Federica **Paolicelli**

ADAS & Autonomous Driving Software Development Engineer, Ph.D.

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«Curiosity is the engine of achievement» - Sir Ken Robinson

Experience

AVL Software and Functions GmbH

Regensburg, Germany

Software Development Engineer

Sep. 2018 - Present

- 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 requirements documents
  - Software testing and validation
  - Testing on real vehicles
  - Code and documentation review
- 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

External Collaborator

Jan. 2018 - Aug. 2018

- Writing scientific papers in international journals.

Politecnico di Torino

Torino, Italy

Post-doctoral Researcher

Jan. 2017 - Nov. 2017

- **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

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. *Torino, Italy*
https://doi.org/10.1016/j.egypro.2016.11.111
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