

# Gabriele Abbate

## Curriculum Vitae

Lugano, Switzerland — gabriele.abbate@supsi.ch — <https://gabry993.github.io>

### EDUCATION

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#### PhD in Applied Data Science and Artificial Intelligence at USI-SUPSI

*Mar 2026 – Today*

I am working on the TANDEM project, which focuses on improving the diagnosis of nodal marginal zone lymphoma by integrating digital pathology, molecular data, and artificial intelligence. My contribution centers on developing computer vision methods for the analysis of whole slide histopathological images, combined with multimodal learning approaches that incorporate clinical text data. This work lies at the intersection of computer vision and medical AI, addressing challenges in large-scale image analysis, representation learning, and clinically relevant model design.

#### MSc in Informatics

*Sep 2016 – Oct 2018*

Double Degree with University of Milano Bicocca (UNIMiB) and Università della Svizzera Italiana (USI)

*Final Grade:* 110/110 summa cum laude

GPA = 9.9/10 (USI) – GPA: 29.857/30 (UNIMiB)

*Thesis:* Implementation of a Laser Turret with 2 Degrees of Freedom, and Applications for Human-Robot Interaction. Developed at the Istituto Dalle Molle di Studi sull'Intelligenza Artificiale, (IDSIA, USI-SUPSI)

*Courses:* Machine Learning, Robotics, Physical Computing, Mobile Computing, Software Engineering (at USI); Machine Learning, Complex System: Model and Simulation, Services and Systems of Telecommunication, Software Quality, Probabilistic Models for Decision Making (at UNIMiB).

#### BSc in Informatics

*Sep 2012 – Mar 2016*

University of Milano Bicocca (UNIMiB)

*Final Grade:* 110/110 summa cum laude

GPA: 28.15/30

*Thesis:* A Sensor Data Labelling App, developed at the Software Architecture Laboratory (SAL, University of Milano Bicocca)

#### Diploma Liceo Scientifico

*Sep 2007 – Jul 2012*

Liceo Scientifico Vittorio Veneto, Milano, Italy

### EMPLOYMENT HISTORY

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#### Research Engineer at IDSIA – Lugano, Switzerland

*Sep 2019 – Today*

I have been working on both research and industry-funded Innosuisse projects, contributing to the design and development of AI-driven solutions across Artificial Intelligence, Computer Vision, Robotics, Human–Robot Interaction (HRI), Virtual Reality, Rehabilitation, Digital Pathology, and 3D Point Cloud processing. My work spans the full project lifecycle, from problem formulation and algorithm development to experimental validation and real-world deployment. I have actively contributed to the preparation of competitive Innosuisse grant proposals and co-authored multiple peer-reviewed conference and journal publications. In addition, I have served as a reviewer for several IEEE conferences and journals, and I have advised both Bachelor's and Master's students on their thesis projects.

#### Assistant with Master at IDSIA – Lugano, Switzerland

*Nov 2018 – Aug 2019*

Contribution to robotics and AI projects.

#### IT Sales Internship as Software Engineer/Developer at Vodafone – Milan, Italy

*Apr 2016 – Oct 2016*

I implemented real-time alarms and notifications based on business data whose purpose was to monitor the state of sales systems, dislocated all over the country. Also, I was responsible for the implementation, configuration, and management of an ELK stack (Elasticsearch, Logstash and Kibana) to build a scalable and highly reliable system for log centralization and monitoring.

## Data Entry Support at Vitalaire - Milan, Italy

Oct 2013 – Mar 2016

Worked while pursuing my studies, contributing to an experimental clinical study at Ospedale San Carlo Borromeo involving patients with Chronic Obstructive Pulmonary Disease (COPD). Responsible for accurate data entry and management of clinical records, and for coordinating communication between the Pulmonology Department and the company to ensure smooth project execution.

