

CONTACT INFORMATION	720 Serra Street Apt. 701 Stanford, CA 94305, USA Tel: (510)-708-9690	Homepage: https://rohansinha.nl/ ✉ E-mail: rhnsinha@stanford.edu Linkedin: connect with me here Twitter: click to follow me Github: https://github.com/GoldeneyeRohan
RESEARCH INTERESTS	Currently, my research focuses on developing methodologies that improve the reliability of ML-enabled robotic systems, particularly when these systems encounter out-of-distribution conditions with respect to their training data. More broadly, my research interests lie at the intersection of control theory, machine learning, and applied robotics.	
EDUCATION	<div> Stanford University 2020–present Ph.D. Candidate, Autonomous Systems Lab (expected 2025) MS Candidate, Aeronautics and Astronautics <i>Advisor: Prof. Marco Pavone, (Rotation: Prof. Sanjay Lal)</i> </div> <div> University of California, Berkeley 2015–2020 B.S. Mechanical Engineering B.A. Computer Science <i>Advisors: Prof. Francesco Borrelli, Prof. Benjamin Recht</i> </div>	
EXPERIENCE	<div> Stanford University– Graduate Research Assistant 2020–present <i>Advisor: Prof. Marco Pavone (2020–present)</i> Research in the Stanford Autonomous Systems Lab (ASL) under Prof. Marco Pavone. I work on reliable and safe robot learning algorithms that are able to cope with out-of-distribution (OOD) data, involving: <ol style="list-style-type: none"> 1. <i>Runtime monitors of deep-learned components and AI systems.</i> 2. <i>Policy learning, Decision-making, and Planning and control algorithms that avoid OOD failures, and strengthen reliability and trustworthiness.</i> 3. <i>Data lifecycle algorithms that inform offline development cycles to address observed failure modes over time.</i> </div> <p>My work on this topic was recognized with the Best Paper award at the 2024 Robotics: Science and Systems conference for pioneering the real-time use of LLMs to improve robot safety. Previously, I developed adaptive, robust predictive control algorithms for safe online learning by combining classical ideas in adaptive control, robust MPC, and deep Bayesian Meta-Learning.</p> <div> Google DeepMind– Student Researcher 2024 Developed inference-time policy steering algorithms to push vision-language-action (VLA) policies towards preferred behavioral modes and away from failures. Our approach was shown to enhance the out-of-distribution deployment reliability and human preference alignment within the state-of-the-art Gemini Robotics release in the context of the DeepMind robotic AI safety efforts. Work completed under Dr. Sumeet Singh and Dr. Vikas Sindhwani. </div>	
	<div> University of California, Berkeley– Undergraduate Research Assistant 2018–2020 <i>Advisor: Prof. Benjamin Recht (2019–2020)</i> Research on learning-based control strategies from monocular visual sensing under Prof. Benjamin Recht at the Berkeley AI Research Lab (BAIR). Developed a model car that races autonomously at high speeds in cluttered environments from a single human demonstration. <i>Advisor: Prof. Francesco Borrelli (2018–2019)</i> Research focused on data-driven control algorithms under Prof. Francesco Borrelli at the Model Predictive Control (MPC) Lab. Worked on Learning Model Predictive Control (LMPC) strategies with convergence to model-free learned strategies subject to stochastic disturbances, and LMPC for multi-agent autonomous racing. </div>	
	<div> Amazon Inc.– Software Development Engineering Intern 2018 Software Engineering Intern at Amazon Digital Music. Completed a data engineering project to collect and analyze gigabytes of search traffic and server performance data generated every minute throughout the Music Search pipeline to monitor and manage the large-scale distributed search cluster system. </div>	
	<div> Motional Inc. (Formerly Delphi Automotive)– Autonomous Driving Engineering Intern 2017 Summer internship working on Self-Driving Cars for Delphi automotive in the Delphi, Intel/Mobileye, BMW Partnership. Developed and validated high fidelity vehicle dynamics models and utilized them </div>	

to perform exploratory research projects using nonlinear online estimation techniques such as EKF and UKF.

