

# object detection For Driverless Cars



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01

**Background**

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04

**Results**

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02

**The Data**

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05

**Next Steps**

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03

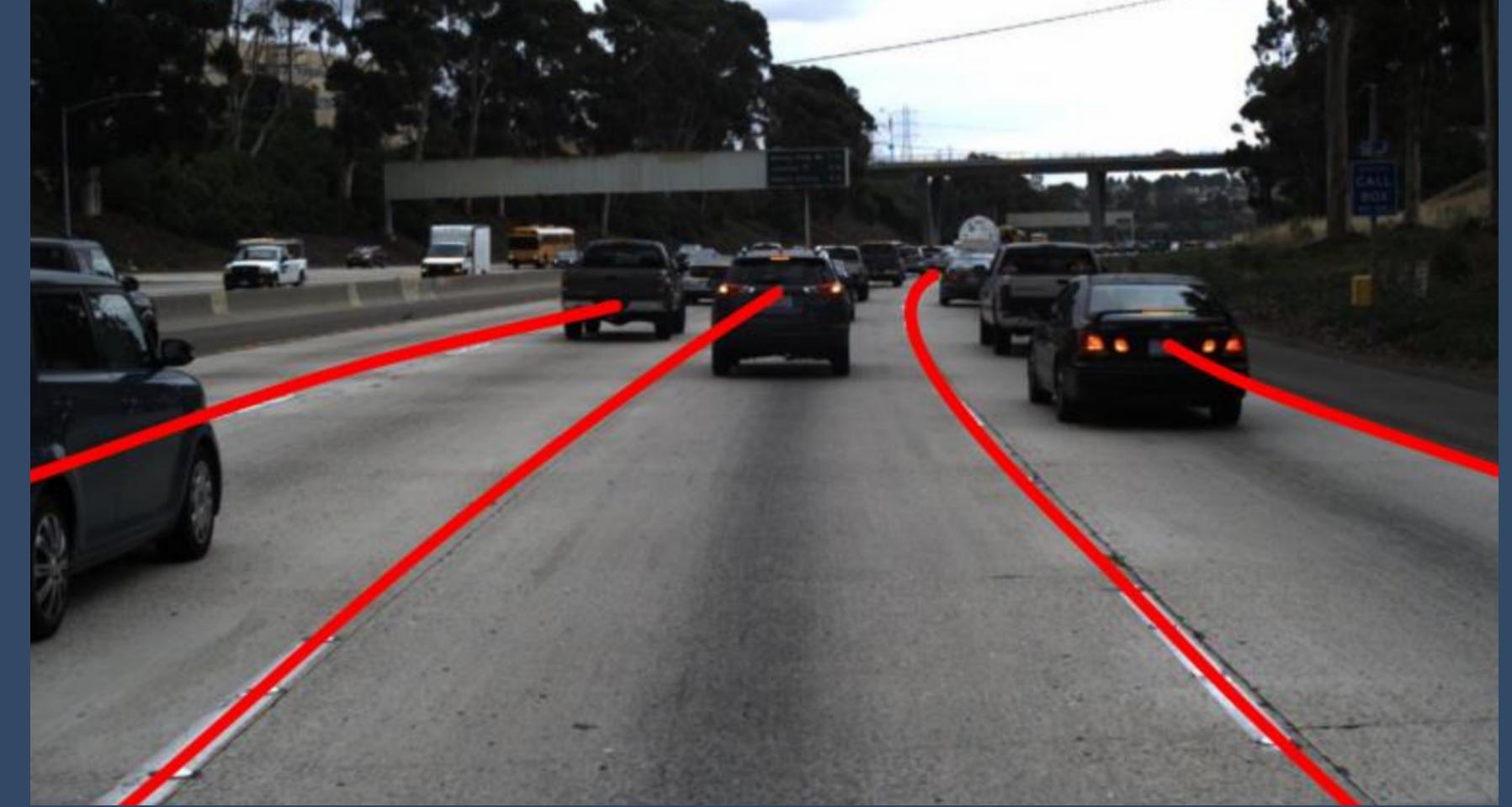
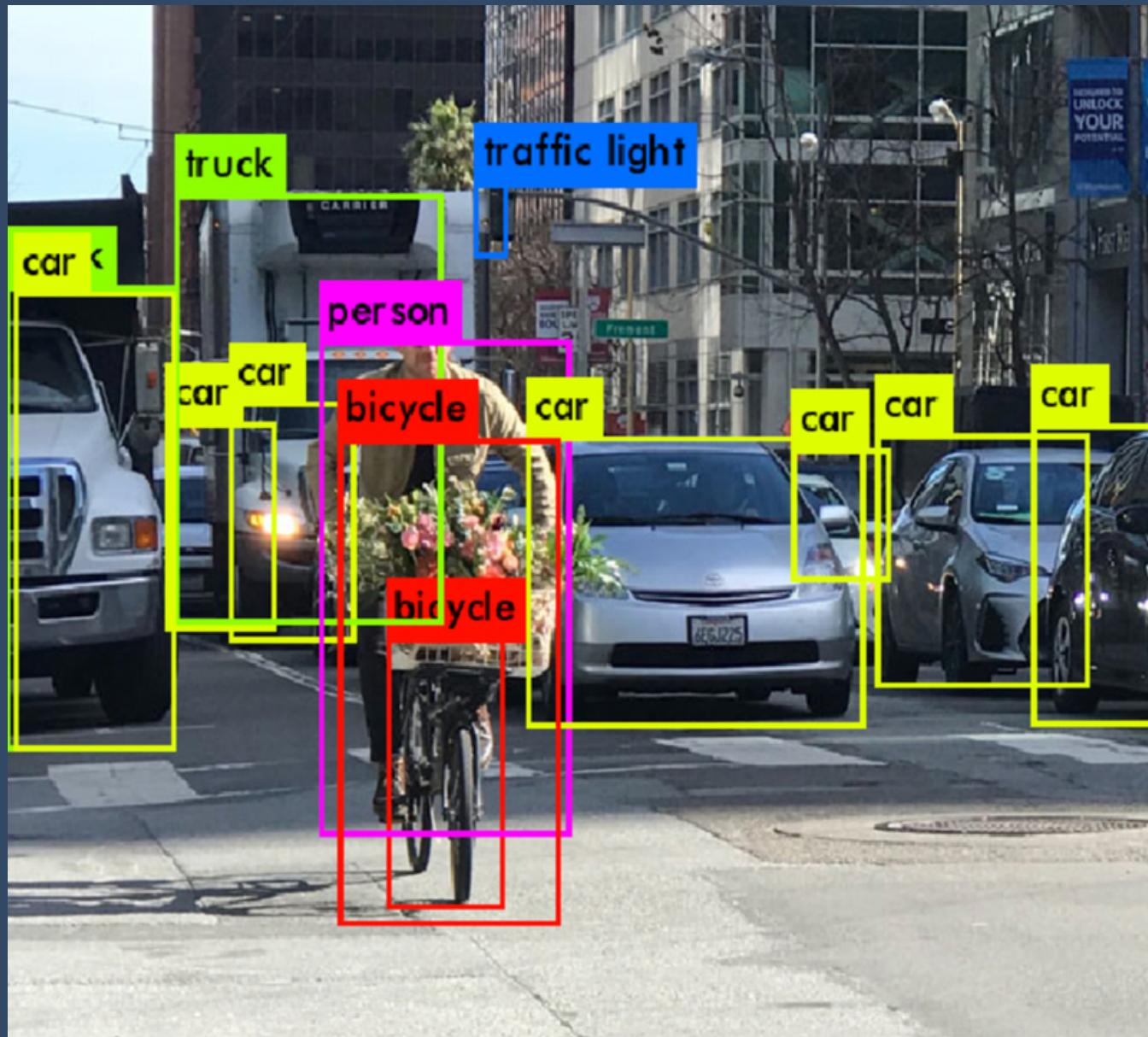
**Modeling**

