ANIMESH GARG

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CURRENT APPOINTMENTS

Georgia Institute of Technology August, 2024 - Present
Stephen Fleming Early Career Professor *Atlanta, GA*

University of Toronto August, 2023 - Present
Assistant Professor, Computer Science (courtesy) *Toronto, ON*

Vector Institute April, 2023 - present
Faculty Affiliate (courtesy) *Toronto, ON*

EDUCATION

University of California, Berkeley *2016*
· Ph.D., Operations Research, Minor in Artificial Intelligence & Machine Learning
Committee: Ken Goldberg, Alper Atamtürk, Pieter Abbeel, Laurent El Ghaoui
· M.S., Computer Science
Committee: Ken Goldberg, Pieter Abbeel, Alper Atamtürk

Georgia Institute of Technology, Atlanta *2011*
· M.S., Industrial Engineering
Committee: Henrik Christensen, Jim Rehg

Netaji Subhas Institute of Technology, University of Delhi, India *2010*
· B.E., Manufacturing Processes & Automation Engineering

HONORS AND AWARDS

Individual Recognition:

2025	World Summit AI Keynote Speaker
2024	Chosun Biz (South Korean Media Conglomerate) Smartcloud Show Keynote Speaker
2021	AAAI New Faculty Highlights Invited Speaker
2020	Canada CIFAR AI Chair
2018	Stanford-Coulter Translational Research Award (with PI: Silvio Savarese) ($100K)
2015	Invited Speaker at the IEEE ICRA 2015 Ph.D. Forum
	UC Berkeley Ira Abraham Fellowship
2014	Elected Student/Non-Oncology Resident, American Society of Clinical Oncology
	UC Regents Fellowship (Summer)
2013	NSF Travel Support for IEEE CASE 2013
	S. Tashiera Fellowship, UC Berkeley (Summer)
2012	UC Berkeley International Office Tuition Award
2012–13	Earl C. Anthony Tuition Fellowship, UC Berkeley
2010	Erasmus Mundus Fellowship (full tuition and stipend at TU Munich)
2007–10	University of Delhi Academic Merit Scholarship Award (full tuition waiver)
2004–10	State Bank of India Meritorious Student Scholarship (stipend)

Research Paper Recognition:

2024	Best Conference Paper Award at IEEE ICRA 2024
2022	Best Paper Finalist at Learning for Dynamics and Control (L4DC) 2022

2021	Best Student Paper Award at Robotics Systems and Science (RSS) 2021
2020	Outstanding Paper Award, Object Oriented Learning Workshop, ICML 2020
2019	Best Conference Paper Award at IEEE ICRA 2019
	Best Workshop Paper Award, Robot Learning Workshop, NeurIPS 2019
	Best Cognitive Robotics Paper Finalist at IEEE ICRA 2019
	Best Cognitive Robotics Paper Finalist at IEEE IROS 2019
2015	Best Video Award at Hamlyn Surgical Robotics Challenge 2015
	Best Medical Robotics Paper Finalist at IEEE ICRA 2015
	Best Workshop Paper Award at IEEE ICRA 2015
2012	Best Application Paper Award at IEEE CASE 2012

PREVIOUS PROFESSIONAL EXPERIENCE

Apptronik Nov, 2024 - Apr, 2024
Chief Science Officer *Austin, TX*

Nvidia AI Research Aug, 2018 - Oct, 2024
Senior Staff Research Scientist *Santa Clara, CA*

University of Toronto Aug, 2019 - Jul, 2023
Assistant Professor, Computer Science & Mechanical Engineering *Toronto, ON*

Vector Institute Aug, 2019 - Apr, 2023
CIFAR AI Chair Faculty *Toronto, ON*

Stanford AI Lab Aug, 2016 - Aug, 2018
Postdoctoral Researcher (Fei-Fei Li and Silvio Savarese) *Stanford, CA*

Osaro Inc Oct, 2016 - May, 2017
Robotics Consultant *San Francisco, CA*

Automation Lab, UC Berkeley Aug, 2011 - Aug, 2016
Graduate Student Researcher *Berkeley, CA*

National Thermal Power Corporation Summer, 2009
Engineering Intern *New Delhi, India*

JK Tyre Pvt India Ltd. Winter, 2007
Engineering Intern *Banmore, India*

RESEARCH INTERESTS & SIGNIFICANT CONTRIBUTIONS

I develop Algorithmic Foundations for **Generalizable Autonomy**. I focus on understanding **representational inductive biases and causal inference** in conjunction with **scalable data-driven embodied learning**. My research blends Reinforcement Learning, Computer Vision and Causality. My current focus is on applications of intelligent manipulation in robotics.

Foundation Models for Decision Making. FMs provide a strong prior for reasoning enabling planning [J19, J20] as well as control. We build new architectures decision making at different spatio-temporal resolutions. **Representation Learning in RL** . Reinforcement Learning is sample inefficient which prevents broad adoption in real robotics. I have new insights to build structure in RL through representations of state [C29], actions [C32], models [C72], gradients [C73, C101] **Crowdsourcing Robot Learning** . Robot Learning has not benefited from large supervised datasets which have driven AI progress in Computer Vision and Natural Language. I have invented, RoboTurk [C27, C33, C102, patent pending], to crowdsource data collection in robotics enabling efficient learning [C37, C46], and built open source frameworks [J17, C99] leading to Isaac Lab community.

TEACHING

University of Toronto
- CSC 375: *Algorithmic Intelligence in Robotics* (Instructor) — *F20, W22*
- CSC 475: *Introduction to Reinforcement Learning* (Instructor) — *W21, F21*
- CSC 2547: *Graduate Topics in Deep Learning: 3D & Geometric Structure* (Instructor) — *W21*
- CSC 2621: *Graduate Topics in Reinforcement Learning for Robotics* (Instructor) — *W20*

Stanford University
- CS 332: *Advanced Survey of Reinforcement Learning* (Co-Instructor) — *F17*

University of California, Berkeley
- IEOR 131: *Simulation of Industrial Engineering Systems* (TA) — *Sp16*
- IEOR 170: *Industrial Design and Human Factors* (TA) — *Sp15*
- IEOR 115: *Industrial and Commercial Data Systems* (TA) — *F14, F13, Sp13, F11*
- IEOR 191: *Technology Entrepreneurship* (TA) — *F12*

Georgia Institute of Technology
- CS 3451: *Computer Graphics* (Grader) — *Sp11*

SERVICE & OUTREACH

- **Conference Organization**:
  - ICLR 2025: *Program Chair*
  - NeurIPS 2023: *Socials Co-Chair*
  - CoRL 2023: *Publicity Chair*
  - NeurIPS 2022: *Communications Co-Chair*
  - CoRL 2022: *Open Problems Co-Chair*
  - CoRL 2020: *Publicity Chair*
- **Workshop Organization**.
  - CORL 2024: *Workshop on Mastering Robot Manipulation in a World of Abundant Data*
  - ICRA 2024: *Workshop C4SR+: Surgical Robotic Systems in the Embodied AI Era*
  - IROS 2023: *Data vs Model in Medical Robotics*
  - NeurIPS 2022: *Deep Learning & Differential Equations*
  - NeurIPS 2021: *Deep Learning & Differential Equations*
  - NeurIPS 2021: *Deployable Decision Making*
  - IROS 2021: *Safe Real-World Robot Autonomy*
  - RSS 2021: *Visual Learning and Reasoning for Robotics*
  - COSPAR 2021: *Autonomy for Future Space Science Missions*
  - ICLR 2020: *Deep Learning and Differential Equations*
  - RSS 2020: *Action Representation Learning*
  - RSS 2020: *Visual Learning and Reasoning for Robotics*
  - RSS 2018: *Causal Learning in Robotics*
  - ICML 2018: *Machine Learning in Robotics*
  - MICCAI 2018: *Deep Reinforcement Learning for Medical Applications*
  - ICRA 2017: *C4 Surgical Robots: Compliant, Continuum, Cognitive, and Collaborative*
  - 3DV 2016: *Understanding 3D and Visuo-Motor Learning*
- **Area Chair/Associate Editor**: Managing reviews and recommending decisions in Sub-Topics.
  - Robotics: RSS (2021), CoRL (2020, 2021, 2022), ICRA (2018, 2020, 2021, 2022), IROS (2020)
  - Machine Learning: NeurIPS (2020, 2021, 2022, 2023), ICML (2024), ICLR (2021, 2024)
  - Computer Vision: ECCV (2022), CVPR (2021, 2024), ICCV (2021)
- **Reviewing**

Funding: NASA Proposal Review in Medical Robotics 2017.

