



HONDA

MOBILITY HACKS

Travel for Safety and Comfort - Virtual Manager

iHack (Team 6)

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1

Motivation:
Demands for safety
and comfort

Obstacles in current driving

Static obstacles & Dynamic obstacles

Autonomous Driving	V2I	V2V
Vehicle to environment	Vehicle to Road	Vehicle to Truck



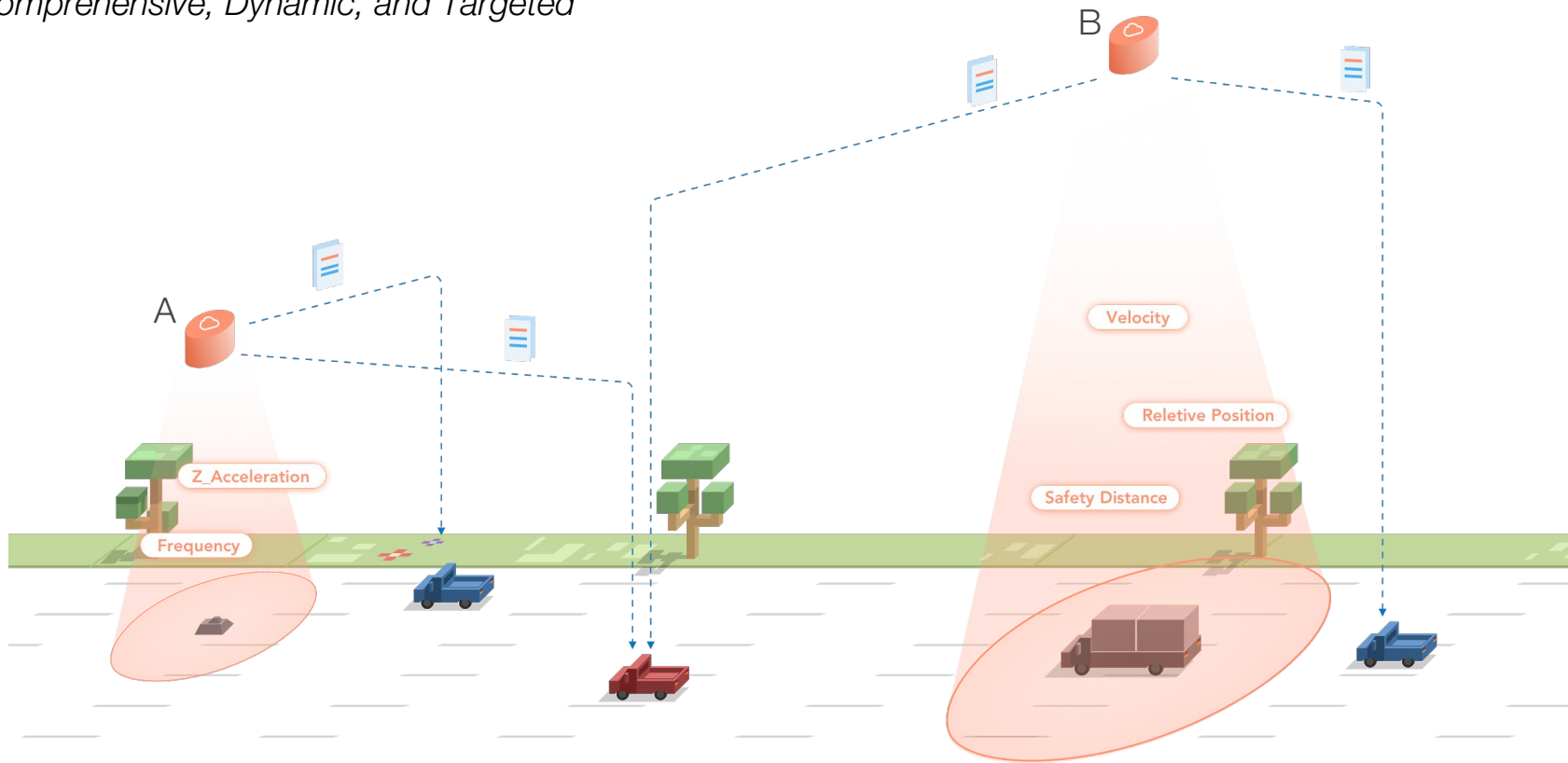


2

Solution:
Framework

“Virtual Manager”

