Edoardo Ghini
Senior SLAM Engineer

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CAREER MOTIVATION

I find profound fulfillment in working as a SLAM software engineer, as it provides the types of challenges I enjoy solving most. I strongly value collaboration and believe that working effectively within a team is paramount. Driven by curiosity, I am eager to deeply understand how systems work. I have a strong passion for programming and prefer using statically typed languages. I bring seven years of professional experience with **C++** and have been learning **Rust** for the past year.

EDUCATION

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

This course covered all the fundamentals of computer engineering introducing me to programming. The thesis covered what I learnt in the brief internship as a PHP back-end developer. **Thesis:** *Unit testing avoiding regression in CI*

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

Completed a Master's degree in Robotics with a strong focus on SLAM and autonomous systems. Built expertise in kinematics, dynamics, navigation, filtering, and AI (planning and reasoning). Worked on multiple hands-on robotics projects, applying theoretical concepts to real-world challenges. For my thesis, developed a 3D LiDAR SLAM pipeline in C++ and ROS, using a probabilistic least-squares approach to extract high-level geometric features.
Thesis: *Position tracking using high order primitives*

SUBJECTS

CALCULUS
PHYSICS
OPERATIVE SYSTEMS
DATABASES
NETWORK PROTOCOLS
ALGORITHMS
SOFTWARE ARCHITECTURE

SUBJECTS

PROBABILISTIC ROBOTICS
COMPUTER VISION
CONTROL THEORY
MULTIAGENT SYSTEMS
PATH PLANNING
FIRST-ORDER LOGIC
COMPUTER GRAPHICS
NEURAL NETWORKS
DRONES CONTROL
MACHINE LEARNING
ROBUST CONTROL
HUMANOIDS GAIT

WORK EXPERIENCE

MAR 2016 – JUL 2016 (FULL TIME)

Translated
Back-end developer

Maintained and improved the codebase of a web application written in **PHP** (**Matecat**). Developed unit tests to ensure correctness of core application logic. Worked with **MySQL**, **Redis**, and **Apache** for database management, caching, and client–server communication. Gained experience with advanced testing techniques, including **mocking dependencies**, **reflection**, and **test-driven development (TDD)**.

OCT 2020,APR 2022 (FULL TIME)

INRIA, French national research institute
Robotics Software Engineer

Developed a system from scratch to teleoperate an industrial robot in hazardous environments. Implemented each pipeline module in **C++**, containerized with **Docker**, and integrated using **ROS**. Simulated system dynamics in a **digital twin** using **DART** and **Gazebo**. Applied advanced control techniques with **Pinocchio** and **TSID** libraries to control the robot in both **Cartesian** and **joint space**. Designed a **GUI** for teleoperation using **ImGui**, implementing quaternion-based visualization and a **state machine** for automation. Gained hands-on experience with **control laws** on humanoid robots through **dynamic programming**. Built **URDF** models and worked with modern C++ frameworks. Acquired practical experience with lab robots: *Franka manipulator* and *Talos* humanoid. Contributed to a research **paper** published at **IEEE ARSO 2023 (Berlin)**.

JUN 2022, NOW (FULL TIME)

Kudan
Senior SLAM Engineer

Contribute to the development and maintenance of a **C++ 3D LiDAR-based SLAM library**, focusing on the algorithmic core. Investigate and resolve complex bugs while validating new algorithmic approaches. Develop internal tools for the team, including **GUI** and **CLI** applications. Integrate data from multiple sensors (**GNSS, INS, wheel odometry, IMU**) to improve robustness of SLAM solutions. Apply state estimation, sensor fusion, graph optimization, Lie algebra ($SE(3)$ manifolds), and advanced covariance handling. Strengthened expertise in multi-threading, software architecture, and design patterns. Promote modern development practices: modern **C++** standards, **Docker** containerization, and continuous improvement of workflows. Conduct thorough code reviews and produce detailed technical documentation in Confluence. Collaborate within a **SAFe framework**, improving communication, epic planning, risk assessment, and time estimation. Currently gaining hands-on experience with **ROS2**.

PERSONAL PROJECTS

Spiking network CNN for classification
Implemented a custom tensorflow layer to obtain a NN of spiking neurons to be used in image classification.

Chess endgames RL engine
Developed in python a reinforcement learning strategy to a achieve autonomous playing on a three by eight board with only Kings and Pawns.

3D game in WebGL using shaders and lighting tecniques
Created an imitation of the game *Slenderman* using computer graphics primitives in Javascript.

Multi agent algorithm for camera field of view coverage
Implemented an article in C++ to solve the problem of multiple cameras at the corners of a room trying to minimise blind spots. Creating a visualisation of it using OpenGL.

Hex game simulator
Developed a simulation of the board game Hex in Rust.

Conway's Game of Life
Built a visualisation of the Game of Life in Rust.

REFERENCES

Dr. Serena Ivaldi
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Dr. Giorgio Grisetti
Professor
La Sapienza, University of Rome
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