



Andrea Pupa

Mechatronic Engineer

Education

- 2019–2023 **PhD**, *University of Modena and Reggio Emilia*, Reggio Emilia, Italy.
Collaborative Robotics
- 2016–2018 **Master's Degree**, *University of Modena and Reggio Emilia*, Reggio Emilia, Italy.
Mechatronic Engineering
- 2013–2016 **Bachelor's Degree**, *Polytechnic University of Milan*, Piacenza, Italy.
Mechanical Engineering

Thesis

- PhD Thesis *Safety-Aware Control Techniques for Advanced Human-Robot Collaboration*
Supervisors Cristian Secchi
- Description This thesis presents a novel framework to enhance human-robot collaboration efficiency in industrial settings, focusing on two key areas. First, it proposes a dynamic strategy for the online allocation and scheduling of tasks between human operators and robots. Second, it addresses the safe and efficient execution of robot tasks. The results were part of the "ROSSINI" European project ([ROSSINI Official Site](#)).
- Master Thesis *Real-Time Reconstruction of an Immersive Environment for Surgical Applications*
Supervisors Cristian Secchi

Experience

Awards

Premio Italiano Meccatronica 2022.

Winner of the award "*Premio Italiano Meccatronica 2022*" with the work entitled "*Architettura di controllo sicura ed efficiente per manipolatori mobili collaborativi in ambienti industriali complessi*"

I-RIM 2021.

Finalist as "*Best Paper*" with the work entitled "*A Human-Centered Dynamic Task Planning Approach for Human-Robot Collaboration*" at I-RIM 2021

PhD Scholarship.

Scholarship for PhD at the Industrial Innovation Engineering School, University of Modena and Reggio Emilia, Italy

Vocational

- Apr. 2023 **Postdoctoral Researcher**, *University of Modena and Reggio Emilia - ARS Control*,
To Date Reggio Emilia, Italy.
Research activity in collaborative robotics, robust control, and energy-based physical human-robot interaction.
- Jun. 2024 **Visiting Researcher**, *Inria centre at Rennes University*, Rennes, France.
Research activity in the field of *Closed-Loop Sensitivity* under the supervision of Paolo Robuffo Giordano.
- Nov. 2019 **PhD Student**, *University of Modena and Reggio Emilia - ARS Control*, Reggio
Mar. 2023 Emilia, Italy.
Research activity in collaborative robotics focuses on dynamic task allocation and scheduling, safe motion planning, and trajectory execution, all aimed at optimizing the performance of human-robot collaboration scenarios.
- Nov. 2021 **Visiting PhD Student**, *The Netherlands Organisation for Applied Scientific Re-*
Apr. 2022 *search (TNO)*, Delft, The Netherlands.
Research activity on developing an efficient and resilient task scheduling strategy, with the goal of personalizing robot behavior based on the capabilities of the human operator.
- Dec. 2018 **Research Fellow**, *University of Modena and Reggio Emilia - ARS Control*, Reggio
Nov. 2019 Emilia, Italy.
Research activity in collaborative robotics, focusing on motion planning and dynamic replanning in highly dynamic scenarios.

Internships

- 01 Mar. 2018 **Master's Degree Internship**, *University of Modena and Reggio Emilia - ARS*
30 Sep. 2018 *Control*, Reggio Emilia, Italy.
Development of an immersive environment for the "SARAS" European project ([SARAS Official Site](#)).

Other Experiences

- 19 May. 2024 **International Conference on Robotics and Automation (ICRA) 2024**, Atlanta
23 May. 2024 - USA.
Organization of the workshop entitled "*Beyond the Lab: Robust Planning and Control in Real World Scenarios*".
- 25 Oct. 2024 **Conference Istituto di Robotica e Macchine Intelligenti (I-RIM) 2024**, Roma
27 Oct. 2024 - Italia.
Co-organizing two challenges: Dog Challenge and Agricultural Challenge.
- 15 Mar. 2024 **European Robotic Forum (ERF) 2024**, Rimini - Italia.
15 Mar. 2024 Co-organizing three challenges: Dog Challenge, Agricultural Challenge, and Manufacturing Challenge.
- 20 Oct. 2023 **Conference Istituto di Robotica e Macchine Intelligenti (I-RIM) 2023**, Roma
23 Oct. 2023 - Italia.
Organization of the workshop entitled "*Perception Unleashed: Achieving Safety, Efficiency, and Awareness in Human-Robot Collaboration*".
- 22 Sep. 2022 **Human-Friendly Robotics 2022 Conference**, Delft - The Netherlands.
23 Sep. 2022 Organizing a Demonstration for the conference in collaboration with TNO.

