Walter **Zimmer**

Machine Learning Research Associate

"The only way to do great work is to love what you do." - Steve Jobs

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Summary

Machine Learning research associate with over 6 years of experience specializing in developing robust and real-time algorithms for safety-critical driver assistance systems. Proven ability to leverage multi-modal data for real-world applications, with 27+ publications (14 first author, h-index: 13) in leading premier AI conferences and journals (CVPR, ECCV, ICCV, T-PAMI).

- 5 years of academic research, 6 years of industry experience in autonomous driving, computer vision & deep learning
- Published **28 papers** (14 first author): CVPR, ECCV, ICCV, T-PAMI, T-IV, ITSC, IV. Total: >**600 citations**, h-index: **13**
- Studied at 4 universities (2 stays abroad in US & NL), Awarded **9 scholarships & awards** (Best Student Paper Award)
- Obtained **45** training **certificates**, presented at **12 conferences**, supervised **44 student projects**, lectured **4 seminars**
- Developed **8** open-source software **projects** (>1,000 GitHub ⭐), participated in **6 hackathons**, organized **12 workshops**
- Reviewed >**90 papers** for 15 conferences and 8 journals, served as **associate editor** (ITSC'25) and **program chair** (RSS'25)

Skills

- **Programming Languages**: C++, Python, C, Java, C#, Go, JavaScript, TypeScript, MATLAB, Bash. >**2,000 code commits**.
- **Tools**: PyCharm, VS Code, Eclipse, IntelliJ, Colab, Blender, CARLA, Unreal Engine, Unity, ROS, Docker, Kubernetes, Git, UNIX
- **Libraries**: PyTorch3D, TensorFlow, JAX, OpenCV, Open3D, NumPy, SciPy, Pandas, Matplotlib, Scikit-learn, spaCy, PCL, Ceres
- **Methodologies**: Agile, Scrum, Kanban, DevOps, MLOps, CI/CD, TDD, Pair Programming, Code Reviews, UML, Design Patterns
- **Languages**: German (native), English (fluent, DAAD Certificate: C2), Spanish (basic), French (basic), Dutch (basic)
- **Certifications**: **45 training certificates**: Modern C++ Software Design, Self-Driving Cars Perception, Scientific Paper Writing
- **Soft Skills**: Leadership, Communication, Teamwork, Problem Solving, Creativity, Time Management, Presentation Skills
- **Research Skills**: Literature Review, Experiment Design, Data Analysis, Paper Writing, Peer Review, Conference Presentation
- **Academic Skills**: Acad. Writing, Grant Writing, Funding Acquisition, Interviewing, Hiring, Mentoring, Workshop Organization
- **Teaching Skills**: Seminar Design, Lecture Preparation & Delivery, Assessment, Student Supervision, Curriculum Development
- **Industry Skills**: Project Management, Software Development, Product Design, Customer Support, Entrepreneurship

Research Interests

- **Interests**: Autonomous Driving, Machine Learning, Deep Learning, Computer Vision, Robotics, Software Engineering,
- **Focus**: 3D Perception, Multi-Object Tracking, Sensor Fusion, Vision-Language Models (VLMs), Cooperative Perception
- **Applications**: Autonomous Vehicles, Intelligent Transportation Systems, Digital Twins, Traffic Scene Understanding
- **Techniques**: Data Mining, Active Learning, Labeling Pipelines, Dataset Curation, Multi-Modal Sensor Fusion (Camera, LiDAR)
- **Research Goals**: Enhance 3D perception for autonomous driving, improve model generalization, develop robust sensor fusion
- **Future Work**: Apply vision-language models to understand traffic scenes, develop cooperative perception methods

Education

Technical University of Munich (TUM), Chair of AI and Robotics (AIR) — Munich, Germany
Machine Learning Research Engineer, advised by: Prof. Dr.-Ing. habil. Alois C. Knoll — *Mar 2020 — May 2025*

- Focused on **3D perception** (3D object detection) for autonomous driving (Python, C++, ROS, PyTorch3D, Open3D)
- Authored dissertation on **Roadside 3D Perception for Autonomous Driving**, 320 p., 135k words, Defense in June 2025
- Published **28 papers** (14 first author): 15 peer-reviewed conference papers (10 first author), **2x CVPR'24**, **ECCV'24**, **ICCV'23**, 2x ITSC'24, IV'24, ITSC'23 (**oral**, IEEE ITSS Best Student Paper Award 🏆, IV'23 (**oral**), IV'22 (**oral**), IV'19, 4 peer-reviewed journal papers: **T-PAMI'24** (IF:20.8), 3x T-IV'24 (IF:14.0). 10 papers in review (ICCV'25). **Total: >600 citations**, h-index: 13
- Presented at **12 conferences**: **CVPR'24** (**oral**), **ECCV'24**, 2x ITSC'24, IV'24, 2x ITSC'23 (**oral** & panel discussion), IV'23 (**oral**), MobilTUM'23, VDI'23, IV'22 (**oral**), VDI'22, ITS World Congress'21, IV'19,
- Attended **17 conferences** in total incl. Automated Driving Symposium '22, IV'21, TechAD'21, IV'20, IROS'20
- Reviewed >**90 papers** for 17 conferences (ICCV'25, CVPR'25, WACV'25, RSS'25, IV'25, ECCV'24, ITSC'24, IV'24, ICCV'23, ITSC'23, IV'23, ITSC'22, IV'22, ITSC'21, IV'21, IV'20, IV'19), 8 journals (T-MM'25, T-ITS'25, T-PAMI'24, RA-L'24, T-ITS'24, RA-L'23, T-ITS'23, T-IV'24)
- Served as **associate editor** for ITSC'25, **session chair** for ITSC'24 and IV'24 and as **program chair** for RSS'25
- Organized **12 workshops**: ICCV'25, **2x CVPR'25**, 2x IV'25, CAIP'25, ITSC'25 (in review), ECCV'24, ITSC'24, IV'24, IV'23, IV'21
- Studied **8 TUM graduate school courses**: Modern C++ Software Design, SCRUM Professional, MLOps, Entrepreneurial Thinking, 2x Leadership Seminar, Scientific Paper Writing, Dissertation Writing. Collected **16 ECTS**
- Presented at **2 PhD retreats**, studied Graph Neural Networks (GNNs) at DeepLearn'22 Summer School on Deep Learning
- Interviewed >**100 students**, supervised **44 student projects**: 37 thesis students (7 with industry partners, e.g. BMW, Siemens, DLR, SETLabs): **2 ITS Bavaria Best Thesis Awards** (Cash Prize: **2 x 500 EUR**), guided **7 student research assistants** (HiWis)
- Lectured **4 seminars**: Adv. Foundation & Perception Models for Aut. Driving (SS'25), 2x 3D Perception for Aut. Driving (WS'21/22, SS'22), Visual Feature Learning for Aut. Driving (SS'21), guest lecture at Uni. of California San Diego, UCSD, 2021
- Awarded **27 training certificates**: Self-Driving Cars Perception (31h), Scientific Writing (2 days), Modern C++ (3 days)
- Developed **8** open-source software **projects**, e.g. 3D BAT, InfraDet3D, CoopDet3D, ActiveAnno3D: >1,000 GitHub ⭐
- Participated in **6 hackathons**: HackaTUM: '16, '19 (1. place, 1,500 EUR 🏆), '22, SDHacks'18, WirVSVirusHackathon'20

Uni. of California San Diego (UCSD), Lab for Intelligent and Safe Automobiles (LISA) — San Diego, USA
Visiting Scholar, 2 scholarships: PROMOS and StMWK, advised by: Prof. Dr. Mohan M. Trivedi — *Sep 2018 — Mar 2019*

- Implemented 3D BAT annotation toolbox to auto-label datasets, achieved **13,800 3D labels per hour**, published paper at IV'19
- Collaborated with PhD students on 3D perception methods for autonomous driving, developed **3D object detection** algorithms