Journals: *International Journal of Robotics Research (IJRR)* – 2016-18; *Robotics & Automation Letters (RA-L)* – 2018; *Computer Vision & Image Understanding (CVIU)* – 2017; *IEEE Transactions on Automation Science and Engineering (T-ASE)* – 2015-16; *Springer Journal on Australasian Physical & Engineering Sciences in Medicine* – 2014.

Conferences

· **Computer Vision**: *IEEE Conf on Computer Vision and Pattern Recognition (CVPR)* – 2018-19; *European Conf on Computer Vision (ECCV)* – 2018-2020.

· **Machine Learning**: *Int'l Conf. on Learning Representations (ICLR)* – 2019-2020; *Neural Information Processing Systems (NeurIPS)* – 2018-19; *Conf. on Artificial Intelligence (AAAI)* – 2017-18.

· **Robotics**: *IEEE Int'l Conf on Robotics and Automation (ICRA)* – 2014-20; *IEEE Int'l Conf. on Intelligent Robots and Systems (IROS)* – 2015-19,2022; *Conference on Robot Learning (CoRL)* – 2017-19; *IEEE Int'l Conf on Automation Science and Engineering (CASE)* – 2013-16.

· **Outreach**

· Tutorial and Demo on Intro to Learning in Robotics at AI4ALL at Stanford. *Summer 2018*

· Organized Lab Tour for Society of Women Engineers to encourage STEM in High-School Girls. *Nov 2015*

· Organized *Berkeley Automation Sciences Lab Open House*, Cal Day *2013–15.*
Research showcase for the community and prospective college students to be exposed to the college environment and STEM as a potential career.

· Student Committee Member for UC Berkeley EECS and IEOR faculty Searches *2015*

· *NSIT Alumni Association* Co-Founded an online alumni network & started bi-annual publication. *2009*

RESEARCH FUNDING

Georgia Institute of Technology, IRIM Seed Award 2023-2024
PI *$30,000 USD*
Learning to Plan with LLM guidance.

University of Toronto, Dean's Strategic Fund 2020-2023
Co PI with T. Barfoot. J. Burgner-Kahrs, S. Waslander, A. Schoellig, J. Kelly, F. Shkurti. $325000 CAD
Connecting the Bots: Accelerating Joint Robotics Research between UTIAS and UTM.

LG AI Research Grant 2021-2022
PI *$120,000 CAD*
Causal Models for Time-Series Forecasting.

Huawei AI Research Grant 2021-2022
PI *$180,000 CAD*
Decision Support Models in Autonomous Driving.

NSERC Discovery Grant 2021-2025
PI *$120,000 CAD*
Causal Models for Generalizable Robot Learning.

Canada Foundation for Innovation's John R. Evans Leaders Fund (CFI-JELF) 2020
Co-PI with Florian Shkurti. *$354,000 CAD*
Autonomous mobile manipulation in human environments – learning algorithms and robot systems.

University of Toronto XSeed Innovation Award 2020-2022
Co-PI with Jonathan Kelly. *$120,000 CAD*
Neural Representation Learning on Continuous Manifolds for Robotics.

New Frontiers in Research Fund (NFRF) Exploration 2020-2022
Co-PI with Florian Shkurti, Sanja Fidler, Angela Schoellig, Alan Aspuru-Guzik. *$250,000 CAD*
Reproducible Chemical Synthesis & Materials Discovery via Human Demonstrations & Autonomous Robotics.

MENTORING

Postdocs: 1+2 (current), PhD: 10 (current), MSc: 4+1(current)

Status	Student	Affiliation	Year	After Graduation
Postdoc	Miroslav Bogdanovic	Toronto CS	2023-	
	Kourosh Darvish	Toronto CS	2022-2024	Acceleration Consortium
	Siqi Zhou	Toronto CS	2022-23	TU Munich
	Nikita Dvornik	Toronto CS	2021-22	Samsung AI Research
PhD	Dylan Turpin	Toronto PhD (CS)	2021-	
	Zihan Zhou	Toronto PhD (CS)	2021-	
	Albert Wilcox	GT PhD (CS)	2023-	
	Lorand Chang	GT PhD (CS)	2023-	
	Jeremy Collins	GT PhD (CS)	2023-	
	Shuxin Cao	GT PhD (CS)	2023-	
	Liquan Wang	GT PhD (CS)	2024-	
	Ezra Ameperosa	GT PhD (CS)	2024-	
	Hrishit Leen	GT PhD (CS)	2025-	
Masters (Thesis)	Liquan Wang	Toronto MSc (CS)	2021-2023	PhD, GT
	Qizhen (Irene) Zhang	Toronto MSc (CS)	2020-22	PhD, Oxford
	Shunshi (Matthew) Zhang	Toronto MSc (CS)	2020-22	PhD, UofT
	Homanga Bharadhwaj	Toronto MSc (CS)	2019-21	PhD, CMU
	Dylan Turpin	Toronto MSc (CS)	2019-21	PhD, UofT
Masters (Project)	Anson Leung	Toronto MScAC	2021	Kindred/Ocado
	Noel Vouitsis	Toronto MScAC	2021	Layer6
	Panteha Naderian	Toronto MScAC	2020	Layer6
	Keyu Long	Toronto MScAC	2020	Layer6
	Priya Thakur	Toronto MScAC	2020	Google
	Mohan Zhang	Toronto MScAC	2020	Quartic.ai
	Yu-Siang Wang	Toronto MScAC	2020	Microsoft
Visitors	Andrew Melnik	Univ. Bielefeld (Postdoc)	2022	
	Chaitanya Devaguptatu	IIT Hyd. MS	2021-22	
	Haoyu Xiong	TJU BS	2020-21	MS, CMU
	Chenjia Bai	HIT PhD	2021	HIT
	Jiankai (Jack) Sun	CUHK BS	2020-21	MSc CUHK
	Mayank Mittal	ETH MSc	2020-2021	PhD, ETH
	Alexandra Volokhova	MIPT MSc	2020-2021	PhD, MILA
	Sizhe (Benny) Sui	SJTU BS	2020	SJTU, MS(Robotics)
Interns	Melissa Mofizian	Nvidia	2021	
	Krishna Javatabhulla	Nvidia	2021	Postdoc, MIT
	Zhaoming Xie	Nvidia	2020	Postdoc, Stanford

Valts Blukis	Nvidia	2020	Research Scientist, Nvidia
Michael Lutter	Nvidia	2020	TU Darmstadt (PhD)
Beidi Chen	Nvidia	2019	Postdoc, Stanford
Weili Nie	Nvidia	2019	Research Scientist, Nvidia
De-An Huang	Nvidia	2019	Research Scientist, Nvidia
Yunzhu Li	Nvidia	2019	MIT (PhD)
Hongyu Ren	Nvidia	2019	Stanford (PhD)
Ajay Mandlekar	Nvidia	2019	Research Scientist, Nvidia

My group also has 24 current UG students (pair-people).
Moreover, in my role as a Postdoc (Stanford), I advised 7 PhD students, 4 MS and 8 UG students. Further as a PhD student (UC Berkeley), I advised 1 MS and 7 UG students.

SELECTED INVITED TALKS & DEMOS

- **Generalizable Autonomy in age of Generative AI**
  - Chosun Biz SmartCloud Show — *Sep 2024*
  - NASA Jet Propulsion Lab (JPL) — *Oct 2024*
  - AUTOMATE AI & Smart Automation Conference — *Nov 2024*
  - EASE Fall School — *Nov 2024*
- **Facets of Dexterity: Simulation, RL, and Imitation**
  - CoRL Workshop on Dexterous Manipulation — *Nov 2024*
- **Robot Foundation Models: Generalizable Embodied Interaction**
  - IEEE Space Computing Conference - Space Robotics Workshop — *Jul 2024*
- **Perspective on Prospection: Generalization through Semantics**
  - RSS Workshop on Semantic Reasoning and Goal Understanding in Robotics — *Jul 2024*
- **Generalizable Robotics in Lab Automation guided by Foundation Models**
  - ICRA Workshop on Accelerating Discovery in Natural Science Labs with AI & Robotics — *May 2024*
- **Embracing Contacts: Differentiable Simulation for Learning Control**
  - ICRA MyoSymposium Expanding Frontiers of Sim2Real — *May 2024*
  - ISAIM Special Session on Deep Reinforcement Learning — *Jan 2024*
- **Towards Generalizable Autonomy: Duality of Discovery & Bias**
  - MIT Embodied AI Seminar — *Jan 2023*
  - Vanderbilt Machine Learning Seminar — *Jan 2023*
  - ETH Autonomy Talks — *Nov 2022*
  - Stanford University — *Oct 2022*
  - UCSD, University of Windsor — *Feb-Mar 2022*
- **Off-Policy Learning: Online, Offline Data Augmentation**
  - DLRL Summer School 2022 — *Jul 2022*
- **Continuous-Time Reinforcement Learning**
  - Invited Speaker at NVIDIA RL Technical Workshop — *Jan 2022*
- **Industrial trends in AI and Research**
  - Invited Speaker & Panelist at UofT AI Conference 2022 — *Jan 2022*
- **Paving the road to Robot Autonomy with Simulation**
  - Invited Speaker at NVIDIA Robotics & AI Technical Workshop — *Sep 2021*
- **Causal Inference in Decision Making & Prediction**
  - Invited Speaker at Canadian Operations Research Society Annual Conference — *Jun 2021*

