Example of PhD Thesis with RoboticsLaTeX template

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In partial fulfillment of the requirements for the degree of

Laurea Magistrale in Robotics Engineering

December 17, 2025

Declaration of Originality

I, Simone Lombardi, hereby declare that this thesis is my own work and all sources of information and ideas have been acknowledged appropriately. This work has not been submitted for any other degree or academic qualification. I understand that any act of plagiarism, reproduction, or use of the whole or any part of this thesis without proper acknowledgment may result in severe academic penalties.

Acknowledgements

I want to thanks all the people that helped me during my time at University of Genova, starting with professor Cannata. His assistance was essential in the development of this thesis. I than extend my depest gratitude to Francesco Grella and Francesco Giovinazzo, them with all the other people of the MACLAB laboratory made me feel welcomed and have given me invaluable advice throughout my journey with them.

On a personal note, I want to thanks all my colleagues of the Robotics Engineering course. The friendship I found are extremely meaningful to shape me in the person I am today. Last but not least, in the slightest I want to tell my family and friends that their unwavering support and belief in me did not go unnoticed, I would not be here today if it wasn't for them.

This is a short, optional, dedication. To all the Master and PhD students of Robotics Engineering at the University of Genova.

Abstract

In industrial application the use of robotic systems has constantly increase from the sixties to today. But even with all the the technological improvements of the later years some tasks are still to complex or difficult to automatize completely. For this reason the research moved towards the "collaboration" between robot and machines. Two of the main challenges of this approach are: safety and ease-of-collaboration, meaning the robot have to be able to recognize the operator and enact safety procedure to avoid injury but also the human agent need to interact with the robot in the most natural way possible to increase the overall performance and the effectiveness of the couple human-machine. On this topic the MACLAB laboratory developed an initial demo for a collaborative workcell, within the SESTOSENSO project, to install the canopy of a car. My contribution to the project, and the objective of this thesis, was to explore the capabilities of the robotic system as one singole entity. Since the real system is composed of two industrial robot mounted in series, and since the dynamics controller was a proprietary one, the MACLAB decidet to opt for a simpler cinematic controller. My work was conducted in a simulation enivironment developed for the control of the real robot, and this allowed me to explore a more complex control scheme. I moved to a Task Priority approach since I wanted to effectively use all the DOF of the robot, to achive different objectives. The main task was to evaluate the behaviour of the robot in a task of obstacle avoidance, I simulated the proximity sensor used in the real system, and evaluated the behaviour with a series of experiment.

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References

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