Delft University of Technology (TUD) — Delft, The Netherlands
Master of Science, Computer Science — *Sep 2017 — Mar 2018*

- Awarded **DAAD scholarship** (Erasmus Program) to study 1 semester at Delft University of Technology, Netherlands
- Passed **10 courses** (46 ECTS): AI, ML, CV, Software Engineering, Intelligent Vehicles and Dutch language course

Technical University of Munich (TUM) — Munich, Germany
Master of Science, Computer Science — *Sep 2016 — Aug 2018*

- Studied Autonomous Driving, Machine Learning, Deep Learning, Computer Vision, Robotics, Software Engineering
- Demonstrated CV project: Intelligent Garage Door Opening System at Living Lab Conn. Mobility (LLCM) conference
- Interned at **AUDI AG**: Master's thesis in multi-modal 3D object detection for autonomous driving, Grade: 1.3 (3.7/4.0 US)
- Passed **27 exams** (7 in addition) and collected **161 ECTS** credits instead of 120 required for the M.Sc. degree

Cooperative State University (DHBW) — Mosbach, Germany
Bachelor of Science, Dual Student in Computer Science, in coop. with SSI Schaefer IT Solutions GmbH — *Sep 2013 — Sep 2016*

- Studied ML, CV & SWE, dual study program. Submitted thesis on student projects each semester. Total: 210 ECTS credits
- Attended International Program of Engineering (IPE) in the final semester, passed 12 exams.

Work Experience

Research Assistant Mar 2020 — May 2025
Technical University of Munich (TUM) *Munich, Germany*

- Coordinated **2 research projects**: Providentia++ (2020-2022) and AUTOtech.agil (2022-2025)

1) Providentia++ (BMDV) (Mar 2020 - Aug 2022):
- Constructed and maintained the A9 Test Field for Autonomous Driving (8 sensor stations, 81 sensors, 20 Gbps data rate)
- Developed 3D perception algorithms and generated datasets (Python, C++, ROS, PyTorch3D, Open3D)
- Created a live digital twin of the real traffic in a reconstructed map of the A9 Test Field in the CARLA simulator, enabling real-time traffic visualization (Python, C++, Unreal Engine, CARLA, Blender, ROS, Open3D, Docker, Git, UNIX)

2) AUTOtech.agil (Oct 2022 - May 2025):
- Created an infrastructure intersection dataset and received the IEEE ITSS Best Student Paper Award 🏆 at ITSC'23
- Streamed live digital twin on public website for the A9 Test Field for Aut. Driving (Python, Open3D, ROS, Docker, Git, UNIX)
- Calibrated and setup vehicle onboard sensors and infrastructure sensors (camera, LiDAR, GPS, IMU) for data collection
- Created TUMTraf V2X Cooperative Perception dataset (*IEEE/CVF Conf. on Computer Vision and Pattern Recognition 2024*)
- Implemented a framework for cooperative fusion of vehicle and infrastructure data based on camera and LiDAR sensors

Autonomous Systems Engineer Apr 2019 — Mar 2020
STTech GmbH *Munich, Germany*

- Developed intelligent **self-driving highway agents** for complex traffic scenarios in CARLA (Python, TensorFlow, C++)
- Implementated and tested complex traffic scenarios within the CARLA simulation
- Built automatic navigation stacks for self-driving robots, local and global path planning (Python, C++, ROS)
- Calibrated vehicle onboard cameras and robots for data collection (Python, C++, OpenCV)
- Implemented automatic recommendation systems using NLP (Python, spaCy, Deep Graph Library (DGL)

Internship Mar 2018 — Sep 2018
AUDI AG, Sensor Data Fusion Department *Ingolstadt, Germany*

- Prototyped deep learning applications for autonomous driving
- Calibrated vehicle onboard sensors (camera, LiDAR) to improve sensor fusion (Python, C++, ROS, ADTF)
- Developed a point cloud annotation tool to label 3D objects in LiDAR data for training 3D object detectors (C++)
- Built 3D object detection pipelines for point cloud data based on PointNet++ and AVOD (Python, TensorFlow)
- Implemented 3D object detectors for multi-modal camera-LiDAR sensor fusion (Python, TensorFlow, C++, ADTF, Docker)
- Improved **86.5%** of the ground truth frames of the AUDI dataset by applying custom correction methods

Research Assistant Oct 2016 — Aug 2017
Siemens AG *Munich, Germany*

- Developed data extraction and filtering pipelines to process large-scale data (Python, NumPy, Pandas, SciPy)
- Implemented web-based visualization dashboards (JavaScript, NodeJS, AngularJS, d3.js, HTML5, CSS3)

Software Engineer Sep 2013 — Feb 2018
SSI Schaefer IT Solutions GmbH *Giebelstadt, Germany*

- Implemented **3D simulations** for warehouse automations (Java, OpenGL, LWJGL, WebGL, Three.js, WebSockets)
- Created data visualization and data analytic tools (web development): JavaScript, WebGL, AngularJS, NodeJS, d3.js, HTML5
- Developed warehouse management software (Java, Java EE, JPA, JavaFX, Jenkins, JUnit, SQL, Hibernate, JIRA)
- Collaborated in a team of 4 to build the WAMAS Lighthouse Product using Java EE Server Architectures (Wildfly, EJB, JPA, CDI, REST and Microservices), Java SE Tools (Java RX, Java FX, XML, OPC/UA, Hibernate, SWT), and DevOps Tools (Scum, Git, Maven, Eclipse, Ant, NodeJS, VS Code, Jenkins, JIRA)
- Obtained skills in Software Development Life Cycle (SDLC), Solution Architecture, Agile Methodologies, Spring Boot, Process Optimization, Product Development, Software/Enterprise Architecture, Gitlab, Team Management, Team Building

Projects

TUM Traffic Datasets (,) Mar 2020 — May 2025

- Curated datasets by hosting labeling events & using advanced tools to generate high-quality 3D labels
- Processed and retrieved data from rosbag recordings, implemented a data pipeline for the TUM Traffic Datasets
- Built data mining & labeling pipelines (Outcome: 12 Traffic Datasets), improved dataset quality for foundation models
- Applied active learning for data selection to reduce the labeling effort by 50%
- Balanced and augmented datasets to ensure diversity and representativeness in training data
- Awarded IEEE ITSS Best Student Paper Award at ITSC'23 for the TUM Traffic Intersection Dataset
- Computed detection and tracking metrics and evaluated methods on TUM datasets (>2,400 downloads)

A9 Test Field for Autonomous Driving () Mar 2020 — May 2025

- Operated & maintained real-world **Test Field for Autonomous Driving** (8 sensor stations, 81 sensors, 20 Gbps data rate)
- Built scalable data infrastructures for the A9 Test Field, enabling real-time data storage, processing and visualization
- Developed end-to-end data pipelines for streaming digital twins of the traffic, integrating roadside sensor data
- Ensured 24/7 availability (99.99% uptime) of live digital twins from roadside sensors through maintenance and updates
- Innovated representations of digital twins with **live 3D visualizations** of the A9 Test Field for Autonomous Driving

Multi-Modal 3D Object Detection and Tracking (,) Mar 2023 — Sep 2024

- Implemented a multi-task perception system integrating 3D object detection, 3D multi-object tracking, and segmentation
- Deployed perception models on infrastructure systems like the the A9 Test Field, enabling real-time detection
- Developed a multi-modal sensor fusion architecture, evaluated on TUM Traffic Datasets, improved segmentation and detection accuracy by **+29.83 mAP** using deep fusion of camera and LiDAR data instead of late fusion
- Showed that fusing LiDARs with cameras improves 3D object detection by **+1.90 mAP** compared to camera-only
- Designed a training and evaluation pipeline for large-scale 3D object detection tasks, optimizing model performance
- Enhanced semantic segmentation models for roadside infrastructure perception
- Built a robust multi-object tracking system, enhancing temporal consistency in dynamic traffic scenarios