- **Building Blocks of Generalizable Autonomy**
  UCSD; MIT; SFU; UWaterloo; VinAI; Technion *Feb 2021 - Jun 2021*
- **Generalizable Autonomy in Robotic Manipulation**
  Keynote Speaker, Student Conference on AI, UoFT *Jan 2021*
  Keynote Speaker, Engineering Science Conference, UofT *Jan 2021*
- **Structured Inductive Bias for Imitation from Videos**
  CVPR Workshop on Learning from Instructional Videos *Jun 2020*
- **Unsupervised Representations towards Counterfactual Predictions**
  CVPR Workshop on Compositionality in Computer Vision *Jun 2020*
- **Generalizable Autonomy in Robotic Manipulation**
  Keynote Speaker, Conference on Computer and Robot Vision *May 2020*
- **Structured Priors in Robot Learning**
  Fields Institute, Toronto; MIT Deep Learning, MIT; Huawei Noah's Ark Research;
  SoE, University of Toronto; EASE Summer school, University of Bremen *Sept 2019 - Jan 2020*
- **Generalizable Autonomy in Robotics**
  Google X; Re:Work Deep Reinforcement Learning; Vector Institute; ETH Zurich *Apr-July 2019*
- **Deep Reinforcement Learning for Medical Applications**
  MICCAI 2018 Tutorial in Deep RL *Sept 2018*
- **Generalizable Robot Learning: Manipulation and Mobility**
  CVPR18 Fine-Grained Instructional Video understanding Workshop; Re:Work Deep Learning for Robotics;
  NVIDIA GTC 2018; TRI Symposium (Stanford-MIT-Michigan) *Dec 2017-June 2018*
- **Towards Generalizable Imitation in Robotics**
  University of Toronto (CS), University of Michigan (CS), NYU (CS-Courant),
  USC (EE), Univ. of British Columbia (EE), University of Sydney (ACFR) *Mar-Apr 2018*
  Google AI, MSR, FAIR, Nvidia Research *May-June 2018*
  Stanford Robotics Seminar Series, MIT (AA), CalTech (MCE), UNC (CS) *Nov 2017 - Jan 2018*
- **Closing the Visuo-Motor Loop with Deep Reinforcement Learning**
  Stanford CS 331B, AA 274, CS 327A Guest Lecturer *Oct'16-Mar'17*
  SAIL-Toyota AI Center Annual Review *Sept 2016*
- **Algorithmic Automation in Medical Robotics**,
  MIT (ME), UC San Diego (ECE), Stanford (CS) *Mar-Apr 2016*
  Uber Marketplace Optimization, Amazon Research, Baidu Research, Drive.ai (now Apple) *Jan-Apr 2016*
- **Unsupervised Task Segmentation For Learning from Demonstrations**,
  BEARS Research Symposium (short talk), Berkeley, CA *Feb 2016*
  Algorithms for Human Robot Interaction Workshop, Berkeley, CA *Nov 2015*
- **Algorithms for 3D Printed Implants for Brachytherapy in Intracavitary Tumors**,
  INFORMS 2015 Conference, Philadelphia, PA *Nov 2015*
- **UC Berkeley IEOR 24** Intro to IEOR (Seminar) Guest Lecture: OR in Healthcare *Sept 2015*
- **Learning by Observation for Surgical Subtasks**,
  BEARS Research Symposium (short talk), Berkeley, CA *Feb 2015*
- **Custom 3D printed Implants for High Dose Rate Brachytherapy**,
  Poster & Demo at Stanford Berkeley Robotics Symposium, *Oct 2014*
  BEARS Research Symposium (short talk), Berkeley, CA *Feb 2014*
- **UC Berkeley IEOR 24** Intro to IEOR (Seminar) Guest Lecture: Linear Programming *Sept 2011*
- **A Robotic System for Needle Steering**, IEEE IROS 2011 Demonstrations *Sept 2011*

REFERENCES

Please contact me for timely delivery of reference letters.

PEER-REVIEWED PUBLICATIONS

Updated list of publications also available on Google Scholar and animesh.garg.tech
Journal: 24, Conference: 113 + 2 (under review), Workshops: 23, Patents: 4+20 (filed)

Theses

[T2] Optimization and Design for Automation of Brachytherapy Delivery and Learning Robot-Assisted Surgical Subtasks. Ph.D. Thesis, University of California, Berkeley, 2016.

[T1] Autonomous Palpation for Tumor Localization: Design of a Palpation Probe and Gaussian Process Adaptive Sampling. Masters' Thesis, University of California, Berkeley, 2016.

Preprints (Under Review)

[U2] A. Wilcox, M. Ghanem, M. Moghani, P. Barroso, B. Joffe, **A Garg**. Adapt3R: Adaptive 3D Scene Representation for Domain Transfer in Imitation Learning. *Preprint under review.*

[U1] Y. Zhao, M. Bogdanovic, C. Luo, S. Tohme, K. Darvish, A. Aspuru-Guzik, F. Shkurti, **A. Garg**. AnyPlace: Learning Generalized Object Placement for Robot Manipulation *Preprint under review.*

Journal Publications

[J24] K. Darvish, M. Skreta, Y. Zhao, N. Yoshikawa, S. Som, M. Bogdanovic, Y. Cao, H. Hao, H. Xu, A. Aspuru-Guzik, **A. Garg**, F. Shkurti ORGANA: a robotic assistant for automated chemistry experimentation and characterization. *Matter 2025*

[J23] A. Cooper, P. Courtney, K. Darvish, M. Eckhoff, H. Fakhruldeen, A. Gabrielli, **A. Garg**, S. Haddadin, K. Harada, J. Hein, M. Hübner, D. Knobbe, G. Pizzuto, F. Shkurti, R. Shrestha, K. Thurow, R. Vescovi, B. Vogel-Heuser, Á. Wolf, N. Yoshikawa, Y. Zeng, Z. Zhou, H. Zwirnmann Accelerating Discovery in Natural Science Laboratories with AI and Robotics: Perspectives and Challenges from the 2024 IEEE ICRA Workshop, Yokohama, Japan *Science Robotics 2025*

[J22] K. Dharmarajan, W. Panitch, B. Shi, H. Huang, L. Chen, M. Moghani, Q. Yu, K. Hari, T. Low, D. Fer, **A. Garg**, K. Goldberg. Robot-Assisted Vascular Shunt Insertion with the dVRK Surgical Robot. *Journal of Medical Robotics Research (JMRR) 2023.*

[J21] A. Melnik, R. Schiewer, M. Lange, A. Muresanu, M. Saeidi, **A. Garg**, H. Ritter Benchmarks for Physical Reasoning AI *Transactional of Machine Learning Research (TMLR) 2023*

[J20] N. Yoshikawa, M. Skreta, K. Darvish, S. Arellano-Rubach, Z. Ji, L. B. Kristensen, A. Z. Li, Y. Zhao, H. Xu, A. Kuramshin, A. Aspuru-Guzik, F. Shkurti, **A. Garg**. Large Language Models for Chemistry robotics. *Autonomous Robots (AuRO) 2023.*

[J19] I. Singh, V. Blukis, A. Mousavian, A. Goyal, D. Xu, J. Tremblay, D. Fox, J. Thomason, **A. Garg**. ProgPrompt: Generating situated robot task plans using large language models *Autonomous Robots (AuRO) 2023.*

[J18] K. Dharmarajan, W. Panitch, B. Shi, H. Huang, L. Chen, M. Moghani, Q. Yu, K. Hari, T. Low, D. Fer, **A. Garg**, K. Goldberg. Robot-Assisted Vascular Shunt Insertion with the dVRK Surgical Robot *Journal of Medical Robotics Research (JMRR) 2023.*

[J17] M. Mittal, C. Yu, Q. Yu, J. Liu, N. Rudin, D. Hoeller, J.L. Yuan, P. Poorsarvi Tehrani, R. Singh, Y. Guo, H. Mazhar, A. Mandlekar, B. Babich, Gavriel State, M. Hutter, **A. Garg.** ORBIT: A Unified Simulation Framework for Interactive Robot Learning Environments *IEEE Robotics and Automation Letters (RA-L) 2023.* (also at IROS 2023)

