

AVS

Autonomous Vehicle Simulation

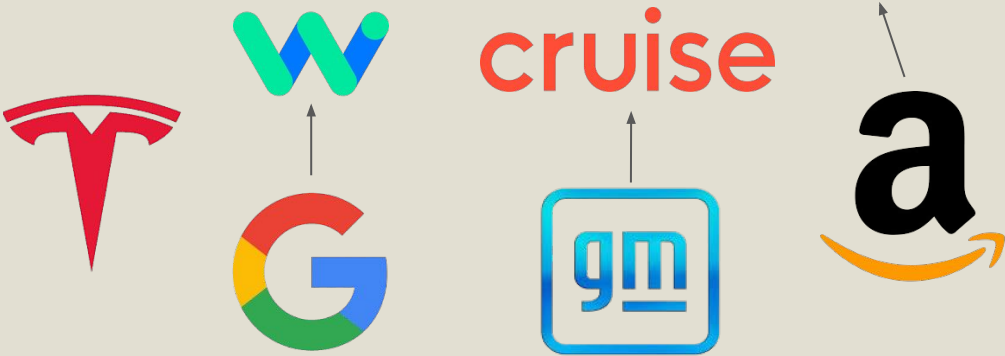


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<https://github.com/LaithBohsali/AVS>

WHO WE ARE



Sami Melhem
ADSC Projects Officer / PM

Class: Junior
Major: Computer Science
Emphasis Area: Data Science

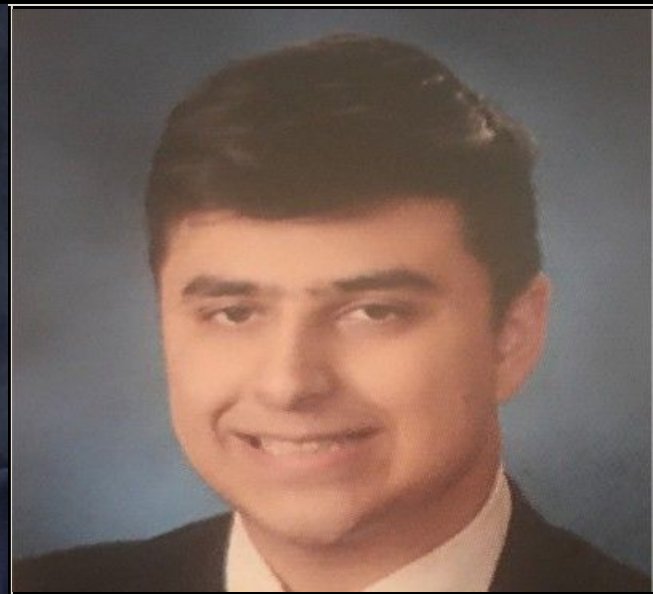
Machine Learning Team Lead



Laith Bohsali
PM

Class: Junior
Major: Computer Science
Minor: Statistics

Data Analytics Team Lead



Arjun Som
PM

Class: Senior
Major: Computer Science
Minor: Mechanical Engineering

Automobile Functionality Team Lead

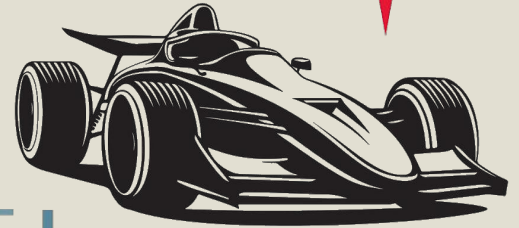
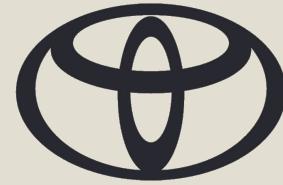
PROJECT OVERVIEW



"Develop autonomous vehicles in CARLA for vehicle navigation, sensor integration, and decision-making."

