

Curriculum Vitae
Lorenzo Scalera

December 30, 2025



Introduction

Lorenzo Scalera achieved the Master's degree in Mechanical Engineering (cum laude) at University of Trieste in 2015, and the Ph.D. in Industrial and Information Engineering at University of Udine (Italy) in 2019. In 2018 he was a visiting Ph.D. student at the Stevens Institute of Technology in Hoboken (NJ, USA). In 2019 he was a Post Doc Research Fellow at Free University of Bozen-Bolzano (Italy). From 2020 to 2024 he was Assistant Professor of Mechanics of Machines at the Polytechnic Department of Engineering and Architecture of the University of Udine. Since 2024 he is Associate Professor at University of Udine. He currently serves in the Editorial Board of IEEE Robotics and Automation Letters. He is author of more than 100 international publications in scientific journals and conferences. His research interests include dynamic modelling of mechatronic and robotic systems, trajectory planning, and collaborative robotics.

Information

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Google Scholar: <https://scholar.google.com/citations?user=x3hNt08AAAAJ&hl=it>

Web of Science: <https://www.webofscience.com/wos/author/record/508132>

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UNIUD Mechatronics and Robotics Lab: <https://mec-rob-lab.uniud.it/>

Current Appointments

- **Associate Professor** (Professore Associato) since 21/12/2024 at the Polytechnic Department of Engineering and Architecture of University of Udine (Italy), sector ING-IND/13, Mechanics of Machines.
- **Teacher of the courses *Robotics* (6 ECTS) and *Dynamics of Mechanical Systems* (12 ECTS)** at the Polytechnic Department of Engineering and Architecture of University of Udine (Italy).

Professional Qualifications

- **Italian Scientific Habilitation for Full Professorship** (Abilitazione Nazionale di I Fascia per il Settore Concorsuale 09/A2 Meccanica Applicata alle Macchine) valid from 31/10/2025 to 31/10/2037 (art. 16, comma 1, Legge 240/10).
- **Italian Scientific Habilitation for Associate Professorship** (Abilitazione Nazionale di II Fascia per il Settore Concorsuale 09/A2 Meccanica Applicata alle Macchine) valid from 17/11/2020 to 17/11/2032 (art. 16, comma 1, Legge 240/10).
- **Professional Habilitation**, Habilitation as a Professional Engineer, Section A (2015).

Working Experience

- **Assistant Professor (Ricercatore RTD-B)** from 21/12/2021 to 20/12/2024 at the Polytechnic Department of Engineering and Architecture of University of Udine (Italy), sector ING-IND/13, Mechanics of Machines, research project: “Trajectory planning for robotic and mechatronic systems”.
- **Assistant Professor (Ricercatore RTD-A)** from 04/05/2020 to 20/12/2021 at the Polytechnic Department of Engineering and Architecture of University of Udine (Italy), sector ING-IND/13, Mechanics of Machines, research project: “Trajectory planning for robotic and mechatronic systems”.
- **Research Fellow (Assegnista di ricerca)** from 01/11/2019 to 03/05/2020 at the Polytechnic Department of Engineering and Architecture of University of Udine (Italy), research project POR-FERS 2014/2020 “Wind Propulsion Aid For Ships – WEPAS”.
- **Research Fellow (Assegnista di ricerca)** from 01/11/2018 to 31/10/2019 at the Faculty of Science and Technology of the Free University of Bozen-Bolzano, research project: “Mech4SME3: Mechatronics for Predictive Maintenance and Energy Efficiency Enhancement”.
- **Coordinator of the student tutoring service** at the Department of Engineering and Architecture, University of Trieste (2015), 200 hours.
- **Student tutor** at the Department of Engineering and Architecture, University of Trieste (2014), 150 hours.

Visiting

- **Visiting Professor** at the AGH University of Krakow (Poland) from October 2025 to January 2026 for 60 teaching hours.
- **Visiting** at the Faculty of Engineering and Science, University of Agder (Grimstad, Norway), August 14-21, 2025, within the Call for Professor Representatives (Bando Professori Rappresentanti) of the Toppo Wassermann High School (Scuola Superiore) of University of Udine.
- **Erasmus+ teaching Staff** at the University of Antwerp (Belgium), May 7-10, 2025, for 8 teaching hours within the course “Industrial Robotics”.
- **Erasmus+ teaching Staff** at the University of Coimbra (Portugal), from 27 to 31/01/2025, for 8 teaching hours within the course “Robotics for applications in intelligent factories”.
- **Erasmus+ teaching Staff** at the University of Antwerp (Belgium), May 13-16, 2024, for 8 teaching hours within the courses “Robotics and Industrial Engineering” and “Industrial Robotics”.
- **Visiting** at the University of Lincoln (United Kingdom), June 13-16, 2023, for research collaborations on mobile robotics for agriculture.
- **Erasmus+ teaching Staff** at the Bialystok University of Technology (Poland), from 17 to 18/11/2022, for 8 teaching hours within the course “Advanced trajectory planning for collaborative robots and safety in industrial robotics”.

- **Invited Researcher** at the Computer-Aided Design Department, School of Computer Science of the St. Petersburg Electrotechnical University (St. Petersburg, Russia). The research activity, carried out in collaboration with prof. Denis Butusov, focuses on the development and experimental validation of algorithms for artistic applications of robotic systems.
- **Visiting Research Fellow** from 16/08/2019 to 14/09/2019 at the Department of Mechanical Engineering of Chiang Mai University, Chiang Mai, Thailand, within the European project SME 4.0. The research activity, carried out with prof. Theeraphong Wongratanaphisan, focused on the study of energy efficiency in parallel robots through the introduction of elastic elements.
- **Visiting PhD student** from 03/01/2018 to 28/07/2018 at the Wearable Robotic System (WRS) Lab, Stevens Institute of Technology, Hoboken (NJ, USA). The research activity, carried out with prof. Damiano Zanotto, focused on the modelling and control of an underactuated cable-driven robotic system.

Education

- **Ph.D. Programme in Industrial and Information Engineering** from 01/11/2015 to 31/10/2018 at the Polytechnic Department of Engineering and Architecture of University of Udine (Italy). The research topics, all related to the scientific disciplinary sector 09/A2 (Mechanics of Machines), included: kinematic and dynamic modelling of mechatronic and robotic systems, trajectory planning, experimental validation of robotic systems, collaborative robotics, human-machine interaction, development of interfaces for mechatronic systems, design and implementation of measurement, control and data acquisition systems. Title of the PhD. thesis: “Modelling and Control of Flexible-Link Robotic Systems”, defended on 05/03/2019.
- **Master’s degree in Mechanical Engineering** (14/10/2015) at the University of Trieste, supervisor: prof. Paolo Gallina, grade: 110/110 cum laude.
- **Bachelor’s degree in Industrial Engineering, curriculum Mechanical Engineering** (13/12/2012) at the University of Trieste, supervisor: prof. Paolo Gallina, grade: 110/110 cum laude.
- **High school diploma** (2009), Scientific high school Liceo N. Copernico in Udine, grade: 100/100.

Bibliometric indicators

	Documents	Citations	H-index
Scopus	103	1417	25
Google Scholar	115	2153	29
Web of Science	103	917	21

Scientific Production

Ph.D. Thesis

- Modeling and Control of Flexible-Link Robotic Systems. Supervisor: Prof. Alessandro Gasparetto. Defended on March 5, 2019, at the Polytechnic Department of Engineering and Architecture, University of Udine.

Journal publications (indexed in Scopus)

1. Tiozzo Fasiolo, D., **Scalera, L.**, Maset, E., Gasparetto, A. (2026). The FriûlBot Dataset: Experimental Validation of an Autonomous Ground Robot for Vineyard 3D Mapping. *Robotics and Autonomous Systems*, 105283.
2. Lozer, F., **Scalera, L.**, Boscarior, P., Gasparetto, A. (2025). Planning optimal minimum-jerk trajectories for redundant robots. *Robotics and Autonomous Systems*, 105049.
3. De Laet, R., Van Oosterwyck, N., **Scalera, L.**, Cuyt, A., Gasparetto, A., Derammelaere, S. (2025). Energy-efficient motion planning for robotic systems using polynomials in the Chebyshev basis. *Robotics and Autonomous Systems*, 105051.

