

RoadSense

Edge-AI Predictive Brake Alert System,
Leveraging V2V Mesh Communications

Amit Resh, Yigal Hoffner, Dean Itzhak, Tomer Ifargan, Shir Amar

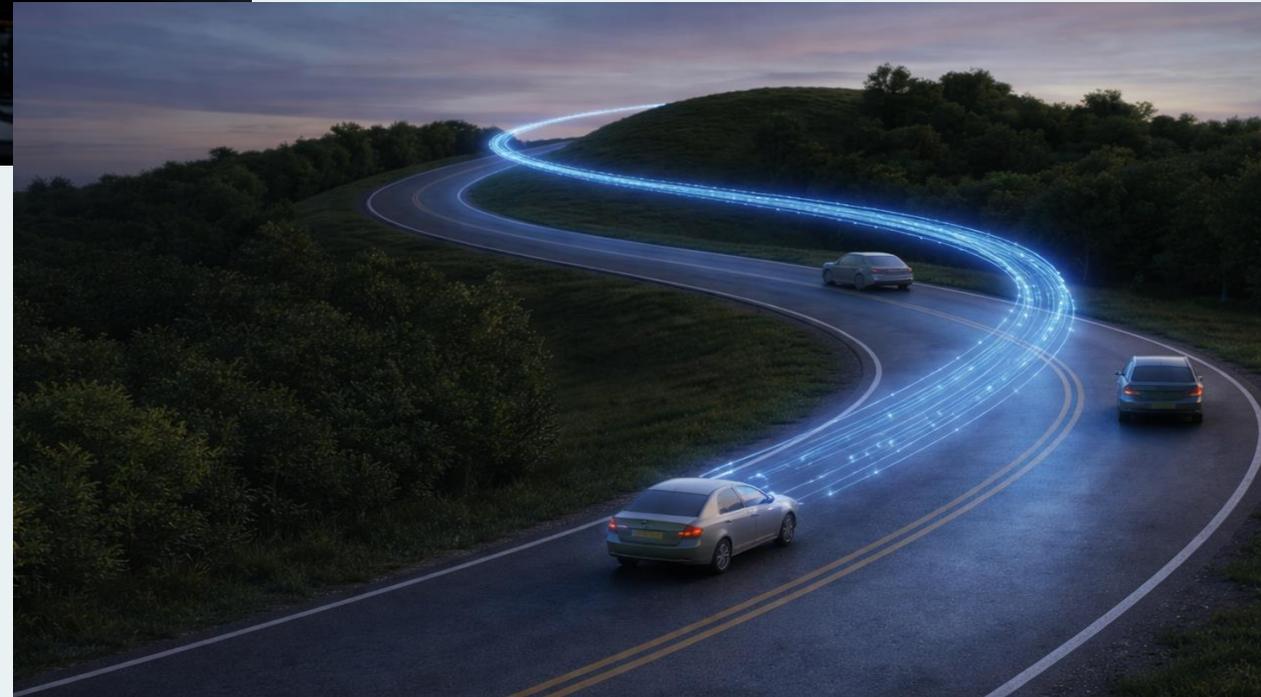
Dept. of Computer Engineering
Shenkar - Engineering. Design. Art.
Ramat-Gan, Israel

