

# Kashyap Chitta

Doctoral Researcher

✉ kashyap.chitta@tue.mpg.de    🌐 <https://kashyap7x.github.io>    📍 Tübingen, Germany, 72076

## Education

2019 – Now	<b>University of Tübingen, Germany</b> <i>PhD in Computer Science; Autonomous Vision Group</i> <ul style="list-style-type: none"><li>• Advisor: Prof. Andreas Geiger</li><li>• Scholarship: International Max Planck Research School for Intelligent Systems (IMPRS-IS)</li><li>• Tentative Thesis Title: Driving with Attention</li><li>• Research Interests: Imitation Learning, Autonomous Driving, Data-driven Simulation, Model-based Reinforcement Learning, Offline Reinforcement Learning, Attention-based Architectures</li></ul>
2017 – 2018	<b>Carnegie Mellon University, USA</b> <i>Master of Science in Computer Vision</i> <ul style="list-style-type: none"><li>• Advisor: Prof. Martial Hebert</li><li>• Thesis project: Exploiting Synthetic Data for Street Scene Segmentation</li><li>• GPA: 4.15/4.33</li><li>• Selected courses: Visual Learning and Recognition, Deep Reinforcement Learning, Geometry Based Methods in Vision, Statistical Techniques in Robotics</li></ul>
2013 – 2017	<b>RV College of Engineering, India</b> <i>Bachelor of Engineering in Electronics and Communication</i> <ul style="list-style-type: none"><li>• Thesis project: Monocular Visual SLAM with a Rotating Mirror</li><li>• GPA: 9.11/10.0</li></ul>

## Internships

Jan 2019 – Aug 2019	<b>NVIDIA, Santa Clara, USA</b> <i>Deep Learning Intern; AI Infrastructure</i> <ul style="list-style-type: none"><li>• Mentor: Dr. José M. Álvarez</li><li>• 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.</li></ul>
May 2018 – Aug 2018	<b>NVIDIA, Santa Clara, USA</b> <i>Software Intern; AI Infrastructure</i> <ul style="list-style-type: none"><li>• Mentors: Dr. José M. Álvarez, Dr. Adam Lesnikowski</li><li>• 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.</li></ul>
Jun 2016 – Jul 2016	<b>Tata Consultancy Services, Bangalore, India</b> <i>Research Intern; Nozomi Embedded Innovation Laboratory</i> <ul style="list-style-type: none"><li>• Mentor: Dr. Apurba Das</li><li>• 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.</li></ul>

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.

