

# Dr. Edoardo Ghini

## Robotics Engineer

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### BRIEF DESCRIPTION

Curious and **self-confident** person, level-headed and quite an experimenter. Passionate about programming and believing it to be a form of art. Fascinated by mysteries of **science** and firm believer in technological progress. Enthusiastic about the latest academic discoveries in my field of expertise. Looking forward to learning more about Neuroscience and Human Consciousness and combine them together with **Robotics** and **Artificial Intelligence**.

### WORK EXPERIENCE

CURRENT, FROM OCT 2020 (FT)

INRIA, French national research institute  
**Robotics Engineer**

Developed a system from the ground up to **teleoperate** an industrial robot in hazardous environments. Each module of the pipeline is written in C++ and it is containerized with **Docker** and communicate through **ROS** middleware. Dynamics of the system is simulated in a **digital twin** using *dart* and *gazebo*. Joint-space and Cartesian control of the robot through *pinocchio* and *tsid* libraries. Designed a **GUI** for teleoperation with C++ library *ImGui* that introduces interactive **automation** of the task. Experience in URDF creation, modern C++ frameworks and libraries interfacing and acquaintance with robots of the lab: *franka* manipulator & *talos* humanoid robot.

FEB 2019 – OCT 2019 (FT)

La Sapienza, University of Rome  
**Master's Thesis**

Implemented a robotic system to achieve autonomous navigation (**SLAM**) in an urban environment of a mobile robot equipped with a **3D-LIDAR** laser sensor. The whole project has been implemented in C++ adopting the ROS build system. High-level features are extracted from the 3D-point cloud and categorized in geometric primitives. The sensor data is processed using the primitives in order to compute the trajectory of the robot. Used a probabilistic approach that involves using the **Gaussian assumption** and a **Least Square** formulation. The work has been developed in collaboration with the Robotics Laboratory of La Sapienza University.

**Master thesis link**

MAR 2016 – JUL 2016 (FT)

Translated  
**Back-end developer**

During this internship, I was responsible for the codebase of a web application: **Matecat**, written in PHP. I developed unit-tests to certify the correctness of the core of the application. Brought code coverage percentage from 0% to 25%. Worked with databases and client-server communications: **MySQL** and **Apache**. Learned how to work in **agile** teams, following **scrum** principles. Acquired deep knowledge of advanced testing techniques: **mock objects**, **reflection**, and **TDD**.

**Bachelor thesis link**

Languages: **Italian:** native **English:** IELTS academic cert. Overall band score **7.0** CEFR level **C1**

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### EDUCATION

2016 – 2019 **Master of Science**  
FINAL GRADE 103 / 110  
Master in Artificial Intelligence and Robotics  
*La Sapienza, University of Rome*

2013 – 2016 **Bachelor of Science**  
FINAL GRADE 95 / 110  
Computer Engineering  
*Roma Tre University*

### PROGRAMMING SKILLS

LANGUAGES C++, python,  $\text{\LaTeX}$ , Javascript  
Java, bash, MATLAB, PHP

C++20 templates, lambdas, move semantic  
smartpointers, concepts

DESIGN OOP, polymorphism, functional programming

TESTING TDD, reflection, mock objects, googletest

LIBRARIES OpenCV, tensorflow, OpenGL, dart, ImGui

DEVOPS cmake, Docker, git, vim, gdb, valgrind

### THEORETICAL SKILLS

ROBOTICS dynamic systems evolution, quaternions  
CONTROL inverse dynamics, robust control

ROBOTIC SLAM, trajectory planning  
NAVIGATION obstacle avoidance, filtering

MACHINE bioinspired networks, CNN  
LEARNING spiking neurons, LSTM

ARTIFICIAL multiagent systems, reinforcement learning  
INTELLIGENCE first order logic

COMPUTER operative systems, network protocols  
SCIENCE algorithms design, databases

### REFERENCES

**Dr. Serena Ivaldi**

POSITION Research scientist  
EMPLOYER INRIA

**Dr. Giorgio Grisetti**

POSITION Professor  
EMPLOYER La Sapienza, University of Rome