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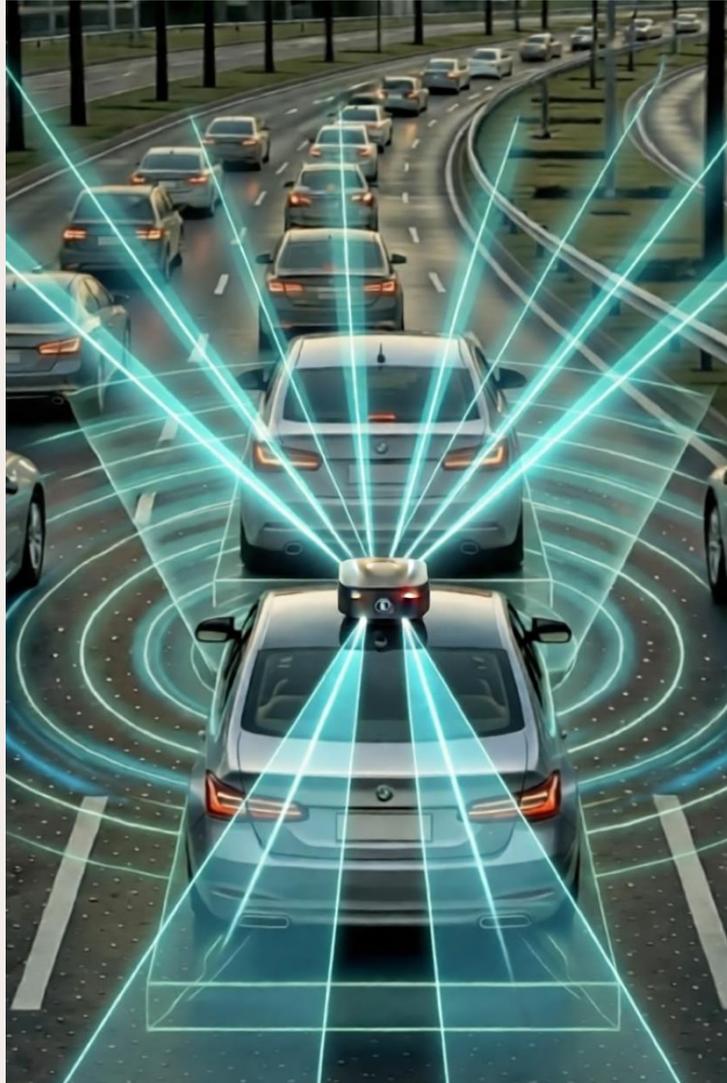
Weather Conditions Limit Field-of-View



Curves and Roadside Obstacles Block Sightlines



Existing Sensors in Modern Vehicles



Advanced Sensors:

- **Cameras**
- **LiDar**
- **Radar**
- **Proximity Sensors**

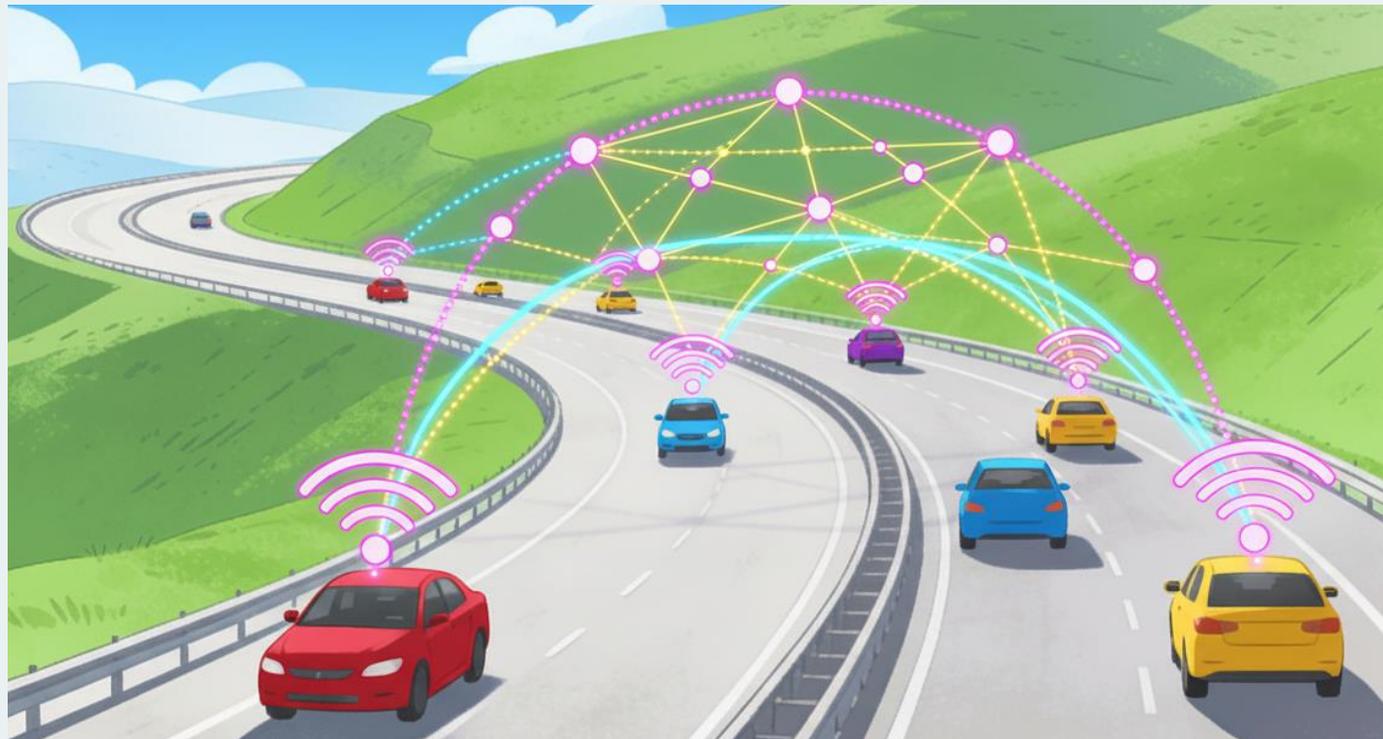
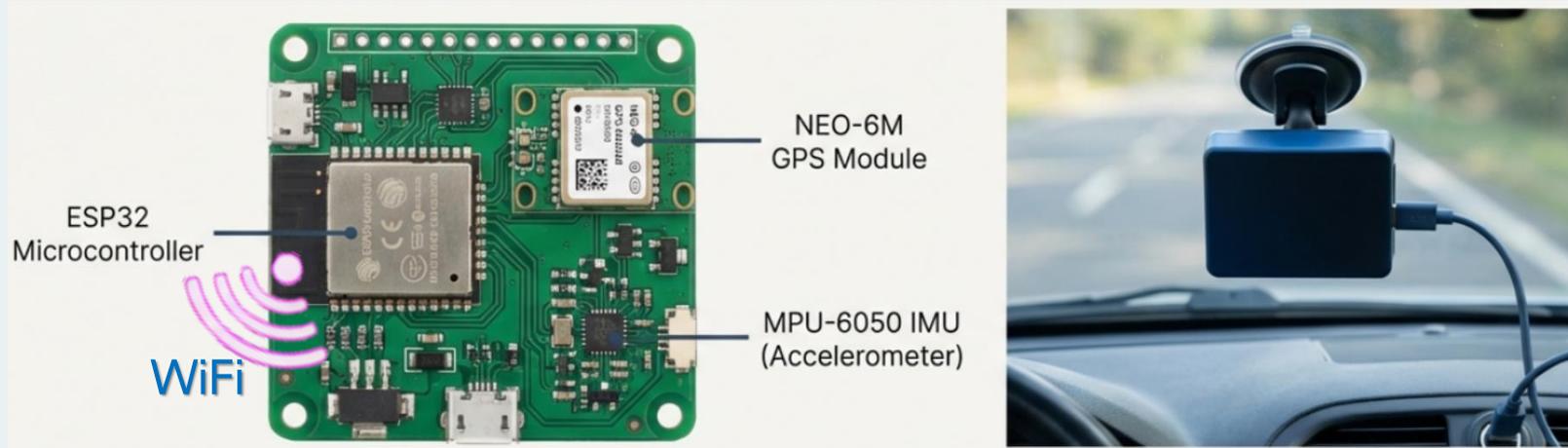
➔ **All bound by Line-of-Sight**

Research Goals

- **Extending Detection Range, beyond line-of-sight**
- **Real-time AI-assisted Environmental Awareness**

