Nishanth J. Kumar

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EDUCATION

Massachusetts Institute of Technology – S.M. and Ph.D. in EECS — Cambridge, MA | 09/2021 –

- **GPA: 5.00/5.00.** Research: Integrated learning and planning/reasoning for long-horizon, complex robotics and agentic tasks. Ph.D. minor in Engineering Leadership. Advisors: Tomás Lozano-Pérez and Leslie Kaelbling.
- **Selected Coursework**: Robotic Manipulation, Theory of Computation, Computational Sensorimotor Learning.

Brown University – Sc.B. in Computer Engineering with Honors — Providence, RI | 09/2017 – 05/2021

- **GPA: 3.95/4.00.** Named *Outstanding Senior* for graduating as the top student in my concentration. Research advisors: Stefanie Tellex, George Konidaris, Michael Littman.

INDUSTRY EXPERIENCE

AI Research Intern – FAIR at Meta [website] — New York City, NY | 05/2025 - Present

- Working on self-improving autonomous computer-use agents via finetuning a Vision-Language Model (VLM) to serve as value functions for planning. Developed system capable of autonomous data collection sufficient to achieve SOTA performance on AgentStudio computer use benchmark.
- Conference submission in preparation. Managers: Mary Williamson, Yuandong Tian, Jimmy Yang.

Research Intern – NVIDIA [website] — Seattle, WA | 05/2024 - 01/2025

- Led development and deployment of 'OWL-TAMP' – a novel method combining VLM's and TAMP. Achieved SOTA performance on tasks from the RAVENS suite. Work featured in NVIDIA press release article [link].
- Submitted 3 conference papers [1, 2, 3] to RA-L, RSS and ICLR. Two open-source code releases that are under active use [gpu-tamp],][aha], with over 80 github stars. Managers: Caelan Garrett, Fabio Ramos, Dieter Fox.

Research Intern – RAI Institute [website] — Cambridge, MA | 11/2022 – 04/2024

- Co-developed 'EES' a novel method to enable efficient, reset-free online learning on real Boston Dynamics Spot robots. Paper accepted at RSS 2024. Manager: Jennifer Barry.

Research Intern – Vicarious AI (now part of Google DeepMind) [website] — Remote | Summer 2021

- Led development of an open-source framework [link] for efficient inference on Probabilistic Graphical Models (PGM's) in JAX. Framework continues to be in active development at DeepMind under the JAX ecosystem.
- Paper accepted at JMLR [paper]. Managers: Stannis Zhou, Miguel Lázaro-Gredilla.

Research Intern Uber ATG (now Waabi AI) [website] — Remote | Summer 2020

- Independent research project [link] on Active Learning to improve sample-efficiency and reduce data-labelling costs for a key neural network model. Paper accepted at CoRL 2021. Managers: Sean Segal, Raquel Urtasun.

SELECTED PUBLICATIONS

- **From Pixels to Predicates: Learning Symbolic World Models via Pretrained Vision-Language Models** [website]. A. Athalye*, **N. Kumar***, T. Silver, Y. Liang, T. Lozano-Pérez, L.P. Kaelbling. Under Review, 2025.
- **Open-World Task and Motion Planning via Vision-Language Model Inferred Constraints** [website]. **N. Kumar**, F. Ramos, D. Fox, C.R. Garrett. Under Review, 2025.
- **VisualPredicator: Learning Abstract World Models with Neuro-Symbolic Predicates for Robot Planning** . Y. Liang, **N. Kumar**, H. Tang, A. Weller, J. Tenenbaum, T. Silver, J. Henriques, K. Ellis. ICLR, 2025 (Spotlight).
- **Trust the PRoC3S: Solving Long-Horizon Robotics Problems with LLMs and Constraint Satisfaction**. A. Curtis*, **N. Kumar***, J. Cao, T. Lozano-Pérez, L.P. Kaelbling. CoRL, 2024.
- **Practice makes Perfect: Planning to Learn Skill Parameter Policies** [website]. **N. Kumar***, T. Silver*, W. McClinton, L. Zhao, S. Proulx, T. Lozano-Pérez, L.P. Kaelbling, J. Barry. RSS, 2024.
- **AHA! A VLM for Detecting and Reasoning over Failures in Robotic Manipulation**. J. Duan, W. Pumacay, **N. Kumar**, Y.R. Wang, S. Tian, W. Yuan, R. Krishna, D. Fox, A. Mandlekar, Y. Guo. ICLR, 2025.

(* indicates equal contribution)

SKILLS & INTERESTS

- **Programming Skills**
  - **Proficient:** Python. Open-source libraries developed and maintained: [1], [2].
  - **Comfortable:** PyTorch, Numpy, Bash, TeX.
  - **Familiar:** HuggingFace transformers and peft, bitsandbytes, JAX, TensorFlow, OpenCV, C, Robot Operating System (ROS).
- **Miscellaneous Skills and Interests:** Fiction Writing, Blogging, Basketball, Public Speaking, Philosophy.