Comprehensive, Dynamic, and Targeted



Static Obstacle 'Virtual Manager'

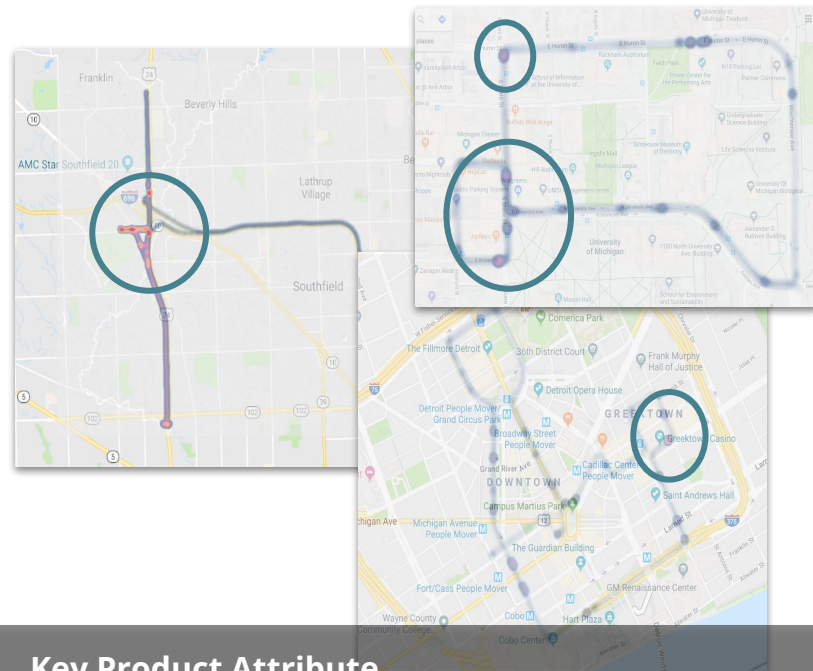
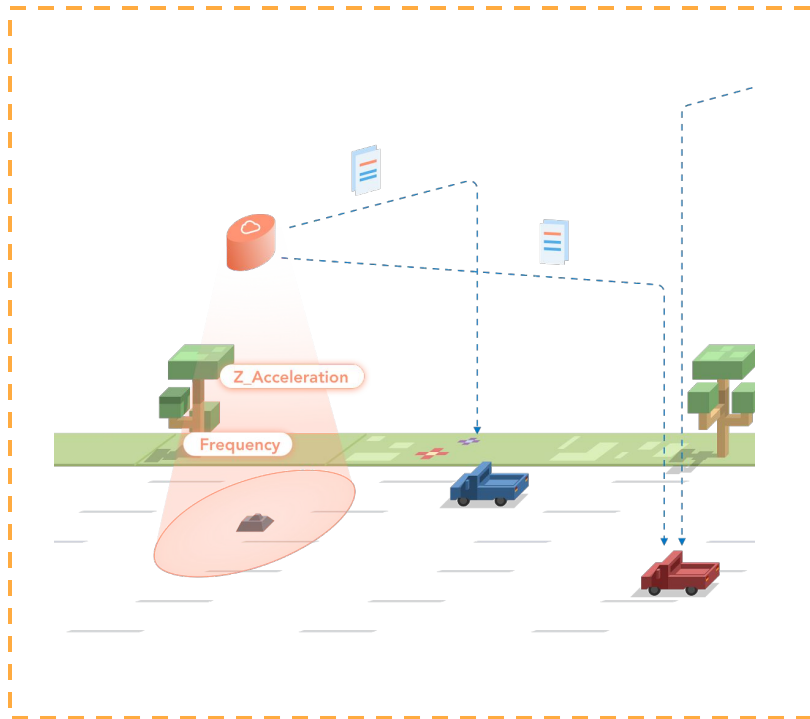
Scenario Declaration