## Publications

- |      |   |
|------|---|
| 2022 | [1] <b>K. Chitta</b> , A. Prakash, B. Jaeger, Z. Yu, K. Renz, and A. Geiger, “Transfuser: Imitation with transformer-based sensor fusion for autonomous driving,” <i>Transactions on Pattern Analysis and Machine Intelligence (T-PAMI)</i> , 2022.                                       |
|      | [2] N. Hanselmann, K. Renz, <b>K. Chitta</b> , A. Bhattacharyya, and A. Geiger, “King: Generating safety-critical driving scenarios for robust imitation via kinematics gradients,” in <i>European Conference on Computer Vision (ECCV)</i> , 2022.                                       |
|      | [3] K. Renz, <b>K. Chitta</b> , O.-B. Mercea, A. S. Koepke, Z. Akata, and A. Geiger, “Plant: Explainable planning transformers via object-level representations,” in <i>Conference on Robot Learning (CoRL)</i> , 2022.   |
| 2021 | [4] <b>K. Chitta</b> , J. M. Alvarez, E. Haussmann, and C. Farabet, “Training data subset search with ensemble active learning,” <i>Transactions on Intelligent Transportation Systems (T-ITS)</i> , 2021.  |
|      | [5] <b>K. Chitta</b> , A. Prakash, and A. Geiger, “Neat: Neural attention fields for end-to-end autonomous driving,” in <i>International Conference on Computer Vision (ICCV)</i> , 2021.   |
|      | [6] A. Prakash, <b>K. Chitta</b> , and A. Geiger, “Multi-modal fusion transformer for end-to-end autonomous driving,” in <i>Conference on Computer Vision and Pattern Recognition (CVPR)</i> , 2021.  |
|      | [7] A. Sauer, <b>K. Chitta</b> , J. Muller, and A. Geiger, “Projected gans converge faster,” in <i>Advances in Neural Information Processing Systems (NeurIPS)</i> , 2021.  |
|      | [8] M. A. Weis, <b>K. Chitta</b> , Y. Sharma, W. Brendel, M. Bethge, A. Geiger, and A. S. Ecker, “Benchmarking unsupervised object representations for video sequences,” <i>Journal of Machine Learning Research (JMLR)</i> , 2021.   |
| 2020 | [9] A. Behl, <b>K. Chitta</b> , A. Prakash, E. Ohn-Bar, and A. Geiger, “Label efficient visual abstractions for autonomous driving,” in <i>International Conference on Intelligent Robots and Systems (IROS)</i> , 2020.  |
|      | [10] <b>K. Chitta</b> , J. M. Alvarez, and M. Hebert, “Quadtree generating networks: Efficient hierarchical scene parsing with sparse convolutions,” in <i>Winter Conference on Applications of Computer Vision (WACV)</i> , 2020.  |
|      | [11] E. Haussmann, M. Fenzi, <b>K. Chitta</b> , J. Ivanecky, H. Xu, D. Roy, A. Mittel, N. Koumchatzky, C. Farabet, and J. M. Alvarez, “Scalable active learning for object detection,” in <i>Intelligent Vehicles Symposium (IV)</i> , 2020.  |
|      | [12] E. Ohn-Bar, A. Prakash, A. Behl, <b>K. Chitta</b> , and A. Geiger, “Learning situational driving,” in <i>Conference on Computer Vision and Pattern Recognition (CVPR)</i> , 2020.  |
|      | [13] A. Prakash, A. Behl, E. Ohn-Bar, <b>K. Chitta</b> , and A. Geiger, “Exploring data aggregation in policy learning for vision-based urban autonomous driving,” in <i>Conference on Computer Vision and Pattern Recognition (CVPR)</i> , 2020.   |
| 2018 | [14] <b>K. Chitta</b> , “Targeted kernel networks: Faster convolutions with attentive regularization,” in <i>Workshop on Compact and Efficient Feature Representation and Learning in Computer Vision (CEFRL)</i> , <i>European Conference on Computer Vision (ECCV)</i> , 2018.          |
|      | [15] <b>K. Chitta</b> , J. M. Alvarez, and A. Lesnikowski, “Deep probabilistic ensembles: Approximate variational inference through kl regularization,” in <i>Workshop on Bayesian Deep Learning (BDL)</i> , <i>Conference on Neural Information Processing Systems (NeurIPS)</i> , 2018. |

## Teaching and Supervision

---

2019 – Now

### University of Tübingen, Germany

#### Teaching Assistant

- *Apr 2022 – Jul 2022*: Autonomous Vision (seminar, 6 teams of 2 students)
- *Apr 2021 – Jul 2021*: Computer Vision (lecture, 150 students)
- *Oct 2019 – Feb 2020*: Self-Driving Cars (lecture, 80 students)

#### Master Thesis Advisor

- *Dec 2022 – May 2023*: Daniel Dauner (Thesis: TBD)
- *Oct 2022 – Apr 2023*: Tim Schreier (Thesis: TBD)
- *Oct 2022 – Apr 2023*: Luis Winckelmann (Thesis: TBD)
- *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)

## Awards

---

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

---

### Reviewing

- *Journal Reviewer*: T-PAMI, IJCV, T-ITS, T-IV
- *Conference Reviewer*: CVPR, ECCV, ICRA, IROS, IV

### 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.

## 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