# Overview

WHAT WE'LL DISCUSS TODAY

# 01

# Background



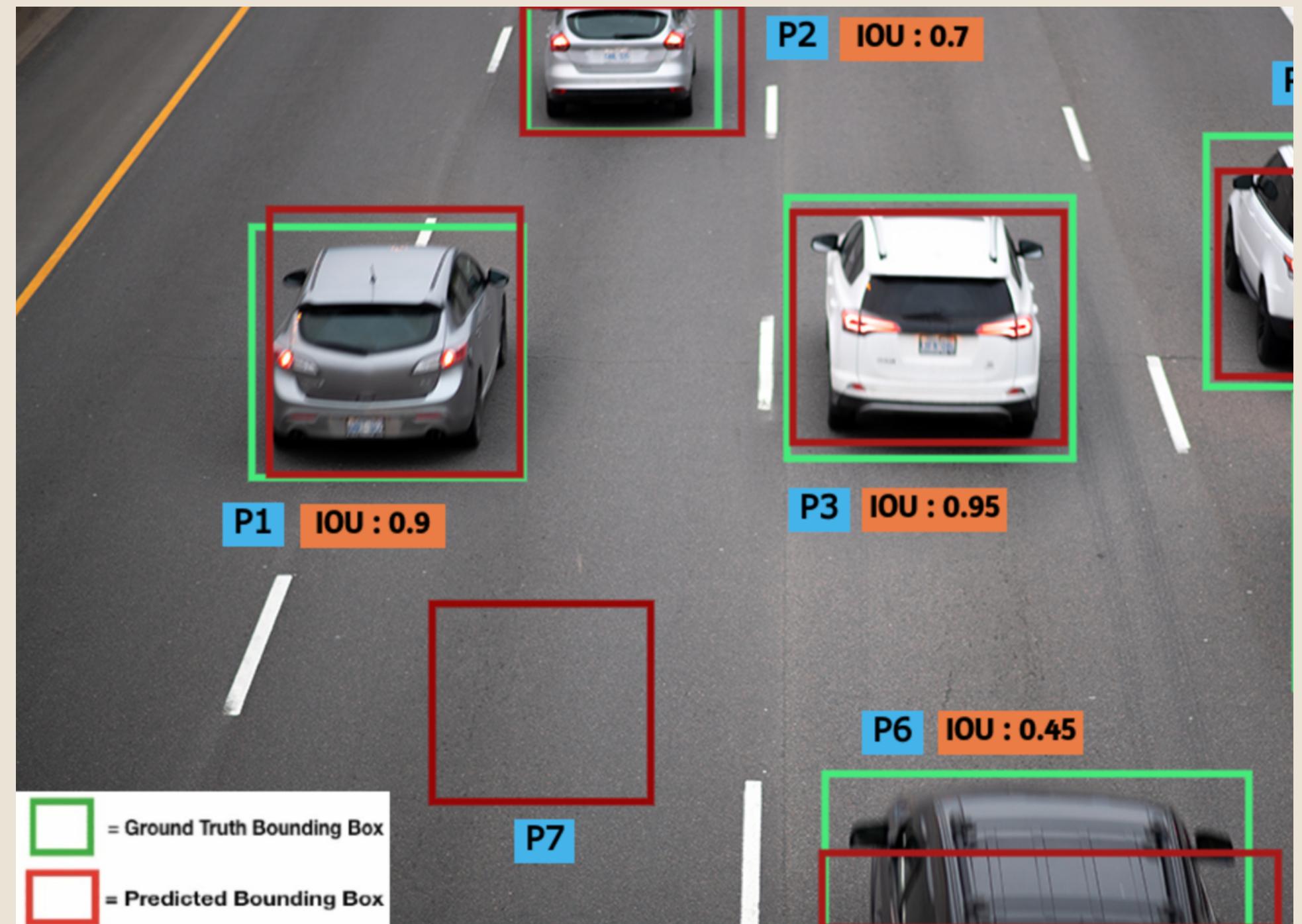
DRIVERLESS CARS NEED  
CAMERA DATA

To distinguish objects in their periphery,  
calculate the velocities of objects, and make  
decisions.

