

# TJA4

## Software Engineering CSE 435 Michigan State University Fall 2022

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# Project Overview

Traffic Jam Assist (TJA) is an extension of current Adaptive Cruise Control (ACC) systems



Minimize frustration while stuck in traffic



Alleviate driver fatigue on Limited Access Highways



Mitigate driver error during bumper to bumper traffic



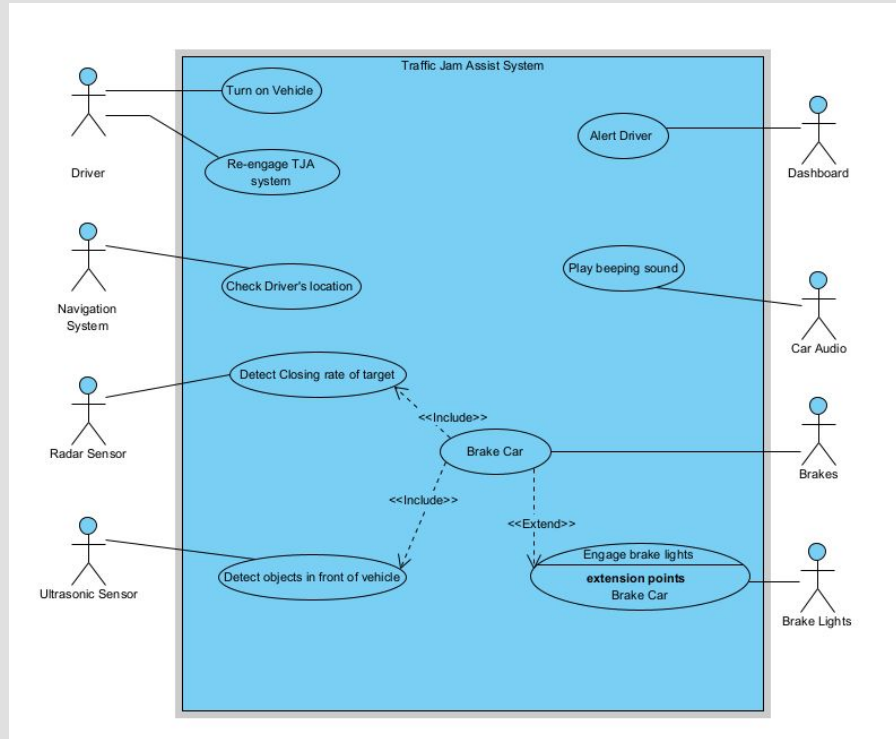
# Overview of Features

- Maintain set distance from target vehicle
- Match speed of surrounding vehicles in slow traffic
- Alert driver when sensors are obstructed
- Allow for driver override
- Prevent unauthorized access to the system

# Domain Research

- Investigated automotive vehicles with similar embedded features – Automatic Cruise Control and Traffic Jam Assist
- Applied improved hardware, software, and security requirements
- Project Constraints
  - Driving on other roads besides limited access highways
  - Poor weather conditions
  - Be active only if ACC is active
  - TJA set speed cannot exceed 35 mph

# Part II: Model-based View of System

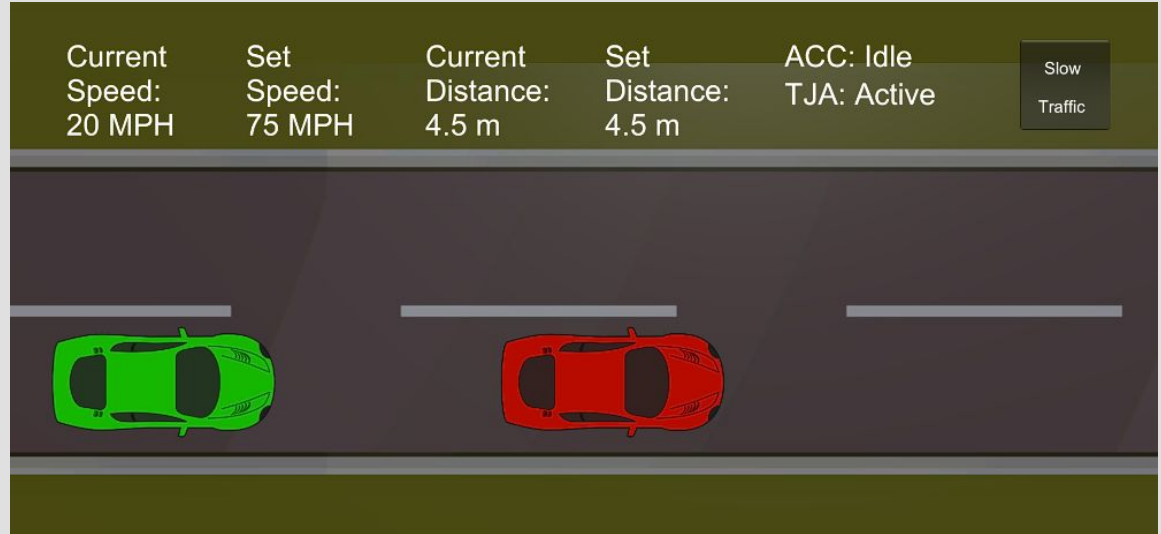


# Part III: Demonstration

- The prototype interface displays a top-down view of the driver's vehicle and the target vehicle
- Sample scenarios
  - When target vehicle slows down, the driver's vehicle also slows down
  - When surrounding vehicles move above 35 mph, TJA is disabled
  - When vehicle is stopped for more than 30 seconds, the driver must re-engage the TJA system

