Leonardo Andreae

Curriculum Vitae

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Profile

Mechanical Engineer (MSc ETH) with multiple years of software development experience (C, C++, Python and Matlab) and a strong robotics and control background. 2.5 years of hands-on experience as an embedded software engineer in the automotive industry, complemented by multiple robotics-focused projects and an internship during the master's program. Passionate about automation and robotics as transformative technologies shaping the future. Fluent in Italian, English and German.

Personal Data

Date of birth	January 12th, 1993.
City of birth	Mendrisio (Switzerland).
Nationalities	Swiss, Italian.
Marital status	Celibate.
Driving license	B.

Work Experience

06.22-10.24   **Embedded Software Developer at INOMO Technologies AG**, *Oensingen (Switzerland)*.
- Contributed to the development and maintenance of the application software (written in C) of various ECUs, mainly a new generation of the BMS and the BCM;
- Developed and maintained software to simulate the behavior of the BCM using a model-based approach in Matlab, Simulink and Stateflow.
- Member of an agile software team employing a SCRUM workflow (issue tracking with Jira);
- Employed Git and GitHub for software version control using the Gitflow branching strategy;
- Performed static code analysis with Helix QAC to meet MISRA coding standards;
- Created and maintained software requirements with Polarion;
- Processing, analysis and integration of CAN-based devices;
- Participated in multiple vehicle trials;
- Performed a variety of HiL and MiL tests on the BMS and BCM;
- Training: Programming Methods and Tools for Embedded Applications (Microconsult).

08.19-02.20   **Internship at F&P Personal Robotics AG**, *Glattbrugg (Switzerland)*.
- Programmed (Python) a 6 DOF robotic arm plus linear axis for an industrial application;
- Built, improved and maintained testing setups for vibration testing of robotic subsystems;
- Wrote Python scripts to post-process data from various tests, in particular for vibration analysis of IMU information (libraries: numpy, matplotlib, pandas);
- Built testbenches and executed a vast array of tests for the analysis of competitor robotic joints;
- CAD modeling (Solidworks) and 3D printing of test setup components;
- Wrote and maintained technical documentation and manuals.

09.16-12.18   **Teaching Assistant in Dynamics & System Modeling**, *ETH Zürich (Switzerland)*.
- Seasonal job available for students obtaining excellent grades in the respective subjects;
- Reviewed theory and solved exercises in front of classes of up to 60 students;
- Created and maintained teaching materials such as theory scripts (LaTeX), in depth exercise solutions and Matlab/Simulink demonstrations.

01.14-02.14   **Internship at HAWE Hydraulik SA**, *Munich (Germany)*.
- Learned basic manual skills such as turning, milling and drilling;
- Assembled mechanical parts;
- Helped building testing setups for hydraulic systems.

07.12-04.13	**Swiss Military Service**, *Emmen (Swizerland)*.
	○ Trained for the role of Radar Subofficer (Sergeant rank);
	○ Leader of a small group of recruits.
12.08-02.11	**Ski Instructor at Snowsports Corvatsch AG**, *Surlej (Swizerland)*.
	○ Held private and public lessons for kids and adults;
	○ Participated to weekly technique improving training sessions with more experienced instructors.

Education

04.25-present	**Independent Studies**, *Zürich (Switzerland)*.

○ Computer science;
○ C++17/20 and Python programming;
○ Mobile Robotics;
○ ACM SIGSOFT Summer School for Software Engineering in Robotics (TU Delft);
○ Game Development.

02.18-09.21	**Master of Science ETH in Mechanical Engineering**, *ETH Zürich (Switzerland)*.

○ Coursework focused on robotic systems and control, in particular:
  - Advanced Dynamics, Model Predictive Control, State Estimation and Optimal Control, Mathematical Modeling and Optimization.
○ Master and Semester theses centered on software development (Linux platform) for robotic applications:
  - Legged and wheeled mobile robots;
  - Path Planning and Collision Avoidance;
  - C++ for robotics (ROS, Catkin, OCS2, Eigen);
  - Optimization (SuperSCS NLopt, Ceres, Mosek).

01.19-05.19	**Worldwide Mobility Program (Erasmus)**, *University of Waterloo (Canada)*.

○ Coursework specialized in advanced topics in dynamics and modern automatic control methods;
○ Participated in 2 course-related projects (3 months duration):
  - Modeling and Simulation of a Dual Arm Robot (Matlab, MSC ADAMS);
  - Parameter Identification and Adaptive Control of an X-Configuration Quadrotor (Matlab, Simulink).

09.13-09.18	**Bachelor of Science ETH in Mechanical Engineering**, *ETH Zürich (Swizerland)*.

○ Learned the mathematical and physics foundations of engineering with a focus on mechatronics;
○ Matlab and Simulink programming;
○ Bachelor thesis topics:
  - Arduino programming;
  - Sensor calibration;
  - CAD modeling (NX);
  - Signal processing and controller design.

09.08-06.12	**High School Diploma at LiLu 1**, *Lugano (Swizerland)*.

○ Specialization in foreign languages with a focus on English.

Software Skills

Basic	Mathematica, MSC ADAMS, Valgrind, Batch, Powershell.
Intermediate	ROS, CMake, Arduino, RTOS, Linux, NX, Solidworks, UDE, Stateflow, EMS, PCAN-Explorer, Jira.
Advanced	Python, C++, Git, GitHub.
Proficient	C, Matlab, Simulink, LaTeX.

Languages

Italian	C2 - Native.
English	C1/C2 - Proficient.
German	C1 - Fluent.
French	B1 - Middle school knowledge.

Hobbies and Personal Interests

Cinema	A passion that I have had since I was a child. I especially enjoy the work of Nolan, Villeneuve, Fincher and Tarantino.
PC Gaming	Gaming has always been one of my favorite things to do. Nowadays I love to build and costumize my own PC and mainly play single-player action games, FromSoftware titles in particular.
Cooking	Allows me to unleash my creativity and take care of my loved ones.
Skiing	By far my favorite winter activity. Allows me to reunite with old friends and enjoy the beautiful mountains Switzerland has to offer.
Scuba Diving	A summer sport that I do as often as possible and that never ceases to amaze me.
Running	Clears my mind and lets me reconnect with nature.