# 02

## The Data

- Thomas Jefferson high school competition dataset
- 1176 street view images
- Ground truth bounding box coordinates



# 03. Modeling

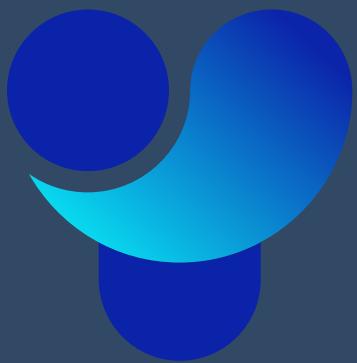
These models classify objects then predicts bounding boxes around them in an image



Bounding Box  
Regression



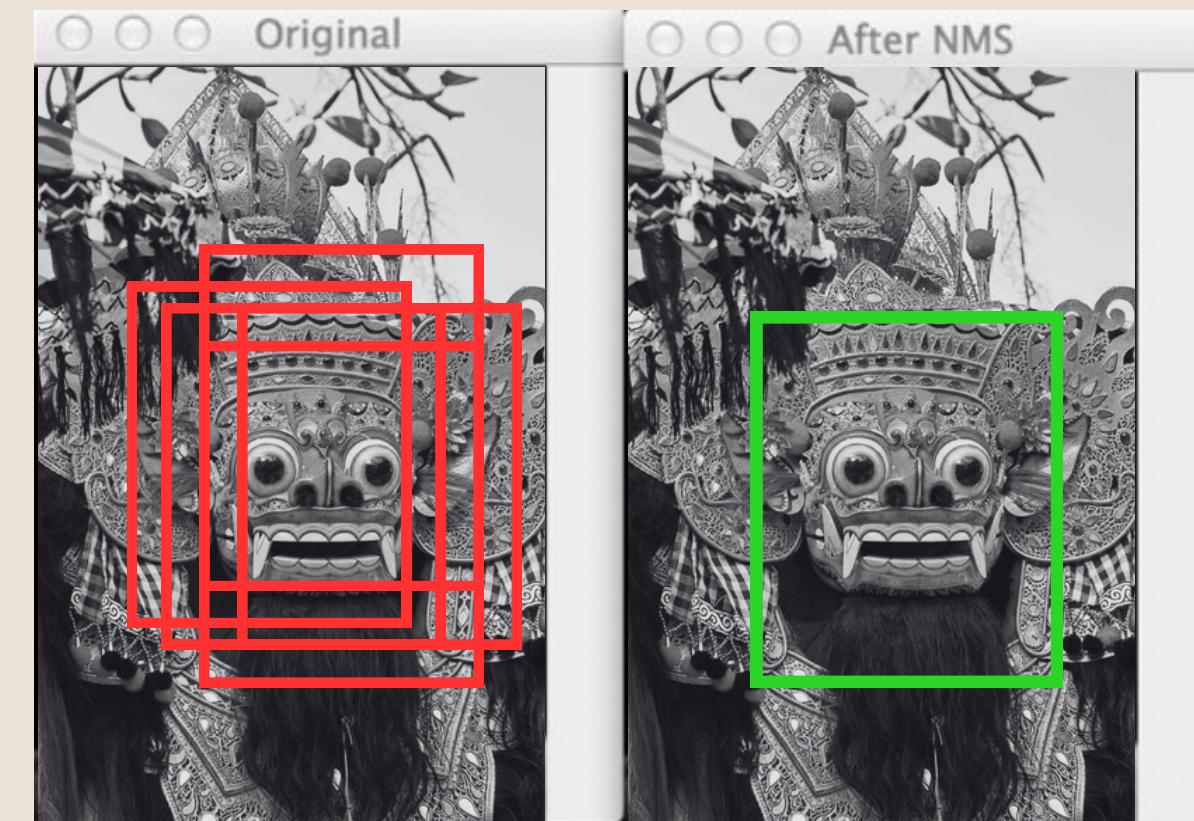
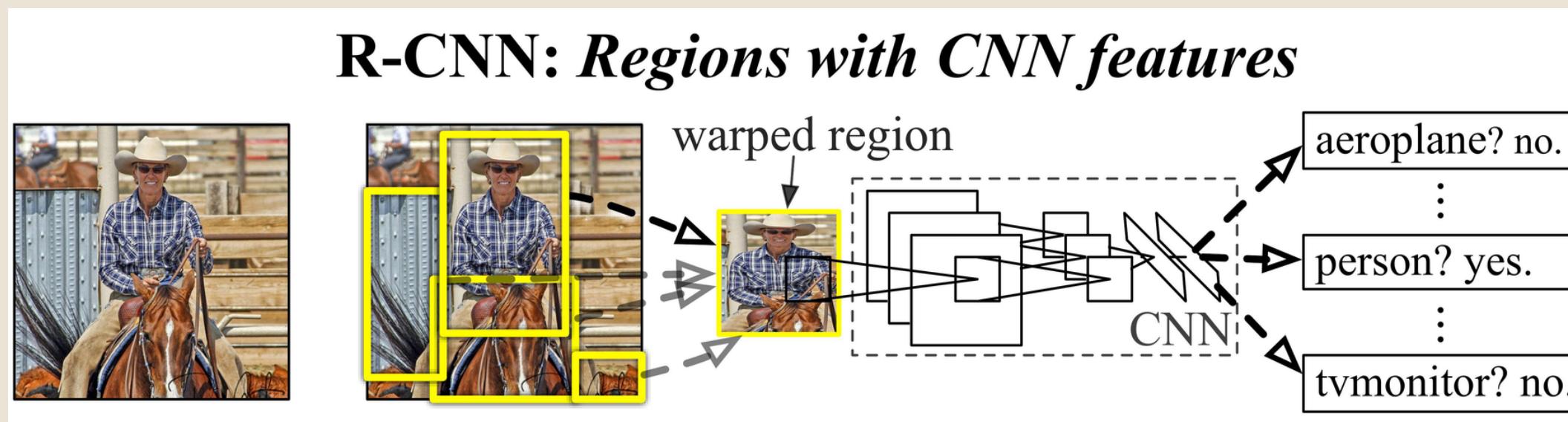
R-CNN