Scenario 1.0 Pothole

There is a coming pothole in the driving path

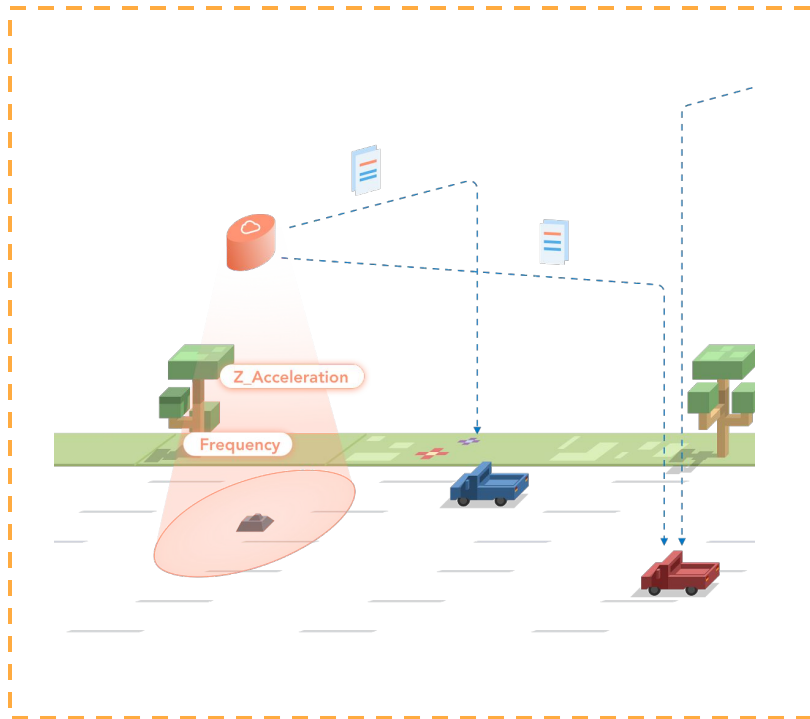
Tech Framework

Static Obstacle



Tech Framework

Static Obstacle

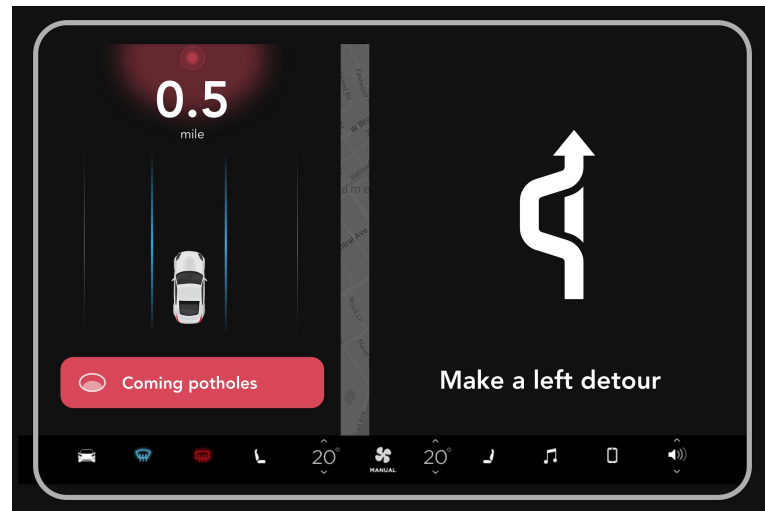
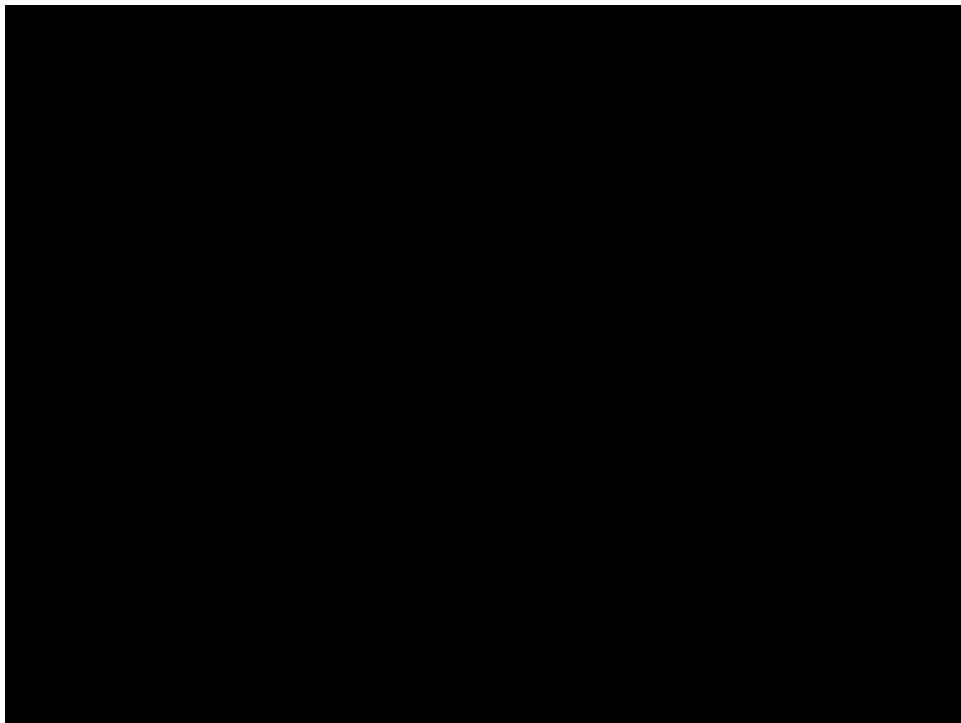


