

Elisabetta Fedele

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Education

- Sep 2024 – **PhD in Computer Science, ETH Zürich**
Sep 2028
 - Co-advised by Prof. Marc Pollefeys and Prof. Bernhard Scholköpf
 - Supported by the ETH AI Center Fellowship
- Sep 2021 – **Master in Computer Science, ETH Zürich**
present
 - Major in **Machine Intelligence** and Minor in **Theoretical Computer Science**.
 - **Courses:** Algorithmic Game Theory, Algorithms Lab, Randomized Algorithms and Probabilistic Methods, Graph Theory, Computational Intelligence Lab, Generative Visual Models, Advanced Machine Learning, Machine Perception, Computer Graphics, Computer Vision, NLP.
- Sep. 2018 – **Bachelor in Computer Systems Engineering, Politecnico di Milano**
Jun. 2021
 - Final grade: 110/110 *cum laude*.
 - **Selected courses:** Probability and Statistics, Mathematical Analysis I and II, Linear Algebra, Algorithms and Principles of Theoretical Computer Science, Software Engineering.

Research Experience

- Nov. 2023 – **Master Thesis Student, ETH**
July 2024
 - Advised by Prof. Marc Pollefeys and Dr. Francis Engelmann.
 - Working on primitive-based representations for 3D scenes.
- Jul. 2023 – **Research Intern, EPFL**
Sep. 2023
 - Advised by Prof. Alessandro Chiesa and part of Compsec Lab.
 - I worked on asymptotically improving the time-space complexity of the sumcheck protocol.
 - We found a new family of algorithms that, by interpolating between the best time-efficient and the best space-efficient algorithms, greatly improves the asymptotic and practical performance of the protocol.
 - Our findings is now integrated into the Arkworks library.
- Mar. 2023 – **Semester Project Student, Google Zürich**
Jun. 2023
 - Co-advised by Dr. Francis Engelmann, Dr. Federico Tombari, and Prof. Marc Pollefeys.
 - We leveraged the capabilities of CLIP to expand the task of 3D instance segmentation to an Open-Vocabulary setting.
 - Resulted in a publication at **NeurIPS 2023**.
- Oct. 2020 – **Research Assistant, Politecnico di Milano**
Mar. 2021
 - Advised by Prof. Stefano Ceri.
 - We processed and analysed data on SARS-CoV2 viral sequence mutations at the nucleotide and amino acid levels.

Publications and Preprints

- 🔗 Ayca Takmaz*, **Elisabetta Fedele***, Robert W. Sumner, Marc Pollefeys, Federico Tombari, Francis Engelmann. OpenMask3D: Open-Vocabulary 3D Instance Segmentation. *Advances in Neural Information Processing Systems (NeurIPS) 2023*. Also presented in Google Zürich, Google booth at ICCV 2023, AI+X Summit Zürich. Also featured in Computer Vision News.
- 🔗 Dimitri Von Rütte*, **Elisabetta Fedele***, Jonathan Thomm*, Lukas Wolf*. FABRIC: Personalizing Diffusion Models with Iterative Feedback. *arXiv 2023*.

* authors contributed equally

Teaching Experience

- Feb. 2023 – **Machine Perception, ETH Zürich**
Aug. 2023 ○ Authored lecture notes for the course.
- Sep. 2020 – **Fundamentals of Computer Science, Politecnico di Milano**
Jan. 2021 ○ Tutored an undergraduate class of 250 students during the coding laboratory.

Workshop Organization

- Jun. 2024 **OpenSUN3D, 2nd Edition, CVPR 2024**
I am among the organizers of the 2nd Workshop on Open-Vocabulary 3D Scene Understanding, held in conjunction with the *Conference on Computer Vision and Pattern Recognition (CVPR) 2024* in Seattle, USA.
- Oct. 2023 **OpenSUN3D, 1st Edition, ICCV 2023**
I was among the organizers of the 1st Workshop on Open-Vocabulary 3D Scene Understanding, held in conjunction with the *International Conference on Computer Vision (ICCV) 2023* in Paris, France.

Academic Projects

- Sep. 2022 – **Ray Tracing Renderer, ETH Zürich**
Dec. 2022 ○ I implemented a ray tracing renderer in C++ for the course of *Computer Graphics*.
- May 2022 – **Sentiment Analysis of Tweets, ETH Zürich**
Jul. 2022 ○ Group project for the course of *Computational Intelligence Lab*.
○ We compared performance of BERTweet, LSTM on Word2Vec embeddings and FastText and we finetuned BERTweet to achieve an accuracy of 92.04%.
○ Code available [here](#).
- Apr. 2022 – **3D Human Pose and Shape Estimation from RGB Images, ETH Zürich**
Jun. 2022 ○ Group project for the course of *Machine Perception*.
○ We implemented a modified version of PARE in PyTorch, with a HR-NetV32 backbone, achieving an error of 57.5 PA-MPJPE.
○ Report available [here](#).
- Mar. 2021 – **Software Engineering Project, Politecnico di Milano**
Jun. 2021 ○ Group project for the course of Software Engineering.
○ We developed a multithreaded software version of a multiplayer board game in Java.
○ Code available [here](#).

Honors & Awards

- 2023 **NeurIPS 2023 Scholar Award, NeurIPS**
2023 **Summer@EPFL Fellowship, EPFL**
2022-2023 **Scholarship for Sardinian students, Regione Sardegna**
2020-2021 **Merit-Based Scholarship, Politecnico di Milano**
2019 **Scholarship for Sports Merits, Politecnico di Milano**
2019 **Best Freshmen Prize, Politecnico di Milano**

Languages and Skills

Languages: Italian (native), English (fluent), French (basic), German (basic).

Computer Skills: Python, Java, C, C++, MATLAB, Git, \LaTeX , PyTorch, TensorFlow, Open3D.

Extracurricular activities

- 2022 - present **Sailing Instructor Diploma - Level I, Italian Sailing Federation**
- 2006–2019 **Professional Optimist and 420 sailor, Cagliari/Mandello del Lario**
○ Member of the **Italian Sailing Team** from 2012 to 2019.
○ Competed in 6 **World Championships** and in 4 **European Championships**.
○ Awarded **Best Italian Female Sailor** by *Tutto Vela* for the year 2014.