[J16] E. Heiden, F. Ramos, M. Macklin, Y. Narang, **A. Garg**, D. Fox. DiSECt: A Differentiable Simulator for Parameter Inference and Control in Robotic Cutting. *Autonomous Robots (AuRO) 2023.*

[J15] A.T. Bourdillon AT, **A. Garg**, H. Wang, Y.J. Woo, M. Pavone, J. Boyd Integration of Reinforcement Learning in a Virtual Robotic Surgical Simulation. *Surgical Innovation. 2023*

[J14] N. Yoshikawa, K. Darvish, M. G. Vakili, **A. Garg**, A. Aspuru-Guzik Digital pipette: Open hardware for liquid transfer in self-driving laboratories. *Journal of Digital Discovery, 2023*

[J13] M. Lutter, B. Belousov, S. Mannor, D. Fox, **A. Garg**, J. Peters. Continuous-Time Fitted Value Iteration for Robust Policies. *IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI) 2022.*

[J12] C. Bai, T. Xiao, Z. Zhu, L. Wang, F. Zhou, **A. Garg**, B. He, P. Liu, Z. Wang. Monotonic Quantile Network for Worst-Case Offline Reinforcement Learning. *IEEE Transactions on Neural Networks and Learning Systems 2022.*

[J11] J. Sun, D.-A. Huang, B. Lu, Y.-H. Liu, B. Zhou, **A. Garg**. PlaTe: Visually-Grounded Planning with Transformers in Procedural Tasks. *IEEE Robotics and Automation Letters (RA-L) 2022.*

[J10] D. P. Losey, H. J. Jeon, M. Li, K. Srinivasan, A. Mandlekar, **A. Garg**, J. Bohg, D. Sadigh. Learning Latent Actions to Control Assistive Robots. *Autonomous Robots (AuRO) 2021.*

[J9] A. Dundar, K. J. Shih, **A. Garg**, R. Pottorf, A. Tao, B. Catanzaro. Unsupervised Disentanglement of Pose, Appearance and Background from Images and Videos. *IEEE Transactions of Pattern Analysis and Machine Intelligence 2021 (PAMI-TC).*

[J8] V. Joseph, G. Gopalakrishnan, S. Muralidharan, M. Garland, **A. Garg**. A Programmable Approach to Model Compression. *IEEE Micro 2020.*

[J7] D. P. Losey, K. Srinivasan, A. Mandlekar, **A. Garg**, D. Sadigh. Controlling Assistive Robots with Learned Latent Actions. *IEEE Robotics and Automation Letters (RA-L) 2020 (also at IEEE ICRA 2020).*

[J6] M. A. Lee, Y. Zhu, P. Zachares, M. Tan, K. Srinivasan, S. Savarese, L. Fei-Fei, **A. Garg**, J. Bohg. Making Sense of Vision and Touch: Learning Multimodal Representations for Contact-Rich Tasks. *Transactions of Robotics, 2020.*

[J5] K. Fang, Y. Zhu, **A. Garg**, V. Mehta, A. Kurenkov, L. Fei-Fei, S. Savarese. Learning Task-Oriented Grasping for Tool Manipulation with Simulated Self-Supervision. *Int'l Journal of Robotics Research, 2020.*

[J4] S. Krishnan, **A. Garg**, R. Liaw, B. Thananjeyan, L. Miller, F. T. Pokorny, K. Goldberg. SWIRL: A Sequential Windowed Inverse Reinforcement Learning Algorithm for Robot Tasks With Delayed Rewards, *Int'l Journal of Robotics Research, 2018.*

[J3] S. Krishnan*, **A. Garg***, S. Patil, C. Lea, G. Hager, P. Abbeel, K. Goldberg.(* equal contribution) Transition State Clustering: Unsupervised Surgical Trajectory Segmentation For Robot Learning, *Int'l Journal of Robotics Research, 2017.*

[J2] K. Mellis, T. Siauw, A. Sudhyadhom, R. Sethi, I-C. Hsu, J. Pouliot, **A. Garg**, K. Goldberg, J. A. Cunha. Material Evaluation of PC-ISO for Customized, 3D Printed, Gynecologic ^{192}Ir HDR Brachytherapy Applicators. *Journal of Applied Clinical Medical Physics (JACMP) 2014.*

[J1] **A. Garg**, T. Siauw, D. Berenson, A. Cunha, I-C. Hsu, J. Pouliot, D. Stoianovici, and K. Goldberg. Open-Loop Robot-Guided Insertion of Optimized Skew-Line Needle Arrangements for High Dose Rate Brachytherapy. *IEEE Transactions on Automation Science and Engineering, 2013.*

Conference Publications (archival)

[C113] I. Georgiev, V. Giridhar, N. Hansen, **A. Garg**. PWM: Policy Learning with Large World Models *International Conference on Learning Representations (ICLR) 2025*

[C112] W. Yu, S. Yin, S. Easterbrook, **A. Garg**. EgoSim: Egocentric Exploration in Virtual Worlds with Multi-modal Conditioning *International Conference on Learning Representations (ICLR) 2025*

[C111] M. Moghani, N. Nelson, M. Ghanem, A. Diaz-Pinto, K. Hari, M. Azizian, K. Goldberg, S. Huver, **A. Garg**. SuFIA-BC: Generating High Quality Demonstration Data for Visuomotor Policy Learning in Surgical Subtasks *Int'l Conference on Robotics and Automation (ICRA) 2025*

[C110] W. Byrnes, M. Bogdanovic, A. Balakirsky, S. Balakirsky, **A. Garg**. CLIMB: Language-Guided Continual Learning for Task Planning with Iterative Model Building *Int'l Conference on Robotics and Automation (ICRA) 2025*

[C109] E. Ameperosa, J. Collins, M. Jain, **A. Garg**. RoCoDA: Counterfactual Data Augmentation for Data-Efficient Robot Learning from Demonstrations *Int'l Conference on Robotics and Automation (ICRA) 2025*

[C108] A. Mete, H. Xue, A. Wilcox, Y. Chen, **A. Garg**. Quest: Self-supervised skill abstractions for learning continuous control *Advances in Neural Information Processing Systems (NeurIPS) 2024*

[C107] K. Srinivasan, J. Collins, E. Heiden, I. Ng, J. Bohg, **A. Garg**. DexMOTS: Dexterous Manipulation with Differentiable Simulation *Int'l Symposium on Robotics Research (ISRR Springer) 2024*

[C106] T. Mu, Y. Guo, J. Xu, A. Goyal, H. Su, D. Fox, **A. Garg**. AdaDemo: Data-Efficient Demonstration Expansion for Generalist Robotic Agent *Int'l Symposium on Robotics Research (ISRR Springer) 2024*

[C105] Z. Zhou, **A. Garg**, D. Fox, C. Garrett, A. Mandlekar. SPIRE: Synergistic Planning, Imitation, and Reinforcement Learning for Long-Horizon Manipulation *Conference on Robot Learning (CoRL) 2024*

[C104] L. Wang, A. Goyal, H. Xu, **A. Garg**. Discovering Robotic Interaction Modes with Discrete Representation Learning. *Conference on Robot Learning (CoRL) 2024*

[C103] M. Moghani, L. Doorenbos, W. C.-H. Panitch, S. Huver, M. Azizian, K. Goldberg, **A. Garg**. SuFIA: Language-Guided Augmented Dexterity for Robotic Surgical Assistants. *Int'l Conf. on Intelligent Robots and Systems (IROS), 2024.*

[C102] N. Walker, X. Yang, **A. Garg**, M. Cakmak, D. Fox, C. Pérez-D'Arpino. Fast Explicit-Input Assistance for Teleoperation in Clutter. *Int'l Conf. on Intelligent Robots and Systems (IROS), 2024.*

[C101] I. Georgiev, K. Srinivasan, J. Xu, E. Heiden, **A. Garg** Adaptive Horizon Actor-Critic for Policy Learning in Contact-Rich Differentiable Simulation. *Int'l Conf. on Machine Learning (ICML) 2024.*

[C100] S. Zhang, Y. Qiao, G. Zhu, E. Heiden, D. Turpin, J. Liu, M.C. Lin, M. Macklin, **A. Garg** HandyPriors: Physically Consistent Perception of Hand-Object Interactions with Differentiable Priors *Int'l Conference on Robotics and Automation (ICRA) 2024*

[C99] Q. Yu, M. Moghani, K. Dharmarajan, V. Schorp, W. Panitch, J. Liu, K. Hari, H. Huang, M. Mittal, K. Goldberg, **A. Garg** Orbit-Surgical: An Open-Simulation Framework for Accelerated Learning Environments in Surgical Autonomy *Int'l Conference on Robotics and Automation (ICRA) 2024*

