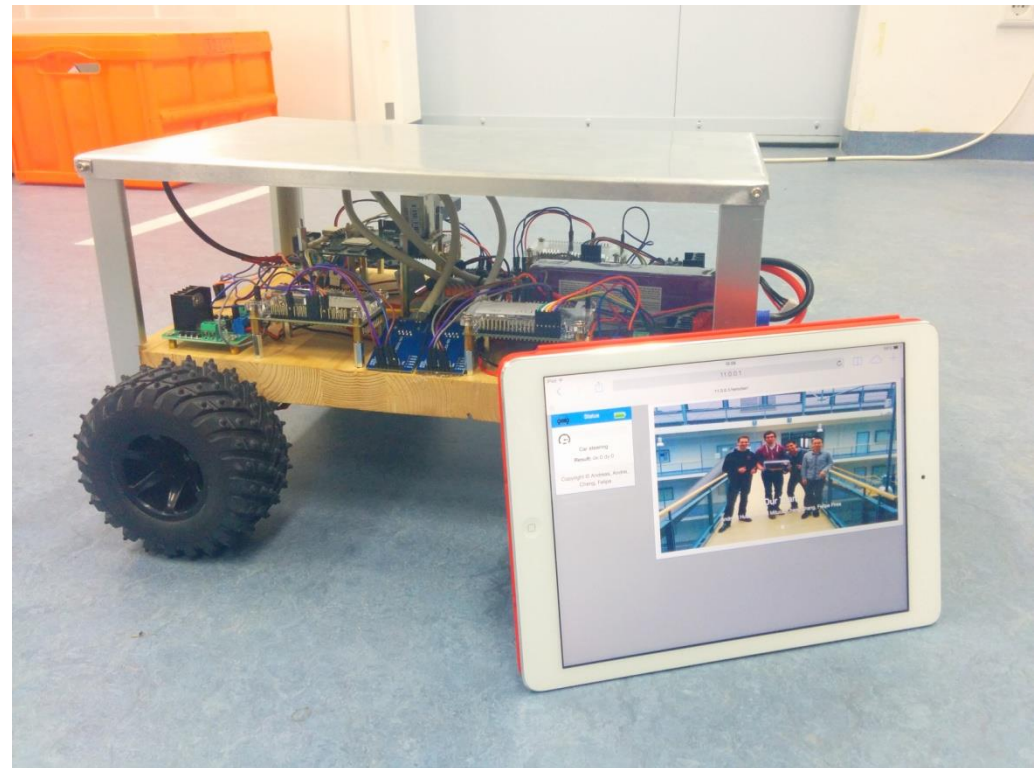# Hardware/Software Co-Design with a LEGO car
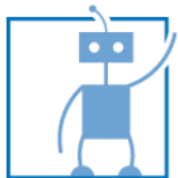
- **Andreas Huber**
- **Andrei Mituca**
- **张程 (Cheng Zhang)**
- **Felipe Pires**
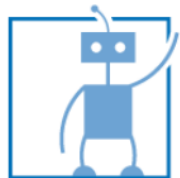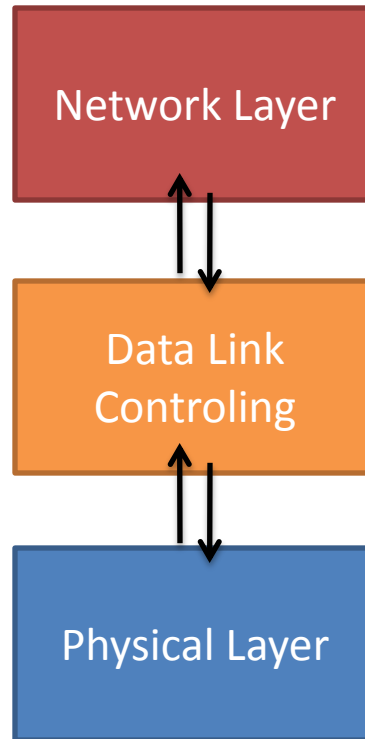
General Topics