YOLOv8

# 03. Modeling

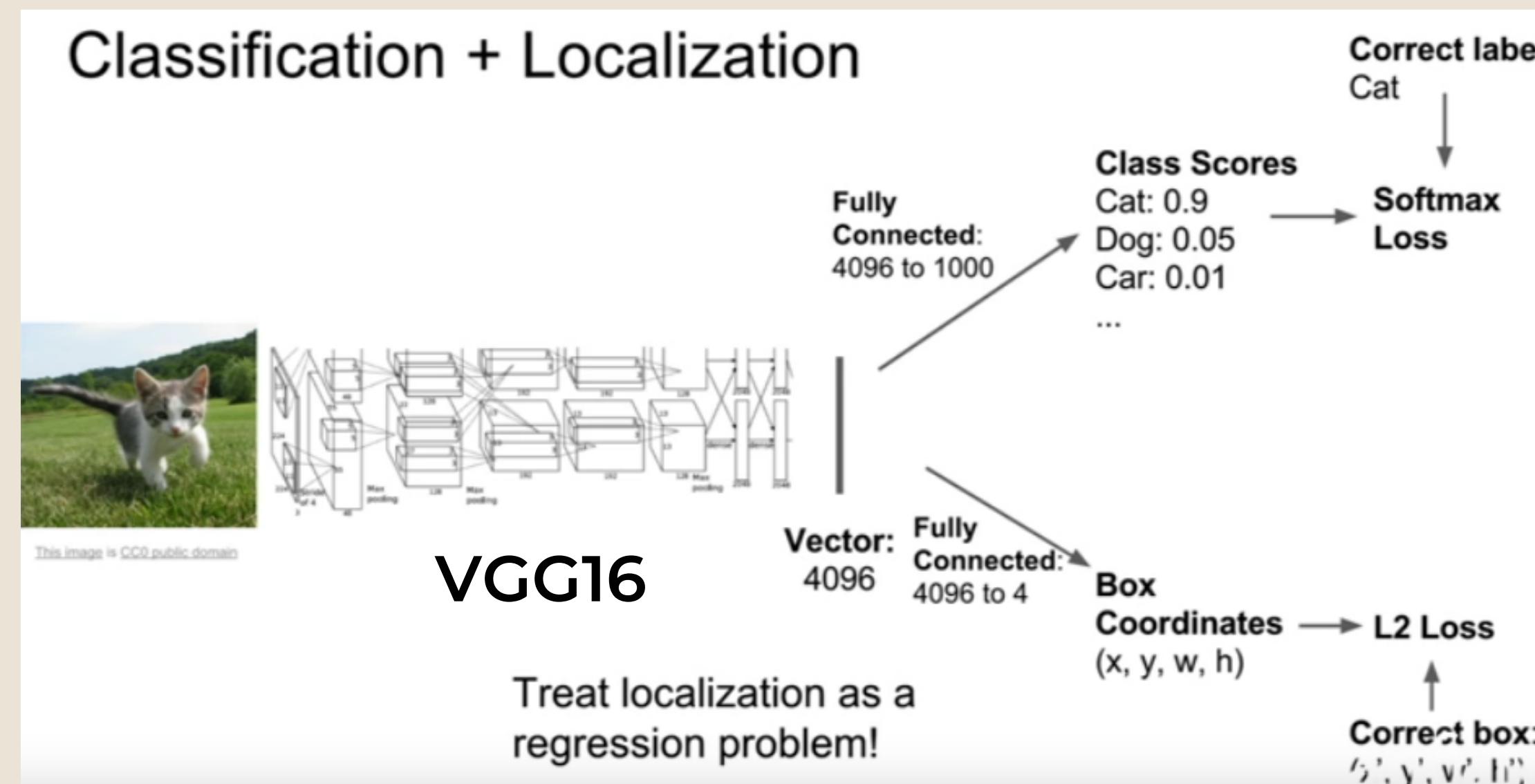
## R-CNN explained



1. Selective search
2. CNN learns features
3. Selective search again
4. Predict then keep true boxes
5. Non-maxima suppression

