Alberto Marnetto

Senior Software Engineer, C++ / Python

Contacts

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Main Languages

- C++ (STL, Boost, Abseil, template metaprogramming)
- Python
- Linux scripting (bash)

Other Languages

- C
- Java
- Matlab

Complementary Skills

- Embedded Linux
- Wireshark
- gdb
- Docker, LXC
- CMake
- CI: Jenkins, Gerrit, GitLab Pipelines
- Protocols: TCP/IP, UDP, CAN, Modbus, NMEA
- Qt Framework
- Prometheus / Grafana
- SQL
- FIX
- Currently learning PyTorch

Main Work Experiences

- **Senior Software Engineer** at **MayStreet** (2023 – present)
  Developer of low-latency C++ code (and Python scripting) for stock exchange data. Focus on performance and correctness.
  - Wrote / rewrote four feed handlers (low-latency data processing libs) with extensive use of advanced techniques, especially template metaprogramming, with minimal (as new hire) or no (currently) supervision.
  - Removed 100+ warnings from the codebase.
  - Collaborated in making the codebase buildable under MacOS.
  - Sped up the CMake configuration time by several seconds by removing / refactoring unnecessary directives.
  - Wrote a Slack integration to notify teammembers about protocol updates published by the exchanges.
  - Mentored an intern.
  - Solved ~20 customer tickets, involving log analysis, troubleshooting and debugging.

- **Senior Software Engineer** at **indurad** (2016 – 2022)
  Software development in C++ and Python for Linux systems.
  - Code owner for the GNSS positioning libraries: main author, mandatory approver for all related CRs, in charge of the code architecture, reference figure for troubleshooting / support / training on the topic.
  - Reworked the CMake architecture of the whole codebase, reducing the developer time needed to integrate new modules and the cross-compiling errors.
  - Created / extended visualization and analysis tools for various datasets (app for 3D visualization of sensor data, scripts to filter and analyze SQL databases, automated processes to download files from mobile devices and detect errors, etc.)
  - Designed client/server communication protocol and data processing algorithms for a project involving various servers and hundred of mobile embedded devices
  - Created tooling to streamline operations, improving the deployment speed and reducing errors. E.g. wrote scripts to detect online remote devices and auto-update their firmware, logging errors in the process, saving hours in deployment time.
  - Collaborated in designing / extending the CI pipelines in GitLab.
  - Developed the monitoring systems (Prometheus connectors, Grafana dashboards) for various embedded devices.
  - Got the best possible evaluation (“Stets zu unserer vollsten Zufriedenheit”) in the *Arbeitszeugnis* (letter given by the employer at the end of a job relationship).

- **R&D Engineer, Combustion Engines** at **FEV** and **Fiat** (2009 – 2016)

Education

- **Double degree in M.Sc., Mathematical Engineering** at Politecnico di Torino and Politecnico di Milano (2008)
  Final mark 110/110 and commendation.
  Results from the M.Sc. dissertation were published on *Optical And Quantum Electronics* and other journals (see Publications)
  Completed the "ASP" program for high-performing students (75 selected out of ~4000), chosen on the base of academic performance and leadership potential.

- **B.Sc., Applied Mathematics** at Politecnico di Torino (2006)
  Final mark 110/110 and commendation.
  Winner of a scolarship by the IndAM (National High Mathematics Institute) covering the full B.Sc. tuition.
  Results from the B.Sc. dissertation were published was published on *IEEE Transactions on Automatic Control* (see Publications)

Certificates

- Coursera's **Deep Learning Specialization**
  (https://coursera.org/share/7390a33ab9c77c353ccbe6ff7adffba3)

Selected side projects

- **Namensmeister** : educational app for Android, written in Java
  play.google.com/store/apps/details?id=marnetto.namensmeister

- **multidim** : C++ utilities for multidimensional containers, with heavy use of metaprogramming
  github.com/AlbertoMarnetto/multidim

- **Beltempo** : image editing program, written in C++/Qt
  https://github.com/AlbertoMarnetto/beltempo

- **Stunt Island "8x detail patch"**, a reverse-engineering project (x86 assembly)
  Hit #1 on Hacker News on 03.12.2024
  marnetto.net/2024/11/20/tweaking-stunt-island

Publications

- Alberto Marnetto, Luciano Pandolfi, "Wave Equations, Fractional Derivatives, and a New Instance of the Lack of Robustness of Velocity Feedbacks", *IEEE Transactions on Automatic Control*, Vol. 53 No. 4, S. 1047 - 1051, 2008
  (dx.doi.org/10.1109/TAC.2008.919574)
- Alberto Marnetto, Michele Penna, Francesco Bertazzi, Enrico Bellotti, Michele Goano, "Ab initio and full-zone k·p computations of the electronic structure of wurtzite BeO", in NUSOD '08, Nottingham, September 2008
  (dx.doi.org/10.1109/NUSOD.2008.4668216)
- Alberto Marnetto, Michele Penna, Francesco Bertazzi, Enrico Bellotti, Michele Goano, "Ab initio, nonlocal pseudopotential, and full-zone k·p computation of the electronic structure of wurtzite BeO", *Optical And Quantum Electronics*, Vol. 40 N. 14, S. 1135-1141, 2009
  (dx.doi.org/10.1007/s11082-009-9273-6)
- Michele Penna, Alberto Marnetto, Francesco Bertazzi, Enrico Bellotti, Michele Goano, "Empirical Pseudopotential and Full-Brillouin-Zone k·p Electronic Structure of CdTe, HgTe, and $Hg_{1-x}Cd_xTe$", *Journal of Electronic Materials*, Vol. 40 N. 8, S. 1717-1725, 2009
  (dx.doi.org/10.1007/s11664-009-0798-z)
- Alberto Marnetto, Michele Penna, Michele Goano, "An accurate dual-expansion-point full-Brillouin-zone k·p model for wurtzite semiconductors", J. Appl. Phys. 108, 033701, 2010
  (dx.doi.org/10.1063/1.3459883)