- ## Hardware
  - Data Flow
  - Power Supply
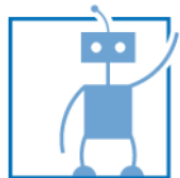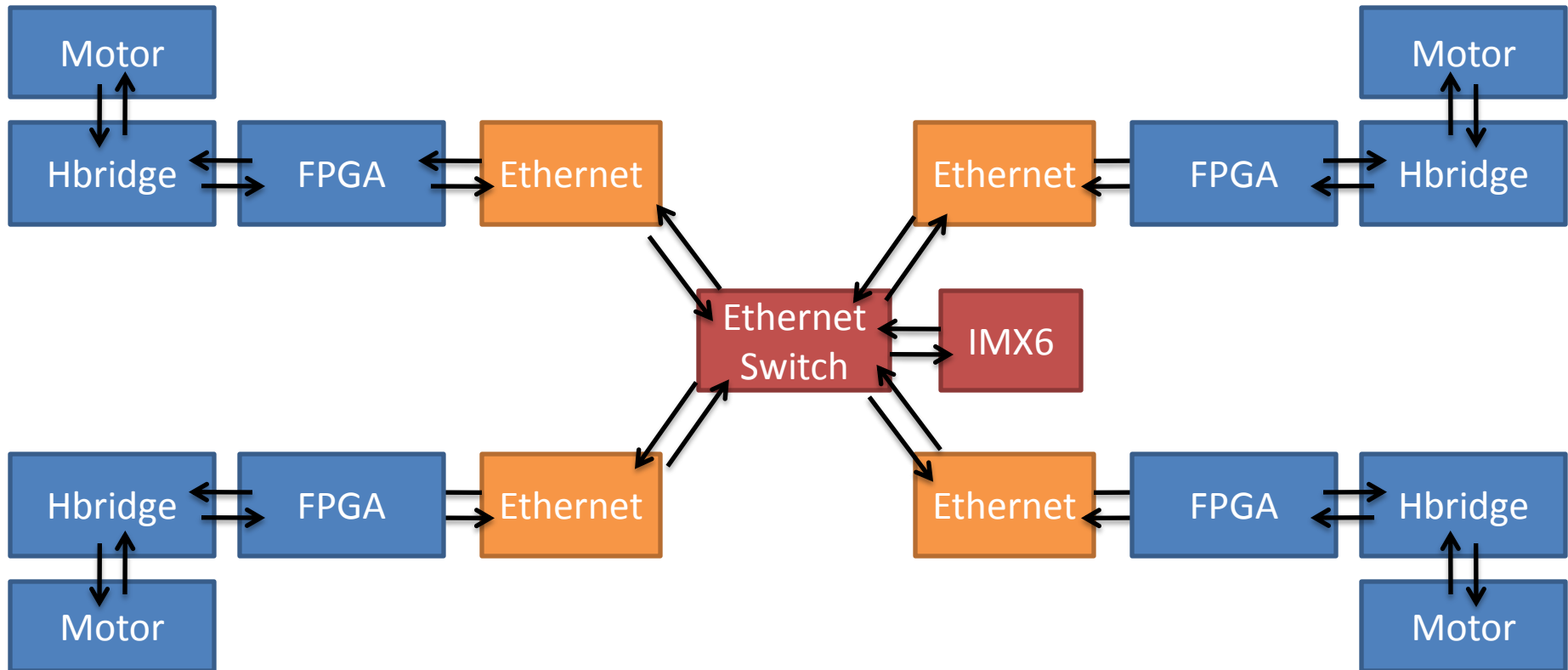 - Overview