# 03. Modeling

## Bounding Box Regression explained

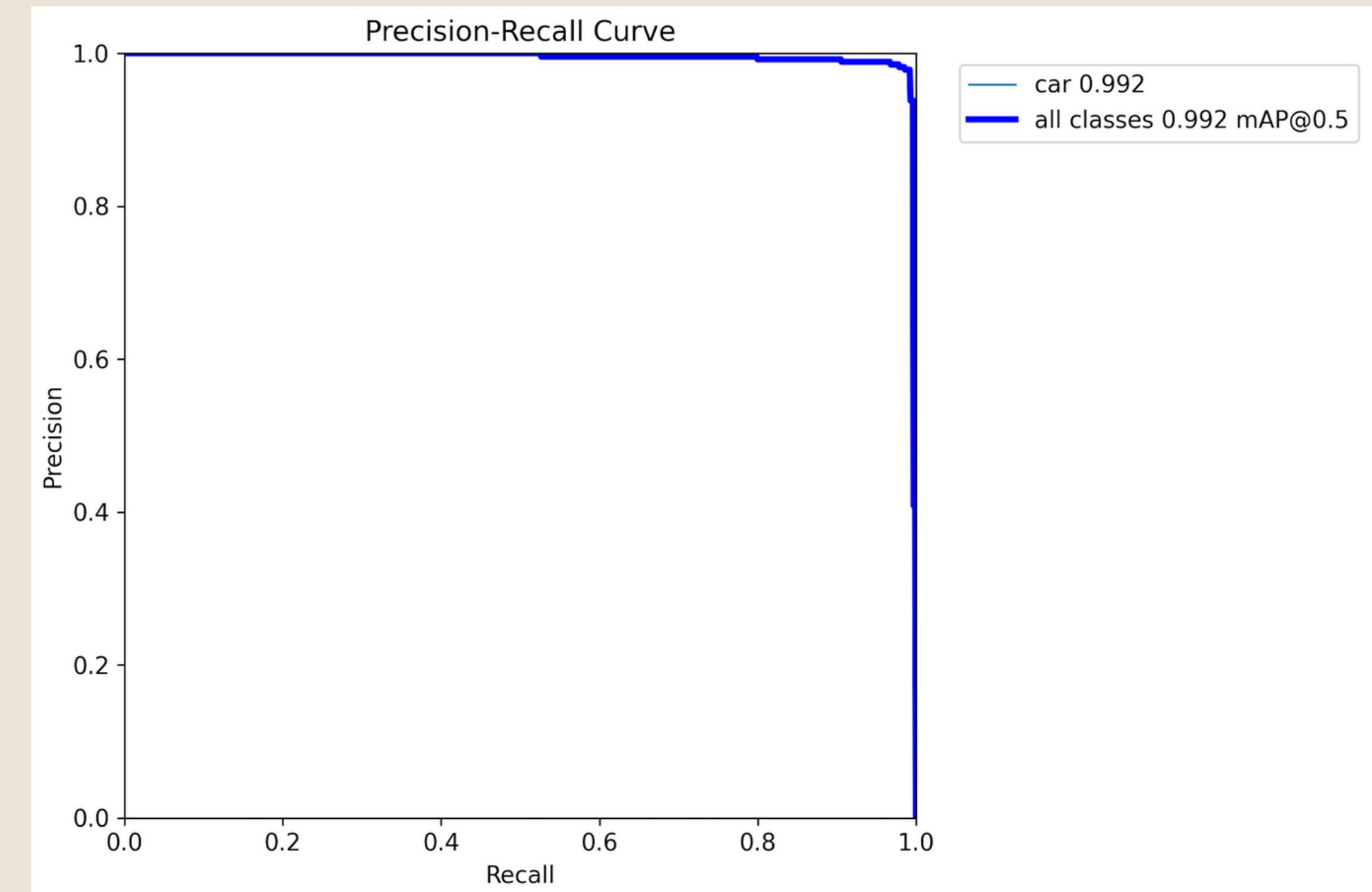


# 03.

# Modeling

Chosen metric:  
mean average  
precision (mAP)