4. Bendali, N., **Scalera, L.**, Sundaram, A., Said, A., Gasparetto, A. (2025). An approach based on multi-quadratic radial basis functions for smooth trajectory planning of robotic manipulators with kinematic constraints. *Nonlinear Dynamics*, 1-19.
5. Tiozzo Fasiolo, D., **Scalera, L.**, Maset, E., Gasparetto, A. (2025). Field Evaluation of an Autonomous Mobile Robot for Navigation and Mapping in Forest. *Robotics*, 14(7), 89.
6. Fabris, G., **Scalera, L.**, Gasparetto, A. (2025). Online optimization of minimum-time and minimum-energy trajectories for a 1-DOF belt-driven robotic system. *Robotica*, 43, 6, pp. 2030 - 2045.
7. Brunello, A., Fabris, G., Gasparetto, A., Montanari, A., Saccomanno, N., **Scalera, L.** (2025). A survey on recent trends in robotics and artificial intelligence in the furniture industry. *Robotics and Computer-Integrated Manufacturing*, 93, 102920.
8. Heczko, D., Chlebek, J., Mlotek, J., Kot, T., **Scalera, L.**, Dekan, M., Zeman, Z., Bobovský, Z. (2025). Enhancing Data Collection Through Optimization of Laser Line Triangulation Sensor Settings and Positioning. *Sensors*, 25(6), 1772.
9. Vegnaduzzo, A., **Scalera, L.**, Pillan, D., Gasparetto, A. (2025). An approach based on B-spline quaternion curves for planning the orientation trajectories of spray-painting robots. *Advanced Robotics*, 1-16.
10. Chlebek, J., Kot, T., Oščádal, P., Heczko, D., Maslowski, J., **Scalera, L.**, Vysocký, A. (2025). Optimized Grid Voxelization for Obstacle Avoidance in Collaborative Robotics. *IEEE Access*.
11. Clochiatti, E., **Scalera, L.**, Boscaroli, P., Gasparetto, A. (2024). Electro-mechanical modeling and identification of the UR5 e-series robot. *Robotica*, 42(7), pp. 2430–2452.
12. Dreon, S., **Scalera, L.**, Salvati, E. (2024). A contact analysis for unconventional mounting processes of angular ball bearings. *International Journal of Mechanics and Materials in Design*, 20(3), pp. 429–443.
13. **Scalera, L.**, Lozer, F., Giusti, A., Gasparetto, A. (2024). An experimental evaluation of robot stopping approaches for improving fluency in collaborative robotics. *Robotica*, 42(5), pp. 1386–1402.
14. Fabris, G., **Scalera, L.**, Gasparetto, A. (2024). Dynamic modelling and energy-efficiency optimization in a 3-DOF parallel robot. *The International Journal of Advanced Manufacturing Technology*, 132(5-6), pp. 2677–2699.
15. **Scalera, L.**, Giusti, A., Vidoni, R. (2024). Trajectory Planning for Intelligent Robotic and Mechatronic Systems. *Applied Sciences*, 14(3), 1179.
16. Fabris, G., **Scalera, L.**, Gasparetto, A. (2024). Playing Checkers with an Intelligent and Collaborative Robotic System. *Robotics*, 13(1), 4.
17. **Scalera, L.**, Nainer, C., Giusti, A., Gasparetto, A. (2024). Robust safety zones for manipulators with uncertain dynamics in collaborative robotics. *International Journal of Computer Integrated Manufacturing*, 37(7), pp. 887–899.
18. Tiozzo Fasiolo, D., Pichierri, A., Sivilotti, P., **Scalera, L.** (2023). An analysis of the effects of water regime on grapevine canopy status using a UAV and a mobile robot. *Smart Agricultural Technology*, 6, 100344.
19. Tiozzo Fasiolo, D., **Scalera, L.**, Maset, E., Gasparetto, A. (2023). Towards autonomous mapping in agriculture: A review of supportive technologies for ground robotics. *Robotics and Autonomous Systems*, 104514.
20. Mystkowski, A., Wolniakowski, A., Kadri, N., Sewiolo, M., **Scalera, L.** (2023). Neural Network Learning Algorithms for High-Precision Position Control and Drift Attenuation in Robotic Manipulators. *Applied Sciences*, 13(19), 10854.
21. Tiozzo Fasiolo, D. T., **Scalera, L.**, Maset, E. (2023). Comparing LiDAR and IMU-based SLAM approaches for 3D robotic mapping. *Robotica*, 41(9), pp. 2588–2604.
22. Martinez-Bejar, R., García-González, M. S., **Scalera, L.**, Gasparetto, A. (2023). A Modelling Approach to Privacy and Safety Issues in Cyber-Physical Systems. In *Exploring Cyber Criminals and Data Privacy Measures* (pp. 241-252). IGI Global.
23. Karimov, A., Kopets, E., Leonov, S., **Scalera, L.**, Butusov, D. (2023). A Robot for Artistic Painting in Authentic Colors. *Journal of Intelligent & Robotic Systems*, 107(3), 34.
24. Boscaroli, P., Gasparetto, A., **Scalera, L.** (2023). Path Planning for Special Robotic Operations. In *Robot Design* (pp. 69-95). Springer, Cham.
25. Gasparetto, A., **Scalera, L.**, Palomba, I. (2022). *Robotics and Vibration Mechanics*. *Applied Sciences*, 12(19), 9478.
26. **Scalera, L.**, Giusti, A., Vidoni, R., Gasparetto, A. (2022). Enhancing fluency and productivity in human-

- robot collaboration through online scaling of dynamic safety zones. *The International Journal of Advanced Manufacturing Technology*, 121(9), 6783-6798.
27. Gasparetto, A., Seriani, S., **Scalera, L.** (2022). Modelling and Control of Mechatronic and Robotic Systems, Volume II. *Applied Sciences*, 12(12), 5922.
 28. Maset, E., **Scalera, L.**, Beinat, A., Visintini, D., Gasparetto, A. (2022). Performance Investigation and Repeatability Assessment of a Mobile Robotic System for 3D Mapping. *Robotics*, 11(3), 54.
 29. Kopets, E., Karimov, A., **Scalera, L.**, Butusov, D. (2022). Estimating Natural Frequencies of Cartesian 3D Printer Based on Kinematic Scheme. *Applied Sciences*, 12(9), 4514.
 30. **Scalera, L.**, Canever, G., Seriani, S., Gasparetto, A., Gallina, P. (2022). Robotic Sponge and Watercolor Painting Based on Image-Processing and Contour-Filling Algorithms. *Actuators*, 11(2), 62.
 31. **Scalera, L.**, Maset, E., Seriani, S., Gasparetto, A., Gallina, P. (2021). Performance evaluation of a robotic architecture for drawing with eyes. *Int. J. Mech. Control*, 22, 53-60.
 32. **Scalera, L.**, Seriani, S., Gallina, P., Lentini, M., Gasparetto, A. (2021). Human–Robot Interaction through Eye Tracking for Artistic Drawing. *Robotics*, 10(2), 54.
 33. Gasparetto, A., Seriani, S., **Scalera, L.** (2021). Modelling and Control of Mechatronic and Robotic Systems. *Applied Sciences* 2021, 11(7), 3242.
 34. Vidussi, F., Boscariol, P., **Scalera, L.**, Gasparetto, A. (2021). Local and trajectory-based indexes for task-related energetic performance optimization of robotic manipulators. *Journal of Mechanisms and Robotics*, 13(2), 021018.
 35. Karimov, A., Kopets, E., Kolev, G., Leonov, S., **Scalera, L.**, Butusov, D. (2021). Image Preprocessing for Artistic Robotic Painting. *Inventions*, 6(1), 19.
 36. Boscariol, P., **Scalera, L.**, Gasparetto, A. (2021). Nonlinear Control of Multibody Flexible Mechanisms: A Model-Free Approach. *Applied Sciences*, 11(3), 1082.
 37. Carabin, G., **Scalera, L.**, Wongratanaphisan, T., Vidoni, R. (2021). An energy-efficient approach for 3D printing with a Linear Delta Robot equipped with optimal springs. *Robotics and Computer-Integrated Manufacturing*, 67, 102045.
 38. Gallina, P., Gei, M., **Scalera, L.**, Seriani, S. (2021). Liquid structures: A novel Computational Fluid Dynamics (CFD) inspired metamaterial. *Extreme Mechanics Letters*, 2021, 42, 101119.
 39. Caruso, M., **Scalera, L.**, Gallina, P., Seriani, S. (2020). Dynamic modeling and simulation of a robotic lander based on variable radius drums. *Applied Sciences (Switzerland)*, 2020, 10(24), pp. 1–21, 8862.
 40. Kopets, E.E., Karimov, A.I., Kolev, G.Y., **Scalera, L.**, Butusov, D.N. (2020). Interactive robot for playing Russian checkers. *Robotics*, 2020, 9(4), pp. 1–15, 107.
 41. Carabin, G., **Scalera, L.** (2020). On the Trajectory Planning for Energy Efficiency in Industrial Robotic Systems. *Robotics*, 9(4), 89.
 42. **Scalera, L.**, Giusti, A., Vidoni, R., Di Cosmo, V., Matt, D.T., Riedl, M. (2020). Application of dynamically scaled safety zones based on the ISO/TS 15066:2016 for collaborative robotics. *International Journal of Mechanics and Control*, 21(1), pp.41-49.
 43. Maset, E., **Scalera, L.**, Zonta, D., Alba, I. M., Crosilla, F., Fusiello, A. (2020). Procrustes analysis for the virtual trial assembly of large-size elements. *Robotics and Computer-Integrated Manufacturing*, 62, 101885.
 44. Beltramello, A., **Scalera, L.**, Seriani, S., Gallina, P. (2020). Artistic robotic painting using the palette knife technique. *Robotics*, 9(1), 15.
 45. **Scalera, L.**, Gasparetto, A., Zanotto, D. (2020). Design and experimental validation of a 3-DOF under-actuated pendulum-like robot. *IEEE/ASME Transactions on Mechatronics*, 25(1), 217-228.
 46. **Scalera, L.**, Boscariol, P., Carabin, G., Vidoni, R., Gasparetto, A. (2020). Enhancing Energy Efficiency of a 4-DOF Parallel Robot Through Task-Related Analysis. *Machines*, 8(1), 10.
 47. **Scalera, L.**, Seriani, S., Gasparetto, A., Gallina, P. (2019). Watercolour robotic painting: a novel automatic system for artistic rendering. *Journal of Intelligent & Robotic Systems*, 95(3-4), 871-886.
 48. **Scalera, L.**, Carabin, G., Vidoni, R., Wongratanaphisan, T. (2019). Energy efficiency in a 4-DOF parallel robot featuring compliant elements. *International Journal of Mechanics and Control*, 20(2), pp. 1-9.
 49. **Scalera, L.**, Seriani, S., Gasparetto, A., Gallina, P. (2019). Non-photorealistic rendering techniques for artistic robotic painting. *Robotics*, 8(1), 10.
 50. **Scalera, L.**, Palomba, I., Wehrle, E., Gasparetto, A., Vidoni, R. (2019). Natural motion for energy saving