Cooperative Perception Using Vehicle and Roadside Infrastructure Data (,) Mar 2023 — Sep 2024

- Developed a cooperative perception system (CoopDet3D), integrating vehicle and roadside infrastructure data
- Fused vehicle and roadside infrastructure sensor data (camera+LiDAR), enabling improved 3D object detection and tracking
- Achieved improvement of **+14.36 mAP** by fusing vehicle & roadside infrastructure data compared to vehicle data only
- Implemented a robust and real-time 3D tracking algorithm, enhancing perception in dynamic traffic environments
- Developed a transformer-based deep fusion model (CoopCMT), improved 3D mAP by **+8.53** compared to vehicle data only

Accident Detection (,) Mar 2024 — May 2025

- Led a group of students for an accident detection study, managed and directed students to work on the project
- Created **digital traffic twins** using cameras, radars, and LiDAR sensors (Python, C++, ROS, PyTorch, CARLA)
- Mined rare traffic scenarios in large datasets to enhance model generalization, particularly for edge cases like accidents
- Developed algorithms for long-tail detection by analyzing sensor data, insights include **12 detected real-world accidents**
- Used JAX to optimize neural network training pipelines, resulting in a significant speedup of large-scale model deployments

Scholarships

- 2017: Awarded **DAAD scholarship** for 1 semester at TU Delft University, NL. Passed **10 courses** in AD & ML
- 2018: Awarded **StMWK scholarship** Visiting Scholar research stay at Uni. of California San Diego, UCSD, LISA Lab, USA
- 2019: Awarded **PROMOS scholarship** Visiting Scholar research stay at Uni. of California San Diego, UCSD, LISA Lab, USA

Awards

- 2023: IEEE ITSS Best Student Paper Award at IEEE International Conference on Intelligent Transportation Systems
- 2019: hackaTUM hackathon Challenge Winner Award. 1. Place at AID challenge (121 teams in total), **Prize: 1,500 EUR**
- 2018: Nomination for **research stay at UCSD** (**16% selection rate**) funded by Bavarian State Ministry of Science (StMWK)
- 2017: TUM ranking: Within the **best 28%** of master students after 3 semesters, passed 27 exams (131 ECTS)
- 2016: Awarded Bachelor's degree within the **best 10-20%** of students at DHBW Mosbach. GPA: 1.7 (3.3/4.0 US)
- 2013: Awarded Information Technology High School degree within the **best 20%** of students in 2013

Certificates

2024 ECVA European Conference on Computer Vision, Milano, Italy.
Participation Certificate. Paper: Transfer Learning from Simulated to Real Scenes for Monocular 3D Object Detection

2024 IEEE International Conference on Intelligent Transportation Systems 2024, Edmonton, Canada.
Participation Certificate. 2 paper presentations:
WARM-3D: A Weakly-Supervised Sim2Real Domain Adaptation Framework for Roadside Monocular 3D Object Detection,
GraphRelate3D: Context-Dependent 3D Object Detection with Inter-Object Relationship Graphs

2024 IEEE/CVF Computer Vision & Pattern Recognition Conference 2024, Seattle, USA.
Participation Certificate. Paper presentation: TUMTraf V2X Cooperative Perception Dataset (CVPR'2024)

2024 IEEE Intelligent Vehicles Symposium 2024, Jeju Island, Korea. Participation Certificate. Paper presentation: ActiveAnno3D: An Active Learning Framework for Multi-Modal 3D Object Detection.

2023 Training Certificate: ADAS Validation. 1 day: Sim to real-world testing. Learn to validate ADAS systems.

2023 Training Certificate: Leadership Seminar in the Alps. Leadership skills, practical application of techniques, 16 hours.

2023 IEEE Intelligent Transportation Systems Conf. 2023, Bilbao, Spain. Participation Certificate. **Oral** paper presentation: TUMTraf Intersection Dataset: All You Need for Urban 3D Camera-LiDAR Roadside. **IEEE Best Student Paper Award**

2023 IEEE Intelligent Vehicles Symp. 2023, Anchorage, Alaska, USA. Oral paper presentation: InfraDet3D: Multi-Modal 3D Object Detection based on Roadside Infrastructure Camera and LiDAR Sensors.

2023 Training Certificate: Dissertation Writers' Workshop. Scientific and compelling writing, 14 hours.

2023 First Aid Training Certificate. First aid training for company first aiders, 1 day.

2022 TUM Hackathon (hackaTUM) Certificate. Rohde&Schwarz Object Detection Challenge, 3 days.

2022 Training Certificate: Leadership Seminar in the Alps. Leadership skills, practical application of techniques. 36 hours.

2022 Int. Gran Canaria Summer School on Deep Learning. Participation Certificate. 40 hours of lectures. 5 days.

2022 IEEE Intelligent Vehicles Symposium (IV 2022), Aachen, Germany. Participation Certificate. Oral paper presentation: A9-Dataset: Multi-Sensor Infrastructure-Based Dataset for Mobility Research.

2022 Int. Scientific Conf. Mobility & Transport, MobilTUM, Singapore. Participation Certificate. Paper presentation: Real-time and Robust 3D Object Detection with Roadside LiDARs.

2022 Training Certificate: MLOps - Operationalizing Data Science. Bring ML models to production, kedro, 21 hours, 3 days.

2021 IEEE Intelligent Vehicles Symposium (IV 2021), Nagoya, Japan. Participation Certificate, 30 hours of presentations.

2021 Training Certificate: Scientific Paper Writing. Analyzing & evaluating papers, effective self-editing tools, 14 hours.

2021 SBS Training Certificate - Safety-appropriate Behavior and Rescue.
2 days safety course & exam: Rescue from high-altitude workplaces.

2021 Training Certificate: Scrum Basics and Scrum Master Exam Preparation.
3 days: agile practices, Scrum Framework, Artifacts, Team, Events.

2021 Training Certificate: Develop your Entrepreneurial Thinking. Participation Certificate, TUM Graduate School, 11 hours.

2021 Training Certificate: Self-Driving Cars. Self-driving software stack and hardware (sensors), 35 hours.

2021 Training Certificate: Visual Perception for Self-Driving Cars. Calibration, Detection, Tracking, Segmentation, 31 hours.

2020 COVID-19 Hackathon Certificate. Participation Certificate. We-VS-Virus hackathon.

2020 Training Certificate: Modern C++ Software Design. Klaus Iglberger: Advanced C++ training, 3 days.

2020 IEEE Intelligent Vehicles Symposium (IV 2020), Las Vegas, USA. Certificate of Participation: 19 Oct to 13 Nov 2020.

2020 Training Certificate: Goal Setting Skills. Learn how to set and achieve your goals.

2020 Training Certificate: Algorithmic Toolbox (UCSD). Design efficient algorithms, 40 hours.

2019 Participation Certificate: TUM Hackathon (hackaTUM). Aut. Intelligent Driving (AID) Challenge Winner, 1,500 EUR Prize. Aut. generating 3D environments to enable the learning of self-driving AI models in a virtual environment.

2019 IEEE Intelligent Vehicles Symposium (IV 2019), Paris, France. Participation Certificate. Poster presentation: 3D BAT: A Semi-Automatic, Web-based 3D Annotation Toolbox for Full-Surround, Multi-Modal Data Streams, 5 days.

2019 UCSD HardHack Hardware Hackathon. 2-day-long hackathon.

2019 UCSD Entrepreneurship Certificate Program. Certified in entrepreneurship, 16 hours.

2019 UCSD Lean Six Sigma - White and Yellow Belt Certificate. Certified in process and quality improvement, 1 day.

2018 UCSD Strengths-Based Leadership Training Certificate. 6 sessions to become a leader and know your strengths.

2018 iLead Leadership Development Program Certificate. Training for acquiring leadership skills, 10 sessions.

