



# Linking2Source: Security of In-Vehicle Networks via Source Identification

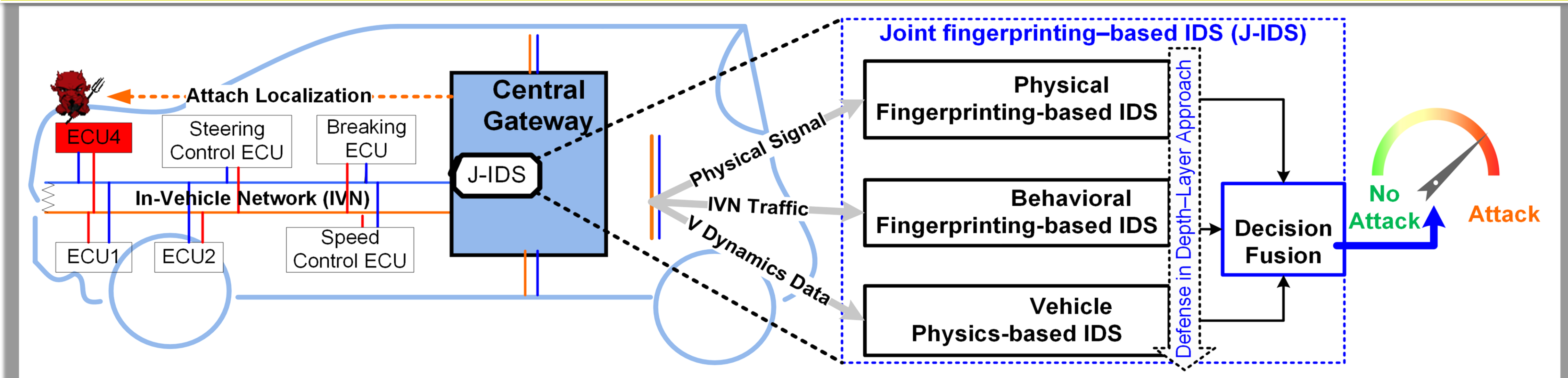


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<https://issf.umd.umich.edu/projects/vehicular-security>

The goal of this project is to develop a robust and reliable framework to safeguard against attacks at different points through a multi-layered framework- Linking2Source (L2S). Each layer of L2S aims at neutralizing cyberattacks on in-vehicle networks by breaking some critical links in the attack chain.



Key Challenges

C1

Securing connected & autonomous vehicles (CAVs) in the presence of interconnected sensors, controllers, and actuators with remote access features is a unique CPS security challenge.

