

# Kashyap Chitta

Doctoral Researcher

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## 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>• <i>Advisor:</i> Prof. Andreas Geiger</li><li>• <i>Scholarship:</i> International Max Planck Research School for Intelligent Systems (IMPRS-IS)</li><li>• <i>Tentative Thesis Title:</i> Imitation via Abstraction and Planning</li><li>• <i>Research Interests:</i> Imitation Learning, Autonomous Driving, Data-driven Simulation, Model-based Reinforcement Learning, Attention-based Architectures, Robot Navigation</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>• <i>Advisor:</i> Prof. Martial Hebert</li><li>• <i>Thesis project:</i> Exploiting Synthetic Data for Street Scene Segmentation</li><li>• <i>GPA:</i> 4.15/4.33</li><li>• <i>Selected courses:</i> 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>• <i>Thesis project:</i> Monocular Visual SLAM with a Rotating Mirror</li><li>• <i>GPA:</i> 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>• <i>Mentor:</i> Dr. José M. Álvarez</li><li>• <i>Role:</i> 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>• <i>Mentors:</i> Dr. José M. Álvarez, Dr. Adam Lesnikowski</li><li>• <i>Role:</i> 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>• <i>Mentor:</i> Dr. Apurba Das</li><li>• <i>Role:</i> 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.

## Awards

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| 2022 | <ul style="list-style-type: none"><li>• Our self-driving approach MapTF++ ranked first on the 2022 CARLA Autonomous Driving Challenge Map track, out of 100+ participating teams.</li></ul>   |
| 2021 | <ul style="list-style-type: none"><li>• Our self-driving approach TransFuser ranked second on the 2021 CARLA Autonomous Driving Challenge, out of 100+ participating teams.</li><li>• Our new computer vision lecture won the 2021 CS teaching award at the University of Tübingen.</li></ul> |
| 2020 | <ul style="list-style-type: none"><li>• Our self-driving approach NEAT ranked second on the 2020 CARLA Autonomous Driving Challenge, out of 45 participating teams.</li></ul>   |

## Academic Activities

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### Invited Talks

- Closed-loop Planning for Autonomous Vehicles. CVPR Workshop on End-to-End Autonomous Driving: Perception, Prediction, Planning and Simulation, Vancouver, 18.06.2023.
- 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.
- Imitation with Transformer-based Sensor Fusion. NeurIPS Workshop on Machine Learning for Autonomous Driving, Virtual, 13.12.2021.

### Organization

- *CVPR 2023:* Workshop on End-to-End Autonomous Driving: Emerging Tasks and Challenges, 18.06.2023. Jointly with Hongyang Li, Holger Caesar, Shenlong Wang, Ziwei Liu, and Tai Wang.
- *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

- *Journal Reviewer:* T-RO, T-PAMI, IJCV, T-ITS, T-IV
- *Conference Reviewer:* ICRA, IROS, CVPR, ICCV, ECCV, IV
- *Program Chair:* ICLR 2023 SR4AD Workshop
- *Evaluator:* ELLIS PhD Program, 2022

## Supervision

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2019 – Now

**University of Tübingen, Germany**

*Master Thesis Advisor*

- *Feb 2023 – Aug 2023*: Daniel Dauner (Thesis: nuPlan Challenge)
- *Jan 2023 – Jul 2023*: Tim Schreier (Thesis: Evaluating Vehicle Detection using Planning Transformers)
- *Dec 2022 – Jun 2023*: Luis Winckelmann (Thesis: LiDAR-based Detection for Planning Transformers)
- *Nov 2022 – May 2023*: Siddharth Ramrakhiani (Thesis: Multimodal Vision Transformers for Autonomous Driving)
- *Oct 2022 – Apr 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)

## Teaching

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2019 – Now

**University of Tübingen, Germany**

*Lead Teaching Assistant*

- *Apr 2023 – Jul 2023*: Autonomous Vision (seminar, 6 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)

## Publications

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| 2022 | <ul style="list-style-type: none"><li>[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.</li><li>[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.</li><li>[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.</li></ul>  |
| 2021 | <ul style="list-style-type: none"><li>[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.</li><li>[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.</li><li>[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.</li><li>[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.</li><li>[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.</li></ul> |

2020	<p>[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.</p> <p>[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.</p> <p>[11] E. Haussmann, M. Fenzi, <b>K. Chitta</b>, J. Ivanecy, 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.</p> <p>[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.</p> <p>[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.</p>
2018	<p>[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.</p> <p>[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.</p>
2016	<p>[16] <b>K. Chitta</b> and N. N. Sajjan, "A reduced region of interest based approach for facial expression recognition from static images," in <i>Region-10 Conference (TENCON)</i>, 2016.</p>

## References

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