- ## Software
  - FPGA
  - IMX6
  - Client interface

- ## Future steps

Hardware - Overview
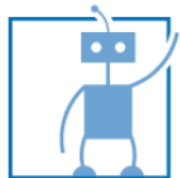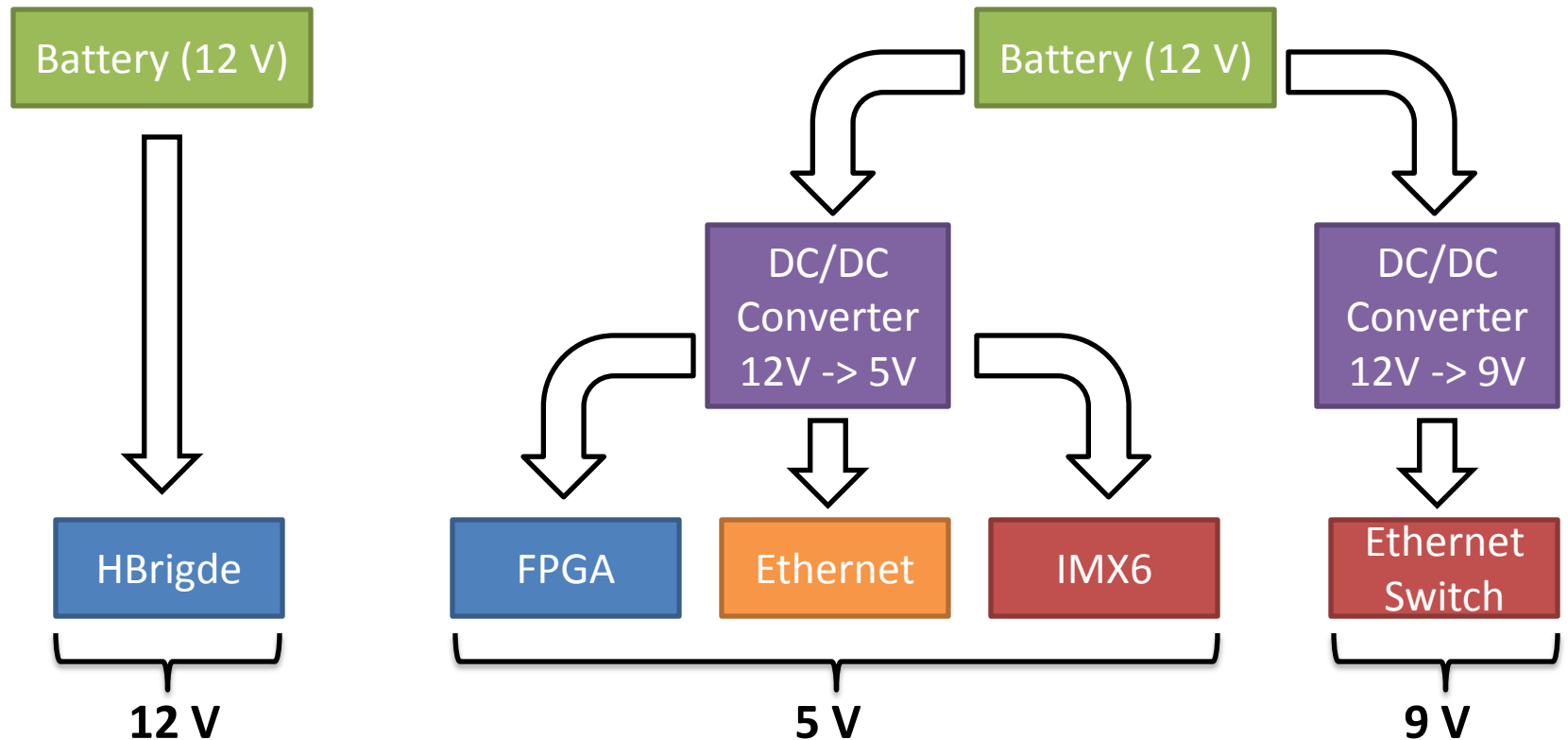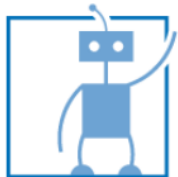
Hardware – Data flow

