

Andreas Ziegler

Robotics & Computer Vision
Researcher/Engineer

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in andreas-ziegler



Summary

I consider myself a broadly trained roboticist with a passion for application-driven robotics, computer vision, and machine learning research. I developed novel algorithms and implemented them to work on real robots.

Having lived, studied, and worked in diverse environments—including Zurich, Basel, Lausanne, Tübingen, Paris, Shanghai, and Seoul/Incheon—I appreciate the opportunity to collaborate and exchange ideas with individuals from diverse backgrounds. Diverse perspectives foster creativity and innovation, enabling teams to navigate challenges and deliver impactful results.

I am committed to contributing to a collaborative work environment that embraces experimentation, celebrates learning from failures, and ensures mutual respect and openness. I believe such a culture empowers individuals to take ownership, enabling both personal and collective growth.

In my next role, I aim to further develop as an individual contributor while leveraging my leadership experience to amplify team efforts. By transitioning from individual successes to driving collective achievements, I aspire to stimulate the field of robotics, computer vision, and machine learning as a Postdoctoral Researcher.

Personal details

Nationality Swiss

Education

05.2021– **PhD Candidate**, *University of Tübingen*, Tübingen, Germany

Thesis: Event-based computer vision for fast robot control

○ In collaboration with Sony AI Zürich

○ Thesis supervisors: Prof. Dr. Andreas Zell and Prof. Dr. Andreas Geiger

09.2014–04.2018 **MSc ETH in EEIT**, *ETH Zürich*, Zürich, Switzerland

Specialized in: Robotics, Computer Vision and Machine Learning

Master Thesis: A Representation for Exploration that is Robust to State Estimate Drift

○ Examiner: Prof. Dr. Roland Siegwart and Prof. Dr. Davide Scaramuzza

○ Resulted in [7]

Semester Project 2: Map Fusion for Collaborative UAV SLAM

○ Examiner: Prof. Dr. Roland Siegwart and Prof. Dr. Margarita Chli

Semester Project 1: Robust object tracking in 3D by fusing ultra-wideband and vision

○ Examiner: Prof. Dr. Luc Van Gool and Prof. Dr. Otmar Hilliges

09.2009–09.2013 **BSc FHO in Electrical Engineering**, *University of Applied Science Eastern Switzerland (HSR)*, Rapperswil, Switzerland

Specialized in: Digital Signal and Image Processing, Embedded Systems and Software Engineering, and Mobile Communication

09.2011–08.2012 **Exchange year**, *Shanghai Jiao Tong University*, Shanghai, China

Courses taken: Chinese language, Electrical engineering and Computer Science

Publications

- [1] T. Gossard, J. Krismer, A. Ziegler, J. Tebbe, and A. Zell, “Table tennis ball spin estimation with an event camera,” in *2024 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, IEEE, Jun. 2024. DOI: 10.48550/arXiv.2404.09870.
- [2] T. Gossard, A. Ziegler, L. Kolmar, J. Tebbe, and A. Zell, “Ewand: A calibration framework for wide baseline frame-based and event-based camera systems,” in *2024 International Conference on Robotics and Automation (ICRA)*, IEEE, 2024. [Online]. Available: <https://arxiv.org/pdf/2309.12685.pdf>.
- [3] T. Gossard, J. Tebbe, A. Ziegler, and A. Zell, “Spindoe: A ball spin estimation method for table tennis robot,” in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, Oct. 2023. DOI: 10.1109/iros55552.2023.10342178. [Online]. Available: <http://dx.doi.org/10.1109/IROS55552.2023.10342178>.
- [4] A. Ziegler, T. Gossard, K. Vetter, J. Tebbe, and A. Zell, “A multi-modal table tennis robot system,” in *RoboLetics: Workshop on Robot Learning in Athletics @CoRL 2023*, 2023. DOI: 10.48550/arXiv.2310.19062. [Online]. Available: <https://arxiv.org/abs/2310.19062>.
- [5] A. Ziegler, D. Teigland, J. Tebbe, T. Gossard, and A. Zell, “Real-time event simulation with frame-based cameras,” in *2023 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, May 2023. DOI: 10.1109/icra48891.2023.10160654. [Online]. Available: <http://dx.doi.org/10.1109/ICRA48891.2023.10160654>.
- [6] A. Horvath, A. Ziegler, S. Gerhard, *et al.*, “Focus on time: Dynamic imaging reveals stretch-dependent cell relaxation and nuclear deformation,” *Biophysical Journal*, Jan. 2021. DOI: 10.1016/j.bpj.2021.01.020.
- [7] T. Cieslewski, A. Ziegler, and D. Scaramuzza, “Exploration without global consistency using local volume consolidation,” in *IFRR International Symposium on Robotics Research (ISRR), Hanoi, 2019*, IFRR: IEEE, Oct. 2019. [Online]. Available: <https://doi.org/10.5167/uzh-197724>.

