Kashyap Chitta

Doctoral Researcher

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Education

2019 – Now | **University of Tübingen, Germany**
PhD in Computer Science; Autonomous Vision Group
- *Advisor:* Prof. Andreas Geiger
- *Scholarship:* International Max Planck Research School for Intelligent Systems (IMPRS-IS)
- *Thesis:* Scalable Autonomous Driving: Abstraction, End-to-End Learning, and Simulation

2017 – 2018 | **Carnegie Mellon University, USA**
Master of Science in Computer Vision
- *Advisor:* Prof. Martial Hebert
- *Thesis project:* Exploiting Synthetic Data for Street Scene Segmentation
- *GPA:* 4.15/4.33

2013 – 2017 | **RV College of Engineering, India**
Bachelor of Engineering in Electronics and Communication
- *Thesis project:* Monocular Visual SLAM with a Rotating Mirror
- *GPA:* 9.11/10.0

Internships

Jan 2019 – Aug 2019 | **NVIDIA, Santa Clara, USA**
Deep Learning Intern; AI Infrastructure
- *Mentor:* Dr. José M. Álvarez
- *Role:* Research and development of an automatic dataset curation engine for the internal *MagLev* AI training and inference infrastructure, involving collaborations across multiple groups, which resulted in two publications.

May 2018 – Aug 2018 | **NVIDIA, Santa Clara, USA**
Software Intern; AI Infrastructure
- *Mentors:* Dr. José M. Álvarez, Dr. Adam Lesnikowsi
- *Role:* Research on approximating Bayesian Neural Networks for Active Learning which resulted in a publication, and was subsequently incorporated into the data annotation platform for the autonomous vehicles group.

Jun 2016 – Jul 2016 | **Tata Consultancy Services, Bangalore, India**
Research Intern; Nozomi Embedded Innovation Laboratory
- *Mentor:* Dr. Apurba Das
- *Role:* Developed a console application for facial expression analysis from live video, incorporated as part of a driver mood detection module in the internal advanced driver-assistance system software.

Jun 2015 – Jul 2015 | **Indian Space Research Organization, Bangalore, India**
Project Trainee; Laboratory for Electro-Optics Systems
- *Mentor:* Mr. V.V. Ramana Reddy
- *Role:* Designed, developed and calibrated a prototype photometer for stereoscopic camera emergency shutter control on the *Chandrayaan-II* moon rover.

Awards

2024
- Our approach TF++ ranked **first** on the 2024 CARLA AD Challenge map track (40 participating teams).

2023
- Our approach TF++ ranked **second** on the 2023 CARLA AD Challenge (20 participating teams).
- I was named a top reviewer at NeurIPS 2023 (1196/11725 reviewers, top 10%).
- I was named an outstanding reviewer at ICCV 2023 (130/7000 reviewers, top 2%).
- I was selected for the doctoral consortium at ICCV 2023 (38 accepted participants).
- Our planner PDM ranked **first** on the 2023 nuPlan Planning Challenge (52 participating teams).
- I was named an outstanding reviewer at CVPR 2023 (232/7000 reviewers, top 3%).
- I was selected as a 2023 RSS Pioneer, (30/135 applicants, 22% acceptance rate).

2022
- Our approach MapTF++ ranked **first** on the 2022 CARLA AD Challenge map track.

2021
- Our approach TransFuser ranked **second** on the 2021 CARLA AD Challenge, (100+ participating teams).
- Our new computer vision lecture won the 2021 CS teaching award at the University of Tübingen.

2020
- Our approach NEAT ranked **second** on the 2020 CARLA AD Challenge (45 participating teams).

Academic Activities

Recorded Talks
- Synthesizing Simulation Environments with Generative Models. CVPR Workshop on Data-Driven Autonomous Driving Simulation, Seattle, 18.06.2024.
- Benchmarking Foundation Models for Autonomous Driving. CVPR Tutorial: Towards Building AGI in Autonomy and Robotics, Seattle, 18.06.2024.
- Non-Reactive Autonomous Vehicle Simulation and Benchmarking. CVPR Workshop on Autonomous Driving, Seattle, 17.06.2024.
- Reading, Writing, and Reviewing for Robotics and Computer Vision Research. Sogang University Applied Data Engineering Seminar, Virtual, 07.06.2023.
- End-to-End Driving with Attention. ICRA Workshop on Scalable Autonomous Driving, London, 02.06.2023.
- Imitation via Abstraction and Planning. ETH Computer Vision Lab, Zürich, 20.02.2023.
- Imitation with Transformer-based Sensor Fusion for Autonomous Driving. University of Toronto AI in Robotics Seminar, Virtual, 28.03.2022.

Workshop Organization
- *CVPR 2024*: Workshop on Foundation Models for Autonomous Systems, 17.06.2024. Jointly with Hongyang Li, Huijie Wang, Holger Caesar, German Ros, Fatma Guney, Christos Sakaridis, Anthony Hu, Dian Chen, Hang Qiu, and Jiajie Xu.
- *CVPR 2023*: Workshop on End-to-End Autonomous Driving: Emerging Tasks and Challenges, 18.06.2023. Jointly with Hongyang Li, Li Chen, Holger Caesar, Shenlong Wang, and Ziwei Liu.
- *ICLR 2023*: Workshop on Scene Representations for Autonomous Driving, 05.05.2023. Jointly with Hongyang Li, Mengye Ren, Li Chen, Chonghao Sima, Holger Caesar, and Ping Luo.

Reviewing and Service

- *Journal Reviewer:* T-PAMI, IJCV, T-RO, RA-L, T-IP, T-ITS, T-IV
- *Conference Reviewer:* CVPR, ICCV, ECCV, WACV, CoRL, ICRA, IROS, NeurIPS, ICLR, IV
- *Publicity Chair:* RSS Pioneers 2024
- *Program Chair:* ICLR 2023 SR4AD Workshop
- *Evaluator:* ELLIS PhD Program, 2022-2023, IMPRS-IS PhD Program, 2023

Supervision

2019 – Now

University of Tübingen, Germany

Master Thesis Advisor

- *Jun 2024 – Nov 2024:* Jens Beißwenger (Thesis: Model-Based Reinforcement Learning for Autonomous Driving)
- *May 2024 – Oct 2024:* Melanie Schneider (Thesis: Dataset Distillation with Fast Diffusion)
- *Feb 2024 – Aug 2024:* Julian Zimmerlin (Thesis: Hidden Biases of End-to-End Driving Datasets)
- *Feb 2023 – Aug 2023:* Daniel Dauner (Thesis: Vehicle Motion Planning using Data-Driven Simulation)
- *Dec 2022 – Jun 2023:* Luis Winckelmann (Thesis: LiDAR-based Object Detection for Planning Transformers)
- *Dec 2022 – Jun 2023:* Tim Schreier (Thesis: On Offline Evaluation of 3D Object Detection for Autonomous Driving)
- *Nov 2022 – May 2023:* Siddharth Ramrakhiani (Thesis: Vision Transformers for Autonomous Driving)
- *Nov 2022 – May 2023:* Jovan Cicvaric (Thesis: Generative Dataset Distillation)
- *Mar 2021 – Sep 2021:* Bernhard Jaeger (Thesis: Expert Drivers for Autonomous Driving)
- *Oct 2020 – Apr 2021:* Micha Schilling (Thesis: Visual Abstractions for Autonomous Driving)

Research Project Advisor

- *May 2024 – Aug 2024:* Zhengyu Su (Project: Dataset Distillation for Autonomous Driving)
- *Nov 2023 – Apr 2024:* Jens Beißwenger (Project: PDM-Lite: A Rule-Based Planner for CARLA Leaderboard 2.0)
- *Apr 2022 – Sep 2022:* Alexander Braun and Luis Winckelmann (Project: Infraction Visualization and Clustering for Better Agent Evaluation in CARLA)
- *Sep 2021 – Dec 2021:* Pavan Teja Varigonda (Project: Learning to Simulate for Out-Of-Distribution Semantic Segmentation)

Teaching

2019 – Now

University of Tübingen, Germany

Lead Teaching Assistant

- *Apr 2023 – Jul 2023:* Autonomous Vision (seminar, 5 teams of 2 students)
- *Apr 2022 – Jul 2022:* Autonomous Vision (seminar, 8 teams of 2 students)

Teaching Assistant

- *Apr 2021 – Jul 2021:* Computer Vision (lecture, 150 students)
- *Oct 2019 – Feb 2020:* Self-Driving Cars (lecture, 80 students)

Publications

All publications listed here have been accepted following peer review. For the latest publications (including pre-prints) and detailed citation statistics, see scholar.google.com.

2024

[1] C. Sima, K. Renz, **K. Chitta**, L. Chen, H. Zhang, C. Xie, J. Beißwenger, P. Luo, A. Geiger, and H. Li, "Drivelm: Driving with graph visual question answering," in *Workshop on Vision and Language for Autonomous Driving and Robotics, Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.

[2] J. Yang, S. Gao, Y. Qiu, L. Chen, T. Li, B. Dai, **K. Chitta**, P. Wu, J. Zeng, P. Luo, J. Zhang, A. Geiger, Y. Qiao, and H. Li, "Generalized predictive model for autonomous driving," in *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.

[3] J. Zimmerlin, J. Beißwenger, B. Jaeger, A. Geiger, and **K. Chitta**, "Hidden biases of end-to-end driving datasets," in *Workshop on Foundation Models for Autonomous Systems, Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.

2023

[4] **K. Chitta**, A. Prakash, B. Jaeger, Z. Yu, K. Renz, and A. Geiger, "Transfuser: Imitation with transformer-based sensor fusion for autonomous driving," *Transactions on Pattern Analysis and Machine Intelligence (T-PAMI)*, 2023.

[5] D. Dauner, M. Hallgarten, A. Geiger, and **K. Chitta**, "Parting with misconceptions about learning-based vehicle motion planning," in *Conference on Robot Learning (CoRL)*, 2023.

[6] B. Jaeger, **K. Chitta**, and A. Geiger, "Hidden biases of end-to-end driving models," in *International Conference on Computer Vision (ICCV)*, 2023.

[7] T. Schreier, K. Renz, A. Geiger, and **K. Chitta**, "On offline evaluation of 3d object detection for autonomous driving," in *Workshop on Robustness and Reliability of Autonomous Vehicles in the Open-world (BRAVO), International Conference on Computer Vision (ICCV)*, 2023.

2022

[8] N. Hanselmann, K. Renz, **K. Chitta**, A. Bhattacharyya, and A. Geiger, "King: Generating safety-critical driving scenarios for robust imitation via kinematics gradients," in *European Conference on Computer Vision (ECCV)*, 2022.

[9] K. Renz, **K. Chitta**, O.-B. Mercea, A. S. Koepke, Z. Akata, and A. Geiger, "Plant: Explainable planning transformers via object-level representations," in *Conference on Robot Learning (CoRL)*, 2022.

2021

[10] **K. Chitta**, J. M. Alvarez, E. Haussmann, and C. Farabet, "Training data subset search with ensemble active learning," *Transactions on Intelligent Transportation Systems (T-ITS)*, 2021.

[11] **K. Chitta**, A. Prakash, and A. Geiger, "Neat: Neural attention fields for end-to-end autonomous driving," in *International Conference on Computer Vision (ICCV)*, 2021.

[12] A. Prakash, **K. Chitta**, and A. Geiger, "Multi-modal fusion transformer for end-to-end autonomous driving," in *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.

[13] A. Sauer, **K. Chitta**, J. Muller, and A. Geiger, "Projected gans converge faster," in *Advances in Neural Information Processing Systems (NeurIPS)*, 2021.

[14] M. A. Weis, **K. Chitta**, Y. Sharma, W. Brendel, M. Bethge, A. Geiger, and A. S. Ecker, "Benchmarking unsupervised object representations for video sequences," *Journal of Machine Learning Research (JMLR)*, 2021.

2020

[15] A. Behl, **K. Chitta**, A. Prakash, E. Ohn-Bar, and A. Geiger, "Label efficient visual abstractions for autonomous driving," in *International Conference on Intelligent Robots and Systems (IROS)*, 2020.

[16] **K. Chitta**, J. M. Alvarez, and M. Hebert, "Quadtree generating networks: Efficient hierarchical scene parsing with sparse convolutions," in *Winter Conference on Applications of Computer Vision (WACV)*, 2020.

[17] E. Haussmann, M. Fenzi, **K. Chitta**, J. Ivanecky, H. Xu, D. Roy, A. Mittel, N. Koumchatzky, C. Farabet, and J. M. Alvarez, "Scalable active learning for object detection," in *Intelligent Vehicles Symposium (IV)*, 2020.

[18] E. Ohn-Bar, A. Prakash, A. Behl, **K. Chitta**, and A. Geiger, "Learning situational driving," in *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020.

[19] A. Prakash, A. Behl, E. Ohn-Bar, **K. Chitta**, and A. Geiger, "Exploring data aggregation in policy learning for vision-based urban autonomous driving," in *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020.

2018 [20] **K. Chitta**, "Targeted kernel networks: Faster convolutions with attentive regularization," in *Workshop on Compact and Efficient Feature Representation and Learning in Computer Vision (CEFRL), European Conference on Computer Vision (ECCV)*, 2018.

[21] **K. Chitta**, J. M. Alvarez, and A. Lesnikowski, "Deep probabilistic ensembles: Approximate variational inference through kl regularization," in *Workshop on Bayesian Deep Learning (BDL), Conference on Neural Information Processing Systems (NeurIPS)*, 2018.

References

Prof. Andreas Geiger. Professor, Dept. of Computer Science, University of Tübingen. a.geiger@uni-tuebingen.de
Dr. José M. Álvarez. Director, Autonomous Vehicles Perception Research, NVIDIA. josea@nvidia.com
Prof. Eshed Ohn-Bar. Asst. Professor, Dept. of Electrical and Computer Eng., Boston University. eohnbar@bu.edu
Prof. Martial Hebert. Dean, School of Computer Science, Carnegie Mellon University. hebert@cs.cmu.edu