lucazunino1999@icloud.com · +49 157 30888914 · Böblingen, Germany · linkedin.com/in/lucazunino

Luca Zunino | Resume

Machine Learning & Robotics Research Engineer

- **Expertise:** Machine Learning • Vision-Language-Action models • Model efficiency & interpretability • End-to-end autonomous driving • Bio-inspired robotics
- **Impact:** Co-inventor on 6 patent disclosures for autonomous driving • Developed a robotic fish platform for Science Robotics cover publication
- **Publications:** Science Robotics (Cover Article) • AMAM 2025 (oral presentation) • EDM 2024 (poster) • Science Robotics (forthcoming)
- **Stack:** PyTorch • Transformers • HuggingFace • Python • CUDA • NumPy • MMDetection • OpenCV • CARLA • Docker • Git • Linux • C
- **Degrees:** EPFL M.Sc. Robotics (5.84/6.0) • Politecnico di Torino B.Sc. (110L/110)
- **Languages:** English (Fluent) • Italian (Native) • German & French (Basic)

Work Experience

Research Engineer, Industrial PhD Program (Bosch Research | Renningen, DE) 03/2024 - Present

- Developed efficient vision-language-action models for end-to-end autonomous driving, achieving 1.9x inference speedup while preserving 99% of baseline accuracy.
- Mentored a master's student on interpretability of vision-language-action models, guiding development of attention visualization frameworks and decision attribution techniques.
- Co-inventor on 6 patent disclosures covering vision-language architectures, multimodal perception systems, and end-to-end autonomous driving frameworks.
- Led exploratory integration of HD map generation with vision-language models to enhance scene understanding.

Software Developer Intern (Rigi Technologies S.A. | Prilly, CH) 09/2022 - 02/2023

- Implemented emergency failsafe procedures for autonomous drones, including return-to-base protocols and mode transitions to ensure operational safety and regulatory compliance.
- Developed path planning algorithms for drone navigation, boosting route efficiency in BVLOS delivery operations.

Complete portfolio and research details - **lucazunino.com**

Education

M.Sc. in Robotics (EPFL – École Polytechnique Fédérale de Lausanne | Lausanne, CH) 2021 - 2024

- Graduated with distinction (5.84/6.0). Focus: Robotics, Machine Learning, Deep Learning, NLP.
- Master's thesis (grade 6.0/6.0): developed a reinforcement learning framework for neuromechanical simulations of zebrafish locomotion, outperforming hand-tuned neural models in complex environments.
- Two-year research at BioRob Lab (Prof. A. Ijspeert) on zebrafish embodied neural circuits and bio-inspired control.
- Teaching Assistant for the course "Evolutionary Robotics" (Prof. D. Floreano); BioRob Laboratory Guide.

B.Sc. in Electronic & Communications Engineering (Politecnico di Torino | Turin, IT) 2018 - 2021

- Graduated with highest honors (110/110 cum laude). Focus: Electronics, Computer Science, Control Theory.
- Selected for competitive Honor Teaching Program (top-performing students).

Publications

Liu, X., Loring, M.D., Zunino, L., et al. (2025). "Artificial embodied circuits uncover neural architectures of vertebrate visuomotor behaviors". *Science Robotics*. **[Cover Article]**

Liu, X., Longchamp, F.A., Zunino, L., et al. (2025). "Robotic Study on the Control and Power Consumption of Bout and Glide Swimming". *AMAM 2025*. **[Oral Presentation - Main Presenter]**

Gado, E.G., Martorella, T., Zunino, L. (co-first authors), et al. (2024). "Student Answer Forecasting: Transformer-Driven Answer Choice Prediction for Language Learning". *EDM 2024*.

Liu, X., Longchamp, F.A., Zunino, L., et al. (in press). "Energy Efficiency and Neural Control of Continuous versus Intermittent Swimming in a Fish-like Robot". *Science Robotics*.