Work experience

- 06.2021–present **PhD Candidate**, *University of Tübingen*, Tübingen, Germany, 100%
- Working on event-based computer vision for fast robot control in collaboration with Sony AI Zürich
 - Supervision of MSc and BSc students
 - Teaching Assistant
- Technologies used: C++, Python, Julia, PyTorch, OpenCV, numpy, Eigen, ROS1/2, git, L^AT_EX
- 11.2023–03.2024 **Research Scientist Intern**, *Sony AI*, Zurich, Switzerland, 100%
- Worked on multi modal camera calibration under the supervision of Dr. Raphaela Kreiser and Dr. Naoya Takahashi.
- Technologies used: C++, Python, OpenCV, Ceres, git
- 08.2022–10.2022 **Computer Vision & ML Research Intern**, *Prophesee*, Paris, France, 100%
- Worked on slow motion from frame and event data under the supervision of Dr. Amos Sironi.
- Technologies used: Python, PyTorch, OpenCV, numpy, git, Atlassian tools

- 09.2018–05.2021 **Robotics Engineer**, *MT-Robot AG*, Zwingen, Switzerland, 100%
 Accomplished tasks:
 - Development of a computer vision based safety field intrusion detection system
 - Improvement of a multi robot collision avoidance system
 - Development and maintenance of software for autonomous mobile robots (AMRs), including topics such as multi sensor fusion, mapping, path planning, (multi robot) obstacle avoidance, etc.
 - Deputy Scrum Master
 Technologies used: C++, Python, ROS1/2, DDS, OpenCV, CMake, git, Atlassian tools
- 06.2018–09.2018 **Research Assistant**, *University of Zürich, Robotics and Perception Group*, Zurich, Switzerland, 100%
 Continued working on my master thesis project which lead to [7].
- 04.2018–06.2018 **Research Associate Intern**, *Disney Research Zürich*, Zürich, Switzerland, 100%
 Integrated a Leica total station in an existing ROS setup within the PaintCopter project.
 Technologies used: C++, Python, ROS, Ceres, CMake, git
- 02.2018–03.2018 **Research Assistant**, *Laboratory for Orthopaedic Biomechanics at the University and ETH Zürich*, Zürich, Switzerland, 100%
 Developed an LED light controller for a microscope setup which contributed to [6].
 Technologies used: C++, Qt, wxWidgets, CMake, git
- 03.2017–08.2017 **Computer Vision & Robotics Research Intern**, *Pix4D SA*, Lausanne, Switzerland, 100%
 Accomplished tasks:
 - Worked on indoor navigation for UAVs
 - Implementation of a filtering method for a robust target detection
 - Investigation of barcode localization and detection algorithms for automatic inventory
 Technologies used: C++, ROS, OpenCV, Eigen, Conan, CMake, Jenkins, git
- 08.2015–06.2018 **Software Engineer & System Administrator**, *Accelerom AG*, Zürich, Switzerland, 20%-30%
 Technologies used: Java, Groovy, JavaScript, jQuery, CSS, Grails, Hibernate, MySQL, git, Redmine, Tomcat, Apache, SAMBA
- 02.2014–08.2015 **Research Assistant**, *Laboratory for Orthopaedic Biomechanics at the University and ETH Zürich*, Zürich, Switzerland, 100%/20%
 Continued my work, provided further consulting and maintenance.
- 11.2013–02.2014 **Research Assistant (Civil service)**, *Computer Assisted Research and Development, University Hospital Balgrist*, Zürich, Switzerland, 100%
 Worked on segmentation algorithms for computer-assisted surgical planning.
 Technologies used: Matlab, C#, VTK, CVS
- 08.2013–11.2013 **Research Assistant (Civil service)**, *Laboratory for Orthopaedic Biomechanics at the University and ETH Zürich*, Zürich, Switzerland, 100%
 Accomplished tasks:
 - Extended and adapted a microscope control software
 - Developed and implemented a stretcher control software
 Technologies used: C++, Qt, wxWidgets, CMake, git
- 08.2008–03.2009 **Computer Science Intern**, *ERPsourcing AG*, Wallisellen, Switzerland, 100%
- 08.2004–08.2008 **Electronics Engineer Apprentice**, *Hch. Kündig & Cie. AG*, Rüti ZH, Switzerland, 100%