HONORS AND AWARDS

Best Paper Award at the RSS Robot Evaluation for the Real World Workshop	2025
Outstanding (Best) Paper Award at the Robotics: Science and Systems Conference	2024
Honorable Mention, NSF Graduate Research Fellowship Program	2021
Best project award, AA228: Decision Making Under Uncertainty	2020
Honors at graduation, UC Berkeley Faculty of Mechanical Engineering	2020
Distinction in General Scholarship, UC Berkeley Faculty of Computer Science	2020
Best Project Award, ME102B: Capstone Mechatronics Design	2019
Third place, NASA Aeronautics Advanced Aerial Vehicles Student Challenge	2017
Tau Beta Pi Honor Society, UC Berkeley	2017
Pi Tau Sigma Honor Society, UC Berkeley	2017
Dean's List, UC Berkeley College of Engineering	2015–2019
Top 10 Finalist, National Physics Olympiad, the Netherlands	2015

TEACHING

AA289/CS529: Robotics and Autonomous Systems Seminar – Organizer 2022-present
Organizer for a weekly seminar hosting invited speakers from both academia and industry to present state-of-the-art research and innovation on robotics and autonomous systems. As an organizer, I 1) invite speakers and host them for their visit, 2) manage the seminar schedule and \$30k annual travel budget, 3) coordinate logistics for a 150+ student course. Talks are publicly available via the [course webpage](#) and YouTube channel, which has accumulated over 200k views.

AA174/CS137A: Principles of Robot Autonomy–Head Course Assistant 2024
Head TA for an Ugrad/MS course teaching basic principles for endowing mobile autonomous robots with planning, perception, and decision-making capabilities. Algorithmic approaches for trajectory optimization; robot motion planning; robot perception, localization, and simultaneous localization and mapping (SLAM); state machines. I developed assignments, managed course logistics, and ran hardware sessions on turtlebots.

EE263: Introduction to Linear Dynamical Systems–Course Assistant 2020
One of the lead TA's for graduate course in linear algebra and dynamical systems under Prof. Sanjay Lall. I was responsible for general course logistics, held weekly discussion sections and office hours, wrote homework assignments and exams, and managed the team of graders for the course.

CS61B: Data Structures–Lab Assistant 2018
Lab Teaching Assistant for Computer Science 61B at UC Berkeley. CS61B is a fundamental software engineering course covering OOP, data structures, introductory graph theory, and other essential programming concepts.

SERVICE AND LEADERSHIP

Principle Workshop Organizer – **2nd Workshop on Out-of-Distribution Generalization in Robotics: Towards Trustworthy Learning-based Autonomy**, held at the 2025 Robotics: Science and Systems conference.

Instructor – “**Test of AI and Emerging Technologies**” Course – I helped develop and instruct a new course on AI and autonomy for the United States Air Force Test Pilot School. (2025)

Workshop Organizer – Workshop on **Safely Leveraging Vision-Language Models in Robotics: Challenges and Opportunities**, held at the 2025 International Conference on Robotics and Automation.

Graduate Steering Committee Member, Stanford Robotics Center – Stanford University (2023-present)

Principle Workshop Organizer – Workshop on **Out-of-Distribution Generalization in Robotics: Towards Reliable Learning-based Autonomy**, held at the 2023 Conference on Robot Learning.

President, Dutch Student Association @ Stanford – Stanford University, previously vice-president from 2022-2023 (2023-present)

Mentor, Stanford Robotics Center Summer Research Program – Mentoring first generation, low income, and racially minoritized students with the goal of providing real-world experiences in science and engineering research (2023)

Organizer, Dutch Royal Visit – I was key in organizing a [state visit by H. M. Queen Maxima of the Netherlands to Stanford](#), accompanied by a trade delegation comprising Dutch cabinet ministers, industry and nonprofit executives, and academic leaders: I organized a seminar on autonomous driving, a panel on AI, a student lunch with the education minister, and [an autonomous vehicle showcase](#) that was extensively covered in the media.