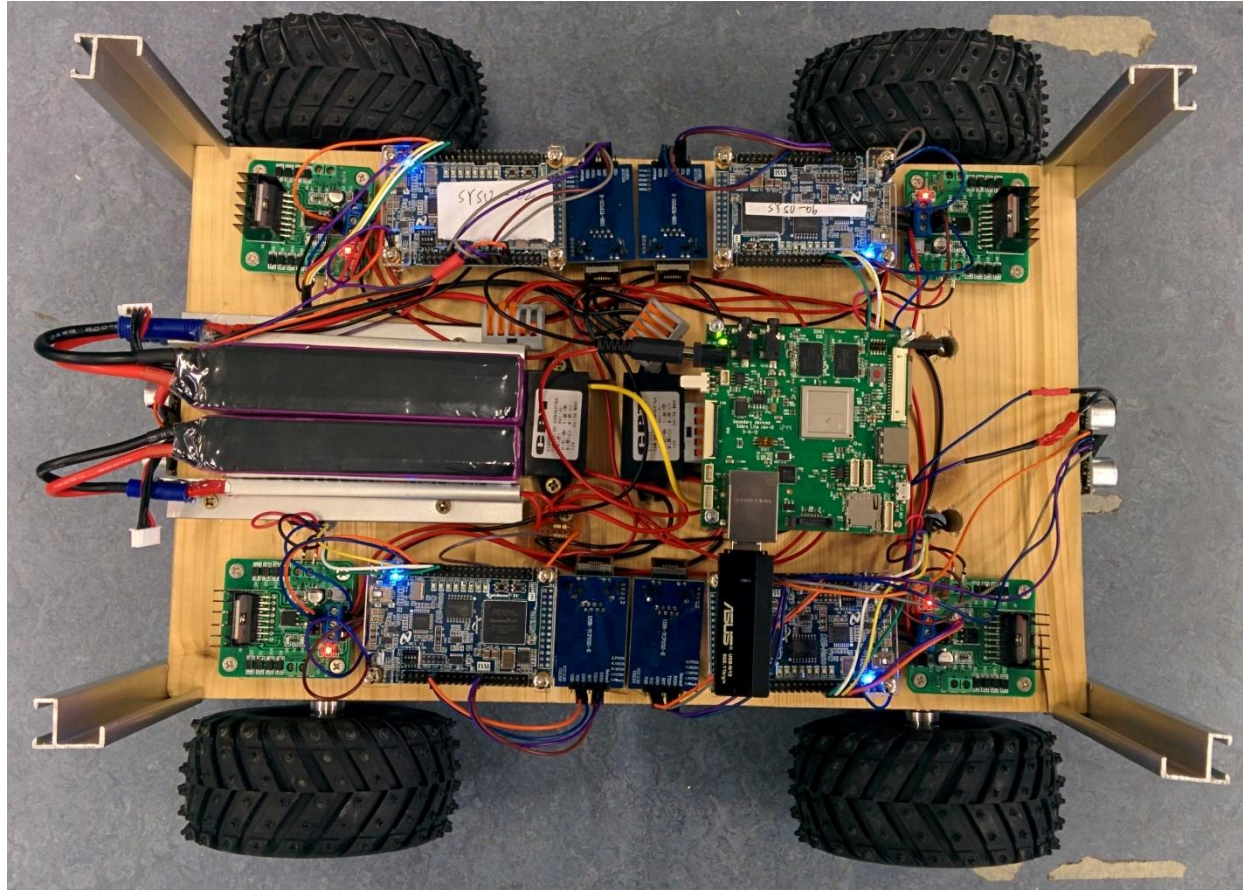# Hardware – Power supply

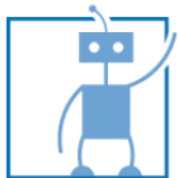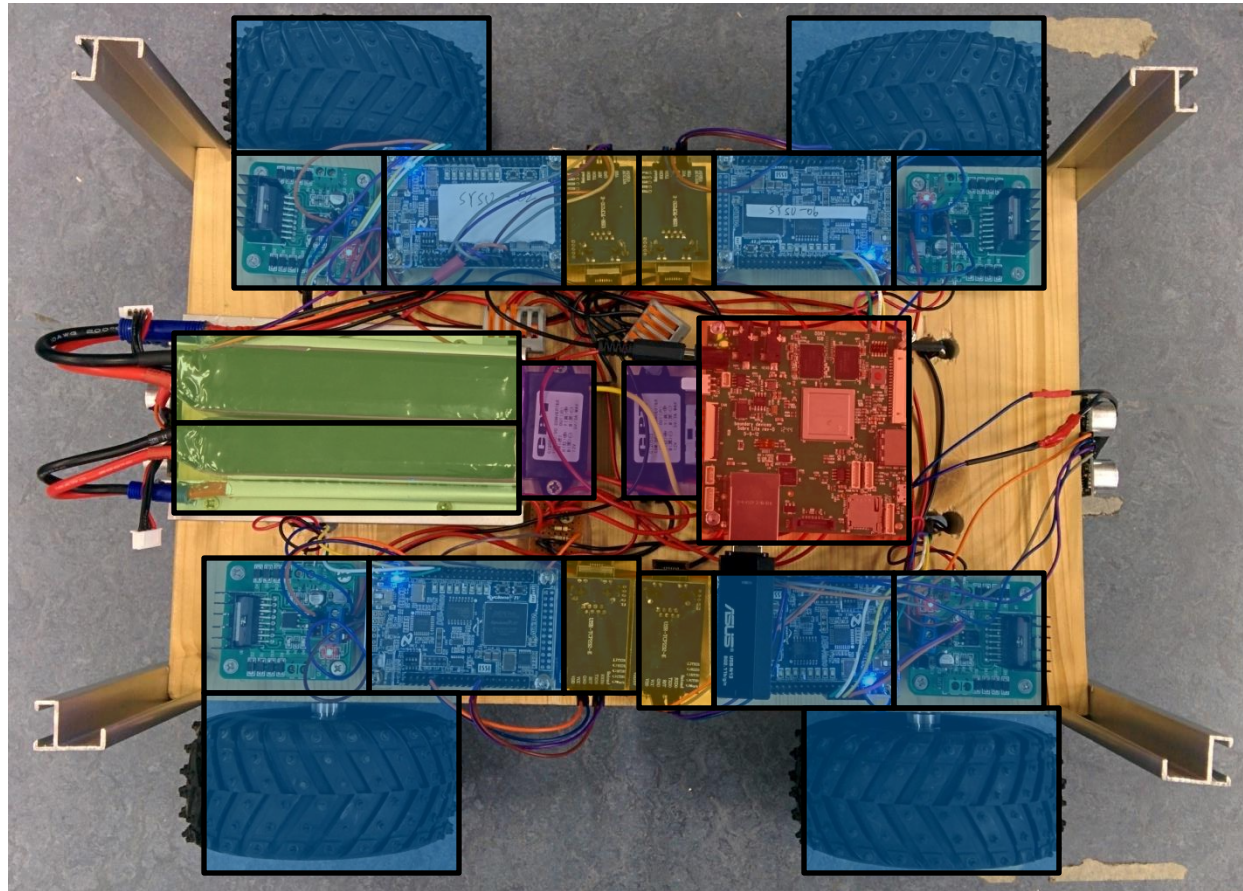# Hardware – Overview