Editorial Activity

Associate Editor for the conference Ubiquitous Robots since 2024

Serving as a reviewer for the most important journals and conferences in robotics

- IEEE Transactions on Robotics (T-RO)
- International Journal of Robotics Research (IJRR)
- IEEE Transactions on Automation Science and Engineering (T-ASE)
- IEEE Robotics and Automation Letters (RA-L)
- IEEE International Conference on Robotics and Automation (ICRA)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Anagraphic Data

Sex Male

Date of Birth 01 October 1994

Publications

- [1] A. Pupa, W. Van Dijk, and C. Secchi, "A human-centered dynamic scheduling architecture for collaborative application," *IEEE Robotics and Automation Letters*, vol. 6, pp. 4736–4743, July 2021.
- [2] A. Pupa, M. Arrfou, G. Andreoni, and C. Secchi, "A safety-aware kinodynamic architecture for human-robot collaboration," *IEEE Robotics and Automation Letters*, vol. 6, pp. 4465–4471, July 2021.
- [3] A. Pupa, C. T. Landi, M. Bertolani, and C. Secchi, "A dynamic architecture for task assignment and scheduling for collaborative robotic cells," in *Human-Friendly Robotics 2020: 13th International Workshop*, pp. 74–88, Springer International Publishing, 2021.
- [4] A. Pupa and C. Secchi, "A safety-aware architecture for task scheduling and execution for human-robot collaboration," in *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 1895–1902, 2021.
- [5] A. Pupa, W. Van Dijk, C. Brekelmans, and C. Secchi, "A resilient and effective task scheduling approach for industrial human-robot collaboration," *Sensors*, vol. 22, no. 13, p. 4901, 2022.
- [6] A. Pupa, F. Breveglieri, and C. Secchi, "An optimal human-based control approach for mobile human-robot collaboration," in *Human-Friendly Robotics 2022: 15th International Workshop*, Springer International Publishing, 2022.
- [7] A. Pupa, M. Minelli, and C. Secchi, "A dynamic planner for safe and predictable human-robot collaboration," *IEEE Robotics and Automation Letters*, vol. 9, no. 1, pp. 507–514, 2023.
- [8] A. Pupa, P. R. Giordano, and C. Secchi, "Optimal energy tank initialization for minimum sensitivity to model uncertainties," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 8192–8199, IEEE, 2023.

- [9] A. Pupa, M. Minelli, and C. Secchi, "A time-optimal energy planner for safe human-robot collaboration," in *2024 IEEE IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2024.
- [10] A. Pupa and C. Secchi, "Efficient iso/ts 15066 compliance through model predictive control," in *2024 IEEE IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2024.
- [11] A. Afifi, T. Belvedere, A. Pupa, P. R. Giordano, and A. Franchi, "Safe and robust planning for uncertain robots: A closed-loop state sensitivity approach," *IEEE Robotics and automation letters*, 2024.
- [12] A. K. Hansen, V. Villani, A. Pupa, and A. H. Lassen, "Introducing novice operators to collaborative robots: a hands-on approach for learning and training," *IEEE Transactions on Automation Science and Engineering*, 2024.
- [13] D. Ferrari, A. Pupa, and C. Secchi, "Compliant blind handover control for human-robot collaboration," in *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 9321–9327, IEEE, 2024.
- [14] D. Ferrari, A. Pupa, and C. Secchi, "Collaborative conversation in safe multi-modal human-robot collaboration," in *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 7071–7077, IEEE, 2024.