[C98] Z. Wu, J. Hu, W. Lu, I. Gilitschenski, **A. Garg** SlotDiffusion: Object-Centric Generative Modeling with Diffusion Models *Advances in Neural Information Processing Systems (NeurIPS) 2023*

[C97] W. Liu, J. Mao, J. Hsu, T. Hermans, **A. Garg**, J. Wu. Composable Part-Based Manipulation. *Conference on Robot Learning (CoRL) 2023*

[C96] M. Attarian, M. A. Asif, **A. Garg**, I. Gilitschenski, J. Tompson Geometry Matching for Multi-Embodiment Grasping *Conference on Robot Learning (CoRL) 2023*

[C95] I. Singh, V. Blukis, A. Mousavian, A. Goyal, D. Xu, J. Tremblay, D. Fox, J. Thomason, **A. Garg** ProgPrompt: Generating Situated Robot Task Plans using Large Language Models. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2023.*

[C94] Y. R. Wang, Y. Zhao, H. Xu, S. Eppel, A. Aspuru-Guzik, F. Shkurti, **A. Garg**. MVTrans: Multi-View Perception of Transparent Objects. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2023.*

[C93] L. Wang, N. Dvornik, R. Dubeau, M. Mittal, **A. Garg** Self-Supervised Learning of Action Affordances as Interaction Modes. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2023.*

[C92] D. Turpin, T. Zhong, S. Zhang, G. Zhu, E. Heiden, M. Macklin, S. Tsogkas, S. Dickinson, **A. Garg** Fast-Grasp'D: Dexterous Multi-finger Grasp Generation Through Differentiable Simulation. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2023.*

[C91] L. Goli, D. Rebain, S. Sabour, **A. Garg**, A. Tagliasacchi nerf2nerf: Pairwise Registration of Neural Radiance Fields. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2023.*

[C90] Z. Zhou, **A. Garg** Learning Achievement Structure for Structured Exploration in Domains with Sparse Reward. *International Conference on Learning Representations (ICLR) 2023*

[C89] Z. Wu, N. Dvornik, K. Greff, T. Kipf, **A. Garg** SlotFormer: Unsupervised Visual Dynamics Simulation with Object-Centric Models *International Conference on Learning Representations (ICLR) 2023*

[C88] S. Pitis, E. Creager, A. Mandlekar, **A. Garg**. MoCoDA: Model-based Counterfactual Data Augmentation. *Advances in Neural Information Processing Systems (NeurIPS) 2022*

[C87] M. Zhang, X. Wang, B. Decardi-Nelson, B. Song, A. Zhang, J. Liu, S. Tao, J. Cheng, X. Liu, D. Yu, M. Poon, **A. Garg**. SMPL: Simulated Industrial Manufacturing and Process Control Learning Environments. *Advances in Neural Information Processing Systems (NeurIPS) Datasets and Benchmarks 2022*

[C86] S. Sellán, Y.-C. Chen, Z. Wu, **A. Garg**, A. Jacobson. Breaking Bad: A Dataset for Geometric Fracture and Reassembly. *Advances in Neural Information Processing Systems (NeurIPS) Datasets and Benchmarks 2022*

[C85] H. Xiong, H. Fu, J. Zhang, C. Bao, Q. Zhang, Y. Huang, W. Xu, **A. Garg**, C. Lu. RoboTube: Learning Household Manipulation from Human Videos with Simulated Twin Environments. *Conference on Robot Learning (CoRL) 2022*

[C84] K. M. Jatavallabhula, M. Macklin, D. Fox, **A. Garg**, F. Ramos. Bayesian Object Models for Robotic Interaction with Differentiable Probabilistic Programming. *Conference on Robot Learning (CoRL) 2022*

[C83] D. Turpin, L. Wang, E. Heiden, Y.-C. Chen, M. Macklin, S. Tsogkas, S. Dickinson, **A. Garg**. Grasp'D: Differentiable Contact-rich Grasp Synthesis for Multi-fingered Hands. *European Conference on Computer Vision (ECCV) 2022.* (**Oral**)

[C82] A. Allshire, M. Mittal, V. Lodaya, V. Makoviychuk, D. Makoviichuk, F. Widmaier, M. Wüthrich, S. Bauer, A. Handa, **A. Garg**. Transferring Dexterous Manipulation from GPU Simulation to a Remote Real-World TriFinger. *Int'l Conf. on Intelligent Robots and Systems (IROS), 2022.*

[C81] M. Mittal, D. Hoeller, F. Farshidian, M. Hutter, **A. Garg**. Articulated Object Interaction in Unknown Scenes with Whole-Body Mobile Manipulation. *Int'l Conf. on Intelligent Robots and Systems (IROS), 2022.*

[C80] M. Weissenbacher, S. Sinha, **A. Garg**, Y. Kawahara. Koopman Q-learning: Offline Reinforcement Learning via Symmetries of Dynamics *Int'l Conf. on Machine Learning (ICML) 2022.*

[C79] Z. Xie, X. Da, B. Babich, **A. Garg**, M. van de Panne. GLiDE: Generalizable Quadrupedal Locomotion in Diverse Environments with a Centroidal Model. *International Workshop on the Algorithmic Foundations of Robotics (WAFR) 2022.*

[C78] S. Sinha, J. Song, **A. Garg**, S. Ermon. Experience Replay with Likelihood-free Importance Weights. *Conference on Learning for Dynamics and Control (L4DC) 2022.* (**Best Paper Finalist**).

[C77] Y.-C. Chen, H. Li, D. Turpin, A. Jacobson, **A. Garg**. Neural Shape Mating: Self-Supervised Object Assembly with Adversarial Shape Priors. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2022.*

[C76] W. Yu, W. Chen, S. Yin, S. Easterbrook, **A. Garg**. Modular Action Concept Grounding in Semantic Video Prediction. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2022.*

[C75] S. K. Gorti, N. Vouitsis, J. Ma, K. Golestan, M. Volkovs. **A. Garg**, G. Yu. X-Pool: Cross-Modal Language-Video Attention for Text-Video Retrieval. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2022*

[C74] S. Sinha, K. Roth, A. Goyal, M. Ghassemi, Z. Akata, H. Larochelle, **A. Garg**. Uniform Priors for Data-Efficient Transfer. *IEEE Conf on Computer Vision and Pattern Recognition workshop (CVPRW) 2022.*

[C73] J. Xu, V. Makoviychuk, Y. Narang, F. Ramos, W. Matusik, **A. Garg**, M. Macklin. Accelerated Policy Learning with Parallel Differentiable Simulation. *International Conference on Learning Representations (ICLR) 2022*

[C72] C. A. Voelcker, V. Liao, **A. Garg**, A. Farahmand. Value Gradient weighted Model-Based Reinforcement Learning. *International Conference on Learning Representations (ICLR) 2022*

[C71] C. Bai, L. Wang, Z. Yang, Z.H. Deng, **A. Garg**, P. Liu, Z. Wang. Pessimistic Bootstrapping for Uncertainty-Driven Offline Reinforcement Learning. *International Conference on Learning Representations (ICLR) 2022*

[C70] Q. Zhang, C. Lu, **A. Garg**, J. Foerster. Centralized Model and Exploration Policy for Multi-Agent RL. *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS) 2022.* (**Oral**)

[C69] S. Zhang, M. Erdogdu, **A. Garg**. Convergence and Optimality for Policy Gradient Methods in Weakly Smooth Settings. *Conference on Artificial Intelligence (AAAI) 2022.*

[C68] N. Dvornik, I. Hadji, K.G. Derpanis, **A. Garg**, A.D. Jepson. Drop-DTW: Aligning Common Signal Between Sequences While Dropping Outliers. Advances in Neural Information Processing Systems (NeurIPS), 2021

[C67] M. Poli, S. Massaroli, L. Scimeca, S. J. Oh, S. Chun, A. Yamashita, H. Asama, J. Park, **A. Garg**. Neural Hybrid Automata: Learning Dynamics with Multiple Modes and Stochastic Transitions. Advances in Neural Information Processing Systems (NeurIPS), 2021.

[C66] C. Bai, L. Wang, L. Han, **A. Garg**, J. Hao, P. Liu, Z. Wang. Dynamic Bottleneck for Robust Self-Supervised Exploration. Advances in Neural Information Processing Systems (NeurIPS), 2021.

[C65] S. Bauer et al. A Robot Cluster for Reproducible Research in Dexterous Manipulation. Neural Information Processing Systems (NeurIPS), Competitions & Datasets Track 2021.

[C64] H. Xu, YR Wang, S. Eppel, A. Aspuru-Guzik, F. Shkurti, **A. Garg**. Seeing Glass: Joint Point-Cloud and Depth Completion for Transparent Objects. Conference on Robot Learning (CoRL) 2021. (**Oral**).

