Davide Capuzzo · Peoria, Illinois, US · **3d.davidecapuzzo@gmail.com** · +1 309 210 8886

Davide Capuzzo | Automotive electronic engineer

- Status: Software in the loop engineer at AutonomouStuff inc (Hexagon inc), M.Sc in Advanced Automotive Electronic Engineering
- Skills: Python, C++, Linux, Arduino, Matlab, Simulink, Rapid prototyping, MS Office suite, ki-cad, ROS2, VECTOR Canalyzer
- Interests: Autonomous driving systems, Automotive Rapid prototyping
- Activities: Hiking, Climbing, Cycling, Learning, Agriculture, Reading, Music

Summary

Open-minded and fast learner engineer focused on automotive electronics systems for self-driving and advanced vehicles.
Strong problem-solving engineering experience matured on 5 years of live presentations, race track tests with fast cars and complex ADAS systems deployment.
Planned and designed a race car system with low resources in half time than average construction time. To achieve this result I have coordinated a team of different suppliers and stakeholders, creating a fast and cooperative environment.

Experience

08/'23 - NOW **Software in the loop engineer** AutonomouStuff (Via Teoresi US)

Software engineer specialized in C++ software and model in the loop tests.
Currently working with the team in charge of creating algorithms for self-driving mining trucks.

- Design and code C++ wrapper to interact with software Simulation API (truckSim) and testing software;
- Automated the SIL test procedure reducing the setup time from 15 minutes to 1 second;
- Standardized the test procedure to ensure interoperability and comparability between tests;
- Tested algorithm in real environment to compare the simulations' result;
- Automated the test result visualization and checking, to automatically highlight the out-of-target areas;
- Debug of algorithms to find the source of unexpected behaviors;

01/'21 - 08/'23 **Innovation electronic engineer** Ferrari SPA (Via Teoresi spa)

Electronic engineer specialized in innovation in Ferrari SPA.
Worked with the team in charge of the design of 2030 cars.

- Designed a complex ADAS and HMI system for racetrack driving with a Dspace ECU programmed with model base design (Matlab and Simulink);
- Tested perception and localization systems based on Lidar, IMU, camera and GPS;
- Designed and built three Ferrari prototypes that integrated the previous ADAS and HMI system, defined the mechanical and electrical system architecture and communication network (CAN and LIN). Developed with Python for CAN interface and graphics, Arduino and Raspberry for rapid prototyping;
- Debugged prototypes with vector suite (CANalyzer, CANape);
- Tested in the racetrack and analyzed telemetry data of the ADAS system with Matlab and Python;
- Collaborated to plan and design the first settings of Ferrari HMI for 2030 cars.

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- NOW **Personal learning projects**

- Created a small self-driving robot with control ECUs (Arduino) and Embedded computer (Raspberry) and a perception system (2D lidar, camera, IMU, ultrasonic sensors);
- Designed and built the wiring and mechanical systems of the robot;
- Integrated and developed many ROS2 self-driving control systems nodes (Low-level control driving node, sensor fusion node, perception node, filter node, telemetry node, remote control node, slam node, planning node, obstacle avoidance node ...);
- Implemented and designed a real-time telemetry and remote control system based on UDP and TCP/IP;
- Created a PyQt graphics interface for real-time telemetry.

'19 - '20/12 **Electronic engineer** Freelancer

Free-lance engineer focusing on small projects on autonomous systems and electronic sensors.

- Technical evaluation of suppliers for perception electronic systems for self-driving rovers;
- Hardware design and programming of embedded boards for self-driving rovers for attitude estimation, engine control and other internal functions;
- Research and first prototyping on sensors for agriculture 4.0.

05/'20 - '11/20 **Computer vision intern** Vislab (an Ambarella company)

Researcher intern in the field of computer vision for perception.

- Creation of perception system for 3D detection and estimation of vehicles position starting from 3D point cloud generated by laser scanner, stereo and mono camera using deep learning algorithms;
- Creation of algorithms to generate medium-level data like stixel starting from a point cloud, achieving a reduction of x10 data dimension;
- Adapt a neural network for the perception of 3D object detection in order to work with stixel;
- Tuning and training neural networks achieving the State of the Art of performance with 10x fewer data on standard benchmarks for autonomous driving.

09/'18 - 12/'20 **Automotive Electronics Engineering** Next Future Transportation.

Electronic Engineering on Modular self-driving busses startup.

- Implementation of perception sensors for autonomous driving such as laser scanners, cameras and radars;
- Programming of embedded systems for traction and steering motor control;
- Criticality analysis for EMC approval;
- Manual assembly of electronic and mechanical components; presentation of fairs and events.

01/'18 - '02/18 **Automotive Electronics Engineering Intern** Next Future Transportation.

Electronic Engineering intern on Modular self-driving busses startup.

- Presentation of the prototype at the World Government Summit in Dubai;
- Fine tuning algorithm for automatic coupling of two running buses;
- Manual assembly of electronic and mechanical components;
- Prototyping of embedded systems for motor control for 4 synchro doors opening.

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Education

NOW **Other courses**

- Visual Perception for Self-Driving Cars (provided by Coursera);
- State Estimation and Localization for Self-Driving Cars (provided by Coursera);
- Introduction to Self-Driving Cars (provided by Coursera);
- Managing Project Risks and Changes (provided by Coursera);
- Initiating and Planning Projects (provided by Coursera);
- Budgeting and Scheduling Projects (provided by Coursera);
- Welcome to Game Theory (provided by Coursera);
- Private Equity and Venture Capital (provided by Coursera).

NOW **Other personal learning project**

- ROS2-based self-driving RC car with remote real-time telemetry;
- MySQL database with web PHP interface;
- Design and build a personal 3D printer.

09/'18 - 12/'20 **Master degree Advanced Automotive Electronic Engineering** Bologna University

- Thesis: 3D detection and estimation of vehicles position starting from 3D point cloud generated by laser scanner, stereo and mono camera using deep learning algorithms.
- Analysis and analytical evaluation of radar from SICK company for perception systems on operating machines, a project carried out in collaboration with CNH;
- Modeling and control of a lane keeping algorithm for self-driving cars;
- Programming and design of embedded systems for aerodynamic load estimation for F1 cars, a project carried out in collaboration with GES Ferrari;
- Modeling and control through model base design approach of a virtual differential.

09/'15 - 07/'18 **Bachelor degree Automation engineering** Bologna University

- Thesis: Creation and evaluation of algorithms for the estimation of the attitude of an agricultural self driving rover.
- Design of a mechanical differential;
- Programming of embedded boards;
- Simulation and control of an elevator.