

# Lorenzo Vignoli

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## Profile

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I am a Master Thesis student at the [CREATE Lab](#) at EPFL, supervised by Prof. Josie Hughes, and completing my MSc in Data Science for Industrial Engineering at Politecnico di Milano, after a BSc in Mechanical Engineering. I am also part of the [Alta Scuola Politecnica](#), a joint honors program between PoliMi and PoliTo. My background bridges mechanics, data-driven methods, and AI.

My work focuses on vision-based reconstruction and feedback control of soft robotic arms, aiming to develop intelligent and adaptive physical systems. I am also contributing to an autonomous pruning robot for precision agriculture at [PIC4SeR](#) Lab in Turin, integrating deep learning and robotic control.

My interests include soft robotics, embodied intelligence, and the integration of AI into physical systems. I am particularly motivated to explore how nature-inspired principles can guide future research.

## Education

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**EPFL Master Thesis and SEMP (Swiss-European Mobility Program)** Feb 2025 - Present

- Thesis title: "Vision-based Soft Robotic Arms Reconstruction and Closed-loop Control".
- Courses: Advanced Control Systems and Data-driven Design.

**Alta Scuola Politecnica Multidisciplinary honors program** Jan 2024 - Present

- Courses in Innovation and Mechanical Design, jointly held by the Polytechnics of Milan and Turin.
- VinPRO robotics project focused on an autonomous vineyard pruning system.

**Politecnico di Milano MSc Data Science for Industrial Engineering** Sep 2023 - Present

- Projects on artificial neural networks, autonomous vehicles, digital twinning, and applied statistics.

**Politecnico di Milano BSc Mechanical Engineering** Sep 2020 - Sep 2023

- Grade: 110/110 with honors.

## Research and Work Experience

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**Student Researcher** Lausanne, Switzerland  
*CREATE Lab* Feb 2025 – Present

- Feedback control of a bio-inspired soft robotic trunk via CNN-based shape reconstruction [↗](#).

**Student Researcher** Turin, Italy  
*PIC4SeR* May 2024 – Present

- Development of an autonomous pruning robot combining segmentation and control.

**Student Worker** Londonderry, UK  
*Erasmus Plus* [↗](#) Jun 2019 – Jul 2019

- Project management: a technology-driven festival on Italian culture.

**Internship** Massa Lombarda, Italy  
*WASP Srl* [↗](#) May 2018 – Jul 2018

- Data collection on Delta Wasp printer performances and clay feedstocks, calibration, and assembly.

## Selected Projects

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**VinPRO** May 2024 - Present

- Automated AI-driven vineyard pruning system with Alta Scuola Politecnica and PIC4SeR [↗](#).

**Autonomous Vehicles - Path Planning and Navigation** Sep 2024 - Jan 2025

- Implementation of path planning and autonomous navigation algorithms in ROS and Gazebo [↗](#).

**Digital Twin of Pressure Vessel and Battery Degradation** Oct 2024 - Feb 2025

- Twin modeling with surrogate models, Metropolis-Hastings, and Particle Filter for RUL [↗](#).

**Blood cells classification and Mars terrain segmentation** Oct 2024 - Dec 2024

- Computer vision tasks with CNNs and U-Net on biomedical and Mars datasets [↗](#).