2018 SD Hacks (hackathon). Participation Certificate. Develop an automated RC car.

2018 Interpersonal Relationships Seminar Certificate. Training on intercultural communication.

2018 MOVE-II Satellite, IDP Certificate. Implementation of Mission Control Center, MOVE-II satellite, 14 months.

2017 Language certificate. DAAD English language certificate, level: C1.

2016 Intercultural Competence & Communication Certificate. Build intercultural communication skills, 3 days (17 hours).

2016 TUM Hackathon (HackaTUM) Certificate. Participation Certificate. Prototype development and presentation to jury and several companies. Smart Garage Door, 3 days.

2016 International Program in Engineering (IPE). International semester in Automation Systems Engineering (Automation, Simulative Engineering, Embedded Systems), passed 12 exams.

2014 Train the Trainer Certificate. Certified trainer, passed two exams.

2013 ACX Application Developer Certificate. Certified Java Application Developer.

2013 Physics Award Certificate. Certified for outstanding achievements in Physics.

Teaching

SS 2025 **Masterseminar - Advanced Foundation and Perception Models for Autonomous Driving (IN2107)**, TUM

SS 2022 **Masterseminar - 3D Perception for Autonomous Driving (IN2107, IN4448)**, Technical Uni. of Munich (TUM)

WS 2021/22 **Masterseminar - 3D Perception for Autonomous Driving (IN2107, IN4448)**, Technical Uni. of Munich (TUM)

SS 2021 **Masterseminar - Visual Feature Learning for Autonomous Driving (IN2107, IN4959)**, Technical Uni. of Munich

Apr 14, 2021 **ECE 285 Autonomous Driving Systems (Guest Lecture)**, University of California San Diego (UCSD)

Publications

*equal contribution

[1] **Walter Zimmer**, Christian Creß, Huu Tung Nguyen, Alois C. Knoll, "TUMTraf Intersection Dataset: All You Need for Urban 3D Camera-LiDAR Roadside Perception," in *2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC), oral, IEEE ITSS Best Student Paper Award* 🏆, Sep. 2023, pp. 1030–1037. doi: 10.1109/ITSC57777.2023.10422289.

[2] **Walter Zimmer**, Gerhard Arya Wardana, Suren Sritharan, Xingcheng Zhou, Rui Song, Alois C. Knoll, "TUMTraf V2X Cooperative Perception Dataset," in *2024 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Jun. 2024, pp. 22668–22677. doi: 10.1109/CVPR52733.2024.02139.

[3] **Walter Zimmer**, Akshay Rangesh, Mohan Trivedi, "3D BAT: A Semi-Automatic, Web-based 3D Annotation Toolbox for Full-Surround, Multi-Modal Data Streams," in *Proc. of the IEEE IV Symposium*, 2019, pp. 1816–1821. doi: 10.1109/IVS.2019.8814071.

[4] Christian Creß*, **Walter Zimmer***, Leah Strand*, Maximilian Fortkord*, Siyi Dai*, Venkatnarayanan Lakshminarasimhan*, Alois Knoll*, "A9-Dataset: Multi-Sensor Infrastructure-Based Dataset for Mobility Research," in *2022 IEEE Intelligent Vehicles Symposium (IV), oral*, Jun. 2022, pp. 965–970. doi: 10.1109/IV51971.2022.9827401.

[5] **Walter Zimmer**, Joseph Birkner, Marcel Brucker, Huu Tung Nguyen, Stefan Petrovski, Bohan Wang, Alois C. Knoll, "InfraDet3D: Multi-Modal 3D Object Detection based on Roadside Infrastructure Camera and LiDAR Sensors," in *2023 IEEE Intelligent Vehicles Symposium (IV), oral*, Jun. 2023, pp. 1–8. doi: 10.1109/IV55152.2023.10186723.

[6] Sondos Mohamed*, **Walter Zimmer***, Ross Greer, Ahmed Alaaeldin Ghita, Modesto Castrillón-Santana, Mohan M. Trivedi, Alois C. Knoll, Salvatore Mario Carta, Mirko Marras, "Transfer Learning from Simulated to Real Scenes for Monocular 3D Object Detection," in *Proc. of the European Conference on Computer Vision ECCV 2024*, Milan, Italy: Springer-Verlag, Aug. 2024, p. 19. doi: https://doi.org/10.48550/arXiv.2408.15637.

[7] **Walter Zimmer**, Ross Greer, Xingcheng Zhou, Rui Song, Marc Pavel, Daniel Lehmberg, Ahmed Ghita, Akshay Gopalkrishnan, Mohan M. Trivedi, Alois C. Knoll, "Safety-Critical Learning for Long-Tail Events: The TUM Traffic Accident Dataset," in *Int. Conference on Robotics and Automation, 40th Anniversary (ICRA@40)*, Netherlands, Sep. 2024, p. 10.

[8] **Walter Zimmer**, Ross Greer, Xingcheng Zhou, Rui Song, Hu Cao, Daniel Lehmberg, Marc Pavel, Ahmed Alaaeldin Ghita, Akshay Gopalkrishnan, Holger Caesar, Mohan M. Trivedi, Alois C. Knoll, "Towards Vision Zero: The Accid3nD Dataset," in *IEEE/CVF Conf. on Computer Vision and Pattern Recognition, CVPR, [Under Review]*, Nashville, USA, Jun. 2025, p. 10.

[9] Ahmed Ghita*, Bjørk Antoniussen*, **Walter Zimmer***, Ross Greer*, Christian Creß, Andreas Møgelmose, Mohan M. Trivedi, Alois C. Knoll, "ActiveAnno3D - An Active Learning Framework for Multi-Modal 3D Object Detection," in *2024 IEEE Intelligent Vehicles Symposium (IV)*, Jun. 2024, pp. 1699–1706. doi: 10.1109/IV55156.2024.10588452.

[10] **Walter Zimmer**, Jialong Wu, Xingcheng Zhou, Alois C. Knoll, "Real-Time And Robust 3D Object Detection with Roadside LiDARs," in *Proc. of the Int. Scientific Conference on Mobility and Transport: Mobility Innovations for Growing Megacities*, Singapore: Springer Nature, 2023, pp. 199–219. doi: 10.1007/978-981-19-8361-0_13.

[11] **Walter Zimmer**, Ross Greer, Xingcheng Zhou, Rui Song, Marc Pavel, Daniel Lehmberg, Ahmed Ghita, Akshay Gopalkrishnan, Mohan Trivedi, Alois Knoll, "Enhancing Highway Safety: Accident Detection on the A9 Test Stretch Using Roadside Sensors," *16. Uni-DAS e.V. Workshop Fahrerassistenzsysteme und automatisiertes Fahren (FAS)*, Feb. 2025, doi: 10.48550/arXiv.2502.00402.

[12] **Walter Zimmer**, Emec Ercelik, Xingcheng Zhou, Xavier Jair Diaz Ortiz, Alois Knoll, "A Survey of Robust 3D Object Detection Methods in Point Clouds," *[Under Review]*, doi: https://doi.org/10.48550/arXiv.2204.00106.

[13] **Walter Zimmer**, Marcus Grabler, Alois Knoll, "Real-time and robust 3D object detection within road-side LiDARs using domain adaptation," *[Under Review]*, 2022, doi: https://doi.org/10.48550/arXiv.2204.00132.

[14] **Walter Zimmer**, Ramandika Pranamulia, Xingcheng Zhou, Mingyu Liu, Alois C. Knoll, "PointCompress3D – A Point Cloud Compression Framework for Roadside LiDARs in Intelligent Transportation Systems," *IEEE 28th Int. Conf. on Intelligent Transportation Systems (ITSC) [Under Review]*, no. arXiv:2405.01750, May 2024, doi: 10.48550/arXiv.2405.01750.