## PUBLICATIONS

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### Journal Articles

5. Lamberti, L., Cereda, E., **Abbate, G.**, Bellone, L., Morinigo, V. J. K., Barciś, M., Barciś, A., Giusti, A., Conti, F., & Palossi, D. (2024). **A Sim-to-Real Deep Learning-Based Framework for Autonomous Nano-Drone Racing.** *IEEE Robotics and Automation Letters*, 9(2), 1899–1906.
4. **Abbate, G.**, Giusti, A., Randazzo, L., & Paolillo, A. (2023). **A mirror therapy system using virtual reality and an actuated exoskeleton for the recovery of hand motor impairments: a study of acceptability, usability, and embodiment.** *Scientific Reports*, 13, 22881.
3. **Abbate, G.**, Giusti, A., Schmuck, V., Celiktutan, O., & Paolillo, A. (2023). **Self-supervised prediction of the intention to interact with a service robot.** *Robotics and Autonomous Systems*, 104568.
2. Paolillo, A., **Abbate, G.**, Giusti, A., Trakić, Š., Dzafic, H., Fritz, A., & Guzzi, J. (2022). **Towards the integration of a pointing-based human-machine interface in an industrial control system compliant with the iec 61499 standard.** *Procedia CIRP*, 107, 1077–1082.
1. Can, G., Mantegazza, D., **Abbate, G.**, Chappuis, S., & Giusti, A. (2021). **Semantic segmentation on Swiss3DCities: A benchmark study on aerial photogrammetric 3D pointcloud dataset.** *Pattern Recognition Letters*, 150, 108–114.

### Conference proceedings

13. **Abbate, G.**, Tricomi, E., Gierden, N., Giusti, A., Masia, L., & Paolillo, A. (2026). **User-Tailored Learning to Forecast Walking Modes for Exosuits.** to appear at *2026 IEEE International Conference on Robotics and Automation (ICRA)*.
12. **Abbate, G.**, Giusti, A., Randazzo, L., & Paolillo, A. (2025). **Learning Hand State Estimation for a Light Exoskeleton.** *Human-Friendly Robotics 2024*, 123–136.
11. Arreghini, S., Paolillo, A., **Abbate, G.**, & Giusti, A. (2025). **Hearing the Robot's Mind: Sonification for Explicit Feedback in Human-Robot Interaction.** *Human-Friendly Robotics 2024*, 45–57.
10. Arreghini, S., **Abbate, G.**, Giusti, A., & Paolillo, A. (2024). **A Service Robot in the Wild: Analysis of Users Intentions, Robot Behaviors, and Their Impact on the Interaction.** *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2536–2541.
9. Arreghini, S., **Abbate, G.**, Giusti, A., & Paolillo, A. (2024). **Predicting the Intention to Interact with a Service Robot: the Role of Gaze Cues.** *2024 IEEE International Conference on Robotics and Automation (ICRA)*, 993–999.
8. Severi, L., Sacchetto, M., Bianco, A., Rottondi, C., **Abbate, G.**, Paolillo, A., & Giusti, A. (2024). **Remote Orchestral Conduction via a Virtual Reality System.** *2024 IEEE 5th International Symposium on the Internet of Sounds (IS2)*, 1–6.
7. Arreghini, S., **Abbate, G.**, Giusti, A., & Paolillo, A. (2024). **A Long-Range Mutual Gaze Detector for HRI.** *Proceedings of the 2024 ACM/IEEE International Conference on Human-Robot Interaction*, 870–874.
6. **Abbate, G.**, Giusti, A., Paolillo, A., Gromov, B., Gambardella, L., Rizzoli, A. E., & Guzzi, J. (2022). **PointIt: A ROS toolkit for interacting with co-located robots using pointing gestures.** *2022 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, 608–612.
5. Guzzi, J., **Abbate, G.**, Paolillo, A., & Giusti, A. (2022). **Interacting with a conveyor belt in virtual reality using pointing gestures.** *2022 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, 1194–1195.