Reviewer – IEEE TCST (2021), WAFR (2022), IEEE CCTA (2022), IEEE CDC (2023, 2024), AAAI (2023, 2024), RSS (2025), IROS (2025), CoRL (2025), RA-L (2025)

Diversity, Equity, and Inclusion Committee Member – Stanford Aero/Astro (2020–2023)

President, Goldeneye Student Engineering Team – UC Berkeley (2017–2019)

Officer, California Sailing Team – UC Berkeley (2016–2017)

INVITED TALKS Keynote, RSS Workshop on Statistical Uncertainty Quantification in the Era of AI-Enabled Robots (June 2025)
Annual meeting of the NASA University Leadership Initiative, Safe Aviation Autonomy (June 2025)
Keynote, **Coordinated Science Conference**, UIUC ECE (February 2025)
Toyota Research Institute (TRI) (October 2024)
DARPA TIAMAT Program Meeting (October 2024)
KTH Royal Institute of Technology Stockholm (October 2024)
Interactive Perception and Robot Learning Lab (June 2024)
Google DeepMind Robotics (June 2024)
Annual meeting of the NASA University Leadership Initiative, Safe Aviation Autonomy (June 2024)
Blue Origin (January 2024)
Center for Automotive Research at Stanford’s annual affiliate meeting (November 2023)
Toyota Research Institute (September 2023)
Apple Inc., Special Projects Group ML seminar (September 2023)
Keynote at IEEE Space Mission Challenges for Information Technology - IEEE Space Computing Conference, workshop on Addressing Trust Challenges in Space Autonomy (July 2023)
Stanford Center for Automotive Research industry affiliate seminar (July 2023)
Annual meeting of the NASA University Leadership Initiative, Safe Aviation Autonomy (June 2023)

PUBLICATIONS **Journal Publications:**

1. Elhafsi, A., **Sinha, R.**, Agia, C., Schmerling, E., Nesnas, I. A. D., Pavone, M., (2023a). “Semantic Anomaly Detection with Large Language Models”. In: *Autonomous Robots*. Special Issue on Large Language Models in Robotics
2. **Sinha, R.**, Sharma, S., Banerjee, S., Lew, T., Luo, R., Richards, S. M., Sun, Y., Schmerling, E., Pavone, M., (2022). “A System-Level View on Out-of-Distribution Data in Robotics”. In: *arXiv preprint arXiv:2212.14020*
3. **Sinha, R.**, Harrison, J., Richards, S. M., Pavone, M., (2022a). “Adaptive Robust Model Predictive Control via Uncertainty Cancellation”. In: *IEEE Transactions on Automatic Control*. (Accepted). Available at <https://arxiv.org/abs/2212.01371>

Conference Publications:

