

Kashyap Chitta

Doctoral Researcher

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Education

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

Internships

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

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	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Our self-driving approach MapTF++ ranked first on the 2022 CARLA Autonomous Driving Challenge map track, out of 100+ participating teams.
2021	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Our self-driving approach NEAT ranked second on the 2020 CARLA Autonomous Driving Challenge, out of 45 participating teams.

Academic Activities

Invited Talks

- Common Misconceptions in Autonomous Driving. Bosch Center for Artificial Intelligence, Renningen, 27.07.2023.
- 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.
- 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, Tai Wang and Enze Xie.
- 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, RA-L, T-PAMI, IJCV, T-ITS, T-IV
- *Conference Reviewer:* ICRA, IROS, CVPR, ICCV, ECCV, NeurIPS, IV
- *Program Chair:* ICLR 2023 SR4AD Workshop
- *Evaluator:* ELLIS PhD Program, 2022

Publications

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| 2023 | [1] D. Dauner, M. Hallgarten, A. Geiger, and K. Chitta , “Parting with misconceptions about learning-based vehicle motion planning,” in <i>Workshop on Robot Representations for Scene Understanding, Reasoning, and Planning, Robotics: Science and Systems (RSS)</i> , 2023. |
| | [2] B. Jaeger, K. Chitta , and A. Geiger, “Hidden biases of end-to-end driving models,” in <i>International Conference on Computer Vision (ICCV)</i> , 2023. |
| 2022 | [3] K. Chitta , 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. |
| | [4] N. Hanselmann, K. Renz, K. Chitta , 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. |
| | [5] K. Renz, K. Chitta , 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 | [6] K. Chitta , 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. |
| | [7] K. Chitta , 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. |
| | [8] A. Prakash, K. Chitta , 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. |
| | [9] A. Sauer, K. Chitta , J. Muller, and A. Geiger, “Projected gans converge faster,” in <i>Advances in Neural Information Processing Systems (NeurIPS)</i> , 2021. |
| | [10] M. A. Weis, K. Chitta , 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 | [11] A. Behl, K. Chitta , 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. |
| | [12] K. Chitta , 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. |
| | [13] 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 <i>Intelligent Vehicles Symposium (IV)</i> , 2020. |
| | [14] E. Ohn-Bar, A. Prakash, A. Behl, K. Chitta , and A. Geiger, “Learning situational driving,” in <i>Conference on Computer Vision and Pattern Recognition (CVPR)</i> , 2020. |
| | [15] 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 <i>Conference on Computer Vision and Pattern Recognition (CVPR)</i> , 2020. |
| 2018 | [16] K. Chitta , “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. |
| | [17] K. Chitta , 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. |

Supervision

2019 – Now

University of Tübingen, Germany

Master Thesis Advisor

- *Feb 2023 – Aug 2023*: Daniel Dauner (Thesis: nuPlan Challenge)
- *Dec 2022 – Jun 2023*: Luis Winkelmann (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)

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.

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Dr. José M. Álvarez. Senior Research Scientist, NVIDIA.

josea@nvidia.com

Prof. Eshed Ohn-Bar. Professor, Dept. of Electrical and Computer Engineering, Boston University.

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Prof. Martial Hebert. Dean, School of Computer Science, Carnegie Mellon University.

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