



# TRAFFIC VEHICLE DETECTION

Real-Time Classification & Counting Using YOLOv8



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# INTRODUCTION

Problem Statement:- Detect, classify, and count vehicles (car, truck, bus, motorcycle) from traffic images.

Proposed Solution:

Leverage YOLOv8 (large) for high-accuracy object detection.

Enhance with:

- Multi-scale inference to capture varying object sizes.
- Non-Maximum Suppression (NMS) to reduce overlaps.
- Bounding box filtering for eliminating noise.



# TECHNOLOGY STACK



YOLOV8L (640X640 INPUT)

VEHICLE-TO-GRID (V2G)

GOOGLE COLAB (GPU RUNTIME)

LIBRARIES: INFERENCE, SUPERVISION, OPENCV, PYTORCH, MATPLOTLIB

- MULTI-SCALE INFERENCE (1.0X, 0.75X, 0.5X)
- NON-MAX SUPPRESSION
- AREA-BASED FILTERING



CONFIDENCE  
SCORE

0.2

CAR

WORKING

# PROJECT OUTCOME

## RESULT

- Accuracy: >90% for clearly visible vehicles
- Output: Annotated images saved in /output/
- Detection Classes: Car, Motorcycle, Truck, Bus

## CHALLENGES

- Small objects missed → Solved via multi-scale inference
- Person/false detections → Filtered using class ID logic
- Overlapping boxes → Handled with NMS
- Colab constraints → Optimized using light models + fewer images

THANK YOU

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