

Alessandra Bernardini

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SUMMARY

PhD Robotics engineer with expertise in **robotic manipulation**, **ML-based control**, and **human-robot interaction**. Experienced in Python, C/C++, and ROS, with a strong background in simulation (MuJoCo, MATLAB/Simulink) and robotic manipulation. Now seeking to bring this experience to applied R&D or robotics product development in industry.

TECHNICAL SKILLS

Programming: Python, C/C++, MATLAB, Bash

Frameworks Tools: ROS, TensorFlow, PyTorch, Git

Libraries: NumPy, pandas, Matplotlib, scikit-learn, OpenCV

CAD & Design: Creo, Onshape

Simulation: MuJoCo, Gazebo, MATLAB/Simulink

Other: Signal Processing, Data Analysis, Control Systems

EDUCATION

Alma Mater Studiorum - University of Bologna

Bologna, IT

PhD in Automatic Control and Operational Research

2021 – 2024

- **Awards:** SIDRA Annual Award for PhD Theses (2025).

Alma Mater Studiorum - University of Bologna

Bologna, IT

MSc in Automation Engineering

2019 – 2021

- **Final Grade:** 110/110 with honors, **GPA:** 4.

Alma Mater Studiorum - University of Bologna

Bologna, IT

BSc in Automation Engineering

2016 – 2019

- **Final Grade:** 110/110 with honors, **GPA:** 4.

EXPERIENCE

Post-Doc Researcher in Robotics

Nov. 2024 – Nov. 2025

University of Bologna – Laboratory of Automation and Robotics (LAR)

Bologna, IT

- Improved adaptability and effectiveness of robotic end-effectors operating in real-world environments via **ML-driven control** strategies.
- Contributed to the EU project IntelliMan, implementing **AI-powered manipulation** systems and validating them on hardware platforms.

Visiting Student Researcher

Oct. 2023 – Apr. 2024

Stanford University – Biomimetics and Dexterous Manipulation Laboratory (BDML)

Palo Alto, CA

- Built a **MuJoCo simulation** to evaluate human-in-the-loop telemanipulation with multiple end-effector designs.
- Analyzed how design choices influence manipulator's performance, supporting design decisions for constrained environments.

PhD Candidate in Robotics

Nov. 2021 – Nov. 2024

University of Bologna – Laboratory of Automation and Robotics (LAR)

Bologna, IT

- Developed advanced **simulation models** of the forearm's muscular system, enabling realistic sEMG signal generation to evaluate and optimize myoelectric control schemes.
- Applied **deep learning** to simplify myoelectric control of robotic hands, reducing the complexity of training and improving robustness and adaptability.
- Built **modular ROS-based robotic architectures** integrating sensors, actuators, and custom control software.

PROJECTS

SLIM: A Symmetric, Low-Inertia Manipulator for Constrained, Contact-Rich Spaces	Research Project
<ul style="list-style-type: none">Validated an end-effector for constrained, contact-rich tasks, reducing swept volume and improving manipulation safety.Built simulation frameworks to benchmark performance in realistic scenarios.	
Shared Autonomy for Robotic Hand Control	Research Project
<ul style="list-style-type: none">Developed a shared autonomy framework combining HMMs with EMG to provide intuitive control of robotic hands.Demonstrated improved task performance and stability in interaction with human operators.	

AWARDS

- 2025: SIDRA **Annual Award for PhD Theses** in Systems and Control Engineering
- 2024: **Best Poster Award** at the International Conference on Robotics and Automation - ICRA
- 2021/2019: **Excellence Scholarships**, University of Bologna