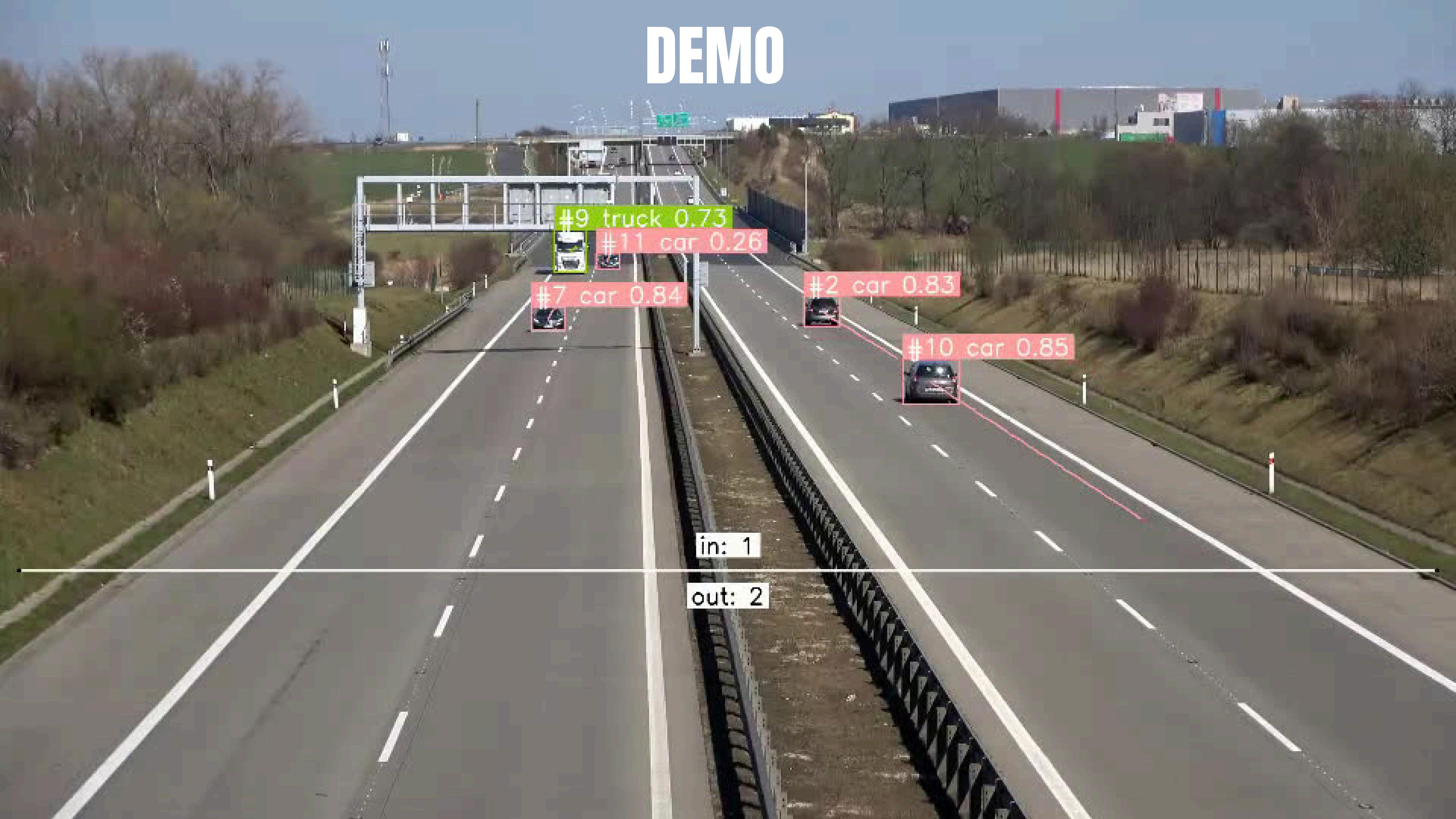




Computer_vision_project

OBJECT COUNTING AND CLASSIFICATION

DEMO



SYSTEM OVERVIEW

This system is designed to count and classify cars in real-time using advanced computer vision technology. It aims to provide accurate and scalable solutions for various applications such as:

- Traffic Monitoring and Management
- Parking Lot Management
- Automated Toll Systems





MOTIVATION

- Importance in Traffic Management
Enhances real-time monitoring and dynamic traffic control.
- Benefits for Urban Planning
Informs better infrastructure development and road network designs.
- Support for Autonomous Vehicles
Ensures safe navigation by detecting and classifying vehicles accurately.

MODELS & TOOLS USED



01

YOLOv8 Model for Object Detection .

Real-time, high-accuracy object detection.
Robust performance in diverse conditions.

02

BYTETracker for Object Tracking .

Accurate and efficient tracking of multiple objects.
Maintains object identities across frames, even in
crowded scenes.

03

Integration of Detection and Tracking

Combines the strengths of YOLOv8 and BYTETracker.
Achieves real-time performance with high accuracy
and reliability.

CHALLENGES

01

Environmental Variability:

- Lighting Conditions: Shadows, glare, night-time conditions.
- Weather Conditions: Rain, fog, snow.
- Camera Positioning: Impact on video quality and coverage.

02

High Traffic Density:

- Occlusion: Cars blocking each other.
- Overlapping Vehicles: Complications in counting.