- in robotic and mechatronic systems. *Applied Sciences*, 9(17), 3516.
51. Seriani, S., **Scalera, L.**, Caruso, M., Gasparetto, A., Gallina, P. (2019). Upside-Down Robots: Modeling and experimental validation of magnetic-adhesion mobile systems. *Robotics*, 8(2), 41.
 52. Seriani, S., Gallina, P., **Scalera, L.**, Lughì, V. (2018). Development of n-DoF preloaded structures for impact mitigation in cobots. *Journal of Mechanisms and Robotics*, 10(5), 051009.
 53. Trigatti, G., Boscariol, P., **Scalera, L.**, Pillan, D., Gasparetto, A. (2018). A new path-constrained trajectory planning strategy for spray painting robots. *The International Journal of Advanced Manufacturing Technology*, 98(9-12), 2287-2296.
 54. **Scalera, L.**, Seriani, S., Gallina, P., Di Luca, M., Gasparetto, A. (2018). An experimental setup to test dual-joystick directional responses to vibrotactile stimuli. *IEEE Transactions on Haptics*, 11(3), 378-387.
 55. **Scalera, L.**, Gallina, P., Seriani, S., Gasparetto, A. (2018). Cable-based robotic crane (CBRC): Design and implementation of overhead traveling cranes based on variable radius drums. *IEEE Transactions on Robotics*, 34(2), 474-485.
 56. Vidoni, R., **Scalera, L.**, Gasparetto, A. (2018). 3-D ERLS based dynamic formulation for flexible-link robots: theoretical and numerical comparison between the finite element method and the component mode synthesis approaches. *International Journal of Mechanics and Control*, 19(1), pp. 39-50.
 57. Boscariol, P., Gasparetto, A., **Scalera, L.**, Vidoni, R. (2017). Efficient closed-form solution of the kinematics of a tunnel digging machine. *Journal of Mechanisms and Robotics*, 9(3).
 58. **Scalera, L.**, Gallina, P., Gasparetto, A., Seriani, S. (2017). Anti-Hedonistic Machines. *International Journal of Mechanics and Control*, 18(2), pp. 9-16.
 59. Ristorto, G., Gallo, R., Gasparetto, A., **Scalera, L.**, Vidoni, R., Mazzetto, F. (2017). A mobile laboratory for orchard health status monitoring in precision farming. *Chemical Engineering Transactions*, 2017, 58, pp. 661-666.

Conference proceedings (indexed in Scopus)

60. Fabris, G., **Scalera, L.**, Gasparetto, A. (2025). Experimental validation of energy-efficient optimal trajectories for redundant robotic systems. In the 13th International Conference on Control, Mechatronics and Automation (IEEE ICCMA 2025). Accepted for publication.
61. **Scalera, L.**, Fabris, G., Rizzo, A., Boscariol, P., Gasparetto, A. (2025). Optimization Approaches for Smooth Motion Planning in Redundant Manipulators. In IFToMM International Conference on Mechanisms, Transmissions and Applications (pp. 280-290). Cham: Springer Nature Switzerland.
62. **Scalera, L.**, Tiozzo Fasiolo, D., Maset, E., Carabin, G., Seriani, S., De Lorenzo, A., Alberti, G., Gasparetto, A. (2025). Mobile Robotics for Forest Monitoring and Mapping Within the AI4FOREST Project. In International Conference Mechanical Engineering Solutions: Design, Simulation, Testing, Manufacturing (pp. 279-288). Cham: Springer Nature Switzerland.
63. Cais, M., Meneghetti, A., Culot, G., **Scalera, L.** (2025). Enhancing inclusion of workers with disabilities in manufacturing: a human-robot collaborative assembly line balancing optimization model. In 11th IFAC Conference on Manufacturing Modelling, Management and Control (IFAC MIM 2025). (accepted for publication).
64. Fabris, G., **Scalera, L.**, Gasparetto, A. (2025). Leveraging kinematic redundancy for energy efficiency in a 8-DOF robotic system. In 3rd International Conference of IFToMM for SDG (I4SDG 2025). Cham: Springer Nature Switzerland. (accepted for publication).
65. Tiozzo Fasiolo, D., **Scalera, L.**, Maset, E., Baptiste Lesquerré-Caudebèz, B., Fusiello, A., Beinat, A., Gasparetto, A. (2025). A navigation approach for autonomous mobile robots in sustainable agriculture. In 3rd International Conference of IFToMM for SDG (I4SDG 2025). Cham: Springer Nature Switzerland. (accepted for publication).
66. **Scalera, L.**, Lozer, F., Geerinck, J., Breda, A., Totis, F., Polo, F., Giusti, A., Gasparetto, A. (2024). A Collaborative Robotics Application for the Assembly of Car Rear Lamps. In International Symposium on Industrial Engineering and Automation (pp. 29-37). Cham: Springer Nature Switzerland.
67. Cottiga, S., Bonin, L., Giberna, M., Caruso, M., Görner, M., Carabin, G., **Scalera, L.**, De Lorenzo, A., Seriani, S. (2024). Leveraging Machine Learning for Terrain Traversability in Mobile Robotics. In IFToMM Symposium on Mechanism Design for Robotics (pp. 345-352). Cham: Springer Nature Switzerland.
68. Fabris, G., **Scalera, L.**, Boscariol, P., Gasparetto, A. (2024). Experimental analysis and comparison of

