FRIEDHELM HAMANN

Computer Vision Researcher

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PhD graduate in Computer Science, specializing in computer vision and machine learning. Expertise in robotic perception, tracking, generative vision models, and computational photography.

Experience

Doctoral Researcher - Robotic Perception, *Technical University Berlin* — Oct '21 - Sept '25

- Dissertation: "Dynamic Scene Understanding with Event Cameras"
- Built a transformer-based model and synthetic data pipeline for event-based point tracking, achieving +20% improvement over SOTA. (CVPR'25 Highlight).
- Formulated a self-supervised loss for non-linear trajectory estimation with event camera data, enabling large-scale training, improving over pure synthetic data training by 29% (ECCV'24, ICCV'25).
- Constructed a system for low-power action detection and recognition for remote scenarios, doubling the time between manual battery changes of the remote-deployed system (CVPR'24).
- Developed a multi-modal video instance segmentation system, which included building a synchronized multi-camera system, implementation of a semi-automated annotation approach, and novel tracking methods combining filter-based approaches with transformer-based models (ECCVW'24).

Research Assistant - Visual Computing, *RWTH Aachen University* — Oct '19 - Sept '21

- Built a generative model based on VQ-VAE's for video compression, including integration in H.266 test model.
- Created a hardware-in-the-loop system with an Nvidia Drive AGX and in-house simulation software (VeroSim) for end-to-end testing of autonomous driving algorithms, including integration of LiDAR and RGB data.

Research Assistant - Camera Calibration, *University Rostock* — Jul '17 - Nov '18

- Developed camera calibration method for multi-camera systems in flow channels.

Education

Ph.D. Computer Vision, *Technical University Berlin* — Oct '21 - Sept '25
with Prof. Guillermo Gallego

Research Visit, *University of Pennsylvania, GRASP Lab* — Sept '23 - Mar '24
with Prof. Kostas Daniilidis

M.Sc. Computer Science, *RWTH Aachen University* — April '19 - Mar '21
GPA: 3.7/4.0 (German equivalent 1.4)

B.Sc. Electrical Engineering, *University Rostock* — Oct '15 - Mar '19
GPA: 3.8/4.0 (German equivalent 1.3, best in class)

Selected Publications

Full and up to date publication list at: Google Scholar

- S. Guo, F. Hamann, and G. Gallego, "Unsupervised joint learning of optical flow and intensity with event cameras," *Int. Conf. Computer Vision (ICCV)*, 2025.
- F. Hamann, D. Gehrig, F. Febryanto, K. Daniilidis, and G. Gallego, "Etap: Event-based tracking of any point," in *IEEE Conf. Computer Vision and Pattern Recognition (CVPR)*, 2025.
- F. Hamann, S. Ghosh, I. J. Martinez, T. Hart, A. Kacelnik, and G. Gallego, "Low-power, continuous remote behavioral localization with event cameras," *IEEE Conf. Computer Vision and Pattern Recognition (CVPR)*, 2024.
- F. Hamann, Z. Wang, I. Asmanis, K. Chaney, G. Gallego, and K. Daniilidis, "Motion-prior contrast maximization for dense continuous-time motion estimation," *European Conference on Computer Vision (ECCV)*, 2024.
- S. Shiba, F. Hamann, Y. Aoki, and G. Gallego, "Event-based background-oriented schlieren," *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 2023.