Process Flow of Virtual Manager:

1. Records trajectories of passing vehicles
2. Records IMU measurements of passing vehicles and estimates passenger comfortness
3. Discretize trajectories (x, y, v) , and cluster trajectories using unsupervised machine learning method (Hierarchical Clustering)
4. Estimate comfortness of each cluster
5. Recover recommended trajectory from most comfort cluster
6. Recommend driving behavior

Static Obstacle 'Virtual Manager'

Demo



obstacle



Pre-passing
Vehicles



Vehicle with
virtual manager

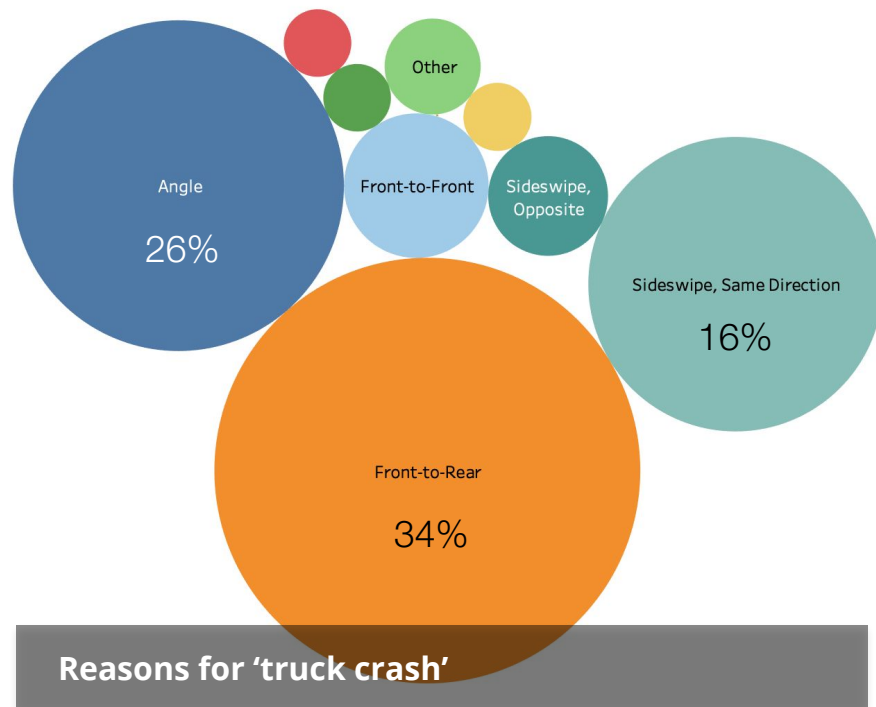
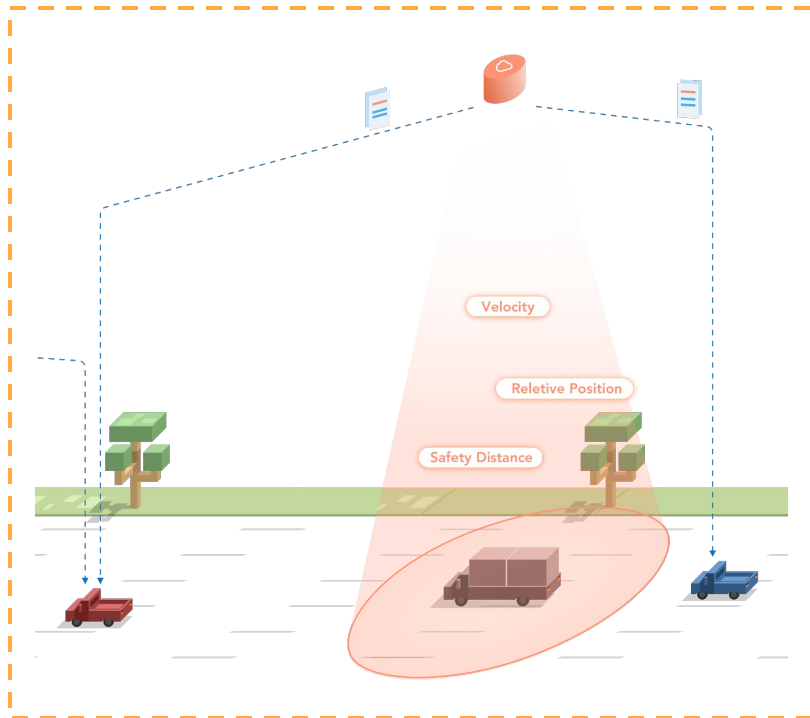
Static Obstacle ‘Virtual Manager’