- friction models applied to the UR5e robot. In IFToMM Symposium on Mechanism Design for Robotics (pp. 125-133). Cham: Springer Nature Switzerland.
69. Boschetti, G., Carbone, G., Ceccarelli, M., Gasparetto, A., **Scalera, L.**, Vidoni, R. (2024). Italian Robotics in 2024: Projects Supported by the National Recovery and Resilience Plan. In IFToMM Asian conference on Mechanism and Machine Science (pp. 170-177). Cham: Springer Nature Switzerland.
 70. Tiozzo Fasiolo, D., **Scalera, L.**, Maset, E., Gasparetto, A. (2024). Robotic Mapping and Detection of Dynamic Objects in Outdoor Environments. In European Conference on Mechanism Science (pp. 245-252). Cham: Springer Nature Switzerland.
 71. Fabris, G., **Scalera, L.**, Gasparetto, A. (2024). Online optimization and trajectory planning for energy efficiency in a robotic linear axis. In The international conference of IFToMM ITALY (pp. 155-162). Cham: Springer Nature Switzerland.
 72. Vegnaduzzo, A., **Scalera, L.**, Pillan, D., Gasparetto, A. (2024). Orientation Trajectory Planning Based on Unit Quaternions for Spray Painting Robots. In International Conference on Robotics in Alpe-Adria Danube Region (pp. 431-438). Cham: Springer Nature Switzerland.
 73. **Scalera, L.**, Gasparetto, A., Seriani, S., Gallina, P. (2024). History of Drawing Robots. In 8th International Symposium on History of Machines and Mechanisms. Cham: Springer Nature Switzerland.
 74. Fabris, G., **Scalera, L.**, Gasparetto, A. (2023). An interactive collaborative robotic system to play Italian checkers. In IFToMM World Congress on Mechanism and Machine Science (pp. 74-84). Cham: Springer Nature Switzerland.
 75. Lozer, F., **Scalera, L.**, Boscariol, P., Gasparetto, A. (2023). An Experimental Setup to Test Time-Jerk Optimal Trajectories for Robotic Manipulators. In International Conference on Robotics in Alpe-Adria Danube Region (pp. 309-316). Cham: Springer Nature Switzerland.
 76. Boscariol, P., Clochiatti, E., **Scalera, L.**, Gasparetto, A. (2023). A Framework for Improving the Energy Efficiency and Sustainability of Collaborative Robots. In Proceedings of I4SDG Workshop 2023: IFToMM for Sustainable Development Goals (pp. 47-54). Cham: Springer Nature Switzerland.
 77. Tiozzo Fasiolo, D., Maset, E., **Scalera, L.**, Macaulay, S. O., Gasparetto, A., Fusiello, A. (2022). Combining LiDAR SLAM and deep learning-based people detection for autonomous indoor mapping in a crowded environment. *The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences*, 43, 447-452.
 78. Tiozzo Fasiolo, D., **Scalera, L.**, Maset, E., Gasparetto, A. (2022). Experimental Evaluation and Comparison of LiDAR SLAM Algorithms for Mobile Robotics. In *The International Conference of IFToMM ITALY* (pp. 795-803). Springer, Cham.
 79. **Scalera, L.**, Giusti, A., Vidoni, R., Gasparetto, A. (2022). Online Planning of Path-Consistent Stop Trajectories for Collaborative Robotics. In *The International Conference of IFToMM ITALY* (pp. 693-701). Springer, Cham.
 80. Boscariol, P., **Scalera, L.**, Gasparetto, A. (2022). Improving the Efficiency of Closed-Chain Robotic Systems by the Trajectory Energy Index. In *The International Conference of IFToMM ITALY* (pp. 612-620). Springer, Cham.
 81. Tiozzo Fasiolo, D., **Scalera, L.**, Maset, E., Gasparetto, A. (2022). Recent Trends in Mobile Robotics for 3D Mapping in Agriculture. In *International Conference on Robotics in Alpe-Adria Danube Region* (pp. 428-435). Springer, Cham.
 82. **Scalera, L.**, Vidoni, R., Giusti, A. (2021). Optimal Scaling of Dynamic Safety Zones for Collaborative Robotics. In *IEEE International Conference on Robotics and Automation (ICRA 2021)*.
 83. Maset, E., **Scalera, L.**, Beinat, A., Cazorzi, F., Crosilla, F., Fusiello, A., Gasparetto, A. (2021). Preliminary comparison between handheld and mobile robotic mapping systems. In *IFToMM and Sustainable Development Goals - Proceedings of the First I4SDG Workshop*. Springer, Cham.
 84. Gallina, P., Scuor, N., Nolich, M., **Scalera, L.**, Seriani, S. (2021). A proof of concept of self replicating robots for space settlements. In *IFToMM and Sustainable Development Goals - Proceedings of the First I4SDG Workshop*. Springer, Cham.
 85. **Scalera, L.**, Seriani, S., Gasparetto, A., Gallina, P. (2021). A Novel Robotic System for Painting with Eyes. In *The International Conference of IFToMM ITALY* (pp. 191-199). Springer, Cham.
 86. **Scalera, L.**, Boscariol, P., Carabin, G., Vidoni, R., Gasparetto, A. (2021). Optimal Task Placement for Energy Minimization in a Parallel Manipulator. In *Joint International Conference of the International*

- Conference on Mechanisms and Mechanical Transmissions and the International Conference on Robotics (pp. 12-22). Springer, Cham.
87. Boscarior, P., **Scalera, L.**, Gasparetto, A. (2020). Task-dependent energetic analysis of a 3-dof industrial manipulator. In International Conference on Robotics in Alpe-Adria Danube Region (pp. 162-169). Springer, Cham.
 88. **Scalera, L.**, Carabin, G., Vidoni, R., Gasparetto, A. (2020). Minimum-Energy Trajectory Planning for Industrial Robotic Applications: Analytical Model and Experimental Results. In International Conference on Robotics in Alpe-Adria Danube Region (pp. 334-342). Springer, Cham.
 89. Seriani, S., Gallina, P., **Scalera, L.**, Gasparetto, A., Wedler, A. (2019). A new mechanism for the deployment of modular solar arrays: kinematic and static analysis, Proceedings of ARK 2018, 16th Int. Symposium on Advances in Robot Kinematics, Bologna, Italy, July 01-05, 2018.
 90. Gasparetto, A., **Scalera, L.** (2019). From the Unimate to the Delta robot: the early decades of Industrial Robotics. In Explorations in the History and Heritage of Machines and Mechanisms (pp. 284-295). Springer, Cham.
 91. Seriani, S., **Scalera, L.**, Gasparetto, A., Gallina, P. (2018). A new family of magnetic adhesion based wall-climbing robots. In The International Conference of IFToMM ITALY (pp. 223-230). Springer, Cham.
 92. **Scalera, L.**, Seriani, S., Gasparetto, A., Gallina, P. (2018). Busker Robot: a robotic painting system for rendering images into watercolour artworks. In IFToMM Symposium on Mechanism Design for Robotics (pp. 1-8). Springer, Cham.
 93. Seriani, S., **Scalera, L.**, Gasparetto, A., Gallina, P. (2018). Preloaded structures for space exploration vehicles. In IFToMM Symposium on Mechanism Design for Robotics (pp. 129-137). Springer, Cham.
 94. Trigatti, G., Boscarior, P., **Scalera, L.**, Pillan, D., Gasparetto, A. (2018). A look-ahead trajectory planning algorithm for spray painting robots with non-spherical wrists. In IFToMM Symposium on Mechanism Design for Robotics (pp. 235-242). Springer, Cham.
 95. **Scalera, L.**, Mazzon, E., Gallina, P., Gasparetto, A. (2018). Airbrush robotic painting system: Experimental validation of a colour spray model. In International Conference on Robotics in Alpe-Adria Danube Region (pp. 549-556). Springer, Cham.
 96. **Scalera, L.**, Seriani, S., Gallina, P., Di Luca, M., Gasparetto, A. (2018). Experimental evaluation of vibrotactile training mappings for dual-joystick directional guidance. In International Conference on Human Haptic Sensing and Touch Enabled Computer Applications (pp. 575-586). Springer, Cham.
 97. **Scalera, L.**, Seriani, S., Gallina, P., Di Luca, M., Gasparetto, A. (2017). An experimental setup to test dual-joystick directional responses to vibrotactile stimuli. In 2017 IEEE World Haptics Conference (WHC) (pp. 72-77). IEEE.
 98. Trigatti, G., **Scalera, L.**, Pillan, D., Gasparetto, A. (2017). A novel trajectory planning technique for anthropomorphic robots with non-spherical wrist. 49th International Symposium on Robotics, ISR 2017.
 99. Vidoni, R., **Scalera, L.**, Gasparetto, A., Giovagnoni, M. (2017). Comparison of model order reduction techniques for flexible multibody dynamics using an equivalent rigid-link system approach. 8th ECCOMAS Thematic Conference on Multibody Dynamics 2017, pp. 269-280.
 100. **Scalera, L.**, Gallina, P., Gasparetto, A., Giovagnoni, M. (2017). Anti-hedonistic mechatronic systems. In Advances in Italian Mechanism Science (pp. 543-550). Springer, Cham.
 101. Boscarior, P., Gasparetto, A., Giovanelli, N., Lazzar, S., **Scalera, L.** (2017). Design and Implementation of a Low-Cost Mechatronic Shoe for Biomechanical Analysis of the Human Locomotion. In Advances in Italian Mechanism Science (pp. 3-10). Springer, Cham.
 102. Boscarior, P., Gallina, P., Gasparetto, A., Giovagnoni, M., **Scalera, L.**, Vidoni, R. (2017). Evolution of a dynamic model for flexible multibody systems. In Advances in Italian Mechanism Science (pp. 533-541). Springer, Cham.
 103. Vidoni, R., Gallo, R., Ristorto, G., Carabin, G., Mazzetto, F., **Scalera, L.**, Gasparetto, A. (2017). ByeLab: An agricultural mobile robot prototype for proximal sensing and precision farming. In ASME International Mechanical Engineering Congress and Exposition (Vol. 58370, p. V04AT05A057). American Society of Mechanical Engineers.
 104. Bietresato, M., Carabin, G., D'Auria, D., Gallo, R., Ristorto, G., Mazzetto, F., Vidoni, R., Gasparetto, A., **Scalera, L.** (2016). A tracked mobile robotic lab for monitoring the plants volume and health. In 2016 12th IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications

(MESA) (pp. 1-6). IEEE.

