Letizia Girardi

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Education

University of Trento — Trento, Italy
Ph.D. Student in Engineering Science — Nov. 2025 – Present

University of Trento — Trento, Italy
Master's Degree in Computer Science (Bioinformatics) — Sept. 2022 – Mar. 2025
Thesis: *Automatic Analysis of Perivascular Spaces in Parkinsonian Patients from Brain MRI Images*
Supervisor: Paolo Giorgini

University of Trento — Trento, Italy
Bachelor's Degree in Computer Science — Sept. 2019 – Sept. 2022
Thesis: *Detection and Localization of Deep Video Inpainting*
Supervisor: Giulia Boato

Charles University — Prague, Czech Republic
Exchange Semester — Sept. 2023 – Feb. 2024

Research Interests

- **Medical Image Generation & Multimodal Diagnostics:** Developing deep learning models that integrate medical imaging and clinical data to improve diagnostic accuracy and generalization. Focus on segmentation and generative approaches for data augmentation, supporting robust multimodal diagnostic pipelines.
- **Adaptive & Self-Evolving AI Models:** Designing adaptive, self-evolving architectures to enhance model robustness, reliability, and clinical validity. Emphasis on interpretable AI to support safe and meaningful collaboration between AI systems and healthcare professionals.

Publications

[2] **Deep segmentation of brain perivascular spaces in Parkinson's disease: informing decision support from clinical low-field MRI**
Authors: Selene Tomassini*, *Letizia Girardi*, Raffaella Di Giacopob, Carlo Cosimo Quattrocchi and Paolo Giorgini
Under peer review

[1] **A Case Study for the Automatic Supervision of Body-Weight Exercises: The Squat**
IEEE International Workshop on Sport, Technology and Research (STAR), Sept. 2023
Authors: Paolo Aliprandi*, *Letizia Girardi*, et al.
DOI:10.1109/STAR58331.2023.10302651

Equal contribution

Reasearch Experience

MediTech Challenge - Vascular Surgery 2026 — *January 2025 — ongoing*
Selected as the top-ranked candidate to join a multidisciplinary team focused on developing and prototyping technological solutions for vascular surgery.

Assegnataria borsa di ricerca, University of Trento — *May 2025 — Oct. 2025*
Conducted research on radiological and optical imaging, focusing on the application of state-of-the-art deep learning

methods, including foundation models and transformers.

Relevant Projects

Automatic Analysis of Perivascular Spaces in Parkinsonian Patients from Brain MRI images Collaborated with the Radiology Department to develop an automatic system for detecting and segmenting perivascular spaces in brain MRIs of Parkinson's patients, using deep learning techniques and statistical methods to assess correlations with disease progression.	3D Slicer, FSL, ANTs, Python
Neural Network Simulation under Deep Brain Stimulation (DBS) Simulated the behavior of neural networks under DBS using the NEURON simulation environment, exploring the impact of DBS on neural dynamics and network functionality.	NEURON, NumPy, SciPy
Automatic Speech Recognition and Statistical Language Modeling Worked on ASR systems and language modeling using Hidden Markov Models and techniques such as HTK and KenLM, optimizing models for speech recognition accuracy and performance.	HTK, KenLM, HMMs, Praat
Localization and Detection of Deep Video Inpainting Developed a system to detect and analyze deep learning-based video inpainting, using PyTorch for neural network implementation and OpenCV for image processing, with an emphasis on identifying altered or altered video content.	PyTorch, OpenCV, Bash

Conferences & Workshops

MedicinAI – Cycle of Seminars

- *Seminar I: AI and Clinical Data – From Fragmentation to a Unified Vision*   17 Oct. 2025
- *Seminar II: AI Supporting Physicians – Diagnosis, Therapy, and Personalized Care*   6 Nov. 2025
- *Seminar III: Reliability and Transparency – Regulating the Use of AI in Healthcare*   25 Nov. 2025

MedicinAI - Workshop   *4 Dec. 2025*
AI and Decision Support in Healthcare: From Data to Clinical Impact
General co-chair & organizer

Data4SmartHealth 2025 – University of Bolzano   *27 Nov. 2025*
Focus on nuclear medicine and radiomics, with sessions on AI-driven image analysis and radiomics workflows.

Trieste Next – Science Research Festival   *Sept. 2023*
Selected for the Academy Scholarship; attended sessions on AI, education, and rehabilitation.

Connect Brain Vol. III, APSS Trento   *Jun. 2024*
Workshop on advanced neuroimaging and neurosurgical techniques.

Awards Honors

20th Bernardo Nobile Award, Area Science Park – Trieste, Italy   *Nov. 2025*
Awarded an honorable mention for the master's thesis "Automatic measurement and analysis of perivascular spaces in parkinsonian subjects from brain MRI images."