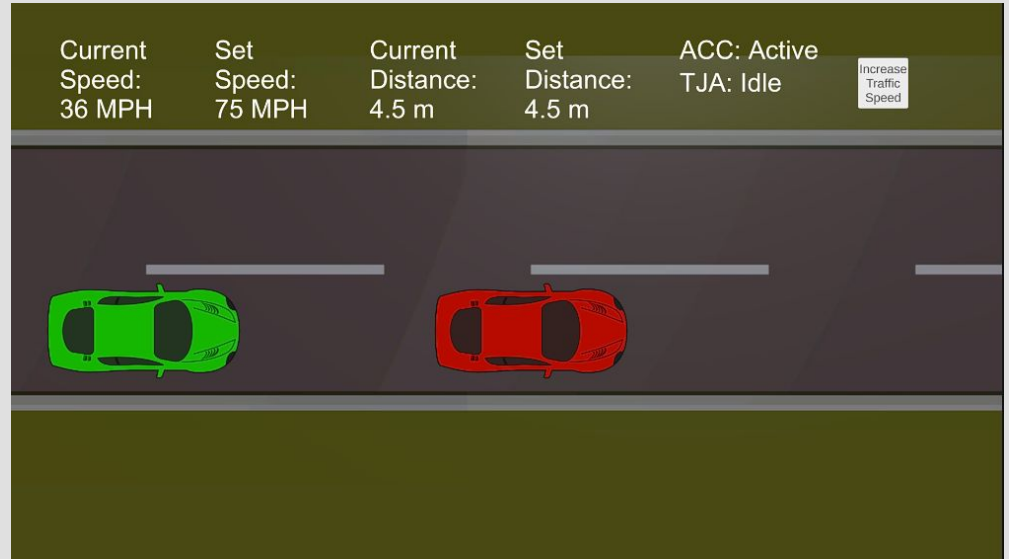
# Sample Scenario 1

- The driver's vehicle was at the set distance from the target vehicle moving at the same speed, and the target vehicle slows down, thus the user vehicle must slow down as well.



# Sample Scenario 2

- When detected vehicles are moving above 35 mph (approx. 56.3 km/h), the TJA system is disabled within 0.5 seconds.

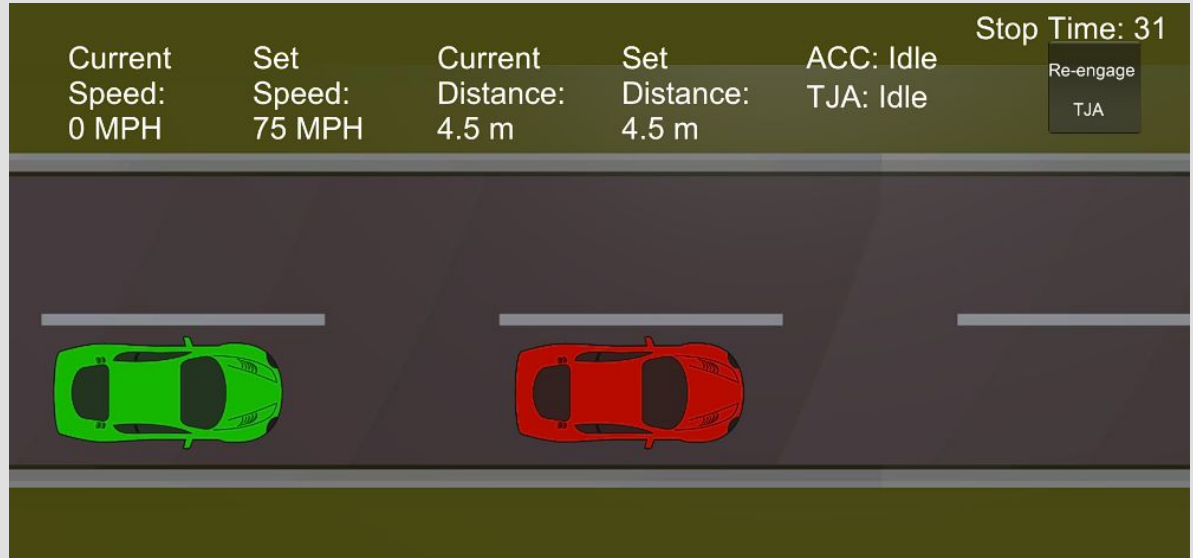




# Sample Scenario 3

Vehicle has been stopped for more than 30 seconds and the driver must re-engage the TJA system.

After re-engaging the vehicle will start moving again if traffic moves.



# Acknowledgements

- We gratefully acknowledge and appreciate the participation of our customer, **Mr. William Milam** from **Wmilam Consulting LLC**