Other scientific publications

105. **Scalera, L.**, Vidoni, R., Gasparetto, A. (2025). Mechatronics and robotics in the Next Generation EU projects at University of Udine and Free University of Bolzano. In *Anales de Ingeniería Mecánica* (Vol. 1, No. 24).
106. **Scalera, L.**, Alberti, G. (2024). Robotica per l'agricoltura 4.0: monitoraggio delle chiome e del suolo. Segnali dal Clima FVG, luglio 2024.
107. **Scalera, L.**, Seriani, S., Gasparetto, A., Gallina, P. (2023). An eye tracking approach for inclusive robotic drawing. DAI, *Il Disegno per l'Accessibilità e l'Inclusione*. ISBN 9788899586355.
108. Maset, E., **Scalera, L.** (2022). SLAM, Intelligenza Artificiale e Robotica per la mappatura di ambienti affollati. *GEOmedia*, 26(6).
109. Maset, E., **Scalera, L.** (2022). Simultaneous Localization and Mapping: la soluzione chiave per il rilievo in movimento. *GEOmedia*, 26(5).
110. Maset, E., **Scalera, L.**, Tiozzo Fasiolo, D. (2022). Mobile Robotics and Autonomous Mapping: Technology for a More Sustainable Agriculture. *GEOmedia*, 26(3).
111. Maset, E., **Scalera, L.** (2022). Geomatica e Robotica: un connubio vincente verso l'automazione del rilievo. *GEOmedia*, 26(1).
112. Vidussi, F., Boscariol, P., **Scalera, L.**, Gasparetto, A. (2019) Energetic analysis of industrial robots for pick-and-place operations, Proceedings of the Second International Jc-IFToMM Symposium, Kanagawa, Japan, October 26, 2019.
113. Gasparetto, A., **Scalera, L.**, (2019). A Brief History of Industrial Robotics in the 20th Century, *Advances in Historical Studies*, 8(1).

Abstracts

114. Fabris, G., **Scalera, L.**, Boscariol, P., Gasparetto, A. (2025). Exploiting Redundancy for Jerk Minimization in Robotic Manipulators. In the 7th Conference on Robotics and Intelligent Machines (I-RIM 3D 2025), Rome, Italy, 17-19 October 2025.
115. Lozer, F., **Scalera, L.**, Gasparetto, A., Brandstötter, M. (2025). Achieving Human-Like Movements with Neural Network-Based Planner in Collaborative Robotics. In the 7th Conference on Robotics and Intelligent Machines (I-RIM 3D 2025), Rome, Italy, 17-19 October 2025.
116. Maset, E., **Scalera, L.**, Tiozzo Fasiolo, D., Gasparetto, A. (2025). Autonomous Forest Navigation and Mapping: Field Validation of a Mobile Robotic System. In the 7th Conference on Robotics and Intelligent Machines (I-RIM 3D 2025), Rome, Italy, 17-19 October 2025.
117. Sodini, M., Pichierri, A., Masutti, G., Tiozzo Fasiolo, D., **Scalera, L.**, Sivilotti, P. (2024). Analisi Bayesiana dell'impatto della grandine su diverse gestioni della chioma su Merlot Kanthus. X Convegno Nazionale di Viticoltura (CONAVI 2024), June 11-13, 2024.
118. **Scalera, L.**, Gasparetto, A., Gallina, P. (2023). Collaborative robot technologies for artistic painting, IEEE International Conference on Robotics and Automation (ICRA), 29 May – 2 June 2023.
119. **Scalera, L.**, Seriani, S., Gasparetto, A., Gallina, P. (2020). Artistic painting with a collaborative robot, 2nd Italian Conference on Robotics and Intelligent Machines I-RIM 2020, online, December 10-12, 2020.
120. **Scalera, L.**, Seriani, S., Gasparetto, A., Gallina, P. (2019). Painting watercolour artworks with Busker Robot, IEEE ICRA-X Robotic Art Program, Montreal, Canada, May 22, 2019.
121. Chiandetti, C., Dissegna, A., Biasin, L., **Scalera, L.**, Gallina, P. (2019). Calming effect of rocking in an avian species, Trieste Symposium on Perception and Cognition and the 27th Kanizsa Lecture, Trieste, Italy, November 8, 2019.

Research projects

- **Principal investigator** of the project: “**Advanced artificial intelligence and visual reasoning approaches for collaborative robotics (AI4ROB)**”. Young Researchers’ Call for the financing of research projects intended for young researchers within the research program of the Innovation Ecosystem PNRR M4C2I1.5 “iNEST – Interconnected Nord-Est Innovation Ecosystem” – ECS_00000043 - CUP G23C22001130006. Total amount: 39.500 euro.
- **Responsible of the research unit of University of Udine** of the project PRIN 2022 (Italian Projects of Significant National Interest): “**An Artificial Intelligence Approach for Forestry Robotics in Environment Survey and Inspection (AI4FOREST)**”. Total amount: 214.966 euro.
- **Member of the research group** of the project **Agritech National Center (Spoke 4: Multifunctional and resilient agriculture and forestry systems for the mitigation of climate change risks)** within the Next Generation EU (PNRR) at University of Udine, since 2022.
- **Member of the research group** of the project **iNEST - The Interconnected Nord-Est Innovation Ecosystem** (Green and digital transition for advanced manufacturing technology - WP2: Smart Manufacturing, Mechatronics and Robotics) within the Next Generation EU (PNRR) at University of Udine, since 2022.
- **Member of the research group** for the project “**E4H2 - Efficiency For Hydrogen**” of the Polytechnic Department of Engineering and Architecture of the University of Udine. The project, with the Friuli Venezia Giulia region as its counterpart, has received funding of 1,000,000 euro.
- **Member of the research group** of the Departmental Strategic Plan Project: “**Mechanical behaviour of cellular materials obtained through additive manufacturing**”. Total amount: 40.000 euro. (3-years project starting from October 2022).

Consultancy projects

- **Consultancy contract**: “Study relating to the level of digitization and automation of manufacturing companies in the furniture and panel sector, with the involvement of 10 companies representing the sector, and an analysis of the state of the art of research and possible applications for companies” commissioned by Cluster Legno Arredo e Sistema Casa FVG (2023).
- **Consultancy contract**: “Automation of the gluing process of small parts on automotive lightings”, commissioned to the Polytechnic Department of Engineering and Architecture of the University of Udine by Marelli Automotive Lighting S.p.a. (2023).
- **Consultancy contract** commissioned by the Free University of Bozen-Bolzano within the research project “Automated Process Planning in Cyber Physical Production Systems of Smart Factories (SMART-APP)” FaST -332/2022 (2022).
- **Consultancy contract**: “Analysis of vibration phenomenon on vacuum pump system and definition of guidelines for possible interventions”, commissioned to the Polytechnic Department of Engineering and Architecture of the University of Udine by SMS Group S.p.A. (2022).
- **Consultancy contract** commissioned by the Free University of Bozen-Bolzano within the research project “Re-Tipping - Tip Extender for wind turbines: vibrational, structural and fluid-dynamic monitoring and analysis” (TN233I-C), 2021.
- **Consultancy contract** commissioned by the Free University of Bozen-Bolzano within the research project “Automation concept for the production of a special nozzle (DURST-1)”.
- **Consultancy contract** commissioned by the Free University of Bozen-Bolzano within the research project “D-VINO: Dynamic models for vibration and noise reduction in planetary gear trains”.
- **Consultancy contract**: “Preliminary study of the applicability of sensor solutions on the Rocky Transformer machine for the crushing of bricks”, commissioned to the Polytechnic Department of Engineering and Architecture of the University of Udine by F.A.R. Fonderie Acciaierie Roiale S.p.a.
- **Member of the research group** for the research project: “Preliminary research activity for the development of a calculation model on the vibrations generated by the rotor head system and correlation with the instability phenomena generated by them (ground resonance)”, commissioned to the Polytechnic Department of Engineering and Architecture of the University of Udine by KONNER S.R.L.
- **Member of the research group** for the research project: “Robotic scanning system”, commissioned

to the Polytechnic Department of Engineering and Architecture of the University of Udine by CMA ROBOTICS S.p.a.

- **Member of the research group** for the research project: “FLASH-LENS”, commissioned to the Polytechnic Department of Engineering and Architecture of the University of Udine by FIRST S.R.L.
- **Member of the research group** for the research project POR FESR 2014-2020: “Future and more than” (University of Udine, Minini & C. S.R.L.)
- **Member of the research group** for the research project POR FESR 2014-2020: “Wind Energy Propulsion Aid for Ships - WEPAS” (University of Udine, CONCRANE S.R.L., NAOS Ship and Boats Design S.R.L.)
- **Member of the research group** for the research project POR FESR 2014-2020: “New materials for fire safety in the naval applications - NUMASTE” (University of Udine, Naval Suppliers S.R.L., HAYAMA TECH SERVICE S.R.L.)