Hardware – Overview

FPGA
H-brigde
Motor

Ethernet

iMX6

DC/DC
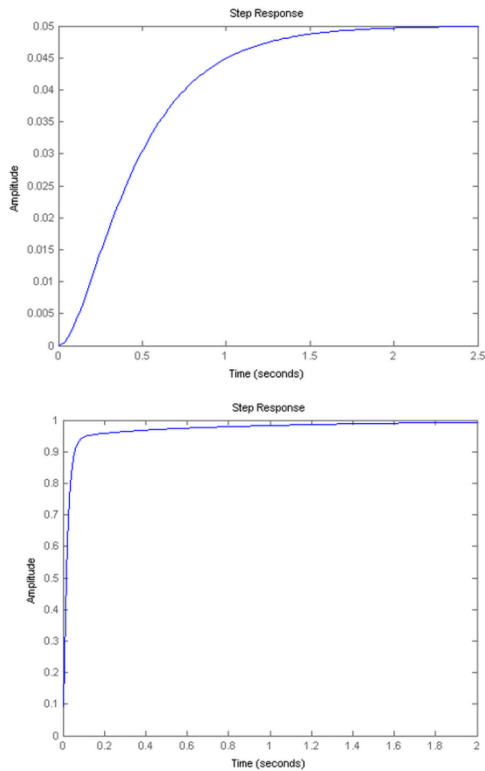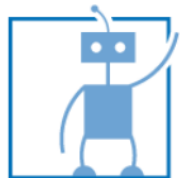
Batteries
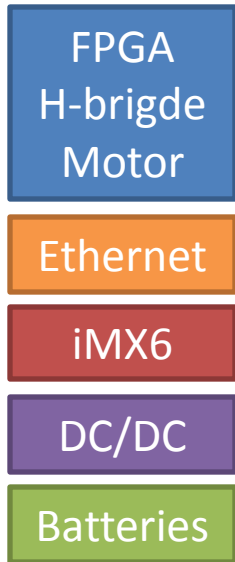
Software - FPGA

Control motor
PID control

Ultra Sound distance measurement

Battery/Voltage measurement
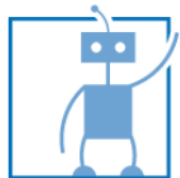
Software – IMX6