1. **Sinha, R.**, Singh, S., Shah, D., Harrison, J., Majumdar, A., Sindhvani, V., (2025). “Inference-Time Steering of Diffusion Models with Control Barrier Functions”. In: (in preparation)
2. Agia, C., **Sinha, R.**, Yang, J., Antonova, R., Pavone, M., Nishimura, H., Itkina, M., Bohg, J., (2025). “CUPID: Curating Data your Robot Loves with Influence Functions”. In: *9th Annual Conference on Robot Learning*. (under review), (**Best Paper Award @ RSS RoboEval Workshop, 2025**)
3. Kwok, J., **Sinha, R.**, Agia, C., Foutter, M., Li, S., Stoica, I., Mirhoseini, A., Pavone, M., (2025). “RoboMonkey: Scaling Test-Time Sampling and Verification for Vision-Language-Action Models”. In: *9th Annual Conference on Robot Learning*. (under review)
4. Ganai, M., **Sinha, R.**, Agia, C., Morton, D., Pavone, M., (2025). “Real-Time Out-of-Distribution Failure Prevention via Multi-Modal Reasoning”. In: *9th Annual Conference on Robot Learning*. (under review)
5. Soroka, E., **Sinha, R.**, Lall, S., (Apr. 2025). “Learning Temporal Logic Predicates from Data with Statistical Guarantees”. In: *Proceedings of the 7th Annual Learning for Dynamics & Control Conference*. Proceedings of Machine Learning Research. PMLR
6. Agia, C., **Sinha, R.**, Yang, J., Cao, Z., Antonova, R., Pavone, M., Bohg, J., (2024). “Unpacking Failure Modes of Generative Policies: Runtime Monitoring of Consistency and Progress”. In: *8th Annual Conference on Robot Learning*
7. **Sinha, R.**, Elhafsi, A., Agia, C., Foutter, M., Schmerling, E., Pavone, M., (2024). “Real-Time Anomaly Detection and Reactive Planning with Large Language Models”. In: *Robotics: Science and Systems*. (**Winner: Outstanding Paper Award (top 0.2%)**). URL: <https://tinyurl.com/aesop-llm>

8. **Sinha, R.**, Schmerling, E., Pavone, M., (2023). “Closing the Loop on Runtime Monitors with Fallback-Safe MPC”. in: *Proc. IEEE Conf. on Decision and Control*. URL: <https://tinyurl.com/fallback-safe-mpc>
9. Luo, R., **Sinha, R.**, Hindy, A., Zhao, S., Savarese, S., Schmerling, E., Pavone, M., (2023). “Online Distribution Shift Detection via Recency Prediction”. In: *Proc. IEEE Conf. on Robotics and Automation*. (Accepted)
10. **Sinha, R.**, Harrison, J., Richards, S. M., Pavone, M., (2022b). “Adaptive Robust Model Predictive Control with Matched and Unmatched Uncertainty”. In: *American Control Conference*
11. Anand, R.^{*}, English, A.^{*}, Gao, D.^{*}, Malekshahi, S.^{*}, **Sinha, R.**^{*}, Stevenson, N.^{*}, (2017). “Goldeneye AB1”. In: *Presented at NASA Aeronautics Design Challenge*. (**Third place/honorable mention**). URL: <http://goldeneyerohan.github.io/files/GoldeneyeAB1.pdf>. ^{*equal contribution}

Workshop Papers:

1. Foutter, M., Bhoj, P., **Sinha, R.**, Elhafsi, A., Banerjee, S., Agia, C., Kruger, J., Guffanti, T., Gammelli, D., D’Amico, S., Pavone, M., (2024). “Adapting a Foundation Model for Space-based Tasks”. In: *RSS’24 Workshop on Semantics for Robotics: From Environment Understanding and Reasoning to Safe Interaction*. URL: <https://arxiv.org/abs/2408.05924>
2. **Sinha, R.**, Dyro, R., Pavone, M., (2023). “Beyond Basics: X-Plane Aircraft Simulator Offers Real-World Testing Environment for Control Systems”. In: *Workshop on Benchmarking, Reproducibility, and Open-Source Code in Controls at CDC 2023*. URL: <https://github.com/StanfordASL/ASL-X-Plane-11-Platform>
3. Foutter, M., **Sinha, R.**, Banerjee, S., Pavone, M., (2023). “Self-Supervised Model Generalization using Out-of-Distribution Detection”. In: *First Workshop on Out-of-Distribution Generalization in Robotics at CoRL 2023*. URL: <https://openreview.net/forum?id=z5XS3BY13J>
4. Elhafsi, A., **Sinha, R.**, Agia, C., Schmerling, E., Nesnas, I. A. D., Pavone, M., (2023b). “Semantic Anomaly Detection with Large Language Models”. In: *Robotics, Systems and Science; Workshop Towards Safe Autonomy: New Challenges and Trends in Robot Perception*
5. **Sinha, R.**, Lall, S., (2022). “Cautious Markov Games for Interaction Aware Robotics”. In: *Conference on Robot Learning: Workshop on Strategic Multi-Agent Interactions*

