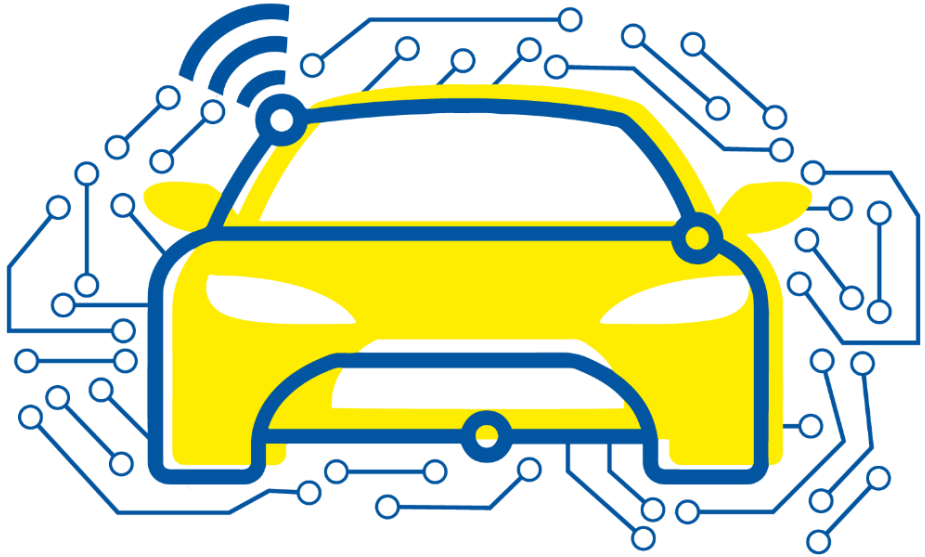
Automated and Connected Driving Challenges

Section 2 – Sensor Data Processing

Introduction

Goals and Challenges



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Sensor Data Processing

Environment Perception Goals

Detection, characterization of elements in the environment

- Existence (confidence)
- 3D Pose (x/y/z-coordinate, orientation)
- Element classes (vehicles, pedestrians, road, building, traffic sign, …)
- Size, shape, speed, acceleration, …

→ Complex tasks that are in large parts solved by Deep Learning nowadays

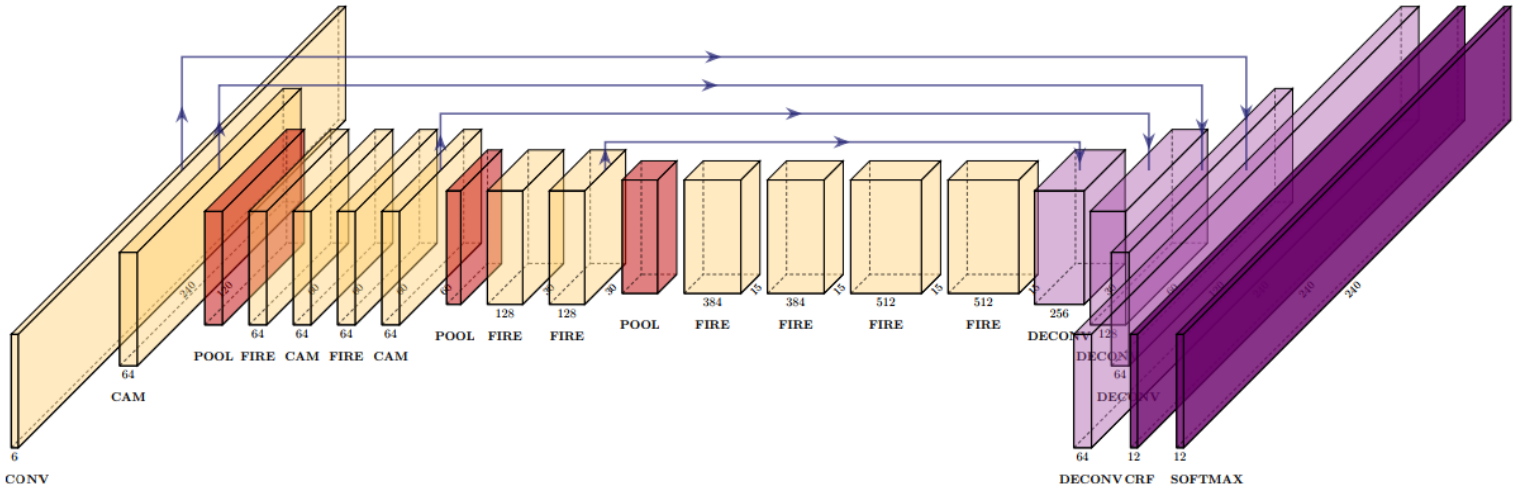

Image: ika, PlotNeuralNet

Sensor Data Processing

Environment Perception Challenges

- **Generation of annotated datasets** for supervised learning
- **Transformation of data** for training neural networks
- **Design of neural network** architectures
- **Efficient training of** neural networks
- **Evaluation** methods for environment perception models
- **Assurance** of **unbiased algorithms** with minimal discrimination
- **Assurance** of **sufficient performance** by perception models
- **Integration** of models into an automated driving software stack
- **Continuous validation and improvement** of environment perception