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: Combining learning and planning for long-horizon, complex robotics and general agentic decision-making. 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.
- **Selected Coursework:** Machine Learning, Learning and Sequential Decision Making, 3D Vision and Deep Learning.

INDUSTRY EXPERIENCE

Research Intern– NVIDIA [website] — Seattle, WA | Summer 2024

- Worked on combining internet-scale generative models with planning and decision-making algorithms to enable robust long-horizon behavior. Managers: Caelan Garrett, Fabio Ramos, Dieter Fox.

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

- Worked on several projects (e.g. planning to practice) combining Task and Motion Planning (TAMP) with a variety of pretrained large models and learning algorithms to enable real-world Boston Dynamics Spot robots to solve challenging long-horizon tasks. Manager: Jennifer Barry.

Research Intern – Vicarious AI (now part of DeepMind) [website] — Union City, CA | Summer 2021

- Led development of an open-source framework [link] for efficient inference on Probabilistic Graphical Models (PGM's) in JAX. Journal paper submitted to JMLR [paper]. Managers: Stannis Zhou, Miguel Lázaro-Gredilla.

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

- Led an independent research project [link] on Active Learning to improve sample-efficiency and reduce data-labelling costs for a key neural network model. Managers: Sean Segal, Raquel Urtasun.

AWARDS AND HONORS

- **RSS Workshop on Learning for TAMP Best Paper Award** 2024
- **Qualcomm Innovation Fellowship Finalist** (1 of 46 teams nationwide) 2022
- **NSF GRFP Fellow** 2021
- **CRA Outstanding Undergrad Research Award Finalist** (1 of 23 nationwide) 2021
- **Goldwater Scholarship** (1 of 396 nationwide) 2020
- **Heidelberg Laureate** 2020

SELECTED PUBLICATIONS

- **Predicate Invention from Pixels via Pretrained Vision-Language Models**. A. Athalye*, **N .Kumar***, T. Silver, Y. Liang, T. Lozano-Pérez, L.P. Kaelbling. AAAI LM4Plan Workshop, 2025.
- **Open-World Task and Motion Planning via Vision-Language Model Inferred Constraints**. **N. Kumar**, F. Ramos, D. Fox, C.R. Garrett. CoRL LangRob Workshop, 2024.
- **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**. **N. Kumar***, T. Silver*, W. McClinton, L. Zhao, S. Proulx, T. Lozano-Pérez, L.P. Kaelbling, J. Barry. RSS, 2024.
- **Learning Efficient Abstract Planning Models that Choose What to Predict**. **N. Kumar***, W. McClinton*, R. Chitnis, T. Silver, T. Lozano-Pérez, L.P. Kaelbling. CoRL, 2023.
- **Predicate Invention for Bilevel Planning**. T. Silver*, R. Chitnis*, **N. Kumar**, W. McClinton, T. Lozano-Pérez, L.P. Kaelbling, J. Tenenbaum. AAAI, 2023 (Oral).
  (* indicates equal contribution)

SKILLS & INTERESTS

- **Programming Skills**
  - **Over 5000 lines:** Python**.**
  - **Over 1000 lines:** PyTorch, Bash, JAX, C, Robot Operating System (ROS), Java, MATLAB, LaTeX.
  - **Familiar:** TensorFlow, OpenCV, Verilog, Scala, OCaml, Racket, MySQL.
- **Miscellaneous Skills and Interests:** Fiction Writing, Blogging, Basketball, Public Speaking, Philosophy.