Area under the curve  
of the precision-  
recall curve



# 03. Modeling

OVERALL YOLOV8 HAD THE BEST PERFORMANCE

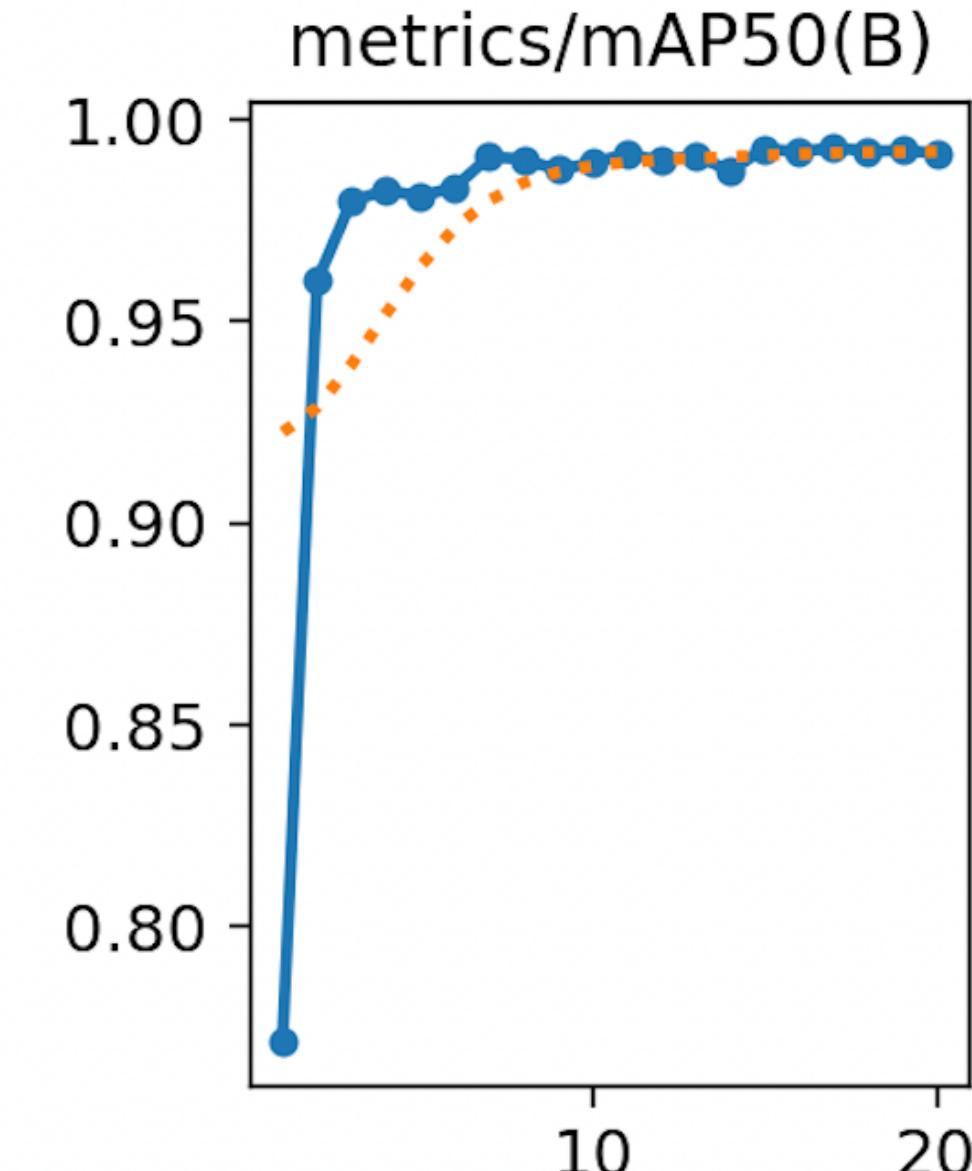
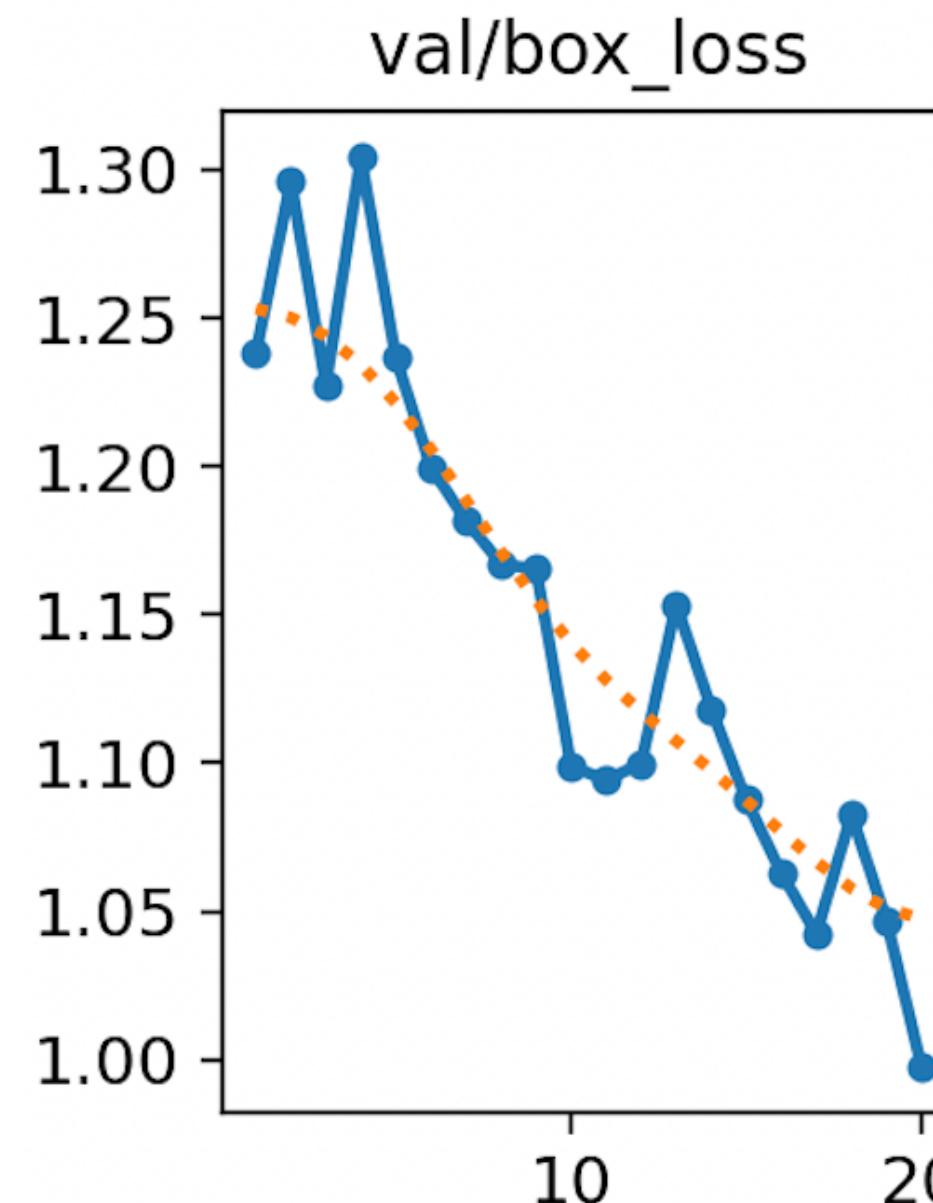
Val Metric	R-CNN	BB	YOLOv8
mAP	0.954	0.825	0.992

04.