[15] **Walter Zimmer**, Carsten Müller, "Solving the Container Shipment Problem with the Focus on Special Goods Using Genetic Algorithms," *[Under Review]*, [Online]. Available: https://rxiv.org/pdf/1911.0157v1.pdf

[16] Rui Song, Chenwei Liang, Hu Cao, Zhiran Yan, **Walter Zimmer**, Markus Gross, Andreas Festag, Alois Knoll, "Collaborative Semantic Occupancy Prediction with Hybrid Feature Fusion in Connected Automated Vehicles," in *IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, Jun. 2024, pp. 17996–18006. doi: 10.1109/CVPR52733.2024.01704.

[17] Aral Hekimoglu, Philipp Friedrich, **Walter Zimmer**, Michael Schmidt, Alvaro Marcos-Ramiro, Alois Knoll, "Multi-Task Consistency for Active Learning," in *2023 IEEE/CVF International Conference on Computer Vision Workshops (ICCVW)*, Oct. 2023, pp. 3407–3416. doi: 10.1109/ICCVW60793.2023.00366.

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[20] Mingyu Liu, Ekim Yurtsever, Jonathan Fossaert, Xingcheng Zhou, **Walter Zimmer**, Yuning Cui, Bare Luka Zagar, Alois C. Knoll, "A Survey on Autonomous Driving Datasets: Statistics, Annotation Quality, and a Future Outlook," in *IEEE Trans. on Intelligent Vehicles, IF: 14.0*, 2024, pp. 1–29. doi: 10.1109/TIV.2024.3394735.

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[22] Salvatore Carta, Modesto Castrillón-Santana, Mirko Marras, Sondos Mohamed, Alessandro Sebastian Podda, Roberto Saia, Marco Sau, **Walter Zimmer**, "RoadSense3D: A Framework for Roadside Monocular 3D Object Detection," in *Proc. of ACM Conf. on User Modeling, Adaptation and Personalization (UMAP)*, Italy, Jun. 2024, pp. 452–459. doi: 10.1145/3631700.3665236.

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[25] Raphael van Kempen, Markus Schön, Jonas Maier, Boris Böhlen, Gergely Bilkei-Gorzo, Esther Hekele, David Philipp Klüner, Fabian Thomsen, Kai-Björn Gemlau, Benedikt Schulz, Nils Gehrke, Matti Henning, Thomas Schulik, Philip Mayer, Lars Ullrich, **Walter Zimmer**, Martin Alfranseder, Timo Woopen, Felix Berkel, Björn Klamann, Richard Schubert, Markus Maurer, Max Hartmann, Moritz Berghöfer, Jens Giesler, Anton Kuznietsov, Dorsa Zaheri, Claudia Hannig, Stephan Rauber, Rolf Ernst, Eduardo Molinos, Dominik Neidhart, Stefan Leinen, David Brecht, Oleksandr Solomakha, Christian Geller, Hermann von Hasseln, Dieter Moormann, Bastian Lampe, Dominik Spychalski, Christian Kehl, Christian Creß, Steven Peters, Paul-David Rostocki, Stefan Katzenbeisser, Norbert Siepenkötter, Christoph Stiller, Nils Rack, Bernhard Rumpe, Knut Graichen, Melina Lutwitzi, Lotte Wagner-Douglas, Dan Greiner, Lukas Jung, Marlon Steiner, Alexander Blödel, Valentyna Afanasenko, Deepak-Kumar Gautam, Jakob Bahle, Arlinda Elmazi, Kai Furmans, Lena Wirtz, Bassam Alrifaee, Marco Konersmann, Lutz Eckstein, Stefan Kowalewski, Ralph Mader, Dennis Niedballa, Lukas Zanger, Martin Lauer, Michael Buchholz, Swapnil Sunil Roge, Ingmar Kallfass, Robin Dehler, Thomas Specker, Jean-Pierre Busch, Marc Leuffen, Xingcheng Zhou, Nick Le Large, Ida Feger, Dominik Püllen, Heinrich Gotzig, Hans-Christian Reuss, Olaf Uszynski, Julius Beerwerth, Andreas Sailer, Felix Steinfurth, Markus Lienkamp, Martin Lilienthal, Gideon Arndt, Frank Diermeyer, Marcel Grandinetti, Lorenz Bayerlein, Charlotte Hermann, Alois Knoll, Klaus Dietmayer, Sebastian Abel, Mohamad Alayan, Christoph Krauß, Niklas Braun, Kaiwen Wang, Carlos Fernandez, "AUTOtech.agil: Architecture and Technologies for Orchestrating Automotive Agility," 2023. doi: https://doi.org/10.18154/RWTH-2023-09783.

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[28] Hu Cao, Xingzhuo Yan, Jiong Liu, Rui Song, **Walter Zimmer**, Yan Xia, Guang Chen, Alois Knoll, "Integrating Events and Frames with Energy-Driven Cross-Modality Fusion Module for Steering Prediction," *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), [Under Review]*, 2025.

[29] Lars Ullrich, **Walter Zimmer**, Ross Greer, Knut Graichen, Alois C. Knoll, Mohan Trivedi, "A New Perspective On AI Safety Through Control Theory Methodologies," *IEEE Open Journal of Intelligent Transport. Systems, IF: 4.6, [Under Review]*, 2025.

[30] Yuping Wang, Shuo Xing, Cui Can, Renjie Li, Hongyuan Hua, Kexin Tian, Zhaobin Mo, Xiangbo Gao, Keshu Wu, Sulong Zhou, Hengxu You, Juntong Peng, Junge Zhang, Zehao Wang, Mingxuan Yan, **Walter Zimmer**, Peiran Li, Chia-Ju Chen, Rui Song, Yue Huang, Ryan Rossi, Lichao Sun, Hongkai Yu, Zhiwen Fan, Frank Hao Yang, Yuhao Kang, Chenxi Liu, Eun Hak Lee, Xuan Di, Liu Ren, Alois Knoll, Xiaopeng Li, Shuiwang Ji, Xinyue Ye, Masayoshi Tomizuka, Marco Pavone, Tianbao Yang, Jing Du, Ming-Hsuan Yang, Hua Wei, Ziran Wang, Yang Zhou, Jiachen Li, Zhengzhong Tu, "Generative AI for Autonomous Driving: Frontiers and Opportunities," *[Under Review]*, 2025.

[31] Chuheng Wei, Ziye Qin, **Walter Zimmer**, Guoyuan Wu, Matthew J. Barth, "HeCoFuse: Cross-Modal Complementary V2X Cooperative Perception with Heterogeneous Sensors," *IEEE 28th Int. Conf. on Intelligent Transportation Systems (ITSC) [Under Review]*, 2025.