[C63] S. Sinha, A. Mandlekar, **A. Garg**. S4RL: Surprisingly Simple Self-Supervision for Offline Reinforcement Learning in Robotics. Conference on Robot Learning (CoRL), 2021.

[C62] V. Blukis, C. Paxton, D. Fox, **A. Garg**, Y. Artzi. A Persistent Spatial Semantic Representation for High-level Natural Language Instruction Execution. Conference on Robot Learning (CoRL) 2021

[C61] H. Xiong, Q. Li, Y-C. Chen, H. Bharadhwaj, S. Sinha, **A. Garg**. Learning by Watching: Physical Imitation of Manipulation Skills from Human Videos. *Int'l Conf. on Intelligent Robots and Systems (IROS), 2021.*

[C60] D. Turpin, L. Wang, S. Tsogkas, S. Dickinson, **A. Garg**. GIFT: Generalizable Interaction-aware Functional Tool Affordances without Labels. *Robotics Systems and Science (RSS) 2021.*

[C59] M. Lutter, S. Mannor, J. Peters, D. Fox, **A. Garg**. Robust Value Iteration for Continuous Control Tasks *Robotics Systems and Science (RSS) 2021.*

[C58] E. Heiden, F. Ramos, M. Macklin, Y. Narang, **A. Garg**, D. Fox. DiSeCT: A Differentiable Simulation Engine for Autonomous Robotic Cutting. *Robotics Systems and Science (RSS) 2021.* (**Best Student Paper Award (2/400)**).

[C57] M. Lutter, S. Mannor, J. Peters, D. Fox, **A. Garg**. Value Iteration in Continuous Actions, States and Time. *Int'l Conf. on Machine Learning (ICML) 2021.*

[C56] C. Bai, L. Wang, L. Han, J. Hao, **A. Garg**, P. Liu, Z. Wang. Principled Exploration via Optimistic Bootstrapping and Backward Induction. *Int'l Conf. on Machine Learning (ICML) 2021.*

[C55] B. Liu, Q. Liu, P. Stone, **A. Garg**, Y. Zhu, A. Anandkumar. Coach-Player Multi-agent Reinforcement Learning for Dynamic Team Composition. *Int'l Conf. on Machine Learning (ICML) 2021.* (**Long Talk (top 3%)**).

[C54] A. Mahajan, M. Samvelyan, L. Mao, V. Makoviychuk, **A. Garg**, J. Kossaifi, S. Whiteson, Y. Zhu, A. Anandkumar. Tesseract: Tensorised Actors for Multi-Agent Reinforcement Learning *Int'l Conf. on Machine Learning (ICML) 2021.*

[C53] Z. Xie, X. Da, M. van de Panne, B. Babich, **A. Garg**. Dynamics Randomization Revisited: A Case Study for Quadrupedal Locomotion. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2021.*

[C52] R. Martín-Martín, A. Allshire, C. Lin, S. Manuel, S. Savarese, **A. Garg**. LASER: Learning a Latent Action Space for Efficient Reinforcement Learning. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2021.*

[C51] H. Bharadhwaj, **A. Garg**, F. Shkurti. LEAF: Latent Exploration Along the Frontier. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2021.*

[C50] X. Pan, **A. Garg**, A. Anandkumar, Y. Zhu. Emergent Hand Morphology and Control from Optimizing Robust Grasps of Diverse Objects. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2021.*

[C49] H. Bharadhwaj, A. Kumar, N. Rhinehart, S. Levine, F. Shkurti, **A. Garg**. Conservative Safety Critics for Exploration. *International Conference on Learning Representations (ICLR) 2021.*

[C48] P. Naderian, G. Loaiza-Ganem, H. J. Braviner, A. L. Caterini, J. C. Cresswell, T. Li, **A. Garg**. C-Learning: Horizon-Aware Cumulative Accessibility Estimation. *International Conference on Learning Representations (ICLR) 2021.*

[C47] K. Xie, H. Bharadhwaj, D. Hafner, **A. Garg**, F. Shkurti. Skill Transfer via Partially Amortized Hierarchical Planning. *International Conference on Learning Representations (ICLR) 2021.*

[C46] S. Sinha, H. Bharadhwaj, A. Goyal, H. Larochelle, **A. Garg**, F. Shkurti. DIBS: Diversity inducing Information Bottleneck in Model Ensembles *Conference on Artificial Intelligence (AAAI) 2021.*

[C45] Y. Li, A. Torralba, A. Anandkumar, D. Fox, **A. Garg**. Causal Discovery in Physical Systems from Videos. *Advances in Neural Information Processing Systems (NeurIPS) 2020.*

[C44] S. Pitis, E. Creager, **A. Garg**. Counterfactual Data Augmentation using Locally Factored Dynamics. *Advances in Neural Information Processing Systems (NeurIPS) 2020.* (**Outstanding Paper award at ICML Workshop on Object Oriented Learning**).

[C43] S. Sinha, **A. Garg**, H. Larochelle. Curriculum By Smoothing. *Advances in Neural Information Processing Systems (NeurIPS) 2020* (**Spotlight**).

[C42] X. Da, Z. Xie, D. Hoeller, B. Boots, A. Anandkumar Y. Zhu, B. Babich, **A.Garg**. Learning a Contact-Adaptive Controller for Robust, Efficient Legged Locomotion. *Conf. on Robot Learning (CoRL) 2020.*

[C41] A. Kurenkov, J. Taglic, R. Kulkarni, M. Dominguez-Kuhne, **A. Garg**, R. Martín-Martín, S. Saverese. Visuomotor Mechanical Search: Learning to Retrieve Target Objects in Clutter. *Int'l Conf. on Intelligent Robots and Systems (IROS), 2020.*

[C40] H. Ren, Y. Zhu, J. Leskovec, A. Anandkumar, **A. Garg**. Ocean: Online Task Inference for Compositional Tasks with Context Adaptation. *Conf. on Uncertainty in Artificial Intelligence (UAI) 2020.*

[C39] B. Chen, W. Liu, **A. Garg**, Z. Yu, A. Shrivastava, J. Kautz, A. Anandkumar. Angular Visual Hardness. *Int'l Conf. on Machine Learning (ICML) 2020.*

[C38] W. Nie, T. Karras, **A. Garg**, S. Debhath, A. Patney, A. B. Patel, A. Anandkumar. Semi-Supervised StyleGAN for Disentanglement Learning. *Int'l Conf. on Machine Learning (ICML) 2020.*

[C37] M. A. Lee, C. Florensa, J. Tremblay, N. Ratliff, **A. Garg**, F. Ramos, D. Fox. Guided Uncertainty-Aware Policy Optimization: Combining Learning and Model-Based Strategies for Sample-Efficient Policy Learning. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2020.*

[C36] D-A Huang, Y-W Chao, C. Paxton, X. Deng, L Fei-Fei, J. C. Niebles, **A. Garg**, D. Fox. Motion Reasoning for Goal-Based Imitation Learning. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2020.*

[C35] A. Mandlekar, F. Ramos, B. Boots, L. Fei-Fei, **A. Garg**, D. Fox. IRIS: Implicit Reinforcement without Interaction at Scale for Learning Control from Offline Robot Manipulation Data. *IEEE Int'l Conf. on Robotics and Automation (ICRA) 2020.*

[C34] A. Kurenkov, A. Mandlekar*, R. Martín-Martín, S. Savarese, **A. Garg**. AC-Teach: A Bayesian Actor-Critic Method for Policy Learning with an Ensemble of Suboptimal Teachers. *Conf. on Robot Learning (CoRL) 2019.*

[C33] K. Fang, Y. Zhu, **A. Garg**, S. Savarese, L. Fei-Fei. Dynamics Learning with Cascaded Variational Inference for Multi-Step Manipulation. *Conf. on Robot Learning (CoRL) 2019.*

[C32] A. Mandlekar, J. Booher, M. Spero, A. Tung, A. Gupta, Y. Zhu, **A. Garg**, S. Savarese, L. Fei-Fei. Scaling Robot Supervision to Hundreds of Hours with RoboTurk: Robotic Manipulation Dataset through Human Reasoning and Dexterity. *Int'l Conf. on Intelligent Robots and Systems (IROS), 2019.* **Best Cognitive Robotics Paper Finalist**

[C31] R. Martín-Martín, M. A. Lee, R. Gardner, S. Savarese, J. Bohg, **A. Garg**. Variable Impedance Control in End-Effector Space: An Action Space for Reinforcement Learning in Contact-Rich Tasks. *Int'l Conf. on Intelligent Robots and Systems (IROS), 2019.*

[C30] D.-A. Huang, D. Xu, Y. Zhu, **A. Garg**, S. Savarese, L. Fei-Fei, J. C. Niebles. Continuous Relaxation of Symbolic Planner for One-Shot Imitation Learning. *Int'l Conf. on Intelligent Robots and Systems (IROS), 2019.*

