Markus **Pobitzer**

Researcher in Computer Vision & Machine Perception

markuspobitzer [at] gmail.com | Markus-Pobitzer | markuspobitzer | Markus Pobitzer | Trento, Italy

Six years of experience in computer vision and machine learning, including one year at IBM Research Zürich. Focused on image and video generation, and multimodality. Worked on recreating the human painting process and on synthetic data generation for instance segmentation. Currently working with Wan 2.1 & 2.2 (1.3B, 5B, 14B) on video generation and privileged-information distillation. One patent and several research papers.

Skills

Research Interests	Computer Vision, Generative AI, Machine Perception, Multi Modality
Programming	Efficient: Python | Prior Experience: Java, C#, PHP
Technologies	PyTorch, Hugging Face (transformers, diffusers, dataset, tgi, accelerate), MLflow, GNU/Linux, Git, uv, Poetry
Languages	German, English, Italian

Experience

PhD Student - Computer Vision — Università di Trento

Nov. 2025 - Now — *Trento, Italy*

- Supervised by Prof. Dr. Niculae Sebe. Part of the Multimedia and Human Understanding Group (MHUG)
- Video generation. Privileged-information distillation for video diffusion: correct/edit human motion in videos.

Computer Vision Research — Università di Trento

Dec. 2024 - Oct. 2025 — *Trento, Italy*

- Part of the Multimedia and Human Understanding Group (MHUG) led by Prof. Dr. Niculae Sebe.
- Working on recreating the human painting process. Image and Video generation.

Research Scientist - Intern — IBM Research, Data & AI

Mar. 2024 - Nov. 2024 — *Zürich, Switzerland*

- Developed a method to train an abstract syntax tree classifier for SQL queries, similar to a validity checker for SQL.
- Advancing NL-to-SQL by generating synthetic data, increasing the training data by a factor of 6x (IBM FlowPilot).
- Fine tuning LLMs up to 34B parameters. Ablation studies on synthetic training data and its impact on downstream tasks.

IT Specialist - Civil Service — Gemeinde Mals

Sep. 2023 - Feb. 2024 — *Mals, Italy*

- Help the local community take a step towards digitalization through IT support, workshops about electronic identity cards, and task automation.
- Created a virtual presence of a small ski museum. Including a YouTube channel, interviews, and detailed descriptions of the museum items.

Research Scientist - Intern — IBM Research, AI Automation

Feb. 2023 - Sep. 2023 — *Zürich, Switzerland*

- Patent: ”Generating annotated data samples for training using trained generative models” filed.
- Developed a method to augment small, annotated instance segmentation datasets to obtain a sizeable dataset using diffusion models.
- The method can generate an indefinite number of new images using a diffusion-based inpainting model to fill out the masked area with a desired object class by guiding the diffusion through the object outline, preserving the provided mask annotations.

IT Specialist — Hoppe

Jun. 2017 - Aug. 2017 — *Schlanders, Italy*

- Created a web application to to facilitate access to internal data. Managed inventory of 200+ employees.

Web Development - Intern — SD Soft

May 2017 — *Mals, Italy*

- Created a dynamic-sized newsletter template. Developed websites for Hotels with search engine optimization and mobile-first best practices.

Education

M.Sc. in Computer Science — ETH Zürich

Sep. 2021 - Aug. 2023 — *Zürich, Switzerland*

- Major: Computer Vision, ML (GPA 5.29/6.0). Minor: Software Engineering.
- Thesis: Image augmentation based on diffusion models. Analyzed methods to augment images with generative AI, mainly by using diffusion models to introduce new image content, outperformed state-of-the-art methods on FID and CLIP scores. Supervised by Prof. Marc Pollefeys.

B.Sc. in Computer Science — **ETH Zürich**

Sep. 2018 - Aug. 2021 — *Zürich, Switzerland*

- Specialization: Visual Computing (GPA 4.9/6.0).
- Thesis: On-body touch input in VR using wrist-watch touch detection. Using haptic on-body input as an interaction method in VR, developed a game-like test in Unity, and carried out a user study on the effectiveness. Supervised by Prof. Christian Holz.

Matura — **TFO Max Valier**

Sep. 2013 - July. 2018 — *Bozen, Italy*

- Specialization: Software engineering (GPA 89/100). Thesis: Search Engine Optimization. Getting a website in the top three search results of Google for several keywords. Programming courses in Java, web development, PHP and several script languages.

Publications

Painting Change Map as guidance for generating painting processes — **WACV 2027**

Markus Pobitzer, Chang Liu, Niccolò Biondi, Nicu Sebe — *Orlando, Florida*

Loomis Painter: Reconstructing the Painting Process — **WACV 2027**

Markus Pobitzer, Chang Liu, Chenyi Zhuang, Teng Long, Bin Ren, Nicu Sebe — *Orlando, Florida*

Outline-Guided Object Inpainting with Diffusion Models — **arxiv.org 2024**

Markus Pobitzer, Filip Janicki, Mattia Rigotti, Cristiano Malossi

RGB-D NeRF: Depth supervised NeRF on synthetic depth maps — **github.io 2023**

Markus Pobitzer, Sergey Prokudin

Tweet Sentiment Classification using BERT Models and Ensembles — **github.io 2022**

Markus Pobitzer, Lucas Dodgson, Lukas Mautner, Pierre Dorge

Patents

Generating annotated data samples for training using trained generative model — **US Patent Office**

Markus Pobitzer, Filip Janicki, Mattia Rigotti, Cristiano Malossi — *US20250209796A1*

Teaching & Talks

Teaching Assistant: Fundamentals of robotics. — **Università di Trento**

2026 — *Trento, Italy*

Text-to-SQL: Synthetic Data Generation & Filtering. — **IBM Research, Data & AI**

Aug. 2024 — *Zürich, Switzerland*

Image Generation with Diffusion Models: How computers imagine our world. — **SFSCON**

Nov. 2023 — *Bozen, Italy*

Interests

I love cooking and am on a mission to make the perfect pizza. I do some Calisthenics to keep my body fit and like to go for a hike in the mountains.