

# Alessandra Bernardini

## Curriculum Vitae

Dipartimento di Ingegneria  
dell'Energia Elettrica  
e dell'Informazione - DEI

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## Personal informations

First name Alessandra  
Last name Bernardini  
Place and date of birth Urbino (Italy), March 26, 1997  
Nationality Italian  
Position PhD student  
Affiliation Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione - DEI  
E-mail alessandr.bernardin5@unibo.it

## Education

November 2021-ongoing **PhD student in Automatic Control and Operational Research**, University of Bologna, Italy

October 2023 - March 2024 **Visiting Student Researcher at Stanford, Biomimetic and Dexterous Manipulation Lab - BDML**, under the supervision of Professor Mark Cutkosky

October, 2021 **Master Degree in Automation Engineering**, University of Bologna, Italy  
Thesis: *Extraction of Grasping Motions from sEMG Signals for the Control of Robotic Hands through Autoencoding.*  
Supervisor: Professor Claudio Melchiorri  
Final grade: 110/110 with honors

October, 2019 **Bachelor Degree in Automation Engineering**, University of Bologna, Italy  
Thesis: *Controllo di mani robotiche basato su elettromiografia: sviluppo di un modello del segnale sEMG per la simulazione di algoritmi di decodifica dell'intento.*  
Supervisor: Professor Claudio Melchiorri  
Final grade: 110/110 with honors

2011 – 2016 **High School Diploma in Scientific Studies**, Liceo Scientifico G.Torelli  
Final grade: 100 with honors

## Research Projects

2022 - ongoing IntelliMan project (AI-Powered Manipulation System for Advanced Robotic Service, Manufacturing, and Prosthetics), coordinated by Prof. Gianluca Palli, funded by the European Commission under the Horizon Europe program.

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## Teaching Activity

- 2022 - ongoing Teaching Tutor for the Course "Foundation of Industrial Robotics" held by Prof. Claudio Melchiorri, part of the Automation Engineering Bachelor's Degree at the University of Bologna.
- 2022 - ongoing Teaching Tutor for the Course "Industrial Robotics M" held by Prof. Claudio Melchiorri, part of the Automation Engineering Master's Degree at the University of Bologna.

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## Honours and Awards

- 2024 Best Poster at the "A-HUMAN – Advanced human-robot interfaces based on physiological signals and sensory stimulations" Workshop at ICRA 2024.
- 2022 Finalist of Best Paper Award for the article "Simulative and Experimental Evaluation of a Soft-DTW Neural Network for sEMG-Based Robotic Grasping" at the International Workshop on Human-Friendly Robotics.
- 2021 Scholarship for deserving students enrolled in the academic year 2020/2021 to study courses of the University of Bologna.
- 2019 Scholarship for deserving students enrolled in the academic year 2018/2019 to study courses of the University of Bologna.

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## Publications

1. R. Meattini, A. Bernardini, G. Palli and C. Melchiorri, "*sEMG-Based Minimally Supervised Regression Using Soft-DTW Neural Networks for Robot Hand Grasping Control*," in IEEE Robotics and Automation Letters, vol. 7, no. 4, pp. 10144-10151, Oct. 2022, doi:10.1109/LRA.2022.3193247.
2. A. Bernardini, R. Meattini, G. Palli and C. Melchiorri, "*Simulative and Experimental Evaluation of a Soft-DTW Neural Network for sEMG-Based Robotic Grasping*," in: Borja, P., Della Santina, C., Peternel, L., Torta, E. (eds) Human-Friendly Robotics 2022. HFR 2022. Springer Proceedings in Advanced Robotics, vol 26. Springer, doi:10.1007/978-3-031-22731-8\_15.
3. R. Meattini, A. Caporali, A. Bernardini, G. Palli and C. Melchiorri, "*Self-Supervised Regression of sEMG Signals Combining Non-Negative Matrix Factorization With Deep Neural Networks for Robot Hand Multiple Grasping Motion Control*," in IEEE Robotics and Automation Letters, vol. 8, no. 12, pp. 8533-8540, Dec. 2023, doi: 10.1109/LRA.2023.3329764.
4. R. Meattini, A. Amerí, A. Bernardini, J. Gonzalez-Huarte, A. Ibarguren, C. Melchiorri, and G. Palli, "*Neuromuscular Interfacing for Advancing Kinesthetic and Teleoperated Programming by Demonstration of Collaborative Robots*," in IEEE Transactions on Haptics, pp. 1-12, 2024, doi: 10.1109/TOH.2024.3484373.
5. A. Bernardini, R. Meattini, A. Pasquali, G. Laudante, C. Gentile, E. Gruppioni, G. Palli, C. Melchiorri, "*Hidden Markov Model Based Shared Autonomy for Grasp Strength Regulation in sEMG Driven Robot Hand Control*", IEEE Robotics and Automation Letters (under Review).
6. R. Thomasson, A. Bernardini, A. Hajj-Ahmad, M. Cutkosky, "*SLIM: A Symmetric, Low-Inertia Manipulator for Constrained, Contact-Rich Spaces*", International Journal of Robotics Research, (under Review).

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## Schools and Conferences attended

July 8 - 13, 2024	<b>Summer School SIDRA</b> , Bertinoro
May 13 - 17, 2024	<b>International Conference on Robotics and Automation - ICRA</b> , Yokohama, Japan
July 3 - 8, 2023	<b>Summer School SIDRA</b> , Bertinoro
June 26 - 30, 2023	<b>HumAN, International Summer School On Human-Centred Robotics</b> , Ancona
October 23 - 27, 2022	<b>International Conference on Intelligent Robots and Systems - IROS</b> , Kyoto, Japan
September 22 - 23, 2022	<b>15th International Workshop on Human-Friendly Robotics</b> , Delft, The Netherlands
September 1 - 3, 2022	<b>Automatica.it</b> , Cagliari
July 14 - 17, 2021	<b>Summer School SIDRA</b> , Bertinoro

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## Computer skills

C Language / Python / Robot operating system - ROS /  
MATLAB&Simulink / CodeSys IEC 61131-3 automation software

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## Languages

Italian	Mothertongue
English	Advanced – C1