[C29] D.-A. Huang, S. Nair, D. Xu, Y, Zhu, **A. Garg**, L. Fei-Fei, S. Savarese, J. C. Niebles. Neural Task Graphs: Generalizing to Unseen Tasks from a Single Video Demonstration, under review at *IEEE Conf. on Computer*

Vision & Pattern Recognition (CVPR), 2019. **Oral**

[C28] M.A. Lee*, Y. Zhu*, K. Srinivasan, P. Shah, S. Savarese, L. Fei-Fei, **A. Garg**, J. Bohg (* equal contribution). Making Sense of Vision and Touch: Self-Supervised Learning of Multimodal Representations for Contact-Rich Tasks, under review at *IEEE Int'l Conference on Robotics and Automation (ICRA) 2019.* **Best Paper Award 1/2500+, Best Cognitive Robotics Paper Finalist**

[C27] M. Danielczuk, A. Kurenkov, A. Balakrishna, M. Matl,R. Martín-Martín, **A. Garg**, S. Savarese, K. Goldberg. Mechanical Search: Multi-Step Retrieval of a Target Object Occluded by Clutter, under review at *IEEE Int'l Conference on Robotics and Automation (ICRA) 2019.*

[C26] A. Mandlekar, Y. Zhu, **A. Garg**, J. Booher, M. Spero, A. Tung, J. Gao, J. Emmons, A. Gupta, E. Orbay, S. Savarese, L. Fei-Fei. ROBOTURK: A Crowdsourcing Platform for Robotic Skill Learning through Imitation, *Conference on Robot Learning (CoRL) 2018.*

[C25] K. Fang, Y. Zhu, **A. Garg**, V. Mehta, A. Kurenkov, L. Fei-Fei, S. Savarese. Learning Task-Oriented Grasping for Tool Manipulation with Simulated Self-Supervision. *Robotics Systems and Science (R:SS), 2018.*

[C24] D.-A. Huang, S. Buch, L. Dery, **A. Garg**, L. Fei-Fei, J. C. Niebles. Finding "It": Weakly-Supervised Reference-Aware Visual Grounding in Instructional Video, *IEEE Conf. on Computer Vision & Pattern Recognition (CVPR), 2018.* **Oral**

[C23] D. Xu*, S. Nair*, Y. Zhu, J. Gao, **A. Garg**, L. Fei-Fei, S. Savarese (* equal contribution). Neural Task Programming: Learning to Generalize Across Hierarchical Tasks, *IEEE Int'l Conference on Robotics and Automation (ICRA) 2018, arXiv 1710.01813.*

[C22] A. Kurenkov*, J. Ji*, **A. Garg**, V. Mehta, J. Gwak, C. Choy, S. Savarese (* equal contribution). DeformNet: Free-Form Deformation Network for 3D Shape Reconstruction from a Single Image. *(IEEE Winter Conf. on Applications of Computer Vision (WACV) 2018), arXiv 1708.04672.*

[C21] J. Harrison*, **A. Garg***, B. Ivanovic, Y. Zhu, S. Savarese, L. Fei-Fei, M. Pavone (* equal contribution). AdaPT: Zero-Shot Adaptive Policy Transfer for Stochastic Dynamical Systems, *Int'l Symposium on Robotics Research (ISRR) 2017. arXiv 1707.04674*

[C20] J. Gwak, C. Choy, **A. Garg**, M.Chandraker, S. Savarese. Weakly supervised 3D Reconstruction with Adversarial Constraint, *Int'l Conf. on 3D Vision (3DV) 2017.*

[C19] A. Mandlekar*, Y. Zhu*, **A. Garg***, L. Fei-Fei, S. Savarese (* equal contribution), Adversarially Robust Policy Learning through Active Construction of Physically-Plausible Perturbations, *Int'l Conf. on Intelligent Robots and Systems (IROS), 2017.*

[C18] B. Thananjeyan, **A. Garg**, S. Krishnan, C. Chen, L. Miller, K. Goldberg. Multilateral Surgical Pattern Cutting in 2D Orthotropic Gauze with Deep Reinforcement Learning Policies for Tensioning. *IEEE Int'l Conference on Robotics and Automation (ICRA) 2017.*

[C17] S. Krishnan, **A. Garg**, R. Liaw, B. Thananjeyan, L. Miller, F. T. Pokorny, K. Goldberg. SWIRL: A Sequential Windowed Inverse Reinforcement Learning Algorithm for Robot Tasks With Delayed Rewards. *Workshop on Algorithmic Foundations in Robotics (WAFR), 2016.*

[C16] **A. Garg**, S. Sen, R. Kapadia, Y. Jen, S. McKinley, L. Miller, K. Goldberg. A Tumor Localization using Automated Palpation with Gaussian Process Adaptive Sampling. *IEEE Int'l Conference on Automation Science and Engineering (CASE), 2016.*

[C15] S. McKinley, **A. Garg**, S. Sen, D. V. Gealy, J. P. McKinley, Y. Jen, M. Guo, D. Boyd, K. Goldberg. An Interchangeable Surgical Instrument System with Application to Supervised Automation of Multilateral

Tumor Resection. *IEEE Int'l Conference on Automation Science and Engineering (CASE), 2016.*

[C14] A. Murali*, **A. Garg***, S. Krishnan*, F. T. Pokorny, P. Abbeel, T. Darrell, K. Goldberg (* denotes equal contribution). TSC-DL: Unsupervised Trajectory Segmentation of Multi-Modal Surgical Demonstrations with Deep Learning *IEEE Int'l Conference on Robotics and Automation (ICRA) 2016*

[C13] S. Sen*, **A. Garg***, D. V. Gealy, S. McKinley, Y. Jen, K. Goldberg (* denotes equal contribution). Autonomous Multiple-Throw Multilateral Surgical Suturing with a Mechanical Needle Guide and Optimization based Needle Planning. *IEEE Int'l Conference on Robotics and Automation (ICRA) 2016*

[C12] S. Krishnan*, **A. Garg***, S. Patil, C. Lea, G. Hager, P. Abbeel, K. Goldberg.(* equal contribution) Transition State Clustering: Unsupervised Surgical Trajectory Segmentation For Robot Learning. *International Symposium on Robotics Research (ISRR), 2015.*

[C11] S. McKinley, **A. Garg**, S. Sen, R. Kapadia, A. Murali, K. Nichols, S. Lim, S. Patil, P. Abbeel, A. M. Okamura, K. Goldberg. A Disposable Haptic Palpation Probe for Locating Subcutaneous Blood Vessels in Robot-Assisted Minimally Invasive Surgery. *IEEE Int'l Conference on Automation Science and Engineering (CASE), 2015.*

[C10] A. Murali, S. Sen, B. Kehoe, **A. Garg**, S. McFarland, S. Patil, W. D. Boyd, S. Lim, P. Abbeel, K. Goldberg. Learning by Observation for Surgical Subtasks: Multilateral Cutting of 3D Viscoelastic and 2D Orthotropic Tissue Phantoms. *IEEE Int'l Conference on Robotics and Automation (ICRA) 2015.* **Best Medical Robotics Paper Finalist**

[C9] **A. Garg**, T. Siauw, G. Yang, S. Patil, J. A. M. Cunha, I-C. Hsu, J. Pouliot, A. Atamtürk, K. Goldberg. Exact Reachability Analysis for Planning Skew-Line Needle Arrangements for Automated Brachytherapy. *IEEE Int'l Conference on Automation Science and Engineering (CASE), 2014.*

[C8] T. Siauw, J. A. M. Cunha, **A. Garg**, K. Goldberg, I-C. Hsu, and J. Pouliot. Customized Needle Guides for Inserting Non-Parallel Needle Arrangements in Prostate HDR Brachytherapy: A Phantom Study. *Brachytherapy 13 (2014): S126-S126.*

[C7] **A. Garg**, S. Patil, T. Siauw, J. A. M. Cunha, I-C. Hsu, P. Abbeel, J. Pouliot, and K. Goldberg. An Algorithm for Computing Customized 3D Printed Implants with Curvature Constrained Channels for Enhancing Intracavitary Brachytherapy Radiation Delivery. *IEEE Int'l Conference on Automation Science and Engineering (CASE), 2013.*

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[W23] Z. Zhou, J. Booher, W. Liu, A. Petiushko, **A. Garg**. Multi-Constraint Safe RL with Objective Suppression for Safety-Critical Applications *Workshop on Machine Learning for Autonomous Driving (ML4AD) 2023*

[W22] S. Sinha, H. Bharadhwaj, A. Srinivas, **A. Garg**. D2RL: Deep Dense Architectures in Reinforcement Learning. *Neurips Workshop in Deep Reinforcement Learning 2020.*

