Kashyap Chitta

Doctoral Researcher

kashyap.chitta@tue.mpg.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:* Driving with Attention
- *Research Interests:* Imitation Learning, Autonomous Driving, Data-driven Simulation, Model-based Reinforcement Learning, Offline Reinforcement Learning, Attention-based Architectures

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.

Teaching and Supervision

2019 – Now | **University of Tübingen, Germany**

Lead Teaching Assistant

- *Apr 2023 – Jul 2023:* Autonomous Vision (seminar, 8 teams of 2 students)
- *Apr 2022 – Jul 2022:* Autonomous Vision (seminar, 6 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)

Master Thesis Advisor

- *Jan 2023 – Jun 2023:* Daniel Dauner (Thesis: Imitation Learning for the nuPlan Challenge)
- *Nov 2022 – May 2023:* Siddharth Ramrakhiani (Thesis: Vision Transformers for Bird's Eye View Driving Representations)
- *Nov 2022 – Apr 2023:* Tim Schreier (Thesis: Evaluating Vehicle Detection using Planning Transformers)
- *Nov 2022 – Apr 2023:* Luis Winckelmann (Thesis: LiDAR-based Detection for Planning Transformers)
- *Sep 2022 – Feb 2023:* Jovan Cicvaric (Thesis: Dataset Distillation for Autonomous Driving)
- *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

- *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)

Academic Activities

Organization

- *ICLR 2023*: Workshop on Scene Representations for Autonomous Driving, 01.05.2023. Jointly with Hongyang Li, Fatma Güney, Holger Caesar, Chen Change Loy, Wei Zhang, and Chonghao Sima.

Invited Talks

- Imitation with Transformer-based Sensor Fusion for Autonomous Driving. *University of Toronto AI in Robotics Seminar (Virtual)*, 28.03.2022.
- Imitation with Transformer-based Sensor Fusion. *NeurIPS Workshop on Machine Learning for Autonomous Driving (Virtual)*, 13.12.2021.

Reviewing

- *Journal Reviewer:* T-PAMI, IJCV, T-ITS, T-IV
- *Conference Reviewer:* CVPR, ECCV, ICRA, IROS, IV
- *Evaluator:* ELLIS PhD Program, 2022

Awards

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.

Publications

2022

[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)*, 2022.

[2] 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.

[3] 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

[4] **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.

[5] **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.

[6] 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.

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

[8] 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 [9] 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.

[10] **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.

[11] 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.

[12] 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.

[13] 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 [14] **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.

[15] **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.

2016 [16] **K. Chitta** and N. N. Sajjan, "A reduced region of interest based approach for facial expression recognition from static images," in *Region-10 Conference (TENCON)*, 2016.

References

Prof. Andreas Geiger. Professor, Dept. of Computer Science, University of Tübingen. andreas.geiger@tue.mpg.de
Dr. José M. Álvarez. Senior Research Scientist, NVIDIA. josea@nvidia.com
Prof. Eshed Ohn-Bar. Professor, Dept. of Electrical and Computer Engineering, Boston University. eohnbar@bu.edu
Prof. Martial Hebert. Dean, School of Computer Science, Carnegie Mellon University. hebert@cs.cmu.edu