Luca Cazzola

Master's student in AI Systems focused on Deep Learning solutions for Computer Graphics and 3D data.

📍 Italy ✉ luca.cazzola.2001@gmail.com 📞 +39 3500323641 in Luca Cazzola ⦿ LuCazzola 💼 Portfolio

Experience

Research Assistant | CESI LINEACT – Nice, Côte d'Azur, France | Apr 2025 – Oct 2025
- Design, implementation and evaluation of a deep generative pipeline for few-shot human activity recognition, leveraging diffusion models for motion synthesis and multimodal representations.
- Data gathering, curation and augmentation workflows for human motion data.
- Conducted extensive experiments and ablations, leading to a first-author publication currently under review at an international peer-reviewed conference.

Research Assistant | University of Trento – Trento, Trentino-Alto adige, Italy | Oct 2025 – Ongoing
- Developing individual-aware deep generative models to synthesize personalized human motion, directly enhancing the realism of digital avatars in VR/AR and immersive virtual environments.
- Conducting novel research to solve fundamental challenges in personalized avatar fidelity, with the goal of publication in academic venues.

Publications

- **Kinetic Mining in Context: Few-Shot Action Synthesis via Text-to-Motion Distillation**
  L. Cazzola, A. Alboody | Under review, 2025 | Dedicated page

Awards

2024 Industrial AI Challenge | Hub Innovazione Trentino | Sep 2024 – Dec 2024
- Led a 7-person team to secure 1st place in a competition sponsored by AWS, successfully delivering a robust solution, solving complex, real-world industrial challenges.
- Engineered a multi-stage optimization pipeline for industrial scheduling, successfully integrating AI solutions based on integer constraint programming and genetic search.
- Recognized as a high-impact initiative; the challenge consistently features industrial partners, including major corporations like Terna (this edition's partner), Pirelli, and Melinda.

Projects

Robotic Manipulator: Perception, Control, and ROS Integration | 2023
- Built a complete perception-to-control pipeline for a UR5 robotic arm.
- Synthetic dataset generation in Blender to train a robust YOLO detector in PyTorch, achieving strong simulation-to-real transferability.
- Implemented a custom 6-DoF pose estimation pipeline based on point cloud interpolation, to recover both object translation and rotation.

Motion Capture: Data Correction and UE5 Integration | 2024
- Developed a data processing pipeline for standard motion capture data, applying traditional techniques like Kalman and Particle filters for noise reduction and data correction.
- Processed motion data into Unreal Engine 5 to simulate real-world scenarios, including implementing 3D-to-2D projection on the camera frame and utilizing Blueprints for simulated data extraction.

GPU Parallelism: CUDA, Matrix Transposition and 2D Convolution | 2024
- Developed CUDA implementations of computational kernels to explore GPU parallelism, memory hierarchy, and performance trade-offs.
- Analyzed execution time, occupancy, and memory access patterns to optimize kernel performance.
- Gained practical experience with low-level GPU concepts relevant to deep learning workloads.

Education

- **Master's Degree in Artificial Intelligence Systems** | University of Trento | 2023 – Ongoing (Spring 2026)
- **Bachelor's Degree in Computer Science** | University of Trento | 2020 – 2023

Skills

AI & Computer Science
- Machine Learning
- Deep Learning
- Computer Vision
- Algorithms & Data structures

Programming
- Python
- C, C++

Frameworks
- PyTorch
- OpenCV
- ROS
- CUDA
- Google OR-Tools

Tools
- Git
- Blender
- LaTeX

Languages
- Italian
- English

Interests
- Digital Twin
- AR/VR
- Virtual environments
- Simulation
- Human Motion Modeling
- Synthetic data generation