Independent coursework and training

University of Tübingen Leadership Talent Academy. Certificate earned on November, 2024

- SIY Search Inside Yourself: Emotional Intelligence for Leadership. Certificate earned on May 28, 2024
- Center for Nonviolent Communication NVC Workshops. Certificate earned on October 6, 2024
- University of Tübingen From Chaos to Structure: Time- and Self-Management for a More Efficient Work Style. Certificate earned on March 9, 2022
- University of Tübingen Slidewriting and Storylining. Certificate earned on May 16, 2022
- University of Tübingen Setting and Achieving Goals Efficiently. Certificate earned on May 5, 2022
- University of Tübingen Speedreading. Certificate earned on April 14, 2022
- edX DT-01x: Self-Driving Cars with Duckietown by ETHx on edX. Specialization Certificate earned on August 15, 2021
- Coursera Deep Learning, a 5-course specialization by deeplearning.ai on Coursera. Specialization Certificate earned on March 16, 2018
- edX Autonomous Mobile Robots by ETHx on edX. Certificate earned on April 17, 2014

Media coverage

- Schwäbisches Tagblatt Forscherteam der Uni Tübingen entwickelt Tischtennis-Roboter

Supervised thesis

- Bachelor thesis Simulating event-based cameras with frame-based cameras, Daniel Teigland
 Deep-learning based table tennis ball tracking with an event camera, Genc Ahmeti
 Event-camera, camera and robot arm calibration, Levin Kolmar
 3D trajectory prediction from event data, Julian John
 Pushing an event-simulator towards its limit, Laura Schiller
 Adding noise and artifacts to the event-simulator, Steven Krämer
 Event-based camera bias optimization, Eric Langlouis
 Multi object tracking via event-based motion segmentation with event cameras, Zhiyu Han
 Automatic bias optimization for event cameras using Reinforcement Learning, Emil Moldovan
 Automatic bias optimization for event cameras using offline Reinforcement Learning, David Joseph
 Grasping a table tennis ball using Model Predictive Control, David Grawe
- Master thesis Spiking neural network for event based ball detection, Karl Vetter
 Event-based spin estimation, Julian Krismer

Teaching activities

AS 2024 Teaching Assistant: Foundations of Robotics
SS 2024 Teaching Assistant: Mobile Robots
AS 2023 Seminar: Robotics and Robot Vision
AS 2022 Teaching Assistant: Introduction to Computer Engineering
SS 2022 Teaching Assistant: Mobile Robots
AS 2021 Teaching Assistant: Deep Learning

Languages

German Mother tongue
English Excellent, Level C1
French Good, Level B1,
Korean Basics, Level A2
Chinese Basics, Level A1

Technical skills

Languages C++, Python, Julia, C, Java
Software packages OpenCV, ROS1/2, PyTorch, Eigen, boost, DDS

Hobbies

Sports Wing Chun Kung Fu, Yoga, Jogging, Mountaineering
Music Drums, Piano, Vocals

Extra-Curricular activities

- Foodsaver at Foodsharing, managing a Labdoo hub
- Co-clerk at Quaker Switzerland Yearly Meeting