4. **Abbate, G.**, Giusti, A., Paolillo, A., Gambardella, L. M., Rizzoli, A. E., & Guzzi, J. (2022). **Selecting Objects on Conveyor Belts Using Pointing Gestures Sensed by a Wrist-worn Inertial Measurement Unit.** *2022 IEEE 18th International Conference on Automation Science and Engineering (CASE)*, 633–640.
3. **Abbate, G.**, Gromov, B., Gambardella, L. M., & Giusti, A. (2021). **Pointing at moving robots: Detecting events from wrist IMU data.** *2021 IEEE International Conference on Robotics and Automation (ICRA)*, 3604–3611.
2. Gromov, B., Guzzi, J., **Abbate, G.**, Gambardella, L., & Giusti, A. (2019). **Video: Pointing gestures for proximity interaction.** *2019 14th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, 370–370.
1. Gromov, B., **Abbate, G.**, Gambardella, L. M., & Giusti, A. (2019). **Proximity human-robot interaction using pointing gestures and a wrist-mounted IMU.** *2019 International Conference on Robotics and Automation (ICRA)*, 8084–8091.

## Edited Books

1. Paolillo, A., Giusti A., & **Abbate, G.** (2025), **Human-Friendly Robotics 2024.** HFR: 17th International Workshop on Human-Friendly Robotics, Conference Proceedings.

## Abstracts

2. **Abbate, G.**, Forni, B., Giudici, L., Migliora, P., Mazzucchelli, L., Martin, V., & Giusti, A. (2025) **PATH-zle, an AI-based tool for histopathology Whole Slide Image reconstruction.** *Precision Health Day 2026 - AI Enabled*
1. Martin, V., **Abbate, G.**, Giudici, L., Forni, B., Migliora, P., Giusti, A., & Mazzucchelli, L. (2025) **AI-empowered tumor diagnosis using PATH-zle, the first user-friendly AI tool for tissue reconstruction.** *Precision Health Day 2026 - AI Enabled*

## GRANTS

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### VRHEM

Proposal Title: Virtual Reality and Hand Exoskeleton for Mirror Therapy: a Feasibility Study (VRHEM)  
 Funding Agency: Innosuisse (62000.1 IP-ICT)  
 Role Status: Contributed to the preparation and writing of the project proposal  
 Funding: 203'469.00 CHF  
 Project Duration: 01.09.2022 – 01.09.2023

### PATH-zle

Proposal Title: PATH-zle: AI-Assisted Reconstruction of Histo-pathology Macro-Sections  
 Funding Agency: Innosuisse (115.958 IP-LS)  
 Role Status: Contributed to the preparation and writing of the project proposal  
 Funding: 213'279.00 CHF  
 Project Duration: 01.10.2024 – 31.03.2026

## ADVISING

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Student Name: Elie Youssef  
 Thesis Title: Human-friendly behaviors for omni-directional ground robots  
 USI – Master of Artificial Intelligence, thesis co-supervisor

Student Name: Andrea Gaiani  
 Thesis Title: Integrating Pointing Gestures with Ground Robot Localization  
 USI – Master of Artificial Intelligence, thesis co-supervisor

Student Name: Miro Rava  
 Thesis Title: End-to-End Pipeline for Thermal Anomaly Detection in PV Plants via Unmanned Aerial Vehicle (UAV) Thermography  
 SUPSI – Data Science and Artificial Intelligence, diploma thesis co-supervisor  
 Awarded the “Paradox Engineering Prize for IoT and Connected Future”

## AWARDS

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4. **Best Oral Presentation** for “*PATH-zle, an AI-based tool for histopathology Whole Slide Image reconstruction.*” at Precision Health Day 2026 - AI Enabled (Lugano, Switzerland, 2026).
3. **Quality of Life label** from the Fondation Dalle Molle for “*Remotely-assisted Enhanced Mirror Therapy (REMiT)*” (developed within VRHEM project). (Sion, Switzerland, 2023)
2. **1<sup>st</sup> place** with the PULP team in the “*Nanocopter AI Challenge*“, at IMAV2022 (Delft, Netherlands, 2022).
1. **Best Video Award** for “*Pointing Gestures for Proximity Interaction*” at HRI2019 (Daegu, South Korea, 2019).