[W21] S. Pitis, E. Creager, **A. Garg**. Counterfactual Data Augmentation using Locally Factored Dynamics. *ICML Workshop on Object-Oriented Learning (OOL) 2020.* **Outstanding Paper Award.**

[W20] M. A. Lee, C. Florensa, J. Tremblay, N. Ratliff, **A. Garg**, F. Ramos, D. Fox. Combining Model-Free and Model-Based Strategies for Sample-Efficient Reinforcement Learning. *NeuRIPS Workshop on Robot Learning, 2019* **Best Paper Award.**

[W19] H. Ren, A. Anandkumar, **A. Garg**. Context-Based Meta-Reinforcement Learning with Structured Latent Space, *NeurIPS Workshop on Learning Transferable Skills, 2019*

[W18] A. Mandlekar, **A. Garg**, F. Ramos. Leveraging Large-Scale Robot Manipulation Data for Control with Selective Offline Imitation Learning. *NeurIPS Workshop on Deep RL, 2019*

[W17] A. Kurenkov, A. Mandlekar, Roberto Martin-Martin, **A. Garg**. AC-Teach: A Bayesian Actor-Critic Method for Policy Learning with an Ensemble of Suboptimal Teachers. *NeurIPS Workshop on Deep RL, 2019*

[W16] G. Portwood, P. Mitra, M. Ribeiro, T.-M. Nguyen, B. Nadiga, J. Saenz, M. Chertkov, **A. Garg**, A. Anandkumar, A. Dengel, R. Baraniuk, D. Schmidt. Turbulence forecasting via Neural ODE *NeurIPS Workshop on Machine Learning & Physical Sciences, 2019*

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[W11] A. Kurenkov*, V. Mehta*, J. Ji, **A. Garg**, S. Savarese (* equal contribution). Towards Grasp Transfer using Shape Deformation. *Conference on Robot Learning (CoRL) 2017.(Workshop Track)*

[W10] A. Mandlekar*, Y. Zhu*, **A. Garg***, L. Fei-Fei, S. Savarese (* equal contribution), Adversarially Robust Policy Learning through Active Construction of Physically-Plausible Perturbations *Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM), 2017.*

[W9] R. Liaw, S. Krishnan, **A. Garg**, D. Crankshaw, J. E. Gonzalez , K. Goldberg. Composing Meta-Policies for Autonomous Driving Using Hierarchical Deep Reinforcement Learning, *Tech Report, 2017. arXiv 1711.01503*

[W8] S. Krishnan, **A. Garg**, R. Liaw, L. Miller, F. T. Pokorny, and K. Goldberg. HIRL: Hierarchical Inverse Reinforcement Learning for Long-Horizon Tasks with Delayed Rewards. *R:SS Workshop on Bootstrapping Manipulation Skills, 2016.*

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[W3] S. McKinley, **A. Garg**, S. Sen, R. Kapadia, A. Murali, K. Nichols, S. Lim, S. Patil, P. Abbeel, A. M. Okamura, K. Goldberg. Preliminary Report on the Design of a Palpation Probe for Robot-Assisted Minimally Invasive Surgery. *ICRA Workshop on Shared Frameworks for Medical Robotics Research, 2015/* **Best Poster/Demo Award.**

[W2] A. Murali*, S. Sen*, B. Kehoe, **A. Garg**, S. McFarland, S. Patil, W D. Boyd, S. Lim, P. Abbeel, K. Goldberg.(* denotes equal contribution). Multilateral Cutting on the da Vinci Research Kit (dVRK): Surgical Subtask Automation using Learning by Observation. *ICRA Workshop on Shared Frameworks for Medical Robotics Research, 2015*

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Patents

[P24] Step discovery and localization in instructional videos using a self-supervised transformer. M. Dvornik, I. Hadji, R. Zhang, K. Derpanis, R. Wildes, **A. Garg**, A. Jepson *US Patent Application No. US20240169732A1*

[P23] Scene understanding using language models for robotics systems and applications **A. Garg**, D. Fox, T. Hermans, W. Liu *US Patent Application No. US18/319,546*

[P22] Prompt generator for use with one or more machine learning processes I. Singh, A. Mousavian, A. Goyal, D. Xu, J. Tremblay, D. Fox, **A. Garg**, V. Blukis *US Patent Application No. US18/122,594*

[P21] Predicting object models F.T. Ramos, **A. Garg**, K.M. Jatavallabhula, M. Macklin. *US Patent Application No. US18/114,146.*

[P20] Machine learning via differentiable simulation. **A. Garg**, F. T. Ramos, J. Xu, M. Macklin, , T. Kim , V. Makoviichuk, Y. Narang, *US Patent Application No. PCT/US2022/081644.*

[P19] Techniques for robot control using neural implicit value functions. A. Murali, B. Sundaralingam, Y-C Chen, D. Fox, **A. Garg**. *US Patent Application No. US17/856,699.*

[P18] Differentiable simulator for robotic cutting

[P17] A differentiable simulator for robotic cutting. **A. Garg**, D. Fox, E. Heiden, F.T. Ramos, M. Skolones, M. Macklin, Y. Narang. *US Patent Application No. 63/180,917.*

[P16] Disentanglement of image attributes using a neural network A. Dundar, K. Shih, **A. Garg**, R. Pottorff, A. Tao, B. Catanzaro *US Patent Application No. 17/678,666*

[P15] Solving embodied intelligence with decoupled high-level reasoning and low-level execution. **A. Garg**, C. Paxton, D. Fox, V. Blukis, Y. Zhou, Y. Zhu. 2021

[P14] Auditing AI models for Verified Deployment under Semantic Specifications. A. Anandkumar, **A. Garg**, C. Xiao, D.-A. Huang, H. Bharadhwaj. *US Patent Application No. 17/482,209.*

[P13] Methods and Systems to Remotely Operate Robotic Devices. A.Mandlekar, Y. Zhu, **A. Garg**, S. Savarese, L. Fei-Fei. *US Patent Application No. 17/755,587.*

[P12] Emergent Hand Morphology and Control from Optimizing Robust Grasps of Diverse Objects. A. Anandkumar, **A. Garg**, Y. Zhu, X. Pan. *US Patent Application No. 17/316,564.*

[P11] Language-Guided Distributional Tree Search for Mobile Manipulation **A. Garg**, C. Paxton, D. Fox, V. Blukis. *US Patent Application No. 17/316,564.*

[P10] Online Task Inference for Compositional Tasks with Context Adaptation. A. Anandkumar, **A. Garg**, Y. Zhu, H. Ren. *US Patent Application No. 16/945,753.*

[P9] A method for learning from large-scale robotic demonstrations. A. Mandlekar, **A. Garg**, B. Boots, D. Fox, F. T. Ramos. *US Patent Application No. 16/998,941.*

[P8] Video Interpolation and Prediction with Unsupervised Landmarks. A. Tao, A. **Garg**, A. Dundar, B. Catanzaro, K. Shih, R. Pottorff. *US Patent Application No. 16/558,620.*

[P7] Unsupervised disentanglement of pose, appearance, and background from images and videos. A. Tao, A. **Garg**, A. Dundar, B. Catanzaro, K. Shih, R. Pottorff. *US Patent Application No. 16/786,057.*

[P6] Attribute-aware image generation using neural networks. W. Nie, T. Karras, **A. Garg**, S. Debnath, A. Patney, A. Anandkumar. *US Patent Application No. 16/925,085.*

[P5] Bayesian optimization of sparsity ratios in model compression. **A. Garg**, M. Garland, S. Muralidharan, V. Joseph. *US Patent Application No. 16/785,044.*

[P4] Imitation learning system. **A. Garg**, C. Paxton, D-A. Huang, D. Fox, Y.W. Chao. *US Patent Application No. 16/931,211.*

[P3] Guided Uncertainty-Aware Policy Optimization: Combining Model-Free and Model-Based Strategies for Sample-Efficient Learning. **A. Garg**, C. Florensa, D. Fox, F. T. Ramos, J. Tremblay, M, A. Lee, N. Ratliff. *US Patent Application No. 16/780,465.*

[P2] Precision Injector/Extractor for Robot-Assisted Minimally Invasive Surgery. Susan M.L. Lim, S. McKinley, **A. Garg**, S. Patil, K. Goldberg. *International Patent Application No. PCT/US2016/039026.*

[P1] Patient-Specific Temporary Implants For Accurately Guiding Local Means of Tumor Control Along Patient-Specific Internal Channels to Treat Cancers. J. Pouliot, K. Goldberg, I-C. Hsu, JAM Cunha, **A. Garg**, S. Patil, P. Abbeel, T. Siauw. *U.S. Patent 10,286,197, issued May 14, 2019.*