

# Aditya Prakash

PHD STUDENT IN COMPUTER SCIENCE AT UIUC

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## Education

### University of Illinois Urbana-Champaign

PHD IN COMPUTER SCIENCE (ADVISORS: SAURABH GUPTA & DAVID FORSYTH)

Urbana-Champaign, USA

August 2021 - Ongoing

### Indian Institute of Technology Roorkee

BACHELORS IN EE & CS (DEPARTMENT GOLD MEDAL & INSTITUTE BRONZE MEDAL)

Roorkee, India

July 2014 - May 2018

## Publications

- **Prakash**, Lundell, Andreychuk, Forsyth, Gupta\*, Sawhney\*. How Do I Do That? Synthesizing 3D Hand Motion and Contacts for Everyday Interactions. *CVPR'25*
- **Prakash**, Tu, Chang, Gupta. 3D Hand Pose Estimation in Everyday Egocentric Images. *ECCV'24*
- **Prakash**, Gupta, Gupta. Mitigating Perspective Distortion-induced Shape Ambiguity in Image Crops. *ECCV'24*
- **Prakash**, Chang, Jin, Tu, Gupta. 3D Reconstruction of Objects in Hands without Real World 3D Supervision. *ECCV'24*
- Fan, Ohkawa, Yang, ..., **Prakash**, Gupta, ..., Yao. Benchmarks and Challenges in Pose Estimation for Egocentric Hand Interactions with Objects. *ECCV'24*
- Chang, **Prakash**, Gupta. Look Ma, No Hands! Agent-Environment Factorization of Egocentric Videos. *NeurIPS'23*
- **Prakash**, Chang, Jin, Gupta. Learning Hand-Held Object Reconstruction from In-The-Wild Videos. *arXiv'23*
- Chitta, **Prakash**, Jaeger, Yu, Renz, Geiger. TransFuser: Imitation with Transformer-Based Sensor Fusion for Autonomous Driving. *TPAMI'22*
- **Prakash**\*, Chitta\*, Geiger. Multi-Modal Fusion Transformer for End-to-End Autonomous Driving. *CVPR'21*
- Chitta\*, **Prakash**\*, Geiger. NEAT: Neural Attention Fields for End-to-End Autonomous Driving. *ICCV'21*
- **Prakash**, Behl\*, Ohn-Bar\*, Chitta, Geiger. Exploring Data Aggregation in Policy Learning for Vision-based Urban Autonomous Driving. *CVPR'20*
- Ohn-Bar, **Prakash**, Behl, Chitta, Geiger. Learning Situational Driving. *CVPR'20*
- Behl\*, Chitta\*, **Prakash**, Ohn-Bar, Geiger. Label Efficient Visual Abstractions for Autonomous Driving. *IROS'20*
- Poursaeed\*, Yang\*, **Prakash**\*, Fang, Jiang, Hariharan, Belongie. Deep Fundamental Matrix Estimation without Correspondences. *GMDL Workshop, ECCV'18*
- Kundu\*, Ganeshan\*, Rahul\*, **Prakash**, Babu. iSPA-Net: Iterative Semantic Pose Alignment Network. *ACMMM'18*
- Recommendation System Based on Individualized Privacy Settings. *US Patent 10817618B2*

## Research Experience

### Research Intern | Microsoft Spatial AI Lab

3D GENERATIVE MODELS FOR HAND-OBJECT INTERACTIONS | SUPERVISORS: HARPREET SAWHNEY & BEN LUNDELL

Redmond, USA

May 2024 - August 2024

- Exploring 3D affordance-based representation learning for hand-object interactions
- Extending VQVAE models for generating hand-object motions in diverse settings with unknown 3D objects

### Research Assistant | Max Planck Institute for Intelligent Systems

IMITATION LEARNING FOR END-TO-END DRIVING IN SIMULATION | SUPERVISORS: ANDREAS GEIGER & ESHED OHN-BAR

Tübingen, Germany

April 2019 - May 2021

- Incorporating attention in imitation learning for multi-modal and interpretable representations for autonomous driving
- Improving data distribution in policy learning using on-policy (Dagger, SMILE, RAIL) and off-policy (DART) techniques

### Global Resident | NAVER AI Research

MACHINE READING COMPREHENSION | MANAGER: JUNG-WOO HA

Seoul, South Korea

August 2018 - February 2019

- Exploring learnable graph based structures for learning long range dependencies and improving interpretability in transformers

### Remote Collaboration | Cornell Tech

DEEP FUNDAMENTAL MATRIX ESTIMATION | SUPERVISOR: OMID POURSAEED

April 2018 - September 2018

- Incorporating positional features, disparity maps & differentiable reconstruction modules in neural networks for epipolar geometry