C2

Real-time attack detection and localization

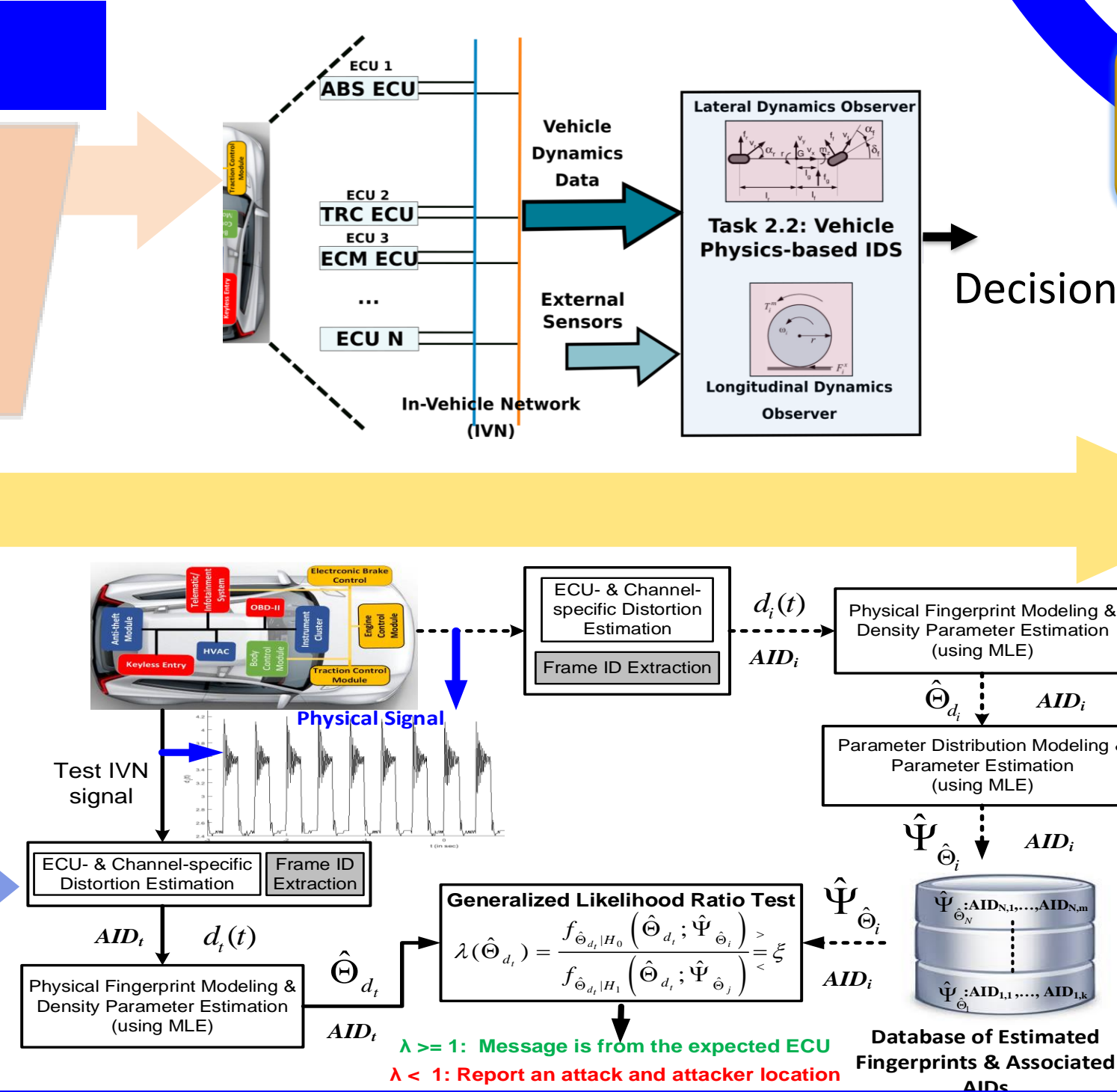
## Multi-Layered Security Framework

L3: Sensor and actuator security using vehicle physics

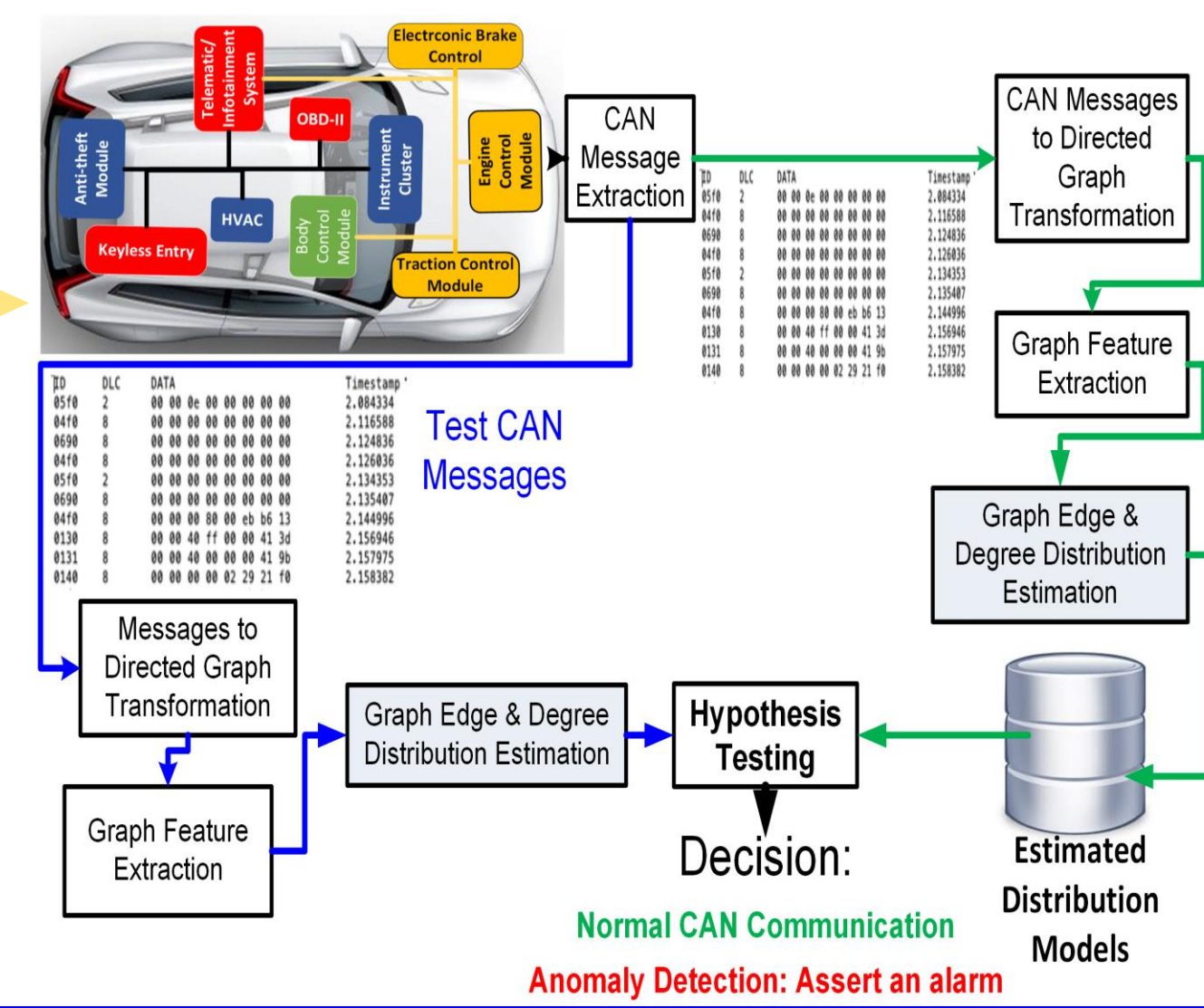
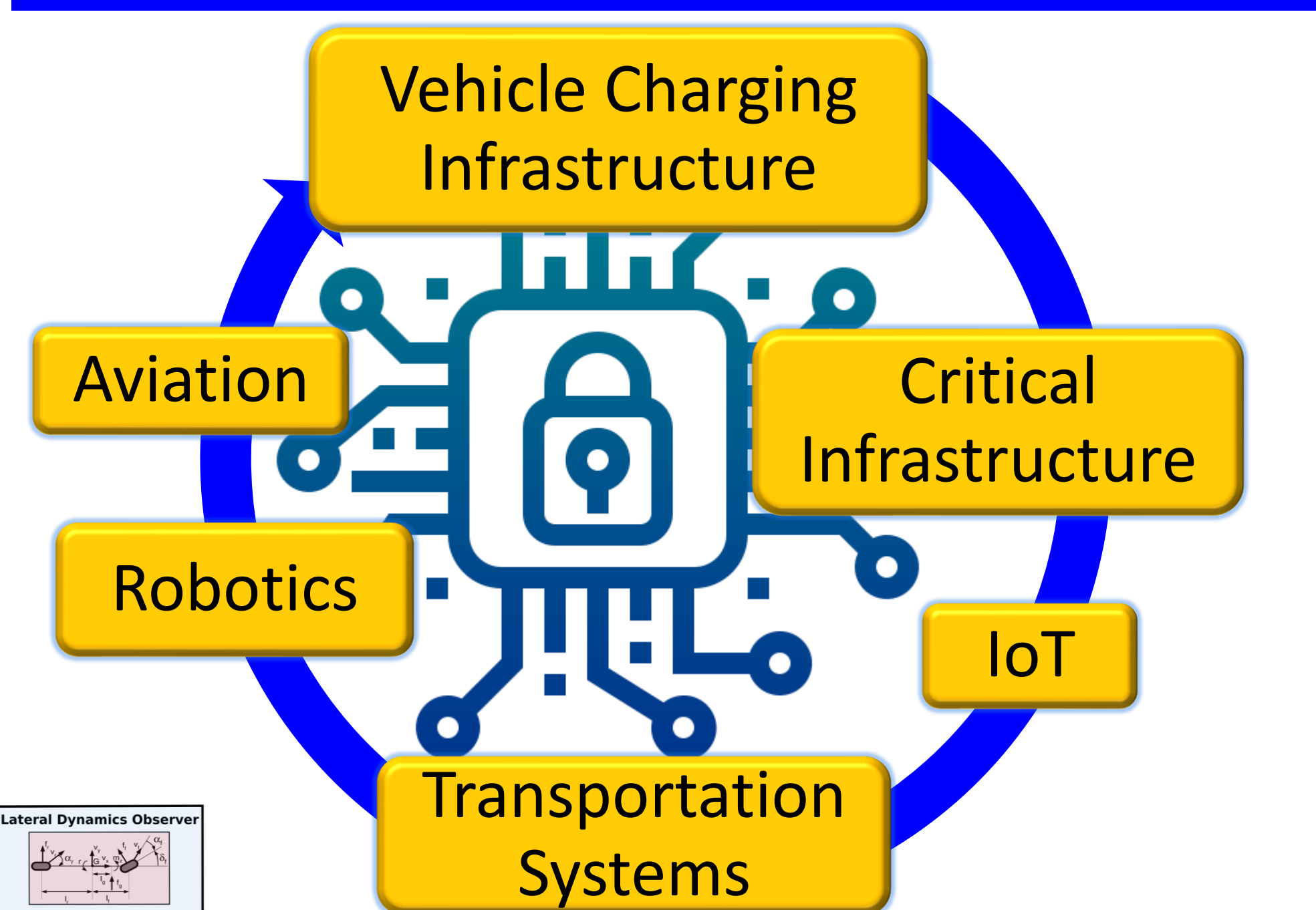
L2: Real-time IVN monitoring using behaviour fingerprinting

L1: Secure in-vehicle network communication via physical fingerprinting

Defense in Depth Approach



## Applications Beyond Automotive Cybersecurity



## Broader Impacts

### Scientific and Societal

- ❖ Securing connected autonomous vehicles against physical as well as remote attacks.
- ❖ Robust real-time attack detection and localization.
- ❖ Quantifying the capabilities of malicious attackers aiming at causing the maximum damage on a vehicle without leaving any forensic evidence behind.
- ❖ Contributing to the U.S. national security.

### Education and Outreach

- The project educational goals are to
- Provide a venue for the study of theoretical and practical aspects of the next generation of digital technologies in an integrated fashion.
  - Increase the number of students choosing STEM careers.
  - Prepare a future generation of cybersecurity professionals capable of developing countermeasures to safeguard critical infrastructure.

### Participation and Potentials

- ✓ Mentored/trained 13/5 undergrads/grads, and 5 ind. studies
- ✓ A new course on Intro. to automotive cybersecurity development
- ✓ UM-Dearborn CyberAuto Challenge
- ✓ Media Coverage
  - <https://www.wemu.org/tags/hafiz-malik/>
  - <https://umdearborn.edu/news/um-dearborn-researchers-land-475k-automotive-cybersecurity-grant>



The 5<sup>th</sup> NSF Secure and Trustworthy Cyberspace Principal Investigator Meeting (2022 SaTC PI Meeting)  
June 1-2, 2022 | Arlington, Virginia