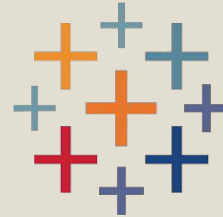
1. Automobile Functionality Team

- a. 3 Vehicles: Toyota, Tesla, and F1 Car
- b. Camera/LiDAR Sensor Integration
- c. CARLA, Unreal Engine, Blender, OpenCV



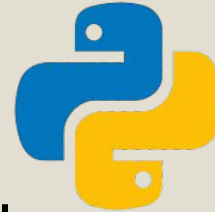
2. Data Analytics Team

- a. Navigation Algorithms: A*, RRT, IDA
- b. Tableau Visualizations
- c. Python, Pandas, Excel



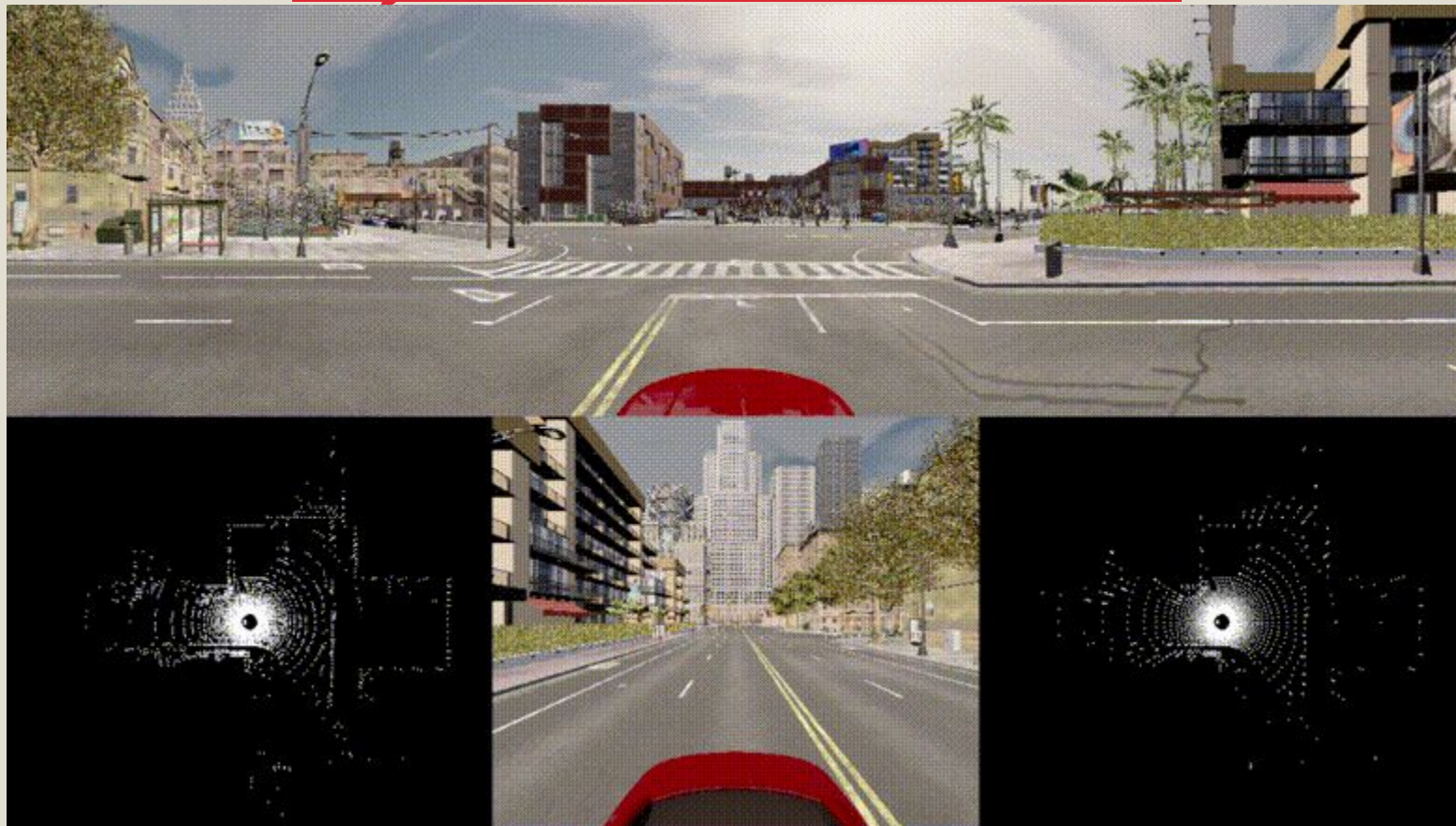
3. Machine Learning Team

- a. Decision-Making ML models (CNNs)
- b. YOLO, SSD, Faster R-CNN, Mask R-CNN
- c. Python, PyTorch, Excel



