# Federico Massa

*Ph.D. Student in Robotics, MSc in Physics*

*Via Francesco Pardi, 18*
*Pisa (PI) - Italy*
*+39 347 7034248*
*fedemassa91@gmail.com*
*federicomassa.github.io*


## Professional Profile

My background is in Physics (BSc and MSc), which provided me with advanced physics, mathematics and statistics skills. In 2016, I started a collaboration with the Robotics Research Center "E.Piaggio" of the University of Pisa, where I started a Ph.D. in 2017 focusing on Autonomous Driving. I am currently part of *Roboteam-Italia*, one of the teams of Roborace, an autonomous full scale electric racing car competition. I have always had a strong inclination toward software development (especially for robotics applications), which led me to delve into the development of the team perception system (based on lidar sensors) and on a driving simulator that the team uses to test the whole perception-control pipeline.

## Education

2017–present **Ph.D. Student in Robotics**, *Research Center E. Piaggio.*

2016–2017 **Research contract**, *Research Center E. Piaggio.*

2013–2016 **MSc in Physics**, *University of Pisa*, 110/110 cum laude.

2010–2013 **BSc in Physics**, *University of Cagliari*, 110/110 cum laude.

2005–2010 **Scienfitic High School Diploma**, *Lic. Sc. Pitagora (Selargius)*, 100/100 cum laude.

## Experience

2019 **Roborace event**, *Zala Zone (Hungary)*, Perception module developer for Roboteam-Italia team.

2019–present **Teaching assistant**, *University of Pisa (Italy)*, "Introduction to ROS" for the Distributed Robotic Systems course, MSc in Robotics and Automation.

2018–present **Perception module team leader**, *Research Center E. Piaggio (Italy)*, Roboteam-Italia team, Developing a lidar-based mapping and localisation system for autonomous racing cars.

2018–present **Simulation module team leader**, *Research Center E. Piaggio (Italy)*, Roboteam-Italia team, Developing a simulator based on Unreal Engine 4 to simulate the whole Roborace autonomous racing competition.

2018 **Roborace event**, *Berlin (Germany)*, Perception module developer for Roboteam-Italia team.

2018 **Introduction to Mobile Robotics**, *ITIS Livorno*, held a workshop on Robotics for High School students.

2016 **Master thesis**, *Geneva (Switzerland)*, Brief stay at CERN under the ITk group (ATLAS experiment).

2016 **Workshop**, *Alghero (Italy)*, Participation to the "XIII Seminar on Software for Nuclear, Subnuclear and Applied Physics": Geant4 framework and GPU programming.

## Core Skills

- Lidar-based mapping and localization
- Driving simulators development
- Classical/Relativistic/Quantum Physics
- Statistical data analysis
- Particle/Kalman filters implementation
- Advanced calculus and differential calculus
- Monte Carlo simulations
- Reinforcement Learning

## Programming Skills

- C++ (strong)
- Matlab/Simulink
- Multithreaded applications programming
- Qt/Qt Quick framework
- Python
- ROS
- Unreal Engine 4
- PhysX basics
- Bash scripting

## Languages

- Italian (mother tongue)
- English (fluent)
- Spanish (intermediate)

## Publications


[1] D. Caporale, A. Settimi, F. Massa, F. Amerotti, A. Corti, A. Fagiolini, M. Guiggiani, A. Bicchi, L. Pallottino: "Towards the Design of Robotic Drivers for Full-Scale Self-Driving Racing Cars", IEEE International Conference on Robotics and Automation (ICRA), 2019

[2] D. Caporale, A. Fagiolini, L. Pallottino, A. Settimi, A. Biondo, F. Amerotti, F. Massa, S. De Caro, A. Corti, L. Venturini: "A Planning and Control System for Self-Driving Racing Vehicles", IEEE Research and Technologies for Society and Industry (RTSI), Sept. 2018