Adithya Murali, Ph.D.

Sr. Researcher in Machine Learning, Robotics, 3D Vision

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Employment History

2023 – · · · · **Sr. Research Scientist** NVIDIA Research

2021 – 2023 **Research Scientist** NVIDIA Research

2019 **Research Intern** NVIDIA Research

2018 – 2019 **Research Intern** Facebook/Meta AI Research

2016 **Software Engineer** Amazon AWS Rekognition service

Education

2016 – 2020 **Ph.D., Carnegie Mellon University** School of Computer Science, Robotics Institute
Thesis title: *Data-Driven Robotic Grasping in the Wild.*

2012 – 2015 **B.S., University of California, Berkeley** Electrical Engineering & Computer Science
Honors, Phi Beta Kappa

2010 – 2011 **Raffles Diploma, Raffles Junior College, Singapore** Distinction, Cambridge A-Levels

Press Coverage on Research

2022 **NVIDIA Tech Blog** *Generating Collision-Free Robot Movement with Motion Policy Networks.* Link

2020 **NVIDIA News** *Robotics Reaps Rewards at ICRA* by Lauren Finkle. Link

2019 **WIRED** *Facebook Unleashes Software to Make Programming Robots Easy* by Matt Simon. Link

2018 **WIRED** *Robots are Renting Airbnbs to Get a Better Grip* by Matt Simon. Link

2016 **IEEE Spectrum** *Would You Trust a Robot Surgeon to Operate on You?* by Eliza Strickland. Link

2014 **The New York Times** *New Research Center Aims to Develop Second Generation of Surgical Robots* by John Markoff. Link

CBS News *Robots vs Ebola.* Link

2012 **The Straits Times** *Students shine in Scientific Research* by Lin Zhaowei. Link

Awards and Achievements

2020 **Best Robot Manipulation and Student Paper Finalist**, ICRA Conference

2017 **Presidential Fellowship**, Carnegie Mellon University and Uber Inc.

2016 **Presidential Fellowship**, Columbia University (Offered)

CSE Fellowship, University of Washington (Offered)

2015 **Best Conference and Medical Robotics Paper Finalist**, ICRA Conference

2014 **The MacBride, and Dolder Family Alumni Scholarship**, Cal Alumni Association

2013 **Leslie Lipson Essay Prize**, UC Berkeley

Edward Kraft Award, UC Berkeley

2012 **All-Rounded Excellence Award**, Raffles Institution

2011 **SSEF Gold Award** Ministry of Education Singapore, Junior College research

Miscellaneous

Academic Service

2016 – · · · · **Program Committee** NeurIPS, CoRL, ICRA, CVPR, ICCV, IROS, T-RO, RA-L

2019 – 2020 **PhD Admissions Committee** PhD in Robotics at CMU SCS

2017 **RoboOrg Officer** Organized events in departmental graduate student organization

Teaching

Fall 2019 **Teaching Assistant, CMU** Statistical Techniques in Robotics with David Held

Fall 2018 **Teaching Assistant, CMU** Learning for Manipulation with Oliver Kroemer; co-designed the class for its first ever offering

Fall 2015 **Tutor, UC Berkeley** Introduction to Structure and Interpretation of Computer Programming (CS61A) by John DeNero

Workshop Organization

2022 **Benchmarking in Robotic Manipulation** at the Conference on Robot Learning (Auckland, New Zealand). https://sites.google.com/view/corl22benchmarkingworkshop/home

2019 **Bringing Robots to the Computer Vision Community** at CVPR (Long Beach, CA) https://sites.google.com/andrew.cmu.edu/cvpr19robots/home

Students and Interns Advised

2022 – 2023 **Wentao Yuan, UW** NVIDIA PhD Intern

2022 **Sudeep Dasari, CMU** NVIDIA PhD Intern

2021 – 2022 **Adam Fishman, UW** NVIDIA PhD Intern, Motion Policy Networks

2021 **Yun-Chun Chen, University of Toronto** NVIDIA PhD Intern, Neural Motion Fields

Tao Chen, MIT NVIDIA PhD Intern, RL for Handover

2017 – 2018 **Tao Chen** M.S. in Robotics, CMU. Next Position: PhD EECS, MIT

Gaurav Pathak CMU Visitor. Next Position: CMU M.S. Robotics

2016 **Maitreyee Joshi** Undergraduate Research, CMU. Next Position: Microsoft

Open-source Software

2022 **Motion Policy Networks** NVIDIA Intern project by Adam Fishman. Large-scale imitation learning of motion-planning: https://github.com/NVlabs/motion-policy-networks

2020 **TaskGrasp** Task-Oriented 6-DOF Grasping with Graph Neural Networks. https://github.com/adithyamurali/TaskGrasp

2019 **PyRobot** Light weight, hardware independent framework for robot manipulation and navigation. https://github.com/facebookresearch/pyrobot

LoCoBot Low-cost (around $4K USD in 2019, before covid-hyperinflation) mobile manipulator for research and education. http://www.locobot.org/

Research Publications

1 **A. Murali**, A. Mousavian, C. Eppner, A. Fishman, and D. Fox, "CabiNet: Scaling neural collision detection for object rearrangement with procedural scene generation," in *Proceedings of the IEEE*

International Conference on Robotics and Automation (ICRA), May 2023. URL: https://cabinet-object-rearrangement.github.io/.