# Results

Validation mAP = 0.992  
Test mAP = 0.963

YOLOv8

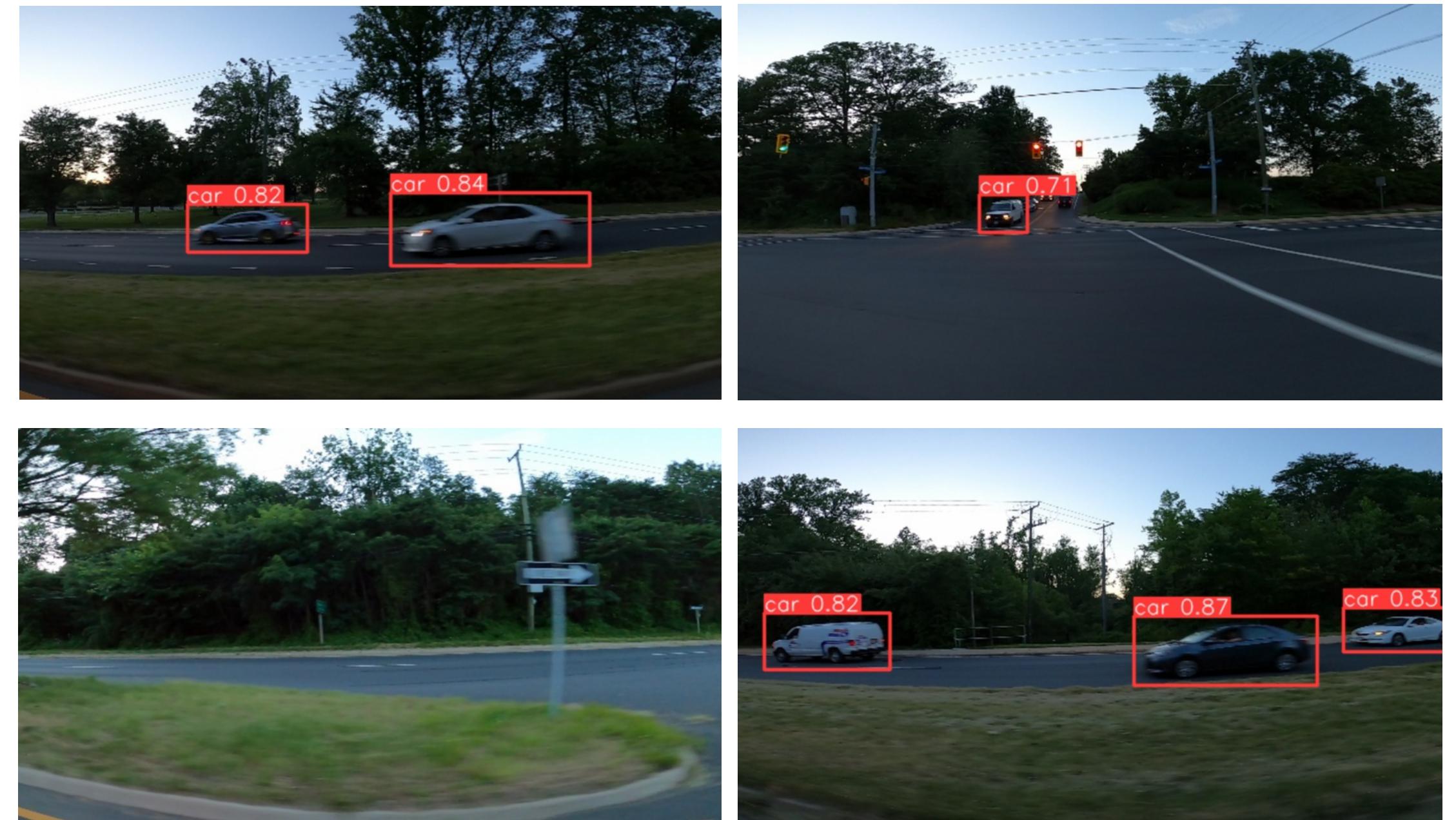


04.