Scenario Declaration

Scenario 2.0 Truck

Tech Framework

Dynamic Obstacle

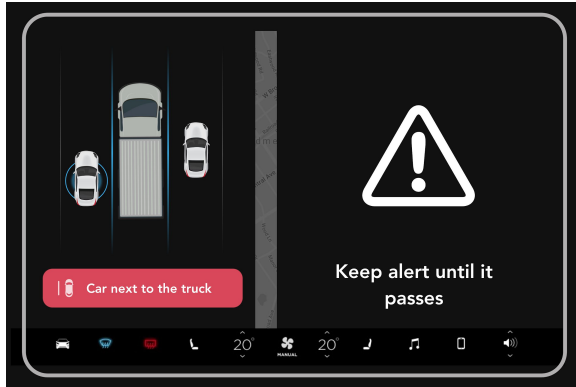


Dynamic Obstacle ‘Virtual Manager’

Scenario Declaration

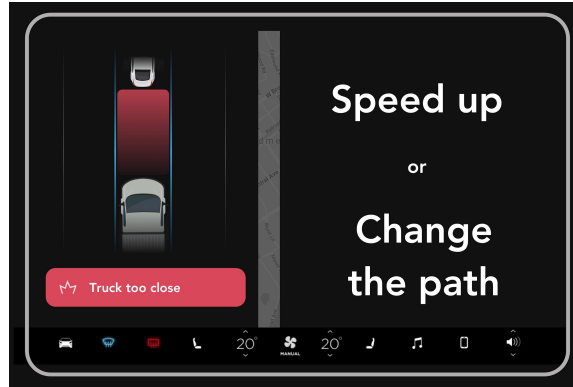
Case 1

There is a car next to the other side of the truck.



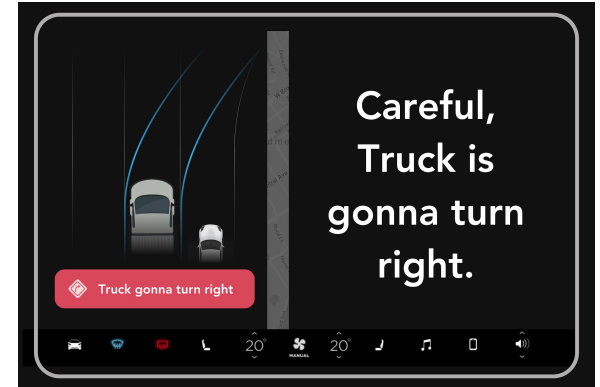
Case 2

Your car is in front of the truck, within the calculated the safety distance.