RECORDED DEMO

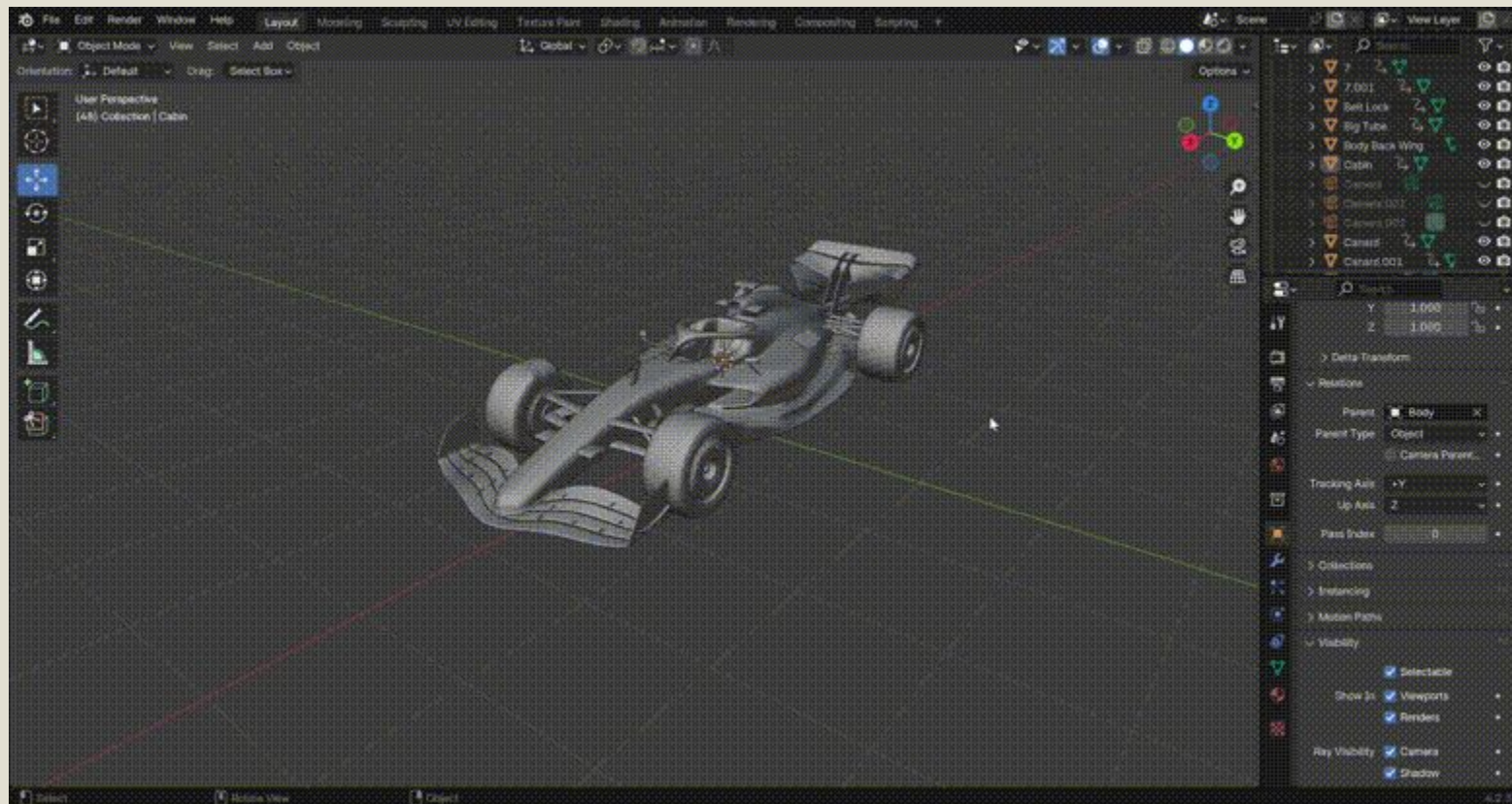
Toyota with LiDAR Sensor



Tesla Cybertruck



F1 Car with Cameras



RESULTS

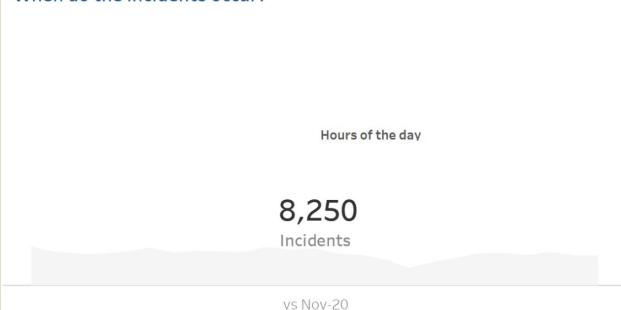
Results

Executive Summary

Current Period vs Reference

Current Month vs Previous Month

When do the incidents occur?



What are the most common Incidents?

