Luca **Bonamini**

Robotics Software Engineer

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Summary

Luca Bonamini is currently a **Software Engineer** with a focus on **Autonomous Driving** at **Yape s.r.l.**. He received his Bachelor Degree in **Mechanical Engineering** from University of Genova and the Master Degree in **Robotics and Automation Engineering** from University of Pisa, in 2015 and 2018, respectively. After graduation he started a collaboration as Research Fellow at Robotics Research Center "E.Piaggio" of the University of Pisa, where he joined Roboteam Italia, one of the teams of **Roborace**, an autonomous full scale electric racing car competition. He joined **Proxima Robotics s.r.l.** in 2020, where he was responsible for developing planning and control algorithms for mobile robots

Work Experience

Yape s.r.l. — *Milan, Italy*

Software Engineer | Autonomous Driving — *Mar. 2021 - Present*

- Design of navigation architecture for a delivery robot

Proxima Robotics s.r.l. — *Pisa, Italy*

Robotics Software Engineer — *Mar. 2020 - Mar. 2021*

- Develop a trajectory planning algorithm in a Frenet Frame for obstacle avoidance for a service robot
- Develop an Adaptive Pure Pursuit controller for path tracking for a service robot
- Develop tools for offline data debug and visualization
- Design and implementation of a CI/CD pipeline

Roboteam Italia — *Pisa, Italy*

Software Engineer | State Estimation, Planning and Control — *Dec. 2018 - Mar. 2020*

- Develop an optimal trajectory planning algorithm for lane change and obstacle avoidance for autonomous racing cars
- Develop a lidar-based localisation system for autonomous racing cars in a GNSS denied environment
- Develop interfaces between ROS ecosystem and real-time sensors for a self-driving car
- Contribute to the development of an MPC controller for real-time path tracking

Research Center "E. Piaggio" — *Pisa, Italy*

Research Fellow — *Dec. 2018 - Mar. 2020*

- Develop an Augmented Reality system to assist mobile robots teleoperation
- Collaborate on Alter-EGO project dealing with the development of an autonomous navigation stack

Education

University of Pisa — *Pisa, Italy*

M.S. in Robotics and Automation Engineering — *Sept. 2015 - Exp. Nov. 2018*

- Towards a shared autonomy control framework: application to Ego robot navigation

University of Genova — *Genova, Italy*

B.S. in Mechanical Engineering — *Sept. 2012 - Sept. 2015*

- Design of a two-stage parallel shaft gear reducer

Skills

Programming	C++, ROS, ROS2, Python, Matlab/Simulink, HTML/CSS, JS
Libraries	STL, Boost, Eigen, Qt
Planning Algorithms	Dijkstra, A*, RRT*, Lattice, DWA, Potential Field, Optimal Trajectory generation
Control Algorithms	PID, LQR, MPC, Apative Pure Pursuit
Real-Time Sensors	GPS, IMU, LIDAR, Speed sensors
Message Protocols	Protobuf, CAN
DevOps	Docker, GitLab CI/CD, Bash scripting
Tools	GitLab, Git, CMake, gdb
Languages	Italian, English

Publications

- **LiDAR-Based GNSS Denied Localization for Autonomous Racing Cars.** Massa, F.; Bonamini, L.; Settimi, A.; Pallottino, L.; Caporale, D. . *Sensors 2020, 20, 3992.*

Certifications

2011 **First Certificate in English (FCE),** Grade A, University of Cambridge ESOL Examinations *La Spezia, Italy*