Invited speaker at international conferences

- 13th International Conference on Control, Mechatronics and Automation (IEEE ICCMA 2025), Paris, France, November 24-26, 2025. Contribution: “Optimization approaches in trajectory planning for energy efficiency in robotic systems”.
- IEEE International Conference on Robotics and Automation ICRA 2023, Workshop on Configurable Collaborative Robot Technologies in Construction. June 29, 2023 (online). Contribution: Collaborative robot technologies for artistic painting.
- 5th Italian Conference on Robotics and Intelligent Machines (I-RIM 2023), Rome, Italy, October 20-22, 2023. Contributions: “Improving fluency in collaborative robotics through online scaling of dynamic safety zones”; “Recent trends in mobile robotics for autonomous mapping in agriculture”.
- IEEE International Conference on Robotics and Automation ICRA 2019, Montreal, Canada, 20-22 May 2019. Invited paper: Scalera, L., Gallina, P., Seriani, S., Gasparetto, A. (2018). CBRC (Cable-Based Robotic Crane): design and implementation of overhead travelling cranes based on variable radius drums. IEEE Transaction on Robotics. Vol. 34, No. 2.

Speaker at national and international conferences

- IFToMM International Conference Mechanical Engineering Solutions: Design, Simulation, Testing, Manufacturing (MES 2025), Yerevan, Armenia, September 17-19, 2025. Contribution: “Mobile Robotics for Forest Monitoring and Mapping Within the AI4FOREST Project”.
- 7th IFToMM Conference on Mechanisms, Transmission and Applications (MeTrApp 2025), September 1-3, 2025, Taoyuan City, Taiwan. Contribution: “Optimization approaches for smooth motion planning in redundant manipulators”.
- Speaker at the event “Technological and Organizational Innovation in Primary Prevention,” organized by Azienda Sanitaria Universitaria Friuli Centrale (ASUF), March 21, 2025, Udine. Contribution: “Robotics in immunization: when?”
- Speaker at the round table “La robotica collaborativa e Industria 5.0: la re-invenzione dell’artigianato?”, within the Automation and Testing (A&T) exposition, November 7, 2024, Vicenza, Italy. Contribution: “Optimal trajectory planning for a safe and fluent human-robot collaboration”.
- 6th IFToMM Symposium on Mechanism Design for Robotics (MEDER 2024), June 27-29, 2024, Timișoara, Romania. Contribution: “Experimental analysis and comparison of friction models applied to the UR5e robot”.
- 3rd International Symposium on Industrial Engineering and Automation (ISIEA 2024), June 19-21, 2024, Bolzano, Italy. Contribution: “A Collaborative Robotics Application for the Assembly of Car Rear Lamps”.
- Second Innovation Design Application Symposium (IDEA 2024), March 18, 2024, online. Contribution: “Inclusive robotic drawing using eye-tracking technology”.
- Il Disegno per l’Accessibilità e l’Inclusione (DAI 2023), Udine, Italia, December 1-2, 2023. Contribution: “An eye tracking approach for inclusive robotic drawing”.
- Second IFToMM for Sustainable Development Goals Workshop, I4SDG 2023, Bilbao, Spain, June 22-23,

2023. Contribution: “A Framework for Improving the Energy Efficiency and Sustainability of Collaborative Robots”.

- Fourth International Conference of IFToMM ITALY, IFIT 2022, 7-9 September 2022, Naples, Italy. Title of the paper: “Online Planning of Path-Consistent Stop Trajectories for Collaborative Robotics”.
- Speaker at the event “Le nuove frontiere della robotica avanzata” (The new frontiers of advanced robotics), organized by Fraunhofer Italia as part of the Interreg IT-AT project “Dolomiti Live: un territorio di talenti” (Dolomites Live: a territory of talents), held in Bolzano on June 28, 2021.
- IEEE International Conference on Robotics and Automation ICRA 2021, online, 1 June 2021. Title of the paper: “Optimal scaling of dynamic safety zones for collaborative robotics”.
- Workshop I-RIM, Institute of Robotics and Intelligent Machines, Motion Planning in Industrial Application, online event, 10-12 December 2020. Title of the paper: “Artistic painting with a collaborative robot”.
- Third International Conference of IFToMM Italy, IFIT 2020, online event, 9-11 September 2020. Title of the paper: “A novel robotic system for painting with eyes”.
- Workshop I-RIM, Institute of Robotics and Intelligent Machines, Motion Planning in Industrial Application, Rome, 20 October 2019. Title of the paper: “Looking for energy efficiency in robotic tasks”.
- IEEE ICRA-X Robotic Art Forum 2019, Montreal, Canada, 20-22 May 2019. Title of the paper: “Painting watercolor artworks with Busker Robot”.
- Second International Conference of IFToMM Italy, IFIT 2018, 29-30 November 2018, Cassino, Italy. Title of the paper: “A new family of magnetic adhesion based wall-climbing robots”.
- 4th IFToMM Symposium on Mechanism Design for Robotics, MEDER 2018, 11-13 September 2018, Udine, Italy. Title of the papers: “Busker robot: a robotic painting system for rendering images into watercolor artworks”, “A look-ahead trajectory planning algorithm for spray painting robots with non-spherical wrist”.
- GMA 2017, presentation of the research activity at the Annual Congress of the Mechanics of Machines Group, Bologna, 11-12 July 2017.
- 8th ECCOMAS Thematic Conference on Multibody Dynamics, Prague, Czech Republic, 19-22 June 2017. Title of the paper: “Comparison of model order reduction techniques for flexible multibody dynamics using an Equivalent Rigid-Link System approach”.
- IEEE World Haptics Conference 2017, Munich, 6-9 June 2017. Title of the paper: “An experimental setup to test dual-joystick directional responses to vibrotactile stimuli”.
- First International Conference of IFToMM Italy, IFIT 2016, Vicenza, 1-2 December 2016. Title of the paper: “Design and implementation of a low-cost mechatronic shoe for biomechanical analysis of human locomotion”.

Organizer of workshops

- Organizer of the workshop “Out of the Lab: Challenges and Opportunities in Field Robotics” (Martina Lippi, Dario Calogero Guastella, Lorenzo Scalera) at the VII Conference of Robotics and Intelligent Machines (I-RIM 3D 2025), October 17-19, 2025, Rome, Italy.
- Organizer of the workshop “Trends and challenges in collaborative robotics: perception, motion planning and control” (Lorenzo Scalera, Matteo Terreran, Enrico Villagrossi) at the VI Conference of Robotics and Intelligent Machines (I-RIM 3D 2024), October 25-27, 2024, Rome, Italy.

Member of scientific committees

- Member of the International Scientific Committee dell’International Symposium on Industrial Engineering and Automation, ISIEA, since 2022.
- Member of the Program Committee of the European Conference on Mobile Robots (ECMR 2025).

Editor of international journals

- Associate Editor of IEEE Robotics and Automation Letters.
- Associate Editor of International Journal of Advanced Robotic Systems (SAGE).
- Associate Editor of Discover Applied Sciences (Springer).
- Editorial Board Member of International Journal of Mechanical Engineering and Robotics Research (ETP).

- Editorial Board Member of Journal of Autonomous Intelligence (Frontier Scientific Publishing).
- Young Advisory Editor of Engineering Reports (Wiley).
- Editorial Board Member of Discover Mechanical Engineering (Springer).
- Review Editor of Frontiers in Mechanical Engineering, Section Mechatronics (Frontiers).
- Review Editor of Frontiers in Space Technology, Section Space Exploration (Frontiers).
- Topic Editor of Applied Sciences (MDPI).
- Guest Editor of the Special issue “Trajectory Planning for Intelligent Robotic and Mechatronic Systems” of Applied Sciences (MDPI).
- Guest Editor of the Special issue “Modelling and Control of Mechatronics and Robotic Systems” (Volume I and II) of Applied Sciences (MDPI).
- Guest Editor of the Special Issue “Robotics and Vibration Mechanics” of Applied Sciences (MDPI).

Editor of books

- Editor of the book “Modelling and Control of Mechatronics and Robotic Systems”. Editors: Alessandro Gasparetto, Stefano Seriani, Lorenzo Scalera. Published by Applied Sciences (MDPI).
- Editor of the book “Modelling and Control of Mechatronics and Robotic Systems, Volume II”. Editors: Alessandro Gasparetto, Stefano Seriani, Lorenzo Scalera. Published by Applied Sciences (MDPI).

Reviewer for scientific journals

- IEEE/ASME Transactions on Mechatronics; IEEE Transactions on Robotics; IEEE Robotics and Automation Letters; IEEE Transactions on Instrumentation & Measurement; IEEE Access; Robotics and Computer-Integrated Manufacturing; Journal of Mechanisms and Robotics; Robotics and Autonomous Systems; Mechanisms and Machine Theory; Robotica; Frontiers in Robotics and AI; Automation in Constructions; International Journal of Advanced Robotic Systems; MDPI Robotics (non-exhaustive list).