03

Real-time Processing:

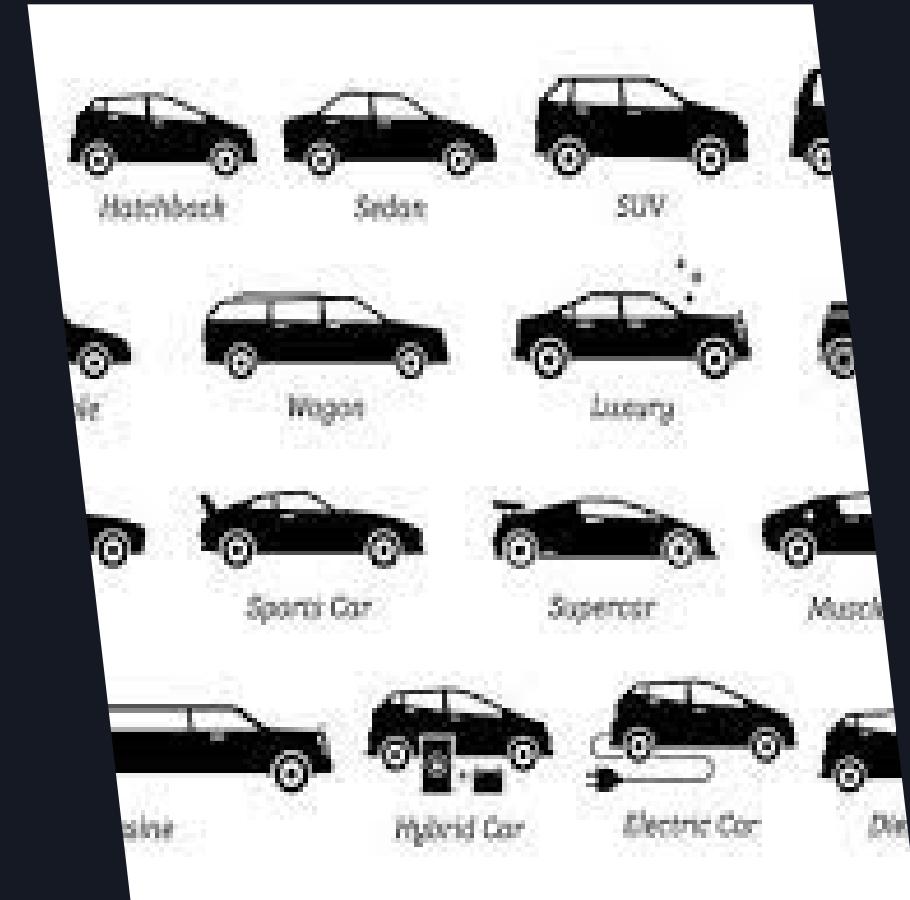
- Computational Load: High processing power requirements.
- Latency: Ensuring real-time feedback.



FUTURE WORK AND IMPROVEMENTS

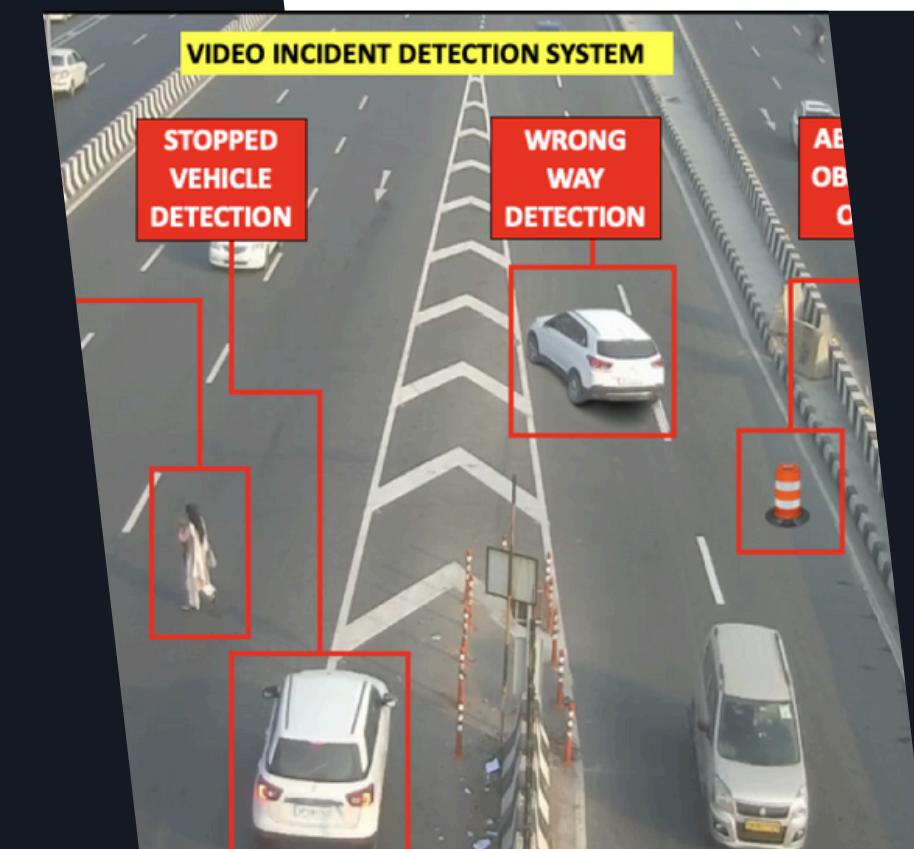
- **Enhancements :**

1. Possible improvements in model accuracy.
2. handling of different vehicle types .
3. scalability.



- **Additional Features :**

1. Real-time alerts .
2. Integration with traffic systems .





THANK YOU