precision per Class: -1.0

Average Precision at IoU=50: 0.9817

Average Precision at IoU=75: 0.9482

Average Recall: 0.8028

## YOLOv8n:

Performance Metrics:

Mean Average Precision (mAP@50): 0.961

Mean Average Precision (mAP@50-95): 0.741

Average Recall (AR): 0.913

Class-wise Metrics:

Class 1: Precision: 0.979

Recall: 1.000

AP@50: 0.995

AP@50-95: 0.804

Class 2:

Precision: 0.961

Recall: 0.827

AP@50: 0.927

AP@50-95: 0.679

# SSD:

I could not get the performance metrics for SSD model.

# Summary:

The Faster RCNN model was trained perfectly and showed the best results. However the Yolov8 model was overfitted. I tried to implement SSD but even after working tirelessly I could not manage to visualize the results. Pretrained model of mobilenet v2 api was used but a lot of dependency issues were faced.   
However from the above activity I did learn a lot and can conclude that Faster RCNN gives you more room to fine tune it. YOLO is easier to implement and SSD is a model that shows results somewhere in between.