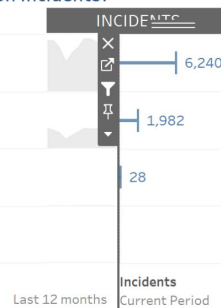
Top Report Types

Property Damage Crash

Injury Crash

Fatal Crash

No Damage



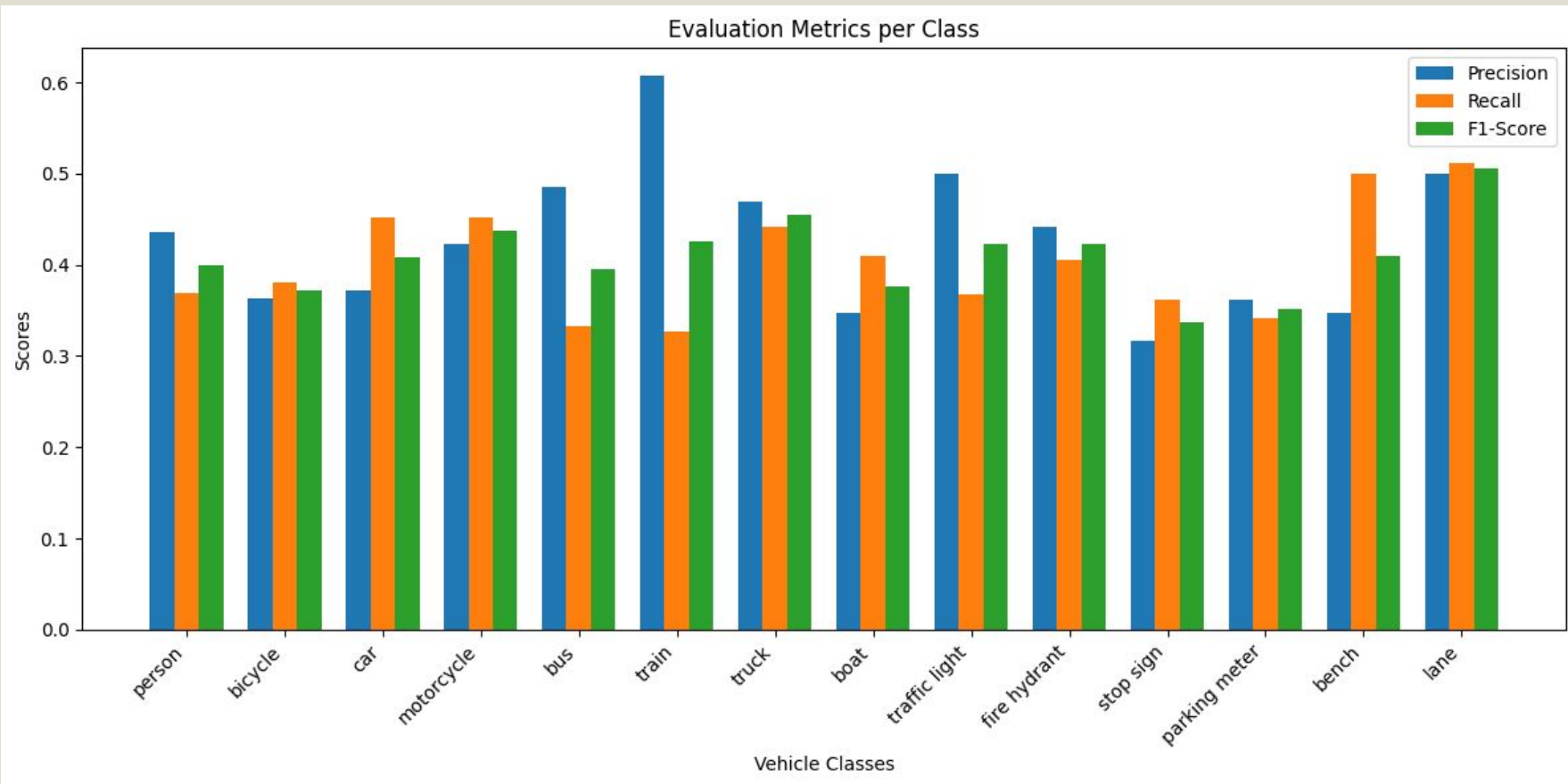
Incident Details

Report No Crash Type Date/Time State Agency

AA0040003H	Head On Left Turn	Injury Crash	17-Dec-.. 7 PM	MD	ABERDEEN
AA0086001J	Same Movement Angle	Injury Crash	18-Nov-.. 3 PM	MD	ABERDEEN
AA0095001G	Same Movement Angle	Property Damage Crash	10-Dec-.. 5 AM	MD	ABERDEEN
AA0095001H	Same Movement Angle	Property Damage Crash	17-Dec-.. 2 PM	MD	ABERDEEN
AA0123003P	Head On Left Turn	Injury Crash	30-Dec-.. 8 PM	MD	ABERDEEN
AA0124001X	Single Vehicle	Injury Crash	02-Nov-.. 1 AM	MD	ABERDEEN
AA0130001K	Other	Property Damage Crash	05-Dec-.. 4 PM	MD	ABERDEEN
AA0132003R	Opposite Direction Both Left Turn	Injury Crash	17-Nov-.. 12 PM	MD	ABERDEEN
AA0134003D	Other	Property Damage Crash	13-Nov-.. 8 PM	MD	ABERDEEN
AA0134003F	Same Movement Angle	Injury Crash	14-Nov-.. 3 AM	MD	ABERDEEN
AA0134003G	Other	Injury Crash	14-Nov-.. 10 PM	MD	ABERDEEN

- General overview of data
- Some information is synthesized to appear more realistic

Results



THANK YOU

Please feel free to ask
any questions,
compliments, or
concerns.