Reviewer for international conferences

- IEEE International Conference of Robotics and Automation (ICRA); IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS); IEEE International Conference on Automation Science and Engineering (CASE); IEEE World Haptics Conference (WHC); IEEE EuroHaptics Conference; ASME International Mechanical Engineering Congress and Exposition (IMECE); International Symposium on Industrial Engineering and Automation (ISIEA); International Conference of IFToMM Italy (IFIT); International Conference on Robotics in Alpe-Adria-Danube Region (RAAD); IFToMM for Sustainable Development Goals Workshop (I4SDG) (non-exhaustive list).

Member of research groups

- **Member of the research group Mechatronics** (Robotics and Automation Research Group of North-East Italy). The Mechatronics group operates in five universities (Padua, Vicenza, Udine, Trieste and Bolzano) carrying out teaching and research activities. The staff of the group includes professors and researchers from the various universities, all of them pertaining to the disciplinary scientific sector of Mechanics of Machines ING-IND/13. The research activity is divided into six main areas that concern different aspects of mechatronics, in particular robotics, medical robotics, haptic interfaces, industrial automation, control of mechanical systems, and mechanics of vibrations. The research activities are carried out in collaboration with Italian and European partners, in the context of national and international research projects as well as within research agreements with companies.
- **Member of the research group of Mechanics of Machines** ING-IND/13 of the Polytechnic Department of Engineering and Architecture of University of Udine. The group is coordinated by prof. Alessandro Gasparetto. The research activity of the group concerns kinematics and dynamics modelling of robotic and mechatronic systems, trajectory planning, and experimental validations. The group deals with issues related to the mechanics of vibration, control and data acquisition, particularly in mechatronic and robotic systems.

The activities of the research group are characterized by collaborations at national and international level with universities and research centers, in particular with:

- the research group of Mechanics of Machines of the **Free University of Bozen-Bolzano**, on the topics of kinematics, dynamics and trajectory planning of robotic and mechatronic systems, and energy efficiency;
- the research group of Mechanics of Machines of the **University of Padua**, on the topics of kinematics, dynamics and trajectory planning of robotic systems and mechatronics;
- the research group of Mechanics of Machines of the **University of Trieste** (coordinator prof. Paolo Gallina), on the topics of cable-driven robots, haptic interfaces and human-machine interaction, robotics for artistic applications and collaborative robotics;
- **Fraunhofer Italia Research** (Dr. Andrea Giusti), on the topic of collaborative robotics (in particular, real-time control and planning of stop trajectories);
- **Chiang Mai University** (coordinator prof. Theeraphong Wongratanaphisan), on the topic of energy efficiency using the natural motion approach for parallel robots;
- **Stevens Institute of Technology**, Hoboken, NJ, USA (coordinator prof. Damiano Zanotto), on the topics of experimental modelling, control and validation of underactuated cable-driven robots;
- School of Computer Science of **St. Petersburg Electrotechnical University**, St. Petersburg, Russia (coordinator prof. Denis Butusov), on the topic of image processing and artistic robotic painting;
- School of Psychology of the **University of Birmingham** (coordinator Dr. Massimiliano Di Luca), on the topics of human-machine interaction and haptic interfaces;
- Intelligent and Autonomous Systems Lab of the **University of Padua** (coordinator prof. Stefano Ghidoni), on the topic of collaborative robotics;
- **Technical University of Ostrava** (coordinator prof. Václav Krys), with whom he collaborates on the topic of collaborative robotics;
- **Bialystok University of Technology** (coordinator prof. Arkadiusz Mystkowski), on the topics of dynamic modelling and trajectory planning of robotic systems;
- **University of Antwerp** (coordinator prof. Stijn Derammelaere), on the topics of trajectory planning and optimization for mechatronic and robotic systems.

Member of the teaching staff

- Member of the Doctoral Council (Collegio di Dottorato) of the **Industrial and Information Engineering PhD Programme** of the Polytechnic Department of Engineering and Architecture of University of Udine, since 2025.
- Member of the Doctoral Board (Collegio di Dottorato) of the **National Doctorate in Artificial Intelligence** (pillar: Agrifood and Environment), headed by University of Naples Federico II, a.a. 2021/2022 (XXXVII cycle).

Teaching activity

- **Dynamics of Mechanical Systems (12 CFU)**, Master degree in Mechanical Engineering, University of Udine. A.A. 2025-2026.
- **Robotics**, Industrial Engineering for Sustainable Manufacturing, Università degli Studi di Udine, English. A.A. 2023-2024, 2024-2025.
- **Mechatronic Systems**, Industrial Engineering for Sustainable Manufacturing, Università degli Studi di Udine, English. A.A. 2023-2024, 2024-2025.
- **Mechanics of Machines, module 2**, Bachelor degree in Mechanical Engineering and Management Engineering, University of Udine, 48 hours, Italian, A.A. 2018-2019, 2019-2020, 2020-2021, 2021-2022, 2022-2023.
- **Measurement techniques for mechatronic systems**, Industrial and Information Engineering PhD Programme (IIE-PhD), University of Udine, A.A. 2019-2020, 2020-2021, 2021-2022, 2022-2023.
- **Dynamics of Mechanical Systems**, Master in Mechanical Engineering, Faculty of Science and Technology, Free University of Bozen-Bolzano, English, A.A. 2021-2022 (16 hours), 2022-2023 (13 hours).

- **Mechatronics and Process Automation**, Bachelor in Wood Engineering, Faculty of Science and Technology, Free University of Bozen-Bolzano, English, A.A. 2019-2020 (25 hours), 2020-2021 (28 hours).
- **National Instruments and LabVIEW environment for data measurement and analysis**, teaching activities within the training plan called "FIMA 1/2019 ERGON SMART FACTORY ID: - SMART FACTORY: IoT sensor systems for innovative production processes." CUP: G91D21000220008. Course held at Bertagni 1882 spa, 8 hours, online. 2020-2021.
- **Data Collection and Analysis for Industry 4.0**, teaching activities within the training plan called "FIMA 1/2019 ERGON SMART FACTORY ID: - SMART FACTORY: IoT sensor systems for innovative production processes." CUP: G91D2100022. Course held at Bertagni 1882 spa, 16 hours. 2020-2021.
- **Introduction to Robotics and Computer Creativity** at the Computer-Aided Design Department, School of Computer Science, St. Petersburg Electrotechnical University (St. Petersburg, Russia). Course held in English. Number of hours: 20. 2019-2020.
- **Collaborative Robots: what they are and how they can be used**, organized by COMET Plus (Metalmechanics Cluster of Friuli Venezia Giulia), Pordenone (PN).
- **Fundamentals of Mechatronics, Robotics, and Cyber-Physical Systems** (since 2017), at the Malignani Foundation ITS in Udine, as part of the Higher Technical Course for Automation and Mechatronic Systems (specialization in Mechatronics and Additive Manufacturing).
- **Teaching activities during the course on Mechanical Vibrations** by Prof. Gasparetto, Master's Degree in Mechanical Engineering, University of Udine. Number of hours: 16. 2017-2028, 2018-2019.
- **Teaching activities during the course on Mechatronics and Robotics** by Prof. Gasparetto, Master's Degree in Mechanical Engineering, University of Udine. Number of hours: 4. 2017-2028, 2018-2019.

Thesis Supervisor and Co-Supervisor

- Supervisor of more than 10 Bachelor's Theses in Mechanical Engineering, 7 Bachelor's Theses in Electronic Engineering, 17 Bachelor's Theses in Management Engineering, 6 Master's Theses in Mechanical Engineering, and 3 Master's Theses in Electronic Engineering at University of Udine.
- Co-Supervisor of 1 Bachelor's Thesis in Electronic Engineering, 5 Master's Theses in Mechanical Engineering, 2 Master's Theses in Electronic Engineering, and 1 Master's Thesis in Management Engineering at University of Udine.

Supervisor of doctoral students and research fellows

- Supervisor of the doctoral student Franci Rrapi (PhD Program in Industrial and Information Engineering of the University of Udine) since 01/11/2025.
- Supervisor of the research fellow Franci Rrapi (within the iNEST project of the National Recovery and Resilience Plan) since 01/07/2024.
- Supervisor of the research fellow Diego Tiozzo Fasiolo (within the AI4FOREST PRIN 2022 project) since 16/03/2024.
- Supervisor of the research fellow Giuliano Fabris (within the iNEST project of the National Recovery and Resilience Plan) from 16/03/2023 to 31/10/2024.
- Supervisor of the doctoral student Diego Tiozzo Fasiolo (National Ph.D. program in Artificial Intelligence) from 1/11/2021 to 31/10/2024.
- Supervisor of the research fellow Federico Lozer from 16/04/2022 to 31/10/2022.

