

# Radar Interference Mitigation, optimization based on V2X and A.I.

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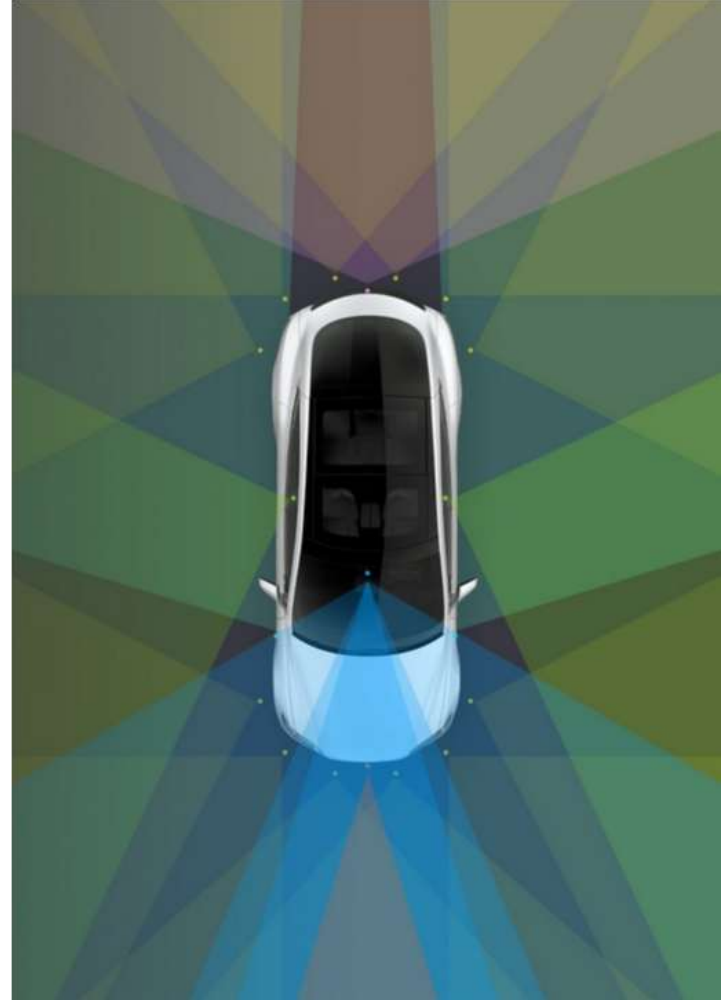
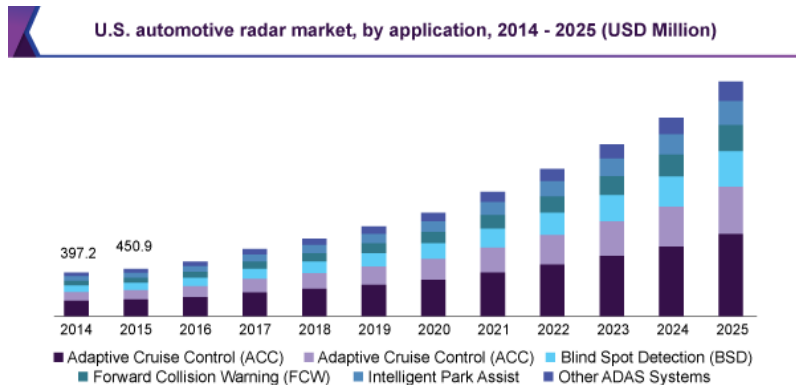
OPTIM

Thesis directors: Daniel DELAHAYE (ENAC); Pierre Maréchal (Université de Toulouse)

# Context

## Problematic

- Market Study: 2030 = ~50% of cars with radars
- 360° radar coverage
- No standardization
- Leads to harmful interference



# Context

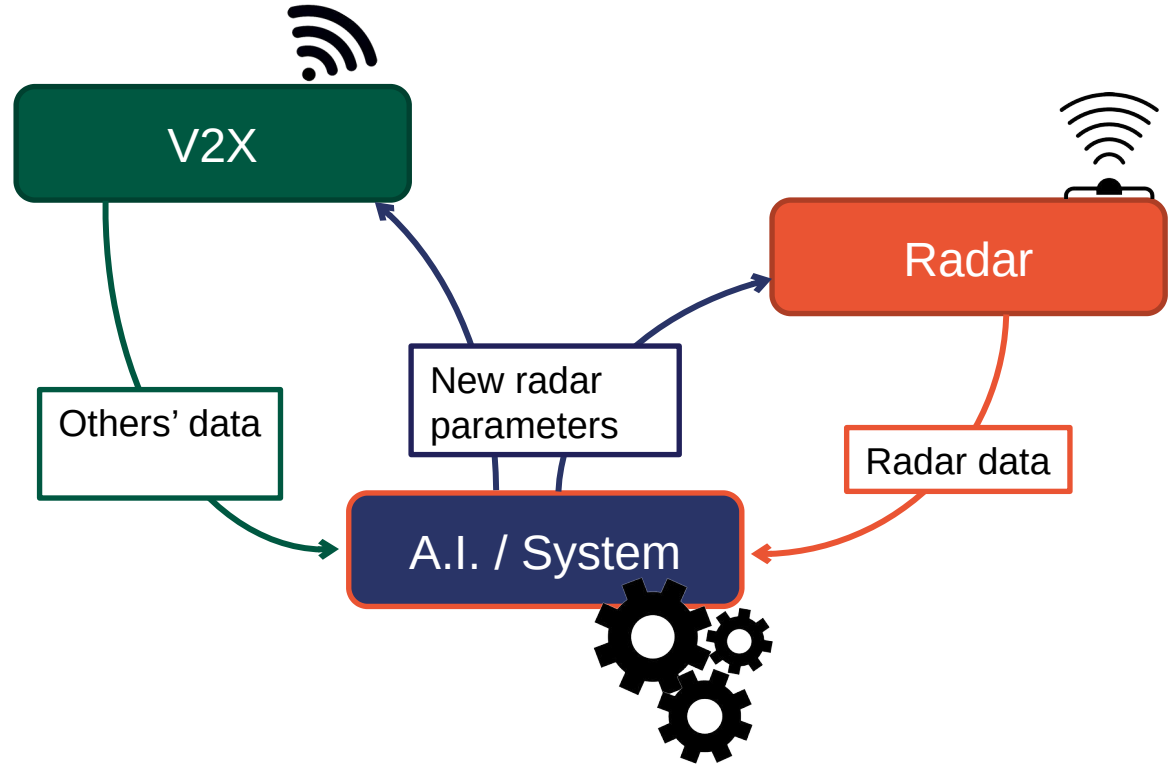
## V2X

- **Vehicle to Everything:** a communication network based on Wifi / 4G / 5G
- Communicates car's data
- Use it to communicate **radar** data too



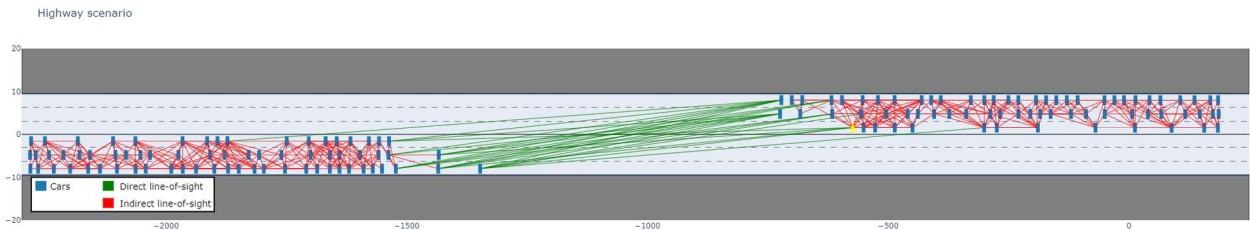
# Objectives

- Mitigating interference
- Coordinate the use of the bandwidth efficiently
- Not crashing the car

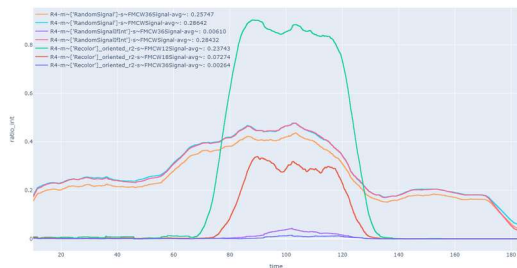


# Results

- A Python simulator

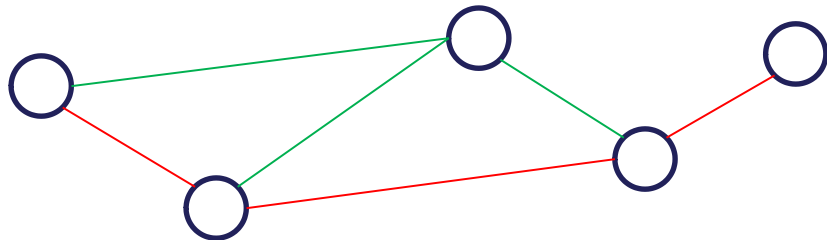


ratio\_int through time



- Investigation of Graph Neural Network

- Strategies reducing by 98% the amount of interference (currently being patented)
- Finding near optimum sharing of the bandwidth



## Publications:

- [1] S. Roudiere, V. Martinez, and D. Delahaye, "Importance of Synchronizing Radars with V2X communication for Radar Interference Mitigation," in **2021 IEEE Intelligent Transportation Systems Conference (ITSC)**, Indianapolis, Sep. 2021.
- [2] S. Roudiere, V. Martinez, and D. Delahaye, "A First Investigation of V2X Communication for Radar Interference Mitigation," in **2021 ITS World Congress**, Hamburg, Oct. 2021.