

ESS-NW/CAR

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Overview

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- SDN
- VSome/IP

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- Sensors
- Actutators
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4 Assembly

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Introduction

- Autonomous Driving (AD) and Advanced Driving Assistance Systems (ADAS)
- Communication in self driving cars
 - CAN
 - LIN
 - FlexRay
 - Ethernet
- Intelligent system monitoring
 - Startup
 - Fault detection
 - Network statistics
- Adaptation services
 - Failsafe
 - Network reconfiguration

Network

- Software defined Network (SDN)

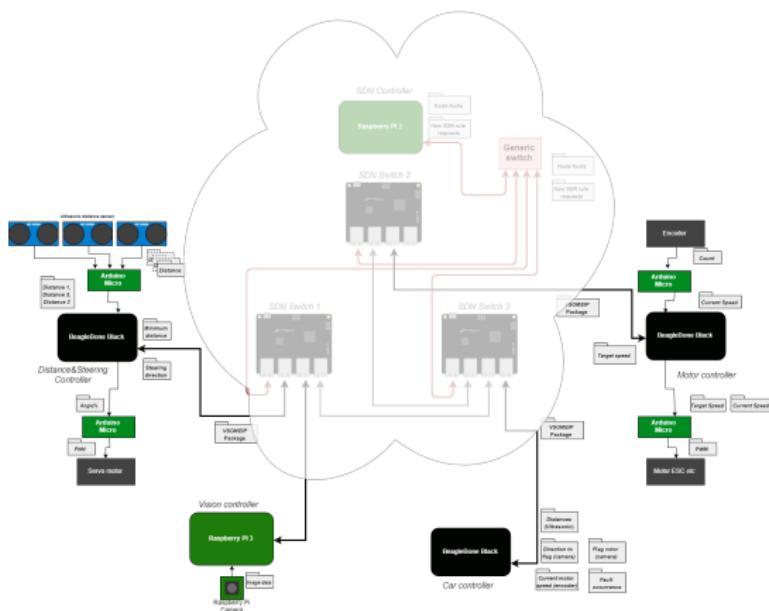
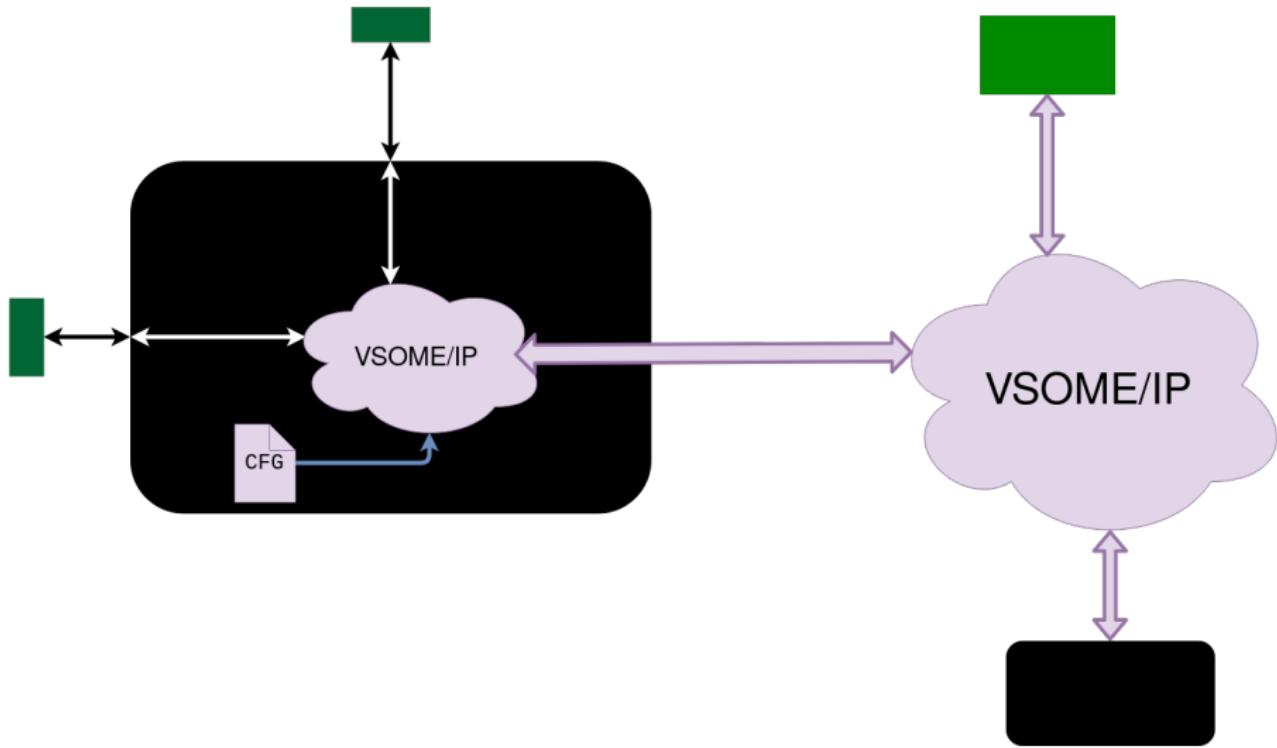


Figure: Network

- Move the intelligence from the switches to a controller
- The controller gather information from the switches
- The controller decides how the traffic should be send in the network
- Scalable
- Ryu controller is the SDN frame work we used, python based and well documented.