⋆ equal contribution

Thesis

2024 **PhD Thesis:** *Roadside 3D Perception for Autonomous Driving.* Technical University of Munich (TUM)

2018 **Master's Thesis:** *Automatic Correction of 3D Ground Truth Information for Piloted Driving Functions based on Velodyne Point Clouds and Camera Images Using Deep Learning Methods.* Technical University of Munich (TUM) in cooperation with AUDI AG

2016 **Bachelor's Thesis:** *Development of a 3D Simulation Environment for Warehouse Automation Systems.* Cooperative State University (DHBW) Mosbach in cooperation with SSI Schaefer IT Solutions GmbH

Student Research Assistant Supervision (7 students)

- **Suren Sritharan:** *Monocular 3D Object Detection* — Oct 2021 — July 2022
- **Maximilian Leonhard Schmid:** *2D Web-based Visualization of Digital Twins* — Oct 2021 — July 2022
- **Umaid Bin Zubair:** *3D Visualization of Digital Twins* — Oct 2021 — July 2022
- **Zumrud Shukurlu:** *Sensor Calibration* — Oct 2021 — July 2022
- **Mansoor Nasir Cheema:** *Monocular 3D Object Detection* — Aug 2021 — July 2022
- **Siyi Dai:** *Sensor Calibration and Data Annotation* — Aug 2021 — July 2022
- **Marcel Bruckner:** *Sensor Calibration and Stabilization* — Aug 2021 — July 2022

Student Supervision (37 students)

Supervised 3D Perception on Roadside LiDARs Under Different Weather Situations — Jan 2024 — July 2024
Chaima Ghaddab — *Master's Thesis*

Domain Adaptation for Road-Side Vision-Based 3D Object Detection — Jan 2024 — July 2024
Deyu Fu — *Master's Thesis*

Real-time Multi-view Road-side 3D Object Detection — Jan 2024 — July 2024
Samyak Jain — *Master's Thesis*

Real-Time Point Cloud Compression on Roadside LiDARs — Oct 2023 — Mar 2024
Ramandika Pranamulia — *Guided Research Thesis*

Accident Detection on the A9 Test Stretch Using Roadside Sensors — Oct 2023 — Mar 2024
Marc Pavel — *Interdisciplinary Project Thesis*

Accident Detection on the A9 Test Stretch Using Roadside Sensors — Oct 2023 — Mar 2024
Daniel Lehmberg — *Interdisciplinary Project Thesis*

3D Tracking on Roadside LiDARs — Oct 2023 — Feb 2024
Vitus Becker — *Bachelor's Thesis*

Monocular Roadside 3D Perception based on Ammodal Instance Segmentation — Oct 2023 — Feb 2024
Bach Ngoc Doan — *Bachelor's Thesis*

Vehicle-Infrastructure Cooperative 3D Object Detection to Support Autonomous Driving Functions — Jan 2023 — Dec 2024
Suren Sritharan — *Interdisciplinary Project Thesis*

Camera-LiDAR Fusion Using On-board Vehicle and Infrastructure Sensors
ITS Bavaria Best Master's Thesis Award 2023, Price: 500 EUR — Apr 2023 — Oct 2023
Gerhard Wardana — *Master's Thesis*

Active Learning for 3D Object Detection and Labeling — Apr 2023 — Dec 2023
Ahmed Alaaeldin Ghita — *Master's Thesis*

Multi-Modal 3D Object Detection in Long Range and Low-Resolution Conditions of Sensors — Mar 2023 — Nov 2023
Egemen Kopuz — *Master's Thesis*

Point Clouds Localization Using Vehicle and Infrastructure LiDARs — Jan 2023 — Dec 2023
Omar Elsobky — *Master's Thesis*

Real-Time 3D Object Detection on Infrastructure LiDARs using Transformers — May 2022 — Aug 2023
Tung Nguyen — *Interdisciplinary Project Thesis*

Multi-Vehicle Detection and Tracking in Aerial Image Sequences based on Deep Learning — Oct 2022 — Apr 2023
Somesh Khandelia — *Master's Thesis*

Deep Multimodal Sensor Fusion for 3D Perception in Autonomous Vehicles Using Occupancy Networks
ITS Bavaria Best Master's Thesis Award 2023, Price: 500 EUR — Nov 2022 — May 2023
Omar Zayed — *Master's Thesis*

Improving the Realism of a Real-Time Digital Twin of Road Traffic Using the CARLA Simulator — Oct 2022 — Feb 2023
Robin Brase — *Bachelor's Thesis*

Monocular 3D Object Detection Using HD Maps — June 2022 — May 2023
Joseph Birkner — *Master's Thesis*

Real-Time and Multi-Modal 3D Object Detection on the Autonomous Driving Test Stretch Using Camera and LiDAR Sensors — June 2022 — Feb 2023
Stefan Petrovski — *Master's Thesis*

Automatic Calibration of Infrastructure LiDAR and Camera Sensors — May 2022 — Jan 2023
Bohan Wang — *Master's Thesis*

Monocular 3D Object Detection on Infrastructure Cameras using Transformers — Mar 2022 — Aug 2022
Anna Fedorova — *Guided Research Thesis*

proAnno - An Automatic and Intelligent 3D Sensor Data Annotation Framework for Autonomous Driving — Mar 2022 — July 2022
Georgiy Nefedov — *Bachelor's Thesis*

Unsupervised LiDAR-based 3D Object Detection Using Infrastructure Sensors — Mar 2022 — Nov 2022
Marcel Brucker — *Master's Thesis*

A Neural Network-based Scenario Detection Framework for Road Perception — Nov 2021 — May 2022
Ugurcan Polat — *Master's Thesis*

Multi-Task Active Learning for Autonomous Driving — Nov 2021 — May 2022
Philipp Friedrich — *Master's Thesis*

Accident Prevention Backend Framework to Support Autonomous Driving — Nov 2021 — May 2022
Noir Nigmatov — *Master's Thesis*

Real-Time and Robust 3D Object Detection within Multi LiDAR Systems on the Autonomous Driving Test Stretch Using Cross-Sensor Domain Adaptation — Nov 2021 — May 2022
Marcus Grabler — *Master's Thesis*

Traffic Trajectory Prediction Framework within Providentia++ Using HD Maps — Nov 2021 — May 2022
Jurek Olden — *Master's Thesis*

Accident Prevention Frontend Framework to Support Autonomous Driving — Nov 2021 — Mar 2022
Mohammad Nannaa — *Bachelor's Thesis*

Real-Time Monocular 3D Object Detection to Support Autonomous Driving — Oct 2021 — Feb 2022
Leon Blumenthal — *Bachelor's Thesis*

Deep Traffic Scenario Mining, Detection, Classification and Generation on the Autonomous Driving Test Stretch using the CARLA Simulator — Apr 2021 — Feb 2022
Aaron Kaefer — *Master's Thesis*

Traffic Trajectory Prediction Framework within Providentia++ — Dec 2020 — July 2021
Jurek Olden — *Guided Research Thesis*

Real-Time and Multi-Modal 3D Object Detection on the Providentia++ Test Stretch — May 2021 — Dec 2021
Maximilian Fortkord — *Master's Thesis*

Real-time LiDAR-based 3D Object Detection on the Providentia++ Test Stretch Using a Single-Stage Architecture — Apr 2021 — Dec 2021
Jialong Wu — *Master's Thesis*

Real-Time and Multi-Modal 3D Object Detection for Autonomous Driving — Nov 2020 — Oct 2021
Xavier Diaz — *Master's Thesis*

Vehicle Position Estimation on Surveillance Dynamic Vision Sensor — Nov 2020 — Sep 2021
Armin Baur — *Master's Thesis*

LiDAR-based 3D Object Detection on the Highway A9 — Oct 2020 — Nov 2021
Xingcheng Zhou — *Master's Thesis*

Talks

Mar 31, 2025 **Enhancing Highway Safety: Accident Detection on the A9 Test Stretch Using Roadside Sensors**, 16. Uni-DAS e.V. Workshop Fahrerassistenzsysteme und automatisiertes Fahren (FAS) 2025, Irsee, Germany

Sep 30, 2024 **Transfer Learning from Simulated to Real Scenes for Monocular 3D Object Detection**, ECVA European Conference on Computer Vision (ECCV), Milan, Italy

Sep 27, 2024 **GraphRelate3D: Context-Dependent 3D Object Detection with Inter-Object Relationship Graphs**, IEEE International Conference on Intelligent Transportation Systems (ITSC), Edmonton, Canada

Sep 27, 2024 **WARM-3D: A Weakly-Supervised Sim2Real Domain Adaptation Framework for Roadside Monocular 3D Object Detection**, IEEE International Conference on Intelligent Transportation Systems (ITSC), Edmonton, Canada

Sep 23, 2024 **Safety-Critical Learning for Long-Tail Events: The TUM Traffic Accident Dataset**, International Conference on Robotics and Automation, 40th Anniversary (ICRA40), Rotterdam, Netherlands

June 21, 2024 **TUMTraf V2X Cooperative Perception Dataset**, IEEE/CVF Conference on Computer Vision and Pattern Recognition, Seattle, WA, USA, Poster Presentation.