2 Y.-C. Chen, **A. Murali**, B. Sundaralingam, W. Yang, A. Garg, and D. Fox, "Neural motion fields: Encoding grasp trajectories as implicit value functions," in *RSS Workshop on Implicit Representations for Robotics*, 2022. URL: https://arxiv.org/abs/2206.14854.

3 A. Fishman, **A. Murali**, C. Eppner, B. Peele, B. Boots, and D. Fox, "Motion policy networks," in *Conference on Robot Learning (CoRL)*, 2022. URL: https://mpinets.github.io/.

4 A. Mousavian, L. Manuelli, B. Okorn, *et al.*, "Objectseeker: A unified framework for one-shot object detection, tracking, and instance segmentation of everyday objects," in *arXiv*, 2022.

5 **A. Murali**, W. Liu, K. Marino, S. Chernova, and A. Gupta, "Same object, different grasps: Data and semantic knowledge for task-oriented grasping.," in *Conference on Robot Learning (CoRL)*, 2020. URL: https://arxiv.org/abs/2011.06431.

6 **A. Murali**, A. Mousavian, C. Eppner, C. Paxton, and D. Fox, "6-dof grasping for target-driven object manipulation in clutter," in *IEEE International Conference on Robotics and Automation (ICRA)*, Best Manipulation Paper Award Finalist, 2020. URL: https://arxiv.org/abs/1912.03628.

7 **A. Murali**, T. Chen, K. V. Alwala, *et al.*, "Pyrobot: An open-source robotics framework for research and benchmarking," 2019. arXiv: 1906.08236. URL: https://arxiv.org/abs/1906.08236.

8 T. Chen, **A. Murali**, and A. Gupta, "Hardware conditioned policies for multi-robot transfer learning," in *Neural Information Processing Systems (NeurIPS)*, 2018. URL: https://arxiv.org/abs/1811.09864.

9 A. Gupta, **A. Murali**, D. Gandhi, and L. Pinto, "Robot learning in homes: Improving generalization and reducing dataset bias," in *Neural Information Processing Systems (NeurIPS)*, 2018. URL: https://arxiv.org/abs/1807.07049.

10 **A. Murali**, Y. Li, D. Gandhi, and A. Gupta, "Learning to grasp without seeing," in *International Symposium on Experimental Robotics (ISER)*, 2018. URL: https://arxiv.org/abs/1805.04201.

11 **A. Murali**, L. Pinto, D. Gandhi, and A. Gupta, "CASSL: Curriculum accelerated self-supervised learning," in *IEEE International Conference on Robotics and Automation*, 2018. URL: https://arxiv.org/abs/1708.01354.

12 **A. Murali**, A. Garg, S. Krishnan, *et al.*, "Tsc-dl: Unsupervised trajectory segmentation of multi-modal surgical demonstrations with deep learning," in *IEEE International Conference on Robotics and Automation (ICRA)*, May 2016. URL: http://berkeleyautomation.github.io/tsc-dl/.

13 S. McKinley, A. Garg, S. Sen, *et al.*, "A single-use haptic palpation probe for locating subcutaneous blood vessels in robot-assisted minimally invasive surgery," in *Conference on Automation Science and Engineering (CASE)*, 2015. URL: http://berkeleyautomation.github.io/surgical-tools/.

14 **A. Murali**, S. Sen, B. Kehoe, *et al.*, "Learning by observation for surgical subtasks: Multilateral cutting of 3d viscoelastic and 2d orthotropic tissue phantoms," in *IEEE International Conference on Robotics and Automation (ICRA)*, Best Medical Robotics Paper Award Finalist, May 2015. URL: https://www.youtube.com/watch?v=beVWB6NtAaA.

15 K. Nichols, **A. Murali**, S. Sen, K. Goldberg, and A. Okamura, "Models of human-centered automation in a debridement task," in *International Conference on Intelligent Robots and Systems (IROS)*, 2015.

16 K. Shamaei, Y. Che, **A. Murali**, *et al.*, "A paced shared-control teleoperated architecture for supervised automation of multilateral surgical tasks," in *International Conference on Intelligent Robots and Systems (IROS)*, 2015.

17 J. Mahler, S. Krishnan, M. Laskey, *et al.*, "Learning accurate kinematic control of cable-driven surgical robots using data cleaning and gaussian process regression," in *Conference on Automation Science and Engineering (CASE)*, 2014.

18 **A. Murali** and S. Subbiah, "A morphological study on direct polymer cast micro-textured hydrophobic surfaces," *Surface and Coatings Technology*, vol. 205, pp. 4764–4770, 2011.

Academic Experience

2016 – 2020 **Research Assistant** Carnegie Mellon University. PhD Advisor: Abhinav Gupta.

2014 – 2016 **Research Assistant** Berkeley Artificial Intelligence Lab. Advisors: Ken Goldberg and Pieter Abbeel.

2013 **Research Assistant** Lawrence Berkeley National Lab. Advisors: Ali Javey.

2009 – 2010 **Research Assistant** Nanyang Technological University. Advisor: Sathyan Subbiah.

2010 **Research Science Institute** Massachusetts Institute of Technology.

References

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