### Research Intern | Vision & AI Lab, Indian Institute of Science

OBJECT POSE ESTIMATION | SUPERVISORS: JOGENDRA NATH KUNDU & R. VENKATESH BABU

Bengaluru, India

December 2017 - March 2018

- Employed siamese architecture (UCN) with iterative error feedback for predicting 3D poses & learning semantic correspondences

### Research Intern | Adobe Research

PRIVACY AWARE RECOMMENDATION SYSTEMS | SUPERVISOR: BY IFTIKHAR AHAMATH BURHANUDDIN

Bengaluru, India

May 2017 - July 2017

- Explored differential privacy in matrix factorization, SVD, KNN, Q-learning, back propagation in LSTMs

## Talks

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- *Hands in Action* in the AVG Reading Group at University of Tübingen (October 2024)
- *Hands in Action* in the Microsoft Research Seminar (September 2024)
- *Understanding Hand-Object Interactions in the Wild* at the Microsoft Spatial AI Lab (June 2024)
- *Robot Learning by Understanding Videos* in the Action and Perception course at U Michigan (Winter 2023-24)
- *Reducing Scale Ambiguity due to Data Augmentation* at Understanding Hands in Action Workshop (ICCV 2023)
- *Learning Hand-Held Object Reconstruction from In-the-Wild Videos* at CV4Metaverse Workshop (ICCV 2023)
- *Neural Attention Fields for End-to-End Autonomous Driving* at Transformers for Vision Workshop (CVPR 2022)
- *Incorporating Attention in Imitation Learning* at ML for Autonomous Driving Workshop (NeurIPS 2020)

## Service

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- Co-organizer for *How to Stand Out in the Crowd?* Workshop at CVPR 2025
- Co-organizer for *CV20/20: A Retrospective Vision Workshop* at CVPR 2024
- Co-organizer for Vision Lunch, External Speaker Series & Allerton Vision Workshop at UIUC (Fall 2022 - Ongoing)
- Reviewer for CVPR, ICCV, ECCV, NeurIPS, ICLR, ICML, TPAMI, 3DV, IROS, IV (2020 - Ongoing)
- Teaching Assistant for Learning-based Robotics Course by Saurabh Gupta at UIUC (Fall 2022)
- Teaching Assistant for Deep Learning Course by Andreas Geiger at Uni-Tübingen (Winter 2020/2021)
- Technical support for DAGM German Conference on Patter Recognition 2020
- Coordinator at Vision and Language Group at IIT Roorkee (August 2017 - May 2018)
- Mentor as part of Student Mentorship Program at IIT Roorkee (October 2016 - May 2018)
- Project Manager at Artificial Intelligence and Electronics Society at IIT Roorkee (July 2016 - March 2017)
- Teaching Assistant for Introduction to Electrical Engineering at IIT Roorkee (January 2017 - April 2017)

## Awards

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- Outstanding Reviewer for NeurIPS 2023, ECCV 2024
- Ranked 2<sup>nd</sup> in the Consistent Motion Reconstruction Challenge at the Hands@ICCV'23 Workshop
- Selected for NVIDIA Academic Hardware Grant Program 2022
- Ranked 2<sup>nd</sup> in the 2020 CARLA Autonomous Driving Challenge at ML4AD@NeurIPS'20 Workshop
- Institute Bronze Medal 2018 for Academic Excellence in B.Tech programme - IIT Roorkee
- Department Gold Medal 2018 in B.Tech Electrical Engineering - IIT Roorkee
- K. D. Goyal and K. Goyal Certificate of Trust Prize 2018 for securing highest CGPA - IIT Roorkee
- Indian Academy of Science Summer Research Fellowship 2016
- R. S. Jain and S. D. Jain Certificate of Trust Prize 2015 for securing highest CGPA - IIT Roorkee

## References

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- **Andreas Geiger**. Professor, University of Tübingen [a.geiger@uni-tuebingen.de](mailto:a.geiger@uni-tuebingen.de)
- **Saurabh Gupta**. Assistant Professor, University of Illinois Urbana-Champaign [saurabhg@illinois.edu](mailto:saurabhg@illinois.edu)
- **David Forsyth**. Professor, University of Illinois Urbana-Champaign [daf@uiuc.edu](mailto:daf@uiuc.edu)
- **Eshed Ohn-Bar**. Assistant Professor, Boston University [eohnbar@bu.edu](mailto:eohnbar@bu.edu)
- **Harpreet Sawhney**. Sr. Principal Applied Scientist, Amazon Robotics [hasawhne@amazon.com](mailto:hasawhne@amazon.com)
- **Benjamin Lundell**. Principal Research Scientist, Microsoft [benjamin.lundell@microsoft.com](mailto:benjamin.lundell@microsoft.com)