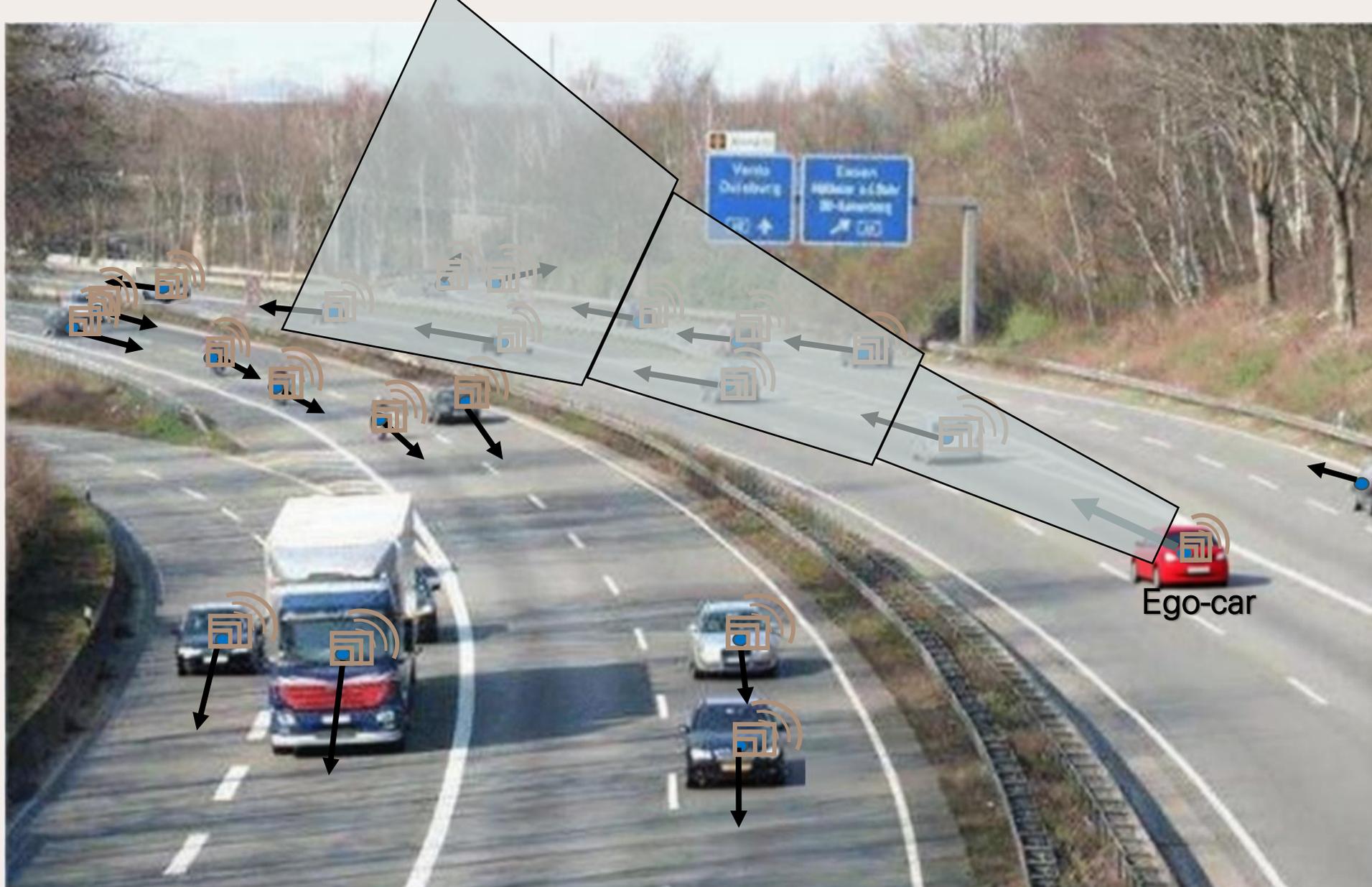
→ Ultimately issue Brake-Alerts

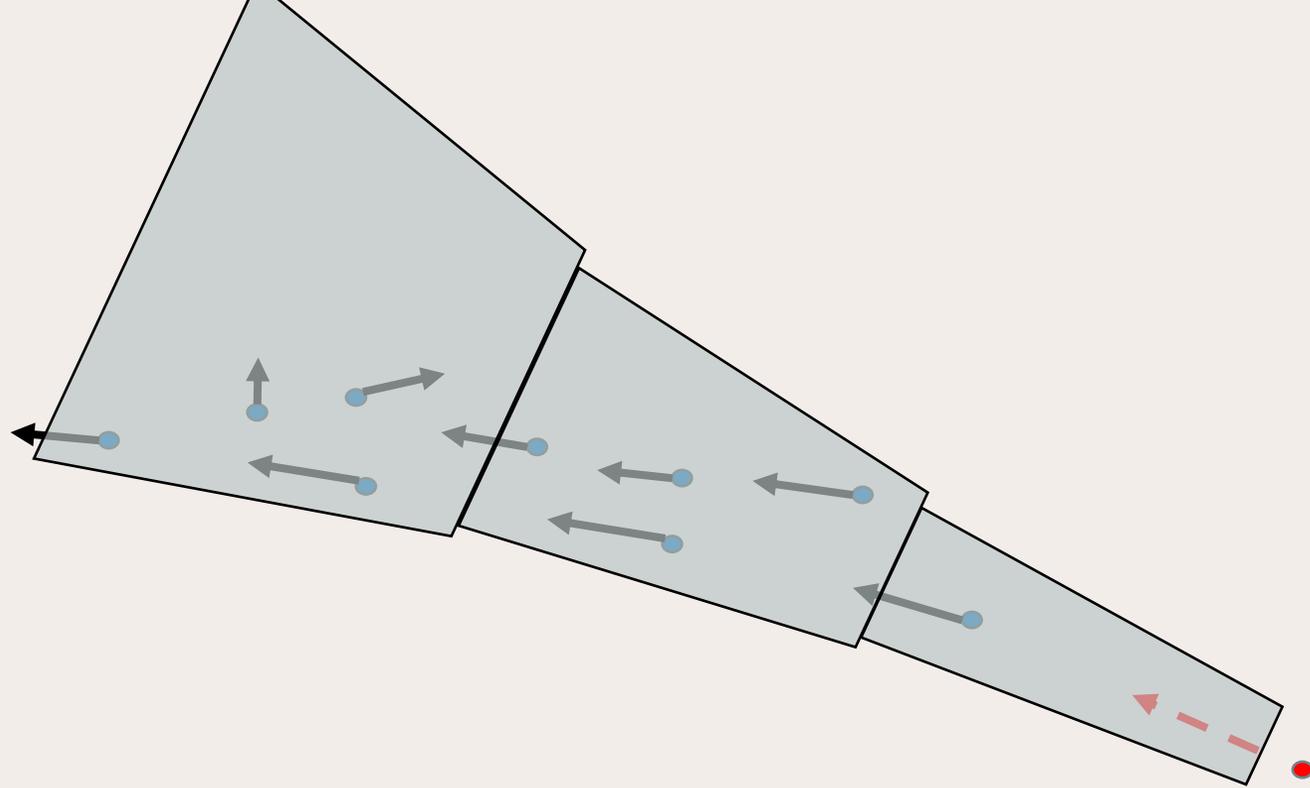
Basic Sensors; Low-Cost Hardware; Mesh Communications



