

Nishant Kheterpal

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734-205-8574

Education

University of Michigan

9/2020 - Present

- *PhD* in Robotics, advised by Jean-Baptiste Jeannin
- Emphasis on formal verification for collision avoidance and machine learning systems

University of California, Berkeley

8/2015 - 12/2018

- *Bachelors of Science* in Electrical Engineering and Computer Sciences
 - Coursework in artificial intelligence, machine learning, vehicle dynamics, optimization, probability, controls, data science, computer architecture, algorithms, discrete math, linear algebra
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Publications

N. Kheterpal, J-B. Jeannin, "Towards a Formalization of the Active Corner Method for Collision Avoidance in PVS.", *Formal Techniques for Safety-Critical Systems, SPLASH, 2022*.

N. Kheterpal, E. Tang, J-B. Jeannin, "Automating Geometric Proofs of Collision Avoidance with Active Corners.", *Formal Methods in Computer-Aided Design, 2022*. (40 accepted / 88 submissions)

N. Kheterpal, E. Vinitsky, C. Wu, A. Kreidieh, K. Jang, K. Parvate, A. Bayen, "Flow: Open Source Reinforcement Learning for Traffic Control." *Workshop on Machine Learning Open-Source Software, NeurIPS, 2018*.

E. Vinitsky, A. Kreidieh, L. Le Flem, **N. Kheterpal**, K. Jang, F. Wu, R. Liaw, E. Liang, A. Bayen, "Benchmarks for Reinforcement Learning in Mixed-Autonomy Traffic." *Conference on Robot Learning, 2018*.

N. Kheterpal, K. Parvate, C. Wu, A. Kreidieh, E. Vinitsky, A. Bayen, "Flow: Deep Reinforcement Learning for Control in SUMO", *SUMO User Conference, 2018*.

C. Wu, K. Parvate, **N. Kheterpal**, L. Dickstein, A. Mehta, E. Vinitsky, A. Bayen, "Framework for Control and Deep Reinforcement Learning in Traffic." *Intelligent Transportation Systems (ITSC), 2017 IEEE 20th International Conference on. IEEE, 2017*.

Work Experience

Uber ATG - Research Intern

3/2020 - 8/2020

- Developed ride comfort metrics for autonomous vehicles to improve passenger experience
- Productionized safety metrics using Traffic Conflict Technique alongside research staff
- Researcher working with Dr. Ersin Yumer and Professor Raquel Urtasun

Ike Robotics - Simulation Software Engineer

1/2019 - 1/2020

- Developed simulation platform in Unreal Engine to test and validate software performance for automated trucking
- Built simulated intelligent actors and integrated control & dynamics into simulation
- Implemented distributed cloud simulation in Google Cloud Platform using Docker and Kubernetes

Berkeley Deep Drive - Undergraduate Researcher

1/2017 - 12/2018

- Built Flow, an open-source framework enabling deep reinforcement learning for traffic control using vehicle simulator SUMO, RLLib, rllab, and Amazon Web Services

- Designed RL experiments in Flow to train vehicle and infrastructure agents to improve traffic flow in congested traffic scenarios
 - Studied gradient accuracy, training time, and reward in deep reinforcement learning methods
- General Motors - Electrification Controls Intern** 6/2017 - 8/2017
- Validated power consumption models for electric vehicles using experimental data
 - Developed and troubleshot Simulink models for electrified powertrain energy consumption
- Apple - Emerging Technologies Intern** 5/2016 - 8/2016
- Developed interactive Matlab tools to analyze and summarize spatial and temporal datasets
 - Streamlined a signal simulation pipeline and created GUIs for rapid signal generation
 - Summarized work in final presentation, well-received by 20+ cross-functional team members
- University of Michigan Transportation Research Institute - Research Assistant** 7/2013 - 8/2015
- Analyzed sensor data using SQL and plotting tool Igor to evaluate active safety performance
 - Built Matlab tools to automatically characterize heavy truck suspension behavior from test data
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Teaching

- Data 8, UC Berkeley - Lead Undergraduate Student Instructor** 8/2018 - 12/2018
- Pedagogy lead supervising a team of 4 instructors developing course materials for 1200+ students
 - Presented weekly to 40+ instructors regarding course material and educational strategy
 - Taught 60+ students weekly in two lab sections applying course material
 - Course evaluations consistently above average (personal: 4.6/5, average: 4.3/5)
- Data 8, UC Berkeley - Undergraduate Student Instructor** 8/2016 - 5/2018
- Primary lab section instructor teaching computational and inferential thinking with real-world data
 - Member of teaching staff responsible for developing course and studying pedagogy
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Honors and Awards

- NASA Graduate Fellowship** 2021-Present
- NSF Graduate Research Fellowship Honorable Mention** 2021
- Berkeley Engineering Honors to Date - Top 20% GPA** Fall 2015 - Fall 2018
- Bronze Medal Winner - Siemens-UC Berkeley Hackathon** 2018
- Outstanding Graduate Student Instructor Award - Top 9% of GSIs** Spring 2018
- Member, Eta Kappa Nu, Mu (Berkeley) Chapter - Top 25% of EECS Majors** Fall 2016
- College of Engineering Dean's List - Top 10% GPA** Fall 2015, Fall 2016, Spring 2017
- Michigan Mathematics Prize Competition - Top 100** 2015
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