Friedrich Wilke Grosche

E-mail: wilkegrosche@gmail.com | **Telephone:** +41 76 265 81 51
Github: https://github.com/wgrosche| **LinkedIn:** https://www.linkedin.com/in/wilke/
Residence/Domicile: Zürich, Switzerland

Profile

German-British Physics graduate (MSc, ETH Zürich) with 3 years of research engineering experience at EPFL CVLab, focused on bridging the gap between control theory, computer vision, and machine learning. Expert in developing high-performance autonomy stacks for high-speed fixed-wing aircraft (100 m/s), with a core strength in translating complex physical systems into tractable optimization problems.

Work experience

EPFL Computer Vision Lab (CVLab) *Lausanne, Switzerland*
Research Engineer *September 2022 – September 2025*

Technical detail for some projects is provided in the appendix.

- **Time Optimal Model Predictive Control (MPC) for Task-Dependent Shape Optimisation of Fixed Wing Drones (Collaboration with Swiss Joint Research Centre):** Developed time-optimal MPC and trajectory optimisation for a fixed-wing drone targeting F5B competition conditions (100 m/s, ~50 laps of 300 m in 3 min); built a differentiable aerodynamic surrogate model, integrating CFD data and first principles physical models to overcome data constraints. (`https://github.com/wgrosche/AIrcraft`). (2.5 years)
- **Camera Localisation and Calibration for Multi-View Tracking System:** Led development of a multi-camera localisation and calibration suite for a multi-view tracking system; automated axis-alignment using RANSAC plane fitting and camera height priors to recover reliable world-frame geometry. (`https://github.com/cvlab-epfl/MARMOT`). (1 year)
- **ML Model Training for Multi-View People Tracking** Conducted data augmentation, pipelining and model training of graph neural network for long-term people tracking with embedded scene occlusions using modified versions of ByteTrack and YoloX [1], [2]. (1 year)
- **Annotation Pipeline for Multi-View Dataset Annotation, Augmentation and Training:** Led development of a web-based multi-view annotation tool (`https://github.com/cvlab-epfl/multicam-gt`) used in the construction of the public SCOUT dataset (`https://scout.epfl.ch/`); automated tracklet merging reduced manual annotation time by ~90%. (8 months)
- **Physics-based Heart and Catheter Simulation for Virtual Surgery:** Developed a physics-based catheter–heart interaction simulation for virtual cardiac catheterisation using Cosserat rod model, implementing SDF-based collision modelling for real-time simulation. (5 months)

Education

M.Sc. in Physics *ETH Zürich (CH)*
Master's degree program *09.2019 – 04.2022*
Thesis: **Model-Agnostic Explainability for ML Regression in Physical Systems**
Thesis Supervisors: Dr. Andreas Adelmann (PSI) and Prof. Dr. Ce Zhang (ETH Zürich)

B.Sc. in Physics *ETH Zürich (CH)*
Bachelor's degree program *09.2015 – 09.2019*
Thesis: **Optimising Flux Gate Positions for Active Magnetic Shielding**
Thesis Supervisor: Prof. Dr. Klaus Stefan Kirch (ETH Zürich)

A-Levels *Hills Road Sixth Form College (Cambridge, GB)*
High School *09.2013 – 09.2015*
Subjects: Physics, Maths, Further Maths, Chemistry, German

Core Competencies

Programming Languages	Python (Advanced, 15 years, research focus), C++ (Proficient)
Tools and Platforms	Git, OpenSFM, SOFA, Docker, RunAI, Slurm, Ipopt, Latex, CMake
Libraries	CasADi, PyTorch, Tensorflow, MMDetection, OpenCV, Django, NumPy, SciPy, Matplotlib
Soft Skills	Problem Abstraction & Formalisation, Cross-disciplinary Communication, Technical Presentation
Languages	English (Native), German (Native), French (Intermediate)

References

Prof. Pascal Fua, Head of CVLab pascal.fua@epfl.ch
Dr. Andreas Adelmann, Master Thesis Supervisor andreas.adelmann@psi.ch
Dr. Martin Engilberge, Project Lead (Tracking) martin.engilberge@gmail.com

Technical Appendix: Projects

EPFL CVLab *Lausanne, Switzerland*
Research Engineer *September 2022 – September 2025*

- **Time Optimal Model Predictive Control for Task-Dependent Shape Optimisation of Fixed Wing Drones (Collaboration with Microsoft Research):** Developed trajectory optimisation and time-optimal MPC for an unmotorised fixed-wing drone targeting the F5B competition (up to 100 m/s, ~50 laps of 300 m in 3 min), including aerodynamic system identification from wind tunnel, CFD, and in-flight data; built a differentiable surrogate model, using CasADi to interface with IPOPT, reducing aerodynamic force evaluation from ~ 8 hours (CFD) to ~ 1ms; independently derived an angular-rate correction to account for dynamic effects absent in CFD, resolving time-integration instability in trajectory rollout. (`https://github.com/wgrosche/AIrcraft`)
- **Camera Localisation and Calibration for multi-view tracking system:** Led camera localisation and calibration for a multi-view tracking system, including an automated axis-alignment method for OpenSFM reconstructions using RANSAC plane fitting on keypoint-dense regions combined with camera height priors to recover z-axis orientation; adapted ByteTrack and YOLOX for ground-plane operation by projecting detections onto the floor to enable meaningful cross-view correspondence. (`https://github.com/cvlab-epfl/MARMOT`)
- **Annotation Pipeline for Multi-View Dataset Annotation, Augmentation and Training:** Built an annotation pipeline for a multi-view people tracking dataset with contiguous overlapping fields of view across 25 cameras (`https://scout.epfl.ch/`), enabling trajectory analysis at ~10-minute timescales; automated proximity-based tracklet merging and cross-view correspondence reduced manual annotation time by ~90%. (`https://github.com/cvlab-epfl/multicam-gt`)

Interests & Hobbies

Competitive board gaming (Eurogames/strategy); fantasy literature; hiking, bouldering and skiing; crosswords

Publications

[1] Martin Engilberge, F. Wilke Grosche, and Pascal Fua. *No Identity, no problem: Motion through detection for people tracking*. 2024. arXiv: `2411.16466 [cs.CV]`. URL: `https://arxiv.org/abs/2411.16466`.

[2] Martin Engilberge et al. *Unified People Tracking with Graph Neural Networks*. 2025. arXiv: `2507.08494 [cs.CV]`. URL: `https://arxiv.org/abs/2507.08494`.