Debian 7 „Wheezy"	Connectivity	Control unit
Kernel 3.0.35		

Client interface

Software Architecture

Car

192.168.0.7 192.168.0.8 192.168.0.9 192.168.0.10

FPGA FPGA FPGA FPGA

Switch

Ethernet

iMX6

Car server 192.168.0.1
C

Unix sockets

Client server 11.0.0.1
Python

Wifi / AJAX

Client

Client

Browser acess
Tablet/Phone
/PC

JavaScript,
Jquery
CSS
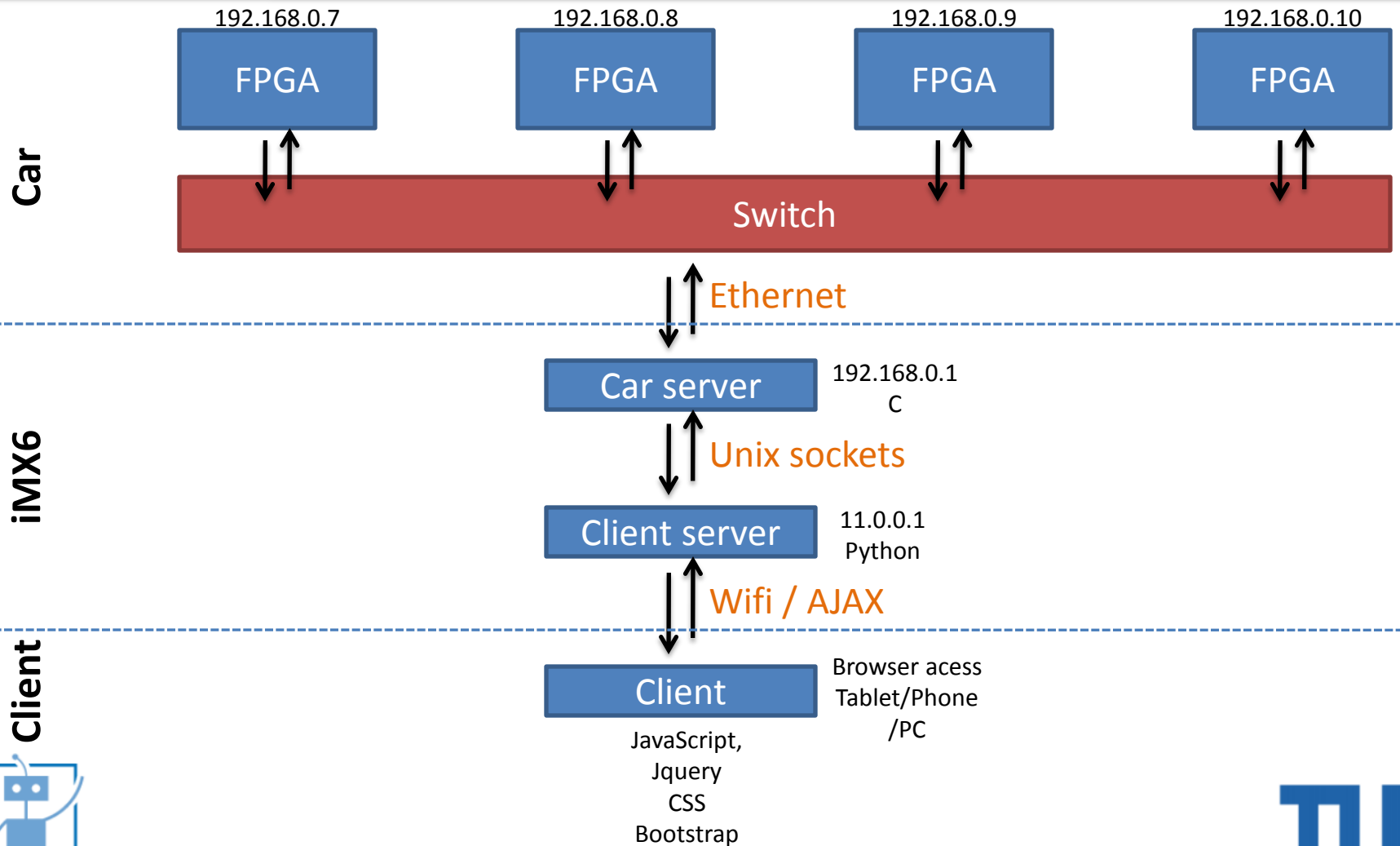Bootstrap

Future steps

- Implement ABS/ESP

- Obstacle detection v2.0

- Autonomous driving

Results

Live demo!