

# 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

<b>Alma Mater Studiorum - University of Bologna</b> <i>PhD in Automatic Control and Operational Research</i> <ul style="list-style-type: none"><li>• <b>Awards:</b> SIDRA Annual Award for PhD Theses (2025).</li></ul>	Bologna, IT 2021 – 2024
<b>Alma Mater Studiorum - University of Bologna</b> <i>MSc in Automation Engineering</i> <ul style="list-style-type: none"><li>• <b>Final Grade:</b> 110/110 with honors, <b>GPA:</b> 4.</li></ul>	Bologna, IT 2019 – 2021
<b>Alma Mater Studiorum - University of Bologna</b> <i>BSc in Automation Engineering</i> <ul style="list-style-type: none"><li>• <b>Final Grade:</b> 110/110 with honors, <b>GPA:</b> 4.</li></ul>	Bologna, IT 2016 – 2019

## EXPERIENCE

<b>Post-Doc Researcher in Robotics</b> <i>University of Bologna – Laboratory of Automation and Robotics (LAR)</i> <ul style="list-style-type: none"><li>• Improved adaptability and effectiveness of robotic end-effectors operating in real-world environments via <b>ML-driven control</b> strategies.</li><li>• Contributed to the EU project IntelliMan, implementing <b>AI-powered manipulation</b> systems and validating them on hardware platforms.</li></ul>	Nov. 2024 – Nov. 2025 Bologna, IT
<b>Visiting Student Researcher</b> <i>Stanford University – Biomimetics and Dexterous Manipulation Laboratory (BDML)</i> <ul style="list-style-type: none"><li>• Built a <b>MuJoCo simulation</b> to evaluate human-in-the-loop telemanipulation with multiple end-effector designs.</li><li>• Analyzed how design choices influence manipulator's performance, supporting design decisions for constrained environments.</li></ul>	Oct. 2023 – Apr. 2024 Palo Alto, CA
<b>PhD Candidate in Robotics</b> <i>University of Bologna – Laboratory of Automation and Robotics (LAR)</i> <ul style="list-style-type: none"><li>• Developed advanced <b>simulation models</b> of the forearm's muscular system, enabling realistic sEMG signal generation to evaluate and optimize myoelectric control schemes.</li><li>• Applied <b>deep learning</b> to simplify myoelectric control of robotic hands, reducing the complexity of training and improving robustness and adaptability.</li><li>• Built <b>modular ROS-based robotic architectures</b> integrating sensors, actuators, and custom control software.</li></ul>	Nov. 2021 – Nov. 2024 Bologna, IT

## PROJECTS

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SLIM: A Symmetric, Low-Inertia Manipulator for Constrained, Contact-Rich Spaces Research Project

- 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

- 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

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- 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