ALBERTO TRABACCHIN

Mechatronics Engineer

My Portfolio
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SUMMARY

Mechatronics Engineering Master's graduate with a passion for embedded systems and computer vision. Aspiring to secure engineering positions for improving safety in the automotive and aerospace sectors.

SKILLS

Languages: C, C++, Python, MATLAB/Simulink
Libraries: PyTorch, OpenCV
Dev. Tools: Git, CMake, AWS, Unit C testing
Environments: RTOS (AVR, ARM), Linux

PROJECTS

PyTorch
OpenCV

VisionADAS (Master's thesis)
Research collaboration with Magna International which involves critical scenarios' detection for improving ADAS systems. The project leverages the capabilities of the vision transformer to perform classification tasks on driving scenarios. Exploration of training pipeline for vision models, including preprocessing of custom datasets and fine-tuning.

C, Unity
CMake
Doxygen

Blockchain simulator **github.com link**
Collaborative project presenting a blockchain simulator based on SHA-256 encryption, developed as a bachelor's project in team. Opportunity of experimenting with teamwork, incorporating technologies like Git, testing with Unity, and generating clear documentation through Doxygen.

MATLAB, C

Delta robot analysis (Bachelor's thesis)
Bachelor's thesis project on the ABB IRB-360 delta robot, focusing on kinematics for trajectory generation and dynamics for motor-side torque analysis.

C, Arduino
Multisim
Eagle

3-axis C.N.C. milling machine
Contributed to the development of a 3-axis C.N.C. milling machine, utilizing Arduino for motor control and establishing PC connectivity via a serial bus. Designed the PCB for sensor conditioning.

EDUCATION

10/2021 - Current **Master's degree in Mechatronics Engineering** **University of Padova - Italy**
Embedded systems programming (multithreading in C++).
Optimal adaptive control (state-space modeling, LQG control).
AC drives for industry and electric mobility (PMSM, SynRM, HSM, IM).
Power electronics (modeling and control of DC-DC converters).

10/2022 - Current **Master's degree in Electrical and Computer Engineering** **Yokohama National Univ. - Japan**
Traditional computer vision (projective geometry, 3D reconstruction).
DL-based computer vision (classification, object detection and tracking).

10/2018 - 9/2021 **Bachelor's degree in Mechatronics Engineering [106/110]** **University of Padova - Italy**
Control systems theory, electrical machines and drives.
Industrial informatics (Linux C programming, Git, CMake, Doxygen).
Analog and digital circuits theory, ARM microcontrollers, FPGA.

9/2013 - 7/2018 **Technical high school diploma in Electronics [100/100]** **I.I.S. Levi-Ponti - Italy**
Design and implementation of PCBs with analog and digital circuits.
Embedded systems with Arduino Uno (sensor readings, signal conditioning).

EXPERIENCE

7/2019 – 9/2019 internship **Refrigeration engineer Intern** **Blauwer S.p.a. - Italy**
- Developed an Excel-VBA application to facilitate the selection of components based on design information.
- Gained exposure to cross-sector collaboration within the engineering department.

7/2017 – 8/2017 internship **Robotics electrician Intern** **Dal Maschio S.r.l. - Italy**
- Teamworking spanning from mechanical assembly to electrical cabling and testing, providing a comprehensive insight into the overall manufacturing process.

LANGUAGES

English - B2+, **Italian** - native