Other Writing:

1. Brown, R.^{*}, Dyro, R.^{*}, **Sinha, R.**^{*}, (2021). *Covariate Shifts in Multi-Agent Interactions*. Tech. rep. Stanford CS329D. ^{*equal contribution}
2. **Sinha, R.** (2021b). *Solving Multi-Agent Zero-Sum Games with Mirror Descent*. Tech. rep. Stanford EE364B
3. **Sinha, R.**^{*}, Soroka, E.^{*}, (2021). *Pose Graph Optimization Using Matrix Sketching*. Tech. rep. Stanford AA273. ^{*equal contribution}
4. **Sinha, R.** (2021a). *Multi-Vehicle Autonomous Racing with Learning MPC and Trajectory Forecasting*. Tech. rep. Stanford AA277
5. **Sinha, R.** (2020). *Cautious Markov Games, a Novel Framework for Human-Robot Interaction*. Tech. rep. (**Best Project Paper**). Stanford AA228
6. Narang, A.^{*}, **Sinha, R.**^{*}, Siththaranjan, A.^{*}, Yang, F.^{*}, (2019). *Data-Poisoning for Linear Models*. Tech. rep. UC Berkeley EE227B. URL: <https://rohansinha.nl/portfolio/projects-4/>. ^{*equal contribution}
7. Anderson, J.^{*}, Chang, B.^{*}, Cosner, R.^{*}, Kruger, S.^{*}, Lim, R.^{*}, **Sinha, R.**^{*}, (2019). *Oversized Load Lifting and Yielding (Project OLLY)*. tech. rep. (**Best Project**). UC Berkeley ME102B. URL: <https://rohansinha.nl/portfolio/projects-3/>. ^{*equal contribution}
8. Anand, R.^{*}, Anderson, J.^{*}, Lim, R.^{*}, **Sinha, R.**^{*}, (2019). *MPC Control of Multiple Quadcopters Cooperatively Lifting an Object*. Tech. rep. UC Berkeley ME231A. URL: <https://rohansinha.nl/portfolio/projects-2/>. ^{*equal contribution}

MENTORING

Kim Christensen (2025-current), currently PhD candidate at NTNU
Francesco Marchiori (2025-current), currently PhD candidate at Univ. of Padova
Milan Ganai (2025-current), currently CS PhD candidate at Stanford
Cassie Chen (2025-current), currently ME MS candidate at Stanford
Kai Storms (2024-current), currently PhD candidate at TU Darmstadt
Jacky Kwock (2024-current), currently CS PhD candidate at Stanford
Sidharth Tadeparti (2024-2025), ME MS at Stanford, currently ML Eng. at Dexterity AI
Andrew Wang (2023-2025), AA MS at Stanford, currently controls at Tesla Optimus
Alex Wang (2024), currently CS BS student at Stanford
Xinmeng Zheng (2024), currently ICME PhD candidate at Stanford
Anish Muthali (2023-2024), currently quantitative researcher at Headlands technologies
David Shen (2023-2024), currently ML Eng. at LinkedIn
Matthew Foutter (2023), currently ME PhD candidate at Stanford
Gabriel Escatel (2023), currently BS candidate at Foothill Community College
Shahir Rahman (2022), currently CS Ph.D. candidate at Stanford

SKILLS AND INTERESTS

Languages: English (fluent), Dutch (native), French (proficient), German (elementary).
Technical Skills: Python, Java, C/C++, Matlab, ROS.
Sports/Hobbies: Sailing, Tennis, Soccer, Field Hockey, Snowboarding.