# Results

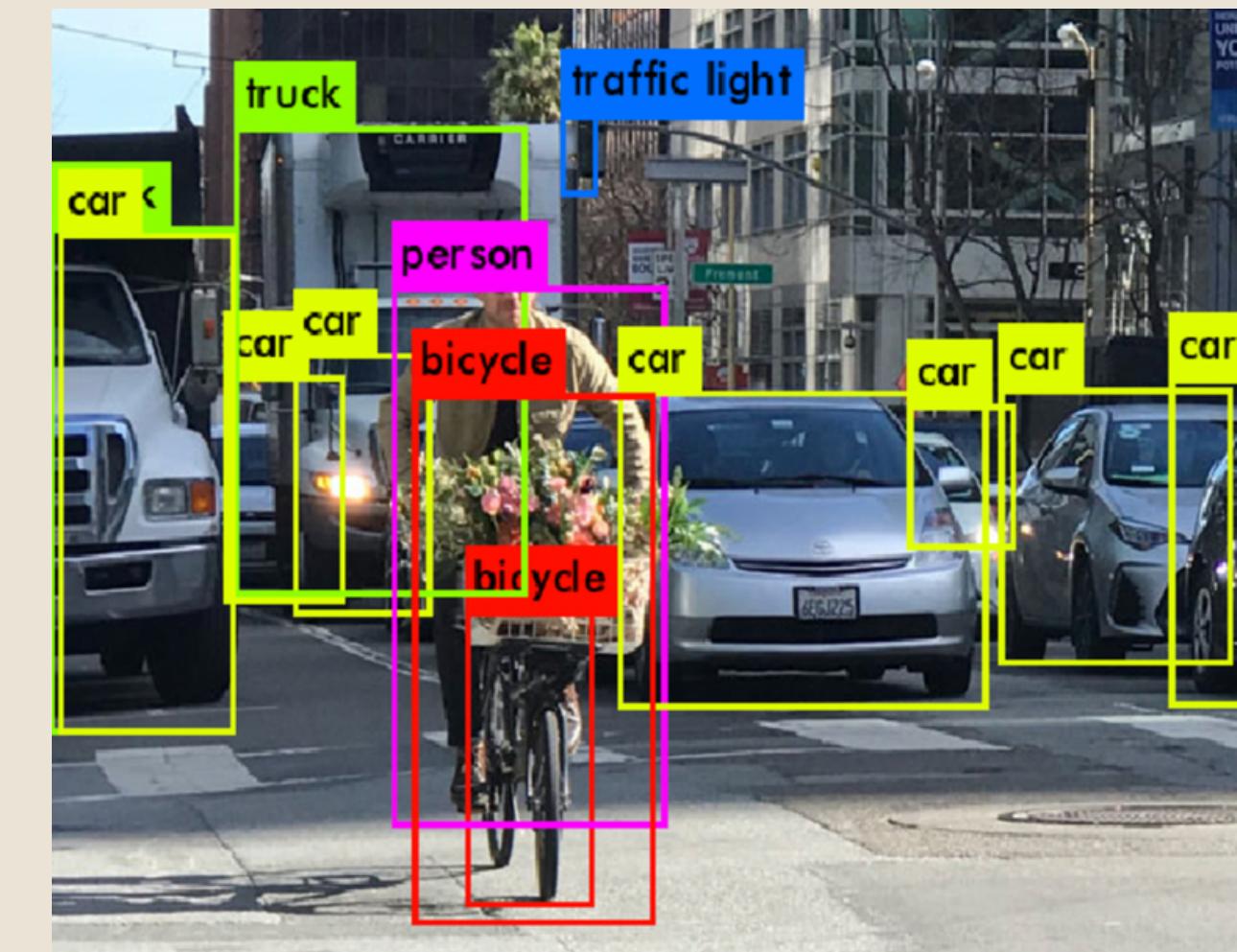
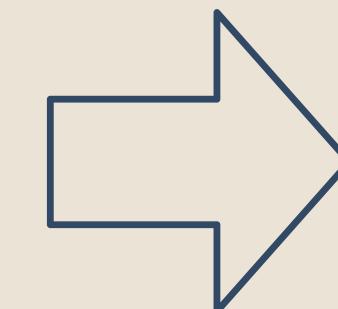
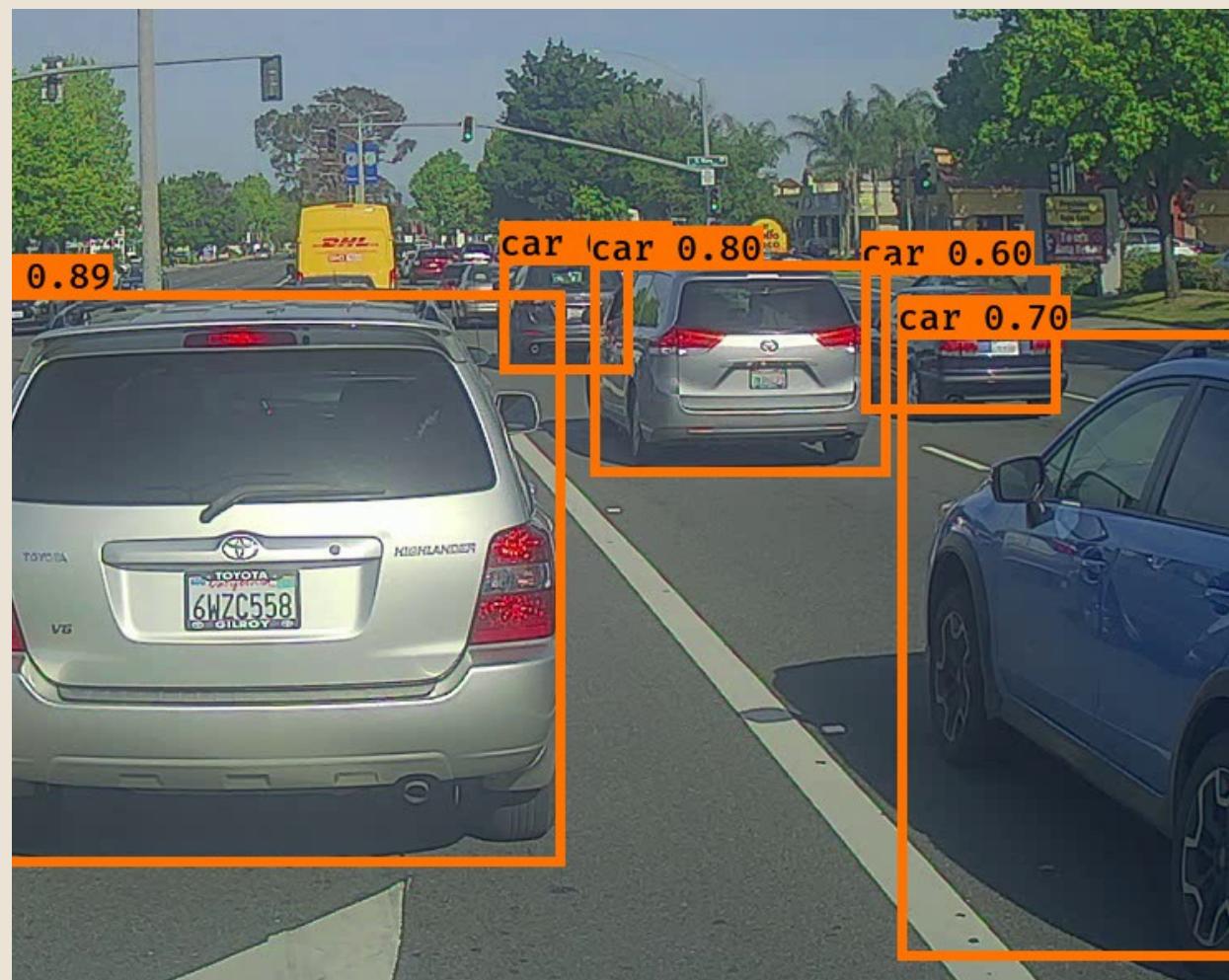
Validation mAP = 0.992  
Test mAP = 0.963

YOLOv8



# 05. Next steps

- Increase object classes (omnibus model)
- Create tangential system to calculate object velocities



# Thank you!



Feel free to contact me if  
you have any questions.



# Resource Page

Use these icons and illustrations in your  
Canva Presentation. Happy designing!