Each car transmits:

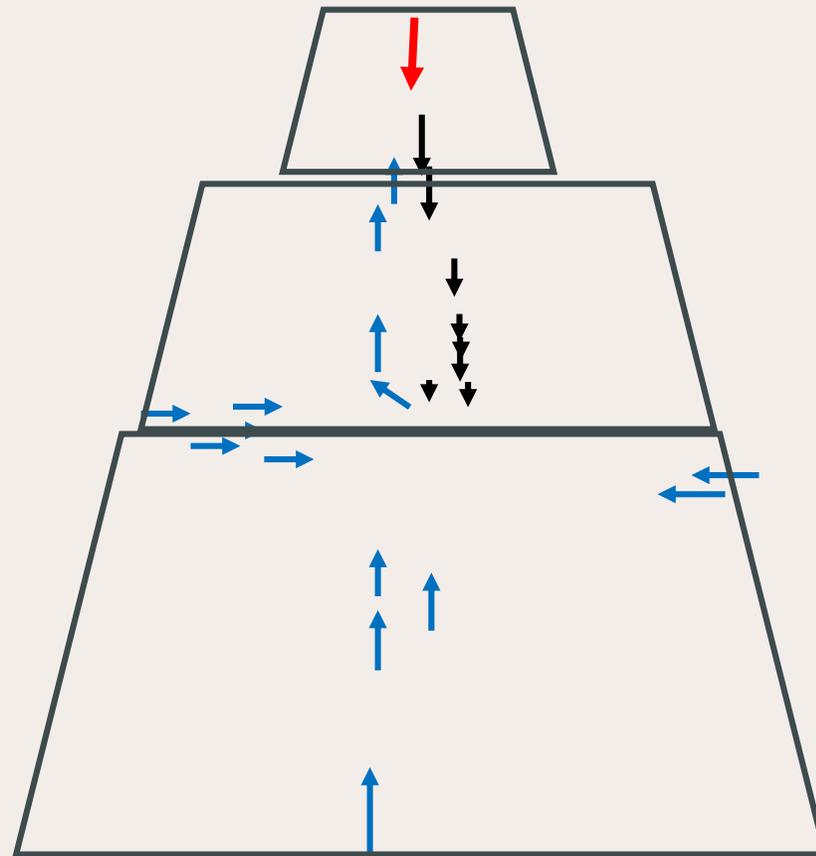
- UID
- GPS Position
- Velocity
- Acceleration /
Deceleration
- Direction (Azimuth)