June 3, 2024 **ActiveAnno3D: An Active Learning Framework for Multi-Modal 3D Object Detection**, IEEE Intelligent Vehicles Symposium (IV), Jeju Island, Korea, Poster presentation.

Dec 19, 2023 **A9 Test Field for Autonomous Driving**, Munich Datageeks, Munich, Germany, Invited talk

Sep 30, 2023 **TUMTraf Intersection Dataset: All You Need for Urban 3D Camera-LiDAR Roadside Perception**, **Best Student Paper Award** 🏆). IEEE Int. Conf. on Intelligent Transportation Systems (ITSC), Spain, oral presentation.

Sep 24, 2023 **Building Reliable Datasets for Autonomous Vehicles**, IEEE International Conference on Intelligent Transportation Systems Workshop (ITSC), Bilbao, Spain, Panel discussion

June 6, 2023 **InfraDet3D: Multi-Modal 3D Object Detection based on Roadside Infrastructure Camera and LiDAR Sensors**, IEEE Intelligent Vehicles Symposium (IV), Anchorage, AK, USA, Oral presentation.

June 6, 2022 **A9-Dataset: Multi-Sensor Infrastructure-Based Dataset for Mobility Research**, IEEE Intelligent Vehicles Symposium (IV), Aachen, Germany, Oral presentation.

Apr 7, 2022 **Real-Time And Robust 3D Object Detection with Roadside LiDARs**, 12th International Scientific Conference on Mobility and Transport: Mobility Innovations for Growing Megacities, Oral presentation.

Oct 13, 2021 **Creating a Real-time Digital Twin of the Traffic - From Sensor Data to Virtualization**, ITS World Congress, Hamburg, Germany, Oral presentation.

Apr 14, 2021 **3D Bounding Box Annotation (3D BAT) Toolbox and Its Application in 3D Object Detection**, University of California San Diego (UCSD), Guest Lecture

June 9, 2019 **3D BAT: A Semi-Automatic, Web-based 3D Annotation Toolbox for Full-Surround, Multi-Modal Data Streams**, IEEE Intelligent Vehicles Symposium (IV), Paris, France, Poster presentation.

Academic Service

Associate Editor:

- 2025 IEEE International Conference on Intelligent Transportation Systems ITSC'25

Program Chair:

- 2025 RSS Robotics Science and Systems 2025 RSS'25

Session Chair:

- 2024 IEEE International Conference on Intelligent Transportation Systems 2024 ITSC'24
- 2024 IEEE Intelligent Vehicles Symposium 2024 IV'24

Journal Reviewer

- 2025 IEEE Transactions on Multimedia 2025 IF: 8.4 T-MM'25
- 2025 IEEE Transactions on Intelligent Transportation Systems 2025 IF: 7.9 T-ITS'25
- 2024 IEEE Transactions on Pattern Analysis and Machine Intelligence 2024 IF: 20.8 T-PAMI'24
- 2024 IEEE Robotics and Automation Letters 2024 IF: 4.6 RA-L'24
- 2024 IEEE Transactions on Intelligent Transportation Systems 2024 IF: 7.9 T-ITS'24
- 2024 IEEE Transactions on Intelligent Vehicles 2024 IF: 14.0 T-IV'24
- 2023 IEEE Robotics and Automation Letters 2023 IF: 4.6 RA-L'23
- 2023 IEEE Transactions on Intelligent Transportation Systems 2023 IF: 7.9 T-ITS'23

Conference Reviewer

- 2025 IEEE/CVF International Conference on Computer Vision 2025 ICCV'25
- 2025 IEEE/RSJ International Conference on Intelligent Robots and Systems 2025 IROS'25
- 2025 IEEE/CVF Conference on Computer Vision and Pattern Recognition 2025 CVPR'25
- 2025 RSS Robotics Science and Systems 2025 RSS'25
- 2025 IEEE International Conference on Intelligent Transportation Systems 2025 ITSC'25
- 2025 IEEE Intelligent Vehicles Symposium 2025 IV'25
- 2024 ECVA European Conference on Computer Vision 2024 ECCV'24
- 2024 IEEE International Conference on Intelligent Transportation Systems 2024 ITSC'24
- 2024 IEEE Intelligent Vehicles Symposium 2024 IV'24
- 2023 IEEE International Conference on Computer Vision 2023 ICCV'23
- 2023 IEEE International Conference on Intelligent Transportation Systems 2023 ITSC'23
- 2023 IEEE Intelligent Vehicles Symposium 2023 IV'23
- 2022 IEEE International Conference on Intelligent Transportation Systems 2022 ITSC'22
- 2022 IEEE Intelligent Vehicles Symposium 2022 IV'22
- 2021 IEEE International Conference on Intelligent Transportation Systems 2021 ITSC'21
- 2021 IEEE Intelligent Vehicles Symposium 2021 IV'21
- 2020 IEEE Intelligent Vehicles Symposium 2020 IV'20
- 2019 IEEE Intelligent Vehicles Symposium 2019 IV'19

Workshop Organization

Nov 18, 2025 **Walter Zimmer**, Ross Greer, Rui Song, Xingcheng Zhou, Max Ronecker, Chuheng Wei, Lars Ullrich, Haibao Yu, Christian Geller, Jiajie Zhang, Stephany Berrio Perez, Alina Roitberg, Daniel Watzenig, Zhengzhong Tu, Jiaqi Ma, Holger Caesar, Mohan Trivedi, Alois C. Knoll, DriveX - 3rd Workshop on Foundation Models for V2X-Based Cooperative Autonomous Driving, IEEE International Conference on Intelligent Transportation Systems (ITSC) 2025 [Under Review], Gold Coast, Australia

Oct 19, 2025 **Walter Zimmer**, Ross Greer, Chuheng Wei, Max Ronecker, Haibao Yu, Rui Song, Xingcheng Zhou, Jiajie Zhang, Stephany Berrio Perez, Akshay Gopalkrishnan, Lars Ullrich, Zewei Zhou, Tianhui Cai, Yifan Liu, Haoxuan Ma, Alina Roitberg, Daniel Watzenig, Jiaqi Ma, Holger Caesar, Mohan Trivedi, Alois C. Knoll, DriveX - 2nd Workshop on Foundation Models for V2X-Based Cooperative Autonomous Driving, IEEE/CVF International Computer Vision Conference (ICCV) 2025, Honolulu, Hawai'i, USA

Sep 19, 2025 **Walter Zimmer**, Ross Greer, Sondos Mohamed, Andrea Atzori, Max Ronecker, Chuheng Wei, Haibao Yu, Rui Song, Xingcheng Zhou, Holger Caesar, Stephany Berrio Perez, Alina Roitberg, Daniel Watzenig, Salvatore Carta, Modesto Castrillón-Santana, Mirko Marras, Jiaqi Ma, Matthew Barth, Brendan Morris, Stewart Worrall, Mohan Trivedi, Alois C. Knoll, Challenges and Advances in V2X-Driven Scene Understanding for Smart Cities, The 21st International Conference in Computer Analysis of Images and Patterns (CAIP) 2025, Las Palmas de Gran Canaria, Gran Canaria, Canary Islands, Spain

June 11, 2025 **Walter Zimmer**, Ross Greer, Max Ronecker, Chuheng Wei, Haibao Yu, Rui Song, Xingcheng Zhou, Holger Caesar, Stephany Berrio Perez, Alina Roitberg, Daniel Watzenig, Mohan Trivedi, Alois C. Knoll, DriveX - 1st Workshop on Foundation Models for V2X-Based Cooperative Autonomous Driving, IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR) 2025, Nashville, USA

