

LEONARDO VANNI

info@leonardovanni.com — [LinkedIn](#) — [GitHub](#)

EDUCATION

Bocconi University, Milan, Italy

Sep 2023 - Jul 2026 Expected

BSc in Mathematics and Computing Sciences for Artificial Intelligence

- Cumulative GPA: 29.95/30
- Exchange Semester: École Polytechnique, Palaiseau, France
 - GPA: 4.3/4

Sep 2025 - Jan 2026

RESEARCH EXPERIENCE

TopoEgo: Topological-Aware 4D Gaussian Splatting for Egocentric Vision

January 2026 – Present

First-author research with Prof. Chiara Plizzari, Dr. Stefano Gasperini, and Prof. Federico Tombari

- Developing a 4D Gaussian Splatting framework for egocentric video that handles non-homeomorphic object changes such as cutting, splitting, fracture, and disassembly.
- Designed a piece-wise rigid kinematic tracker with spacetime clustering to route canonical Gaussians into independent post-event SE(3) branches, reducing stretching and ghosting artifacts at topological boundaries.
- Building TopoEgo, a benchmark from EPIC-KITCHENS and Ego4D with camera poses, dense 2D segmentation masks, and temporal state-change annotations for discontinuous egocentric interactions.

Geometrically-Grounded Uncertainty Quantification for Foundational 3D Vision Models

2026

BSc Thesis, Bocconi University. Supervisor: Prof. Alessandro Pigati

- Extended VGGT with SE(3)-consistent uncertainty estimation for learned Structure-from-Motion.
- Derived scale-aware NLL and implemented Lie-group log/exp maps, left Jacobians, and full 6×6 camera-pose covariance prediction.

Research on Discrete Diffusion Models for Mathematics

Sep 2025 - Present

- Designing a text diffusion decoder for Lean theorem proving, using the Lean kernel as an automated verifier and benchmarking against autoregressive LLMs.

SELECTED EXPERIENCE

Politecnico di Milano & Bocconi AI and Neuroscience Association

Sep 2024 - Jun 2025

Computer Vision Lead, Intelligent Prosthetic Arm

Report: [ResearchGate](#)

- Led a real-time CV pipeline for prosthetic grasp validation, combining monocular depth, segmentation, object detection, hand pose, and Kalman-filtered 3D state tracking.
- Trained a hybrid grasp-validation model assessing feasibility from 3D object geometry and user hand pose.

Accenture

Jun 2025 - Sep 2025

Machine Learning Engineer

- Built a BERT/medical-LLM pipeline mapping diagnoses to a 20k-class medical ontology, reaching 94% accuracy.
- Improved OCR/OpenCV document parsing from 2 to 15 documents/min and reduced false positive image extractions by 78%.

TEACHING & LEADERSHIP

Bocconi University

Jan 2025 - Present

- Teaching Assistant, *Mathematical Analysis - Module 2*: Selected by course faculty to design and deliver 3 lectures on multivariable analysis and optimization.

- AI Tutor Developer, *Advanced Analysis and Optimization - Module 1*: Partnered with course faculty to develop the official AI-powered tutor, providing personalized guidance on ODE theory.
- Guest Speaker, *Bocconi Summer School*: Invited to lead a Computer Vision lecture and workshop.

Bocconi Association for Mathematical Sciences

Jul 2025 - Present

- Cofounder: Established a faculty-mentored training program preparing students for the Imperial–Cambridge Mathematics Competition (ICMC).
- Finished 45/680 with 33 points in the first round of ICMC and qualified for the second round

Bocconi AI and Neuroscience Association

Oct 2023 - Present

- Head of Research: Coordinated and mentored 60 student researchers across multiple ML projects, while sourcing and defining project scopes with professors and research partners.
- Led two flagship projects: Intelligent Prosthetic Arm (Computer Vision Lead) and Crypto Market Trend Forecasting (Project Lead).

LANGUAGES

Italian native; **English** C2; **German** B2; **French** B2.