Erasmus Exchange Coordinator

- Erasmus Exchange Coordinator for the exchange program between the University of Udine and the University of Antwerp (Belgium).
- Erasmus Exchange Coordinator for the exchange program between the University of Udine and the Technical University of Ostrava (Czech Republic).
- Erasmus Exchange Coordinator for the exchange program between the University of Udine and the Democritus University of Thrace (Greece).

Committees

- Member of the Internationalization Committee of the Polytechnic Department of Engineering and Architecture of the University of Udine.
- Member of Doctoral Committees at the University of Bologna (Italy) and Politecnico di Torino (Italy).
- Member of the Doctoral Committees at the University of Antwerp (Belgium), for the PhD thesis “Motion Profile Optimization for Enhanced Energy Efficiency in Industrial Positioning Applications” by Nick Van Oosterwyck, and the PhD thesis “Generic Industrially Applicable Algorithms to Design Mechanisms with Minimal Energy Usage” by Abdelmajid Ben Yahya.
- Member of the State Examination Committee for the qualification to the Profession of Engineer (Industrial Section) at the University of Udine, 2023.
- Member of Bachelor’s and Master’s Degree Committees in Mechanical, Electronics and Management Engineering at University of Udine.
- Chairman of the State Examination Committee of the ITS Accademy Meccatronico Veneto Foundation, Vicenza (Italy), in 2023 and 2024.
- Member of Committees for Research Fellowships at University of Udine and Free University of Bolzano.
- Commissioner of the TOLC (Online Test for University Admission) and OFA (Additional Training Obligations) tests, organized by CISIA, at University of Udine.
- Judge of the Technical Jury for the “Robot Design” category at the First Lego League in Udine, 2019.

Other activities

- Participation in the Collega-Menti Festival, organized in Udine by the University of Udine from October 3 to 5, 2025, with the stands: “Who can beat the collaborative robot at checkers?” and “Data from the vineyard: when technology walks among the vines.”
- Participation in the contemporary art exhibition “Art and Robots” at the Museo Diffuso di Arte Contemporanea (MAC) in Lula (Sardinia) from 21/04/2023 to 25/06/2023.
- Participation in the working group “Boschi Vetusti” (Ancient Forests), coordinated by Prof. Roberto Tognetti, since 2022, <https://sisef.org/sisef/gdl/boschi-vetusti/>
- Participation in the international art exhibition “Art and Robotics” from November 17 to 28, 2018 (Trieste, TS) with Busker Robot, an artist robot developed in collaboration with Prof. Paolo Gallina.
- Participation in Trieste Next 2017 with Busker Robot (in collaboration with Prof. Paolo Gallina), held in Trieste in September 21-23, 2017.
- Participation in the exhibition “Art and Robotics” (in collaboration with Prof. Paolo Gallina), held in Trieste from October 29 to November 27, 2016.

Participation in international workshops

- Embodied Intelligence Robotics Workshop at the Architecture Biennale 2025 in Venezia, June 28, 2025.
- IFToMM Italy International Summer School On Human-Centred Robotics (HumAN), Ancona, Italy, June 26-30, 2023.
- Mobile Mapping School, Padua’s Botanic Garden, May 23, 2023.
- ROBOzen: International Winter School on Mechanism Design and Motion Planning for Robotics, Free University of Bozen-Bolzano, January 27-31, 2020.
- 1st Italian Multibody Summer School, Parma, April 11-15, 2016.

Honors and awards

- **Young Delegate Program Award** at the 7th IFToMM Conference on Mechanisms, Transmission and Applications (MeTrApp 2025), held in Taoyuan City, Taiwan, September 1-3, 2025.
- **Gold Best Application Paper Award** at the 3rd IFToMM for Sustainable Development Goals Conference (I4SDG 2025) for the contribution: “A navigation approach for autonomous mobile robots in sustainable agriculture”.

- **Editorial Contribution Award 2025 and Author Service Award 2025** from the scientific journal Discover Applied Sciences published by Springer Nature (29/05/2025). This award recognizes the role of the editor in evaluating new submissions and rigorously managing the peer review process, safeguarding the scientific accuracy of published scientific articles.
- **Gold Best Research Paper Award** at the 5th International Conference of IFToMM ITALY (IFIT 2024) for the contribution: “Online optimization and trajectory planning for energy efficiency in a robotic linear axis”.
- **Gold Best Paper Award and Springer Best Paper Award** at the 8th Int. Symp. on History of Machines and Mechanisms (HMM 2024) for the contribution: “History of Drawing Robots”.
- **Machines 2023 Outstanding Reviewer Award** from the journal MDPI Machines (2024).
- **Silver Best Application Paper Award** at the Second IFToMM for Sustainable Development Goals Workshop (I4SDG 2023) for the contribution: “A Framework for Improving the Energy Efficiency and Sustainability of Collaborative Robots”.
- **Silver Best Application Paper Award** at the Third International Conference of IFToMM ITALY (IFIT 2020) for the contribution: “A novel robotic system for painting with eyes”.
- **Best Application Paper Award** at the 29th International Conference on Robotics in Alpe-Adria-Danube Region (RAAD 2020) for the contribution: “Minimum-Energy Trajectory Planning for Industrial Robotic Applications: Analytical Model and Experimental Results”.
- **Best Paper Award** at the 6th IFToMM International Symposium on History of Machines and Mechanisms (HMM 2018) for the contribution: “From the Unimate to the Delta robot: the early decades of Industrial Robotics”.
- **Honorable Mention** received by the Busker Robot team (Lorenzo Scalera and Paolo Gallina, University of Trieste) at the RoboArt Competition 2018, an online competition for robot artists, <https://robotart.org/>
- **Best Paper Award** in Research Category at the First Conference of IFToMM Italy (IFIT 2016) for the contribution: “Anti-hedonistic mechatronic systems”.

Scientific memberships

- Representative of the University of Udine for the **EuRobotics** technology platform starting from 2022.
 - Participation in the European Robotics Forum 2022 in Rotterdam (Netherlands) from 28 to 30/06/2022.
 - Participation in the European Robotics Forum 2023 in Odense (Denmark) from 14 to 16/03/2023.
 - Participation in the European Robotics Forum 2024 in Rimini (Italy) from 12 to 15/03/2024.
 - Participation in the European Robotics Forum 2025 in Stuttgart (Germany) from 24 to 27/03/2025.
- Member of **GMA, Group of Mechanics of Machines** (Gruppo Italiano di Meccanica Applicata), since 2022.
- Member of **IFToMM ITALY, International Federation for the Promotion of Mechanisms and Machine Science**, since 2017.
- Student member of **IEEE**, 2018.

Linguistic skills

- Italian: Native language.
- English: Very good proficiency in both written and spoken forms, also gained abroad.
- German: Goethe Institut certification, level A2.

Software skills

- Microsoft Office (Word, Excel, PowerPoint), LaTeX, Solidworks, Matlab and Simulink, Python, ANSYS, MSC Adams, LabVIEW, real-time C programming with Arduino and Teensy micro-controllers, Universal Robot Programming Language, RoboDK.
- Courses on LabView software and National Instruments instrumentation to acquire the ability to design a measurement, control, and data acquisition system: LabView Core 1, Assago (MI), January 18-20, 2016; LabView Core 2, Assago (MI), January 25-26, 2016; LabView Embedded Control and Monitoring using

LabView, Assago (MI), February 8-12, 2016; Data Acquisition Using NI-DAQmx and LabView, December 14-15, 2017, Udine (UD); LabView Core 3, June 16-19, 2020.

- CLAD Certification, Certified LabView Associate Developer, Padua, March 31, 2016.
- Training course for programming Universal Robots collaborative robots, Udine (UD), November 9, 2018.
- Training course on the Concept Laser 3D printer, Udine (UD), May 5, 2016.
- Training course on Omron Electronics Machine Controller NX/NJ, Padua (PD), November 29, 2019.

Licenses

- Driving licenses B and A2.
- Recreational boating license for sailing and motor boats with no coastal limits.

Other certifications

- RSPP (Responsabile del Servizio Sicurezza Protezione e Prevenzione) certification, modules A, B (macro-sector Ateco 4), and C, December 11, 2015.

Other associations

- Member of the Lega Navale Italiana (LNI), section of Grado (Italy).
- Member of the Italian Tennis Federation (FIT).
- Volunteer for the AFDS, Friulan Association of Blood Donors, section of Corgnolo-Pampaluna, since 2016.

I, the undersigned Lorenzo Scalera, born in Trieste on 26/02/1991, aware of the criminal sanctions in case of false statements and falsehood in official documents, as referred to in Article 76 of Legislative Decree No. 445 of 28/12/2000, declare that the information provided in this document is true and authorize the processing of my personal data in accordance with Article 13 of the EU Regulation 679/2016 (General Data Protection Regulation) and Article 13 of Legislative Decree No. 196/2003 (Personal Data Protection Code).

Udine, December 30, 2025

Lorenzo Scalera