Intersection

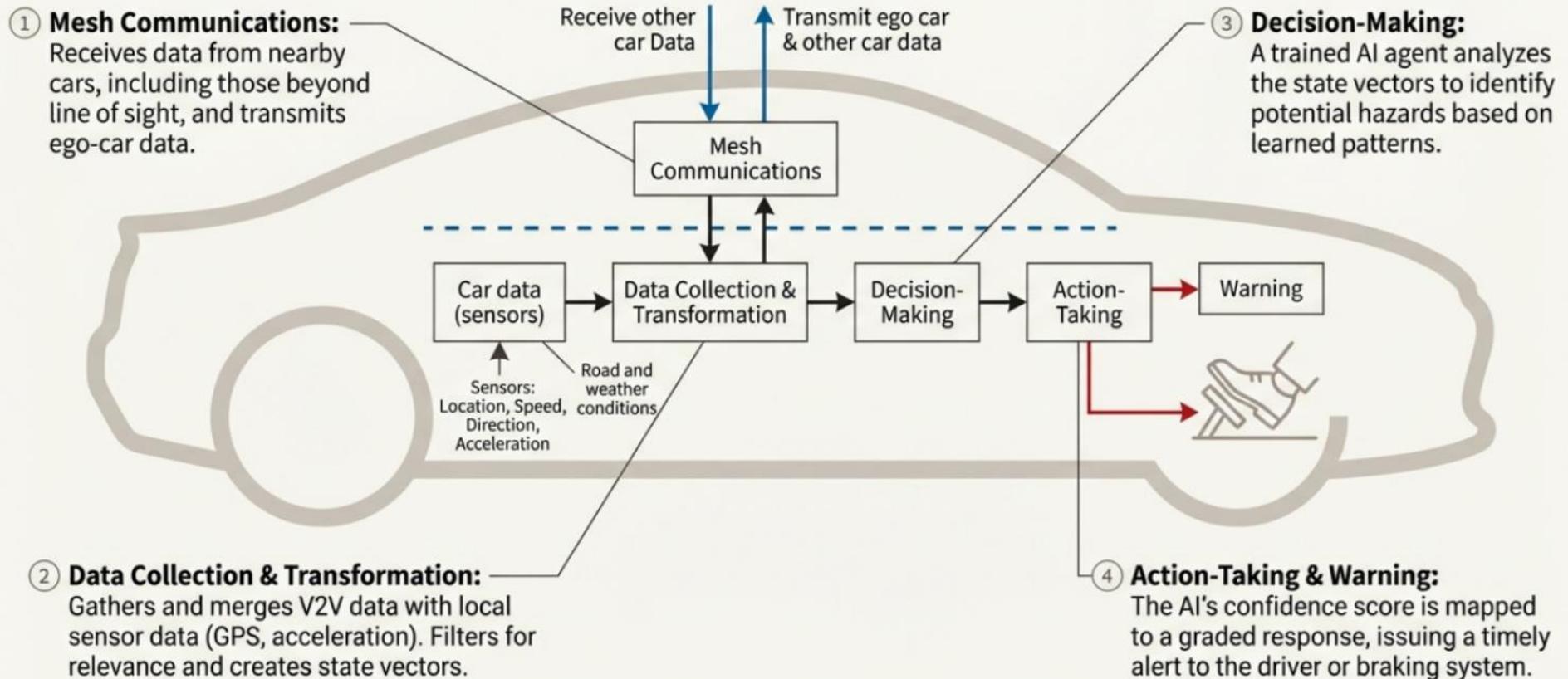




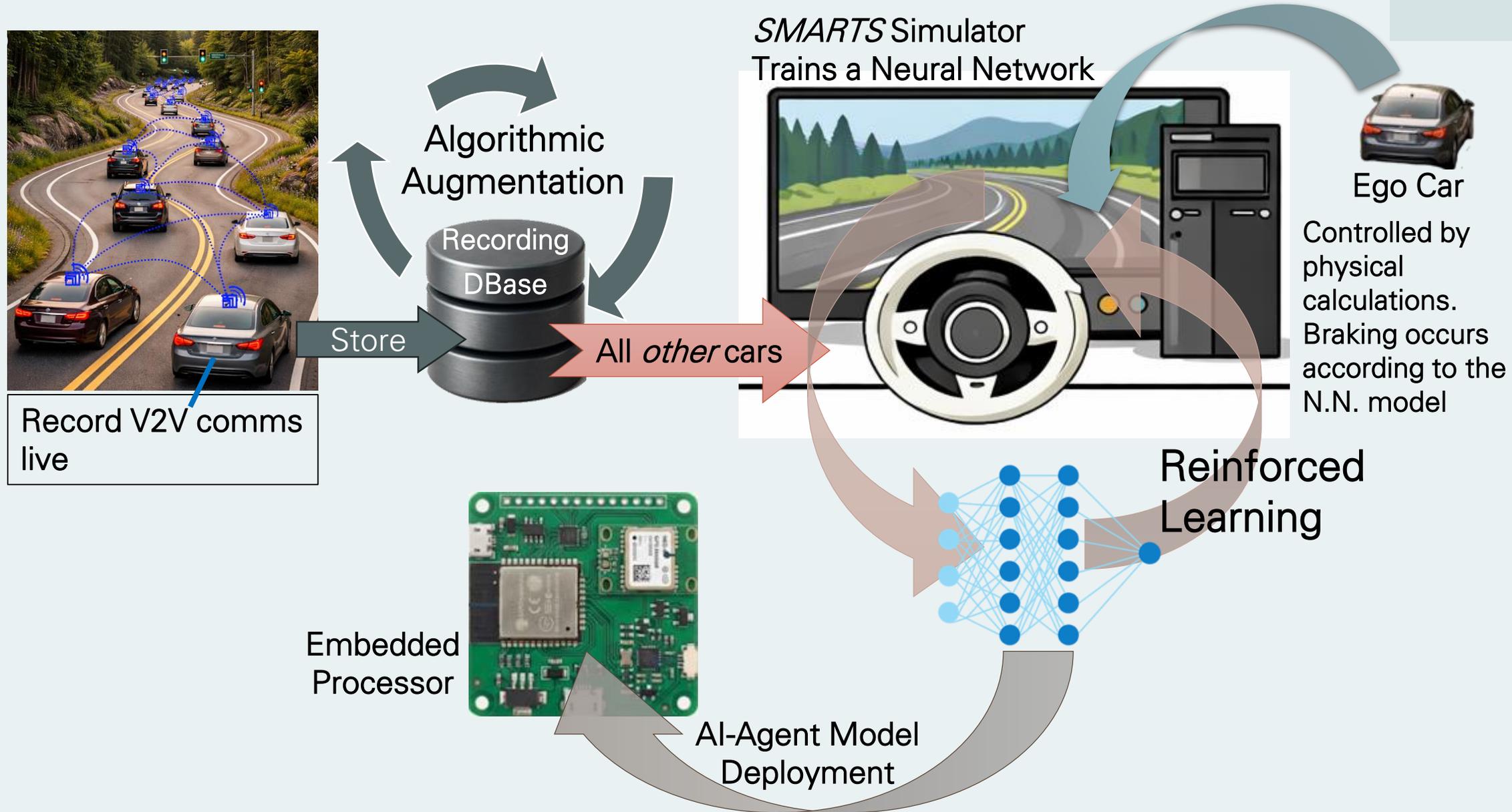
Extending Perception Beyond Line-of-Sight



The Onboard System: From Raw Data to Driver Alert



AI Agent Training and Deployment



Future Work

- **Add Sensors**
- **Enhance Scenario Augmentation**
- **Modify the AI model to use permutation-invariant set encoding with pooling or attention mechanisms**

Thank
you

Amit Resh

Shenkar - Engineering. Design. Art.

Ramat-Gan, Israel

amit.resh@shenkar.ac.il