

Federica Paolicelli

EXPERT SOFTWARE & FUNCTION ENGINEER, ADAS & AUTONOMOUS DRIVING, PH.D.

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Experience

AVL Software and Functions GmbH

Regensburg, Germany

EXPERT SOFTWARE & FUNCTION ENGINEER

July 2021 - Present

- Design and development of automotive sensor models (LiDARs)
- Simulation in virtual environments
- Research and Development

AVL Software and Functions GmbH

Regensburg, Germany

SOFTWARE DEVELOPMENT ENGINEER

Sep. 2018 - June 2021

- Development of software components for autonomous driving applications, working mainly on the **Decision-Making** feature as part of a team. My task also includes:
 - Concept definition of software components
 - Writing functional requirement documents
 - Software testing and validation
 - Testing on real vehicles
 - Code and documentation review
 - Version control
- Member of a team of a small number of people defining the **C++ Coding Guideline** to be used within the ADAS department (based on *Adaptive Autosar C++14 19-11*).

Politecnico di Torino

Torino, Italy

POST-DOCTORAL RESEARCHER

Jan. 2017 - Aug. 2018

- **Project:** apparatus and method for controlling the amount of fuel injected in a diesel engine.
Proof of Concept Grant 2016 - Politecnico di Torino, Dec. 2016 - May 2017
 - Test bench set-up and hydraulic characterization of a commercial common rail fuel injection system
 - Development of the injected mass control strategy
 - Implementation of the control algorithm in the ECU by rapid prototyping
 - Team management and interaction with project partners and suppliers
- Writing scientific papers in international journals

Politecnico di Torino

Torino, Italy

PH.D. CANDIDATE

Jan. 2014 - Dec. 2016

- Numerical simulations and testing of fuel injection systems at the hydraulic test bench
- Set-up of experimental equipment
- Designing experiments
- Modelling of experimental data
- Statistical analysis of experimental data
- Writing scientific papers in international journals
- Speaker at automotive international conferences
- Master thesis students advisor
- **Additional project:** consultancy for an injector manufacturer regarding the performance of their solenoid injectors and the identification of key design elements for further component development, Jan. 2015 - Mar. 2015

Education

Politecnico di Torino

Torino, Italy

DOCTOR OF PHILOSOPHY (PH.D.) IN ENERGY ENGINEERING - DIAGNOSTICS AND CONTROL

- Thesis: Hydraulic circuit layout analysis, diagnostics and control of the injection process in Common Rail diesel fuel injection systems.

Development of methodologies and algorithms for the identification of key moments in a fuel injection event and real-time evaluation of the amount of fuel actually injected in the engine. Modelling of Common Rail fuel injection systems and implementation of mathematical techniques (Modal Analysis, Time-Frequency Analysis) to examine injection dynamics. Assessment of solenoid-actuated injectors for diesel engine applications.

Politecnico di Torino

Torino, Italy

MASTER OF SCIENCE (M.Sc.) IN MECHANICAL ENGINEERING

- Thesis: Numerical-experimental analysis of innovative injection systems without accumulator for diesel engines.

Università degli Studi della Basilicata

Potenza, Italy

BACHELOR OF SCIENCE (B.Sc.) IN MECHANICAL ENGINEERING

- Thesis: Kinetics of the expansion of a spherical plasma irradiated by a laser beam.

Publications

JOURNAL

- 2019 **Elsevier, Mechanical Systems and Signal Processing**, A virtual injection sensor by means of time frequency analysis.
<https://doi.org/10.1016/j.ymssp.2018.07.009>
- 2018 **Asme, Journal of Engineering for Gas Turbines and Power**, Modal Analysis of Fuel Injection Systems and Determination of a Transfer Function between Rail Pressure and Injection Rate.
<http://dx.doi.org/10.1115/1.4039348>
- 2017 **Elsevier, Fuel**, An indirect method for the real-time evaluation of the fuel mass injected in small injections in Common Rail diesel engines.
<https://doi.org/10.1016/j.fuel.2016.11.053>
- 2016 **Asme, Journal of Engineering for Gas Turbines and Power**, Hydraulic performance comparison between the newly designed common feeding and standard common rail injection systems for diesel engines.
<http://dx.doi.org/10.1115/1.4032644>
- 2015 **Elsevier, Applied Energy**, The new generation of solenoid injectors equipped with pressure-balanced pilot valves for energy saving and dynamic response improvement.
<https://doi.org/10.1016/j.apenergy.2015.03.074>

PROCEEDING

- 2016 **Elsevier, Energy Procedia**, Hydraulic characterization of solenoid-actuated injectors for diesel engine Common Rail systems.
<https://doi.org/10.1016/j.egypro.2016.11.111> Torino, Italy
- Presented at "71st Conference of the Italian Thermal Machines Engineering Association ATI 2016" (Sep. 14-16).
- 2015 **SAE, Technical Paper**, Modal analysis as a design tool for dynamical optimization of Common Rail fuel injection systems. Capri, Naples, Italy
<http://dx.doi.org/10.4271/2015-24-2467>
- Presented at "SAE ICE 12th International Conference on Engines & Vehicles" (Sep. 13-17).
- 2014 **SAE, Technical Paper**, Common Feeding Injection System Equipped with Reduced-Leakage Solenoid Injectors. Birmingham, United Kingdom
<http://dx.doi.org/10.4271/2014-01-2735>
- Presented at "SAE 2014 International Powertrain, Fuels & Lubricants Meeting" (Oct. 20-23).

Skills

OS Windows, Ubuntu

Programming C++, Python, Matlab/Simulink/Stateflow

IDEs Visual Studio Code, Spyder, Jupyter Notebook

Languages Italian (Native), English (Full Professional), German (A2)

Professional Service Regular reviewer for international journals