Case 3

A truck and you are both going to take a right turn.





3

Long-Term Impact: Customer Value & Social Impact

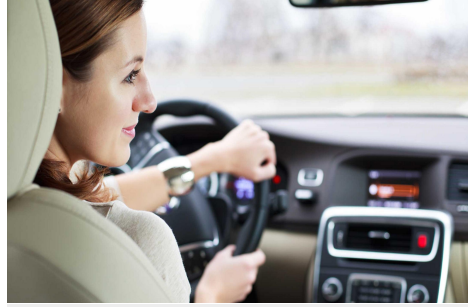
Long-Term Impact

Customer & Society



Road Safety

Protect drivers from both static and dynamic obstacles.



Comfort Transportation

Provide users intelligent recommendations of driving routes and decisions



Path Monitoring

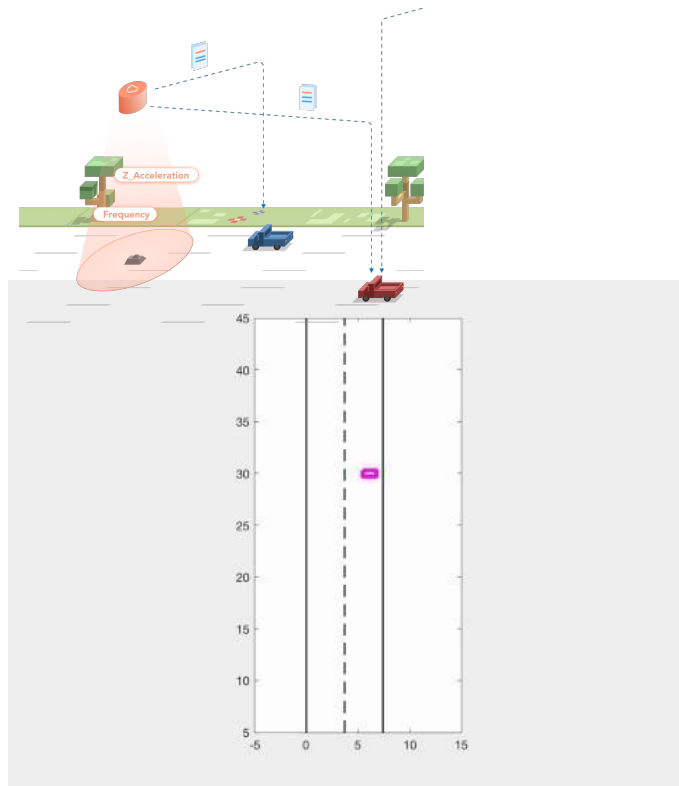
Able to monitor the road situations especially in blind spot



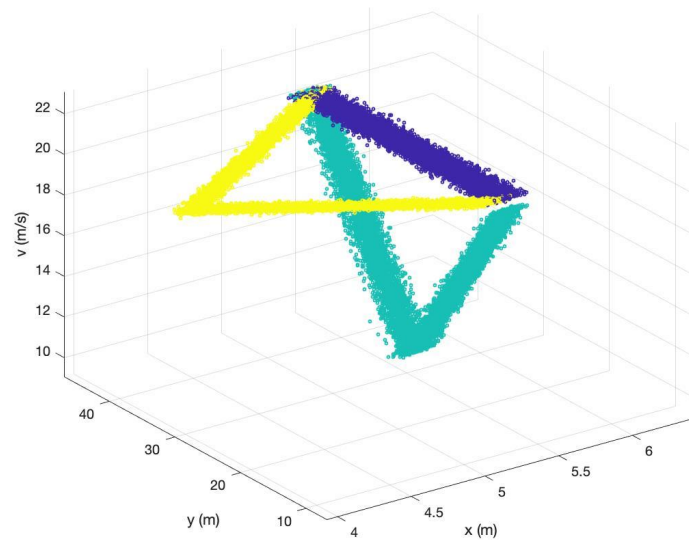
Questions?

Tech Framework - Backup

Static Obstacle



Trajectory Clustering



A Day of Mr. A

Static Obstacle



Industry

Consumer

Analysis

Product

Long-Term

A Day of Mr. A

Dynamic Obstacle



Industry

Consumer

Analysis

Product

Long-Term