VSOME/IP



Sensors

- Ultrasonic sensor



- Reflective object sensor

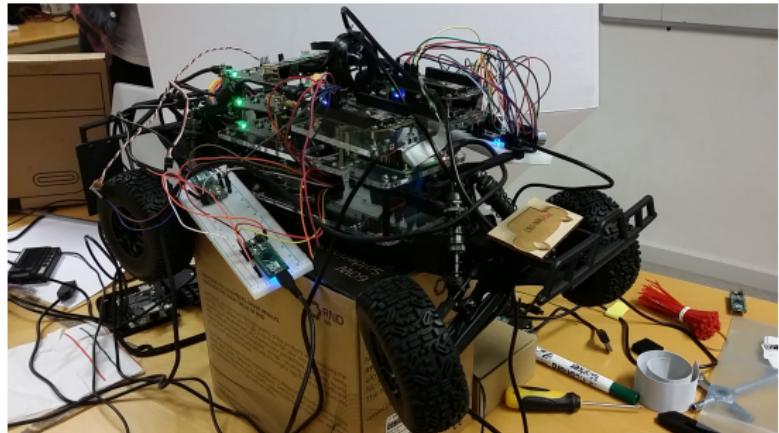


- Camera



Actuators

- Motor controller
- Steering controller



Autonomous behaviour

- Services
- State machine

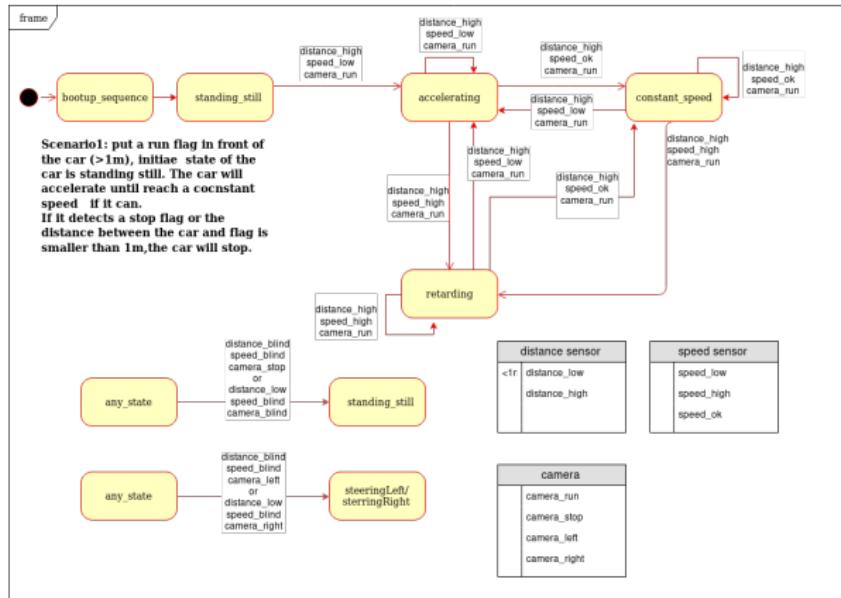
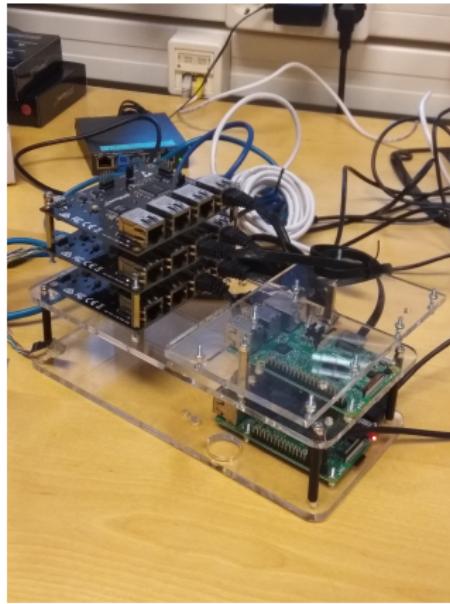


Figure: State machine

The platform

- Designed in Fusion 360
- Cut out in the laser cutter
- The idea of the design was to build up to get access to everything and to be modular
- Mounted on the car via two holes



- We had designed PCBs to mount the Arduinos on and to power the other devices
- Could not order PCB
- The machine PCB mill was broken both the one MentorSpace and proto Prototype Center
- Had to use breadboard

Conclusion

- Ethernet is a promising candidate for increasing demand on bandwidth for communication in autonomous cars.
- Ethernet is not without problems, many of which a SDN might be able to solve.
- SDN networks allow for safe, fast and customisable communication on autonomous vehicles.
- Thanks to our project owners!

The End