June 11, 2025 Haibao Yu, Jianing Qiu, Yao Mu, Jiankai Sun, Li Chen, **Walter Zimmer**, Jiaru Zhong, Dandan Zhang, Fei Gao, Shanghang Zhang, Mac Schwager, Ping Luo, Zaiqing Nie, 2nd MEIS Workshop on Multi-Agent Embodied Intelligent Systems Meet Generative-AI Era: Opportunities, Challenges and Futures, IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR) 2025, Nashville, USA

June 22, 2025 Ross Greer*, **Walter Zimmer***, Felix Hauser*, Madhumitha Sakthi*, Mohan Trivedi*, Frank Bieder*, Mert Keser, Florian Geissler, Jörg Reichardt, Ömer Şahin Taş, Christoph Stiller, Akshay Gopalkrishnan, Rui Song, Max Ronecker, Xingcheng Zhou, Andrei Bulzan, Banglore Ravi Kiran, Senthil Yogamani, Chuheng Wei, Lars Ullrich, Christian Geller, Stephany Berrio Perez, Holger Caesar, Alois C. Knoll, Workshop on Data-Driven Learning for Intelligent Vehicle Applications, IEEE Intelligent Vehicles Symposium (IV'25), Cluj-Napoca, Romania

June 22, 2025 Meng Lu, Christian Geller, Raphael van Kempen, Lutz Eckstein, Michael Buchholz, Frank Diermeyer, Timo Woopen, **Walter Zimmer**, Adrian Zlocki, 14th Workshop and Industry Panel on Cooperative Automated Driving and Future Mobility Systems, IEEE Intelligent Vehicles Symposium (IV'25), Cluj-Napoca, Romania

Sep 27, 2024 Mohan M. Trivedi*, Ross Greer*, **Walter Zimmer***, Stephany Berrio Perez, Nachiket Deo, Xingcheng Zhou, Akshay Gopalkrishnan., Vision and Language Oriented Representation (VALOR): Topics in Semantics, Safety, and Explainability in Intelligent Transportation, IEEE International Conference on Intelligent Transportation Systems (ITSC'24), Edmonton, Canada

Sep 29, 2024 Haibao Yu*, **Walter Zimmer***, Jianing Qiu, Jiankai Sun, Li Chen, Mac Schwager, Ping Luo, Ruigang Yang, Si Liu, Zaiqing Nie, Multi-Agent Autonomous Systems Meet Foundation Models: Challenges and Futures, 18th IEEE European Conference on Computer Vision 2024 (ECCV'24), Milano, Italy

June 2, 2024 **Walter Zimmer**, Rui Song, Bernd Gaßmann, Stephany Berrio Perez, Christian Creß, Xingcheng Zhou, Alois C. Knoll, 5th Workshop on Data-Driven Intelligent Vehicle Applications (DDIVA'24), IEEE Intelligent Vehicles Symposium (IV'24), Jeju Island, Korea

June 4, 2023 **Walter Zimmer**, Christian Creß, Bernd Gaßmann, Emeç Erçelik, Neslihan Köse Cihangir, Fabian Oboril, Alois C. Knoll, 4th Workshop on Data-Driven Intelligent Vehicle Applications (DDIVA'23), IEEE Intelligent Vehicles Symposium (IV'23), Anchorage, Alaska, USA

June 3, 2021 **Walter Zimmer**, Emeç Erçelik, Esra İçer, Neslihan Köse Cihangir, Alois C. Knoll, 3rd Workshop on Data-Driven Intelligent Vehicle Applications (DDIVA'21), IEEE Intelligent Vehicles Symposium (IV'21), Nagoya, Japan

* equal contribution

Open-Source Software Projects

- 3D BAT: A Semi-Automatic, Web-based 3D Annotation Toolbox for Full-Surround, Multi-Modal Data Streams
- proCalib: A Calibration Framework for Roadside Sensors
- CARLA dev tools
- YOLOv7-TRT: A 2D Object Detector for Roadside Sensors
- MonoDet3D: A Monocular 3D Object Detector for Roadside Sensors
- InfraDet3D: A Multi-modal 3D Object Detection Framework based on Roadside Infrastructure Camera and LiDAR Sensors
- TUM Traffic Dataset Development Kit
- CoopDet3D: A Cooperative 3D Object Detector for V2X Perception Systems
- ActiveAnno3D: An Active Learning Framework for Multi-Modal 3D Object Detection
- PointCompress3D: A Point Cloud Compression Framework for Roadside LiDARs in Intelligent Transportation Systems
- AccidentDet3D: Automated Accident Detection for Roadside Sensors

Press (Selected Media Coverage)

English:

- AUTOtech.agil: Architectures and Tools for Future Mobility, Newsletter, Issue 1, 2024
- Looking Far Ahead and Around Corners with Digital Twins, Research Highlights, Faszination Forschung, page 34-43, 2022
- Bavaria: A Testbed for the Future of Mobility, Invest in Bavaria, 23 February 2022

German:

- Konsortium präsentiert Forschungsergebnisse zur offenen Software- und Hardware-Architektur für das Mobilitätssystem der Zukunft, RWTH Aachen University, 2024
- Eine offene Software- und Hardware-Architektur für zukünftige Fahrzeuge, RWTH Aachen University, 2023
- Weit voraus und um die Ecke schauen mit digitalen Zwillingen, Forschungshighlights, Faszination Forschung, S. 34-43, 2022
- Schnell durch den Stau: Intelligente Verkehrssteuerung auf dem Vormarsch, Hessischer Rundfunk, 21 May 2022
- Daten aus dem realen Verkehr bilden die Basis von Analyse und Simulation, Straßenverkehrstechnik, April 2022
- Simulation der Welt mit digitalen Zwillingen, European News Agency, April 29, 2022
- E-Mobilität oder wie bewegen wir uns morgen?, all-electronics, April 26, 2022
- Mehr Staus durch selbstfahrende Autos, Handelsblatt, April 19, 2022
- Forscher geben Datensätze zur Verkehrsoptimierung frei, AutomotiveIT, March 1, 2022
- Künstliche Intelligenz auf dem Prüfstand: Wo stehen wir, wo geht es hin?, SIEMENS Podcast, January, 2022
- Intelligente Straßen der Zukunft, BR 1, October 27, 2021
- Die Straße der Zukunft ist digital, Bayerische Staatszeitung, October 2021
- Motion – Zweite Ausgabe: Der vernetzte Verkehr, ÖAMTC, October 4, 2021
- Dem Verkehr auf der Spur, VDI Nachrichten, August 20, 2021
- Umfeldsensorik: „Autoindustrie kann nicht weiter auf Ego-Perspektive beharren.“, Automobil Industrie, July 20, 2021
- Verkehrsleitsystem mit KI: Jeder, der nicht im Straßenverkehr getötet wird, ist ein enormer Gewinn., Next Mobility, July 2021
- Vorsehung auf der Bundesstraße, Süddeutsche Zeitung, June 22, 2021
- Digitaler Schutzengel auf den Straßen, Münchner Merkur, June 7, 2021
- „Digitaler Zwilling im Verkehr“, automotiveIT, January 2021
- Echtzeitverkehr in der Cloud, Vision Mobility, March 2021
- TUM erforscht „digitalen Zwilling“, VISION mobility, February 3, 2021
- „Car-to-X-Vernetzung ist das A und O“, AutomotiveIT, January 21, 2021
- Digitale Zwillinge orchestrieren den Verkehr der Zukunft, Huawei Magazin, December 2, 2020
- Sensoren und Kameras auf dem digitalen Testfeld Autobahn, Deutschlandfunk Kultur, September 21, 2020
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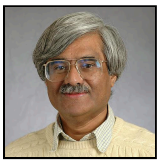

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