Victoria Dean

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Education

Carnegie Mellon University 2018 – 2023 (expected)

PhD Candidate in Robotics, School of Computer Science

Thesis: *Improving Robotic Exploration with Self-Supervision and Diverse Data*

Committee: Abhinav Gupta (Advisor), David Held, Shubham Tulsiani, Rob Fergus, Chelsea Finn

Future Faculty Program Participant, Eberly Center for Teaching Excellence and Educational Innovation

Massachusetts Institute of Technology 2013 – 2017

Bachelor of Science, Computer Science and Engineering

Teaching Experience

CMU Ethics and Robotics (16-735), Instructor of Record Spring 2021

Designed and taught course with Professor Illah Nourbakhsh. Created module design project in which students developed ethics curricula for 11 CS courses with CMU faculty. Authored 2022 SIGCSE paper. Received a course evaluation rating of 4.94/5.0 (Department average is 4.41 and School average is 4.30).

CMU Deep RL for Robotics (16-881), Teaching Assistant Spring 2020

As sole TA for Professor David Held, gave guest lectures, led discussions, and graded writing and projects.

FIRST Robotics Team Castilleja Gatorbotics, Head Coach 2017 – 2018

Mentored all-girls high school robotics team on topics ranging from programming to project management.

MIT Introduction to Deep Learning (6.S191), Lecturer and Co-Chair January 2017

Co-taught MIT's first deep learning course for 231 students. My multimodality lecture has 23,000+ views.

MIT Global Teaching Labs, Computer Science Instructor January 2016

Developed and taught a month's worth of curriculum on elective topics, including algorithms and machine learning, to 4th and 5th year computer science students at a vocational school in Prato, Italy.

MIT Society of Women Engineers #HelloWorld, Lead Instructor 2014 – 2017

Developed and taught 7-week course encouraging middle school girls to pursue computer science. Still run every semester, the program enables students to build websites using HTML, CSS, and JavaScript.

MIT Code for Good (6.S187), Founder and Instructor of Record 2014 – 2017

Created and managed course connecting students and nonprofits on CS projects. Cumulatively since 2014, hundreds of students have worked with 60+ nonprofits. Helped start related programs at 3 schools.

MIT Introduction to EECS (6.01), Student Lab Assistant Spring 2014

Led students through course labs on topics ranging from probability to PID control on real robots.

Khan Academy Discovery Lab, Student Instructor Summer 2012

Taught middle school students math and science with activities in probability, engineering, and CS.

Research and Industry Experience

CMU Robotics Institute, Graduate Student Researcher 2018 – present
Conducting research to improve efficiency and evaluation of robot learning advised by Professor Abhinav Gupta. Published 3 papers (4th in submission) at top learning conferences, including NeurIPS and CoRL.

DeepMind, Research Scientist Intern Fall 2021
Investigated policy fine-tuning in task transfer, advised by Professor Doina Precup on the Montreal team.

Waymo, Machine Learning Research Resident 2017 – 2018
Combined imitation learning with reinforcement learning for better trajectory generation. Designed and deployed a low-latency text detection and recognition system that runs on the Waymo fleet.

MIT Computer Vision Group, Undergraduate Researcher 2015 – 2017
Trained video models using dynamics and audio with Professor Antonio Torralba and Carl Vondrick.

Deep Genomics, Research Intern Summer 2016
Designed RNA pattern recognition model that improved sensitivity by 1.2x with Professor Brendan Frey and Andrew Delong. Won 2nd best paper at 2016 Machine Learning for Computational Biology workshop.

Counsyl, Computational Biology Research Intern Summer 2015
Developed analysis pipeline for a liquid biopsy that reconstructs a tumor's genome from circulating tumor DNA. Used signal processing techniques to reduce sequencer and polymerase noise by 1000x.

Google, Software Engineering Intern Summer 2014
Designed and implemented a distributed video analysis system for finding coherent animated clips in YouTube videos. Launched the system internally, allowing all Google employees to test out the project.

Coursera, Software Engineering Intern Summer 2013
Created internationalization architecture for Coursera's website and shortened page load time by 10-20%.

UC Santa Cruz Astronomy Group, Research Intern Summers 2011, 2012
Developed pattern matching software to search spectra for distant galaxies advised by Professor Raja Guhathakurta. Wrote paper and presented at the 2013 American Astronomical Society conference.

Honors and Awards

Siebel Scholars Award Recipient ($35,000)	2023
Best Paper Award at NeurIPS Broadening Collaborations in Machine Learning Workshop	2022
Schmidt Futures Grant for CMU Robotics Testbed ($209,000 over 2 years)	2021
NSF Graduate Research Fellowship Program Awardee ($102,000 over 3 years)	2020
2nd Place Oral Presentation at NeurIPS Machine Learning in Computational Biology Workshop	2016
Cisco Undergraduate Research and Innovation Scholar	2015
Dropbox Engineering Prize at Stanford TreeHacks	2015
Winner of MIT Education DesignShop	2014
Intel Science Talent Search Semifinalist (One of 300 across US)	2013

Publications

Conference Papers

G. Zhou*, **V. Dean***, M. Srirama, A. Rajeswaran, J. Pari, K. Hatch, A. Jain, T. Yu, P. Abbeel, L. Pinto, C. Finn, A. Gupta. Train Offline, Test Online: A Real Robot Learning Benchmark. *ICRA* 2023.

V. Dean, I. Nourbakhsh. Teaching Ethics by Teaching Ethics Pedagogy. *ACM SIGCSE* 2022.

S. Parisi*, **V. Dean***, D. Pathak, A. Gupta. Interesting Object, Curious Agent: Learning Task-Agnostic Exploration. *Oral at NeurIPS* 2021.

V. Dean, Y. Shavit, A. Gupta. Robots on Demand: A Democratized Robotics Research Cloud. *Blue Sky Oral at CoRL* 2021.

V. Dean, S. Tulsiani, A. Gupta. See, Hear, Explore: Curiosity via Audio-Visual Association. *NeurIPS* 2020.

Other Publications (Preprints, Workshops, Posters, and Patents)

J. Mejia, S. Alshammari, **V. Dean**, T. Hellebrekers, P. Morgado, A. Gupta. Hearing Touch: Using Contact Microphones for Robot Manipulation. *RoboAdapt workshop at CoRL* 2022.

S. Alshammari, **V. Dean**, T. Hellebrekers, P. Morgado, A. Gupta. Hearing Touch: Using Contact Microphones for Robot Manipulation. *Women in Machine Learning workshop at NeurIPS* 2022.

V. Dean, D. Toyama, D. Precup. Don't Freeze Your Embedding: Lessons from Policy Finetuning in Environment Transfer. *Agent Learning in Open-Endedness (spotlight) and Generalizable Policy Learning in the Physical World workshops at ICLR* 2022.

E. Xing, A. Gupta, S. Powers, **V. Dean**. KitchenShift: Evaluating Zero-Shot Generalization of Imitation-Based Policy Learning Under Domain Shifts. *Distribution Shifts workshop at NeurIPS* 2021.

V. Dean, A. Ogale, H. Kretzschmar, D. Silver, C. Kershaw, P. Chaudhari, C. Wu, C. Li. Phrase Recognition Model for Autonomous Vehicles. *US Patent Number 10699141B2*.

V. Dean, S. Tulsiani, A. Gupta. Audio Prediction as Instrinsic Reward for Exploration. *Women in Machine Learning workshop at NeurIPS* 2019.

V. Dean, A. Delong, B.J. Frey. Deep Learning for Branch Point Selection in RNA Splicing. *Machine Learning for Computational Biology (oral) and Women in Machine Learning workshops at NeurIPS* 2016.

V. Dean, C. Vondrick, A. Torralba. Understanding Personality with Deep Convolutional Neural Networks. *MIT EECSCon* 2016.

V. Dean, C. Vondrick, A. Torralba. Predicting the Future: Generative Models for Video. *MIT SuperUROP Poster Session* 2015.

V. Dean, P. Guhathakurta, et al. Search for High-Redshift Lyman-Alpha Emitters in the DEEP3 Galaxy Redshift Survey. *American Astronomical Society meeting* 2013.

K. McCormick, A. Alvarez-Buylla, **V. Dean**, et al. Semi-automated Search For Lyman-alpha And Other Emission Lines In The DEEP2 And DEEP3 Databases. *American Astronomical Society meeting* 2012.

Academic Service

Conference Reviewing

International Conference on Robotics and Automation (ICRA)	2023
Conference on Robot Learning (CoRL)	2021, 2022
Neural Information Processing Systems (NeurIPS)	2021, 2022
International Conference on Machine Learning (ICML)	2022
International Conference on Learning Representations (ICLR)	2022

Workshop Organizing

Learning from Diverse, Offline Data at ICRA (*organizer*)	2023
Robot Learning in the Cloud: Remote Operations and Benchmarking at RSS (*lead organizer*)	2022
Learning from Diverse, Offline Data at RSS (*meta-reviewer and organizer*)	2022
Differentiable Computer Vision, Graphics, and Physics at NeurIPS (*meta-reviewer and organizer*)	2020

Workshop Reviewing

Self-Supervised Learning for Reasoning and Perception at ICML	2021
Self-Supervised Learning: Theory and Practice at NeurIPS	2020
Women in Machine Learning at NeurIPS	2016, 2018

PhD Qualifier Committees

Michelle Zhao, *Upcoming*	2023
Adam Villaflor, *Fine-Tuning Offline Reinforcement Learning with Model-Based Policy Optimization*	2021

Carnegie Mellon Service and Outreach

Robotics Institute PhD Retreat, Organizer 2022

Secured over $15,000 in funding from multiple sources to organize the department's first PhD Student retreat. Managed 10-person organizing team to orchestrate the overnight trip for 72 attendees.

School of Computer Science Teaching Assistant Awards Committee, Committee Member 2021

Read nomination packets and participated in awards selection as awards committee student representative.

Robotics Institute Faculty Hiring Committee, Committee Member 2021

Contributed to faculty hiring committee as a full member, including reading packets, interviewing all 16 candidates selected for visits, and soliciting and consolidating feedback from the department.

AI Mentoring Program, Organizer 2018 – 2021

Founded program with goal of involving more women and underrepresented minorities in AI research. Since 2018, the program has cumulatively matched 712 undergraduates with PhD student mentors.

SCS Dean's Advisory Committee, Founding Member 2019 – 2021

Represented Robotics Institute on School of Computer Science committee reporting to Dean Martial Hebert about experiences and challenges facing PhD students. Led Anti-Racism Group, whose letter, Towards Anti-Racist Change in the School of Computer Science, amassed more than 600 signatures.

Robotics Institute Director Search, Interview Committee Member 2021

Interviewed candidates and elevated student interests as representative in department chair search.

OurCS, Committee Member 2019

Co-organized research conference for undergraduate women with Dr. Carol Frieze. Initiated scholarship program and secured $5,000 in travel grants for students from Mexico, Ghana, Uganda, and Ethiopia.

Invited Talks and Panels

3rd Annual Learning Workshop	March 2023
Embedded EthiCS Conference at Stanford University	March 2023
Pittsburgh Women in Mathematics and Computing Symposium	February 2023
CoRL Learning to Adapt and Improve in the Real World Workshop Panel	December 2022
Institute for Computational and Data Sciences Symposium AI Governance Panel	October 2022
CMