OBJECT DETECTION, TRACKING & CLASSIFICATION IN 4D IMAGING RADAR

IN PARTNERSHIP WITH PROVIZIO

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Problem Statement:
Current issues faced in autonomous vehicles

- Sensor Fusion and Perception
- Clutter and Interference
- Detection of Vulnerable Road Users
- Safety and Reliability
- Data Collection and Processing
- Cost and Implementation

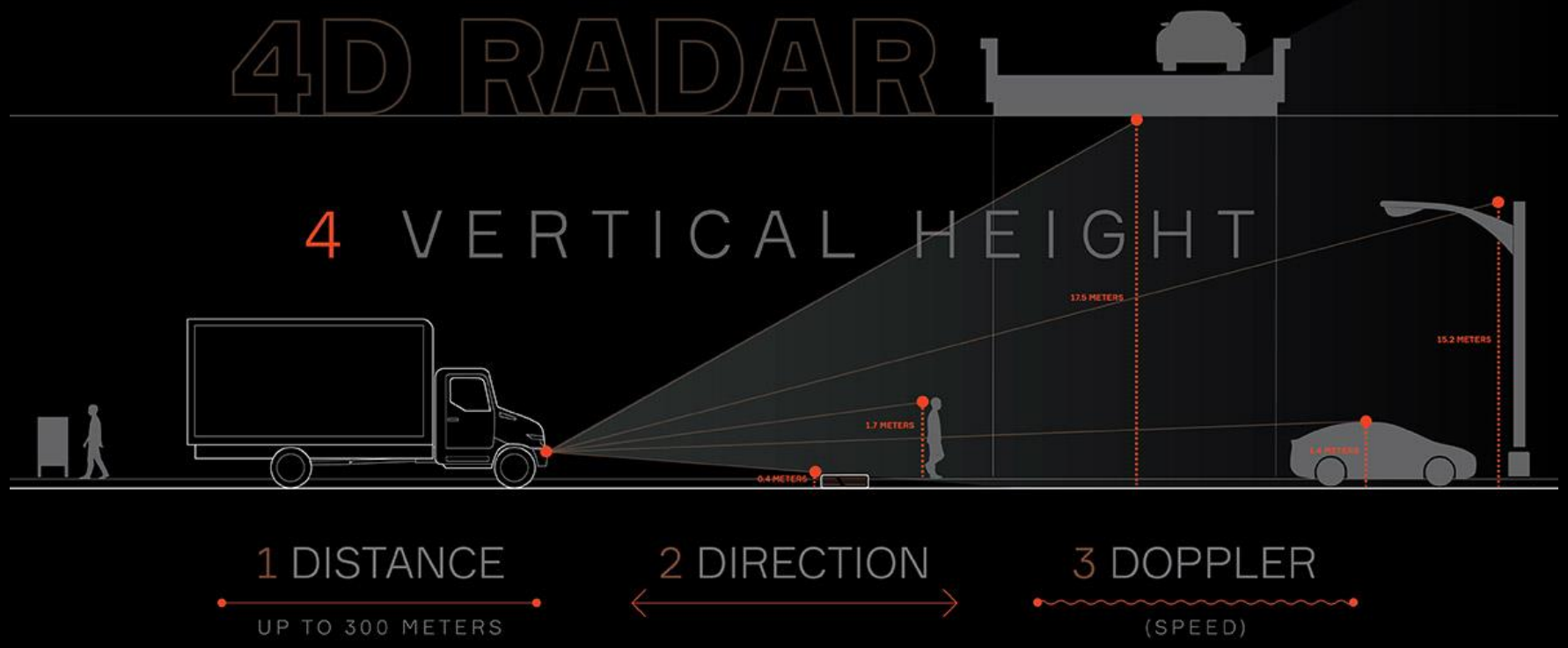
Aim of Thesis

- The aim of this thesis is to develop software for **Object Detection, Tracking, and Classification** Using **RNNs** in 4D Radar in the context of autonomous vehicles, along with some **User Interface** to be able to demonstrate the **efficiency** and **robustness** of the model and algorithm that I will develop.

Motivation:

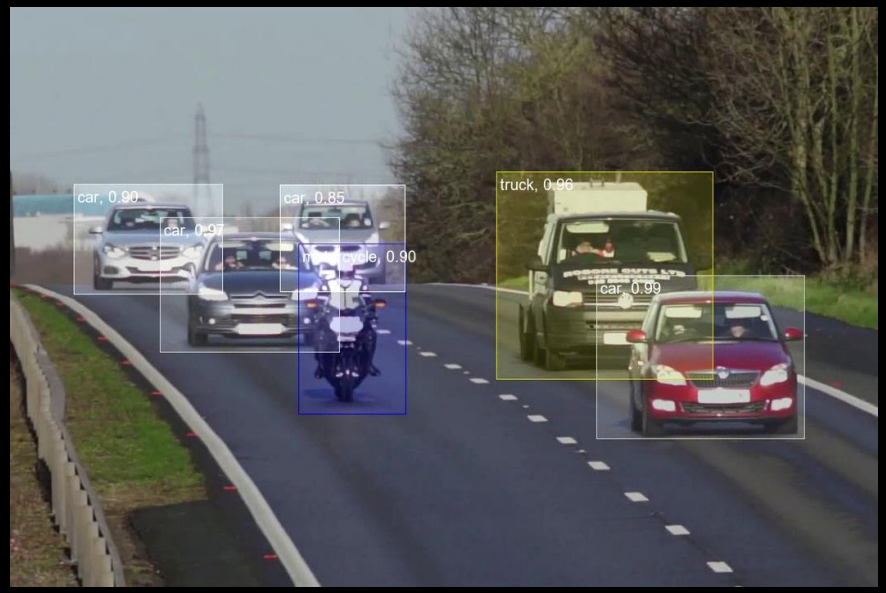
- Personal Experience - wanting to improve road safety
- Specialize in computer vision & ML to work in this field
- Improve current solutions to help drive innovation in ADAS
- Interest in the automotive industry.

What is 4D Radar?



Research Question:

"How can recurrent neural networks (RNNs) be effectively applied to improve the accuracy and efficiency of object detection, tracking, and classification in 4D radar data, and what novel architectures and techniques can be developed to address the unique challenges posed by this multidimensional and dynamic data?"



Objectives:

1. Literature Review
2. Data Collection and Preprocessing
3. Model Architecture Design
4. Training and Optimization
5. Object Detection
6. Object Tracking
7. Object Classification
8. Testing
9. Performance Evaluation

Outcome:

- Desired outcome and inspiration for the User Interface
- https://provizio.ai/

Questions?