Kashyap Chitta

Doctoral Researcher

✉ kashyap.chitta@uni-tuebingen.de 🌐 `https://kashyap7x.github.io` 📇 Tübingen, Germany, 72076

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)
- *Tentative Thesis Title:* Scalable Autonomous Driving with Simulation and End-to-End Learning
- *Research Interests:* Autonomous Driving, Data-driven Simulation, Imitation Learning, World Models, Attention-based Architectures, Robot Navigation

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
- *Selected courses:* Visual Learning and Recognition, Deep Reinforcement Learning, Geometry Based Methods in Vision, Statistical Techniques in Robotics

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

2023
- 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, out of 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 self-driving approach MapTF++ ranked **first** on the 2022 CARLA Autonomous Driving Challenge map track, out of 100+ participating teams.

2021
- Our self-driving approach TransFuser ranked **second** on the 2021 CARLA Autonomous Driving Challenge, out of 100+ participating teams.
- Our new computer vision lecture won the 2021 CS teaching award at the University of Tübingen.

2020
- Our self-driving approach NEAT ranked **second** on the 2020 CARLA Autonomous Driving Challenge, out of 45 participating teams.

Academic Activities

Invited Talks
- 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 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-RO, RA-L, T-PAMI, IJCV, T-IP, T-ITS, T-IV
- *Conference Reviewer:* ICRA, IROS, CVPR, ICCV, ECCV, WACV, NeurIPS, ICLR, IV
- *Website/Social Media 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
- *Oct 2023 – Mar 2024:* Julian Zimmerlin (Thesis: Few-shot Imitation for Autonomous Driving)
- *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)

Publications

2023 | [1] **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.

[2] 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.

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

[4] 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 | [5] 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.

[6] 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 | [7] **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.

[8] **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.

[9] 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.

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

[11] 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 [12] 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.

[13] **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.

[14] 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.

[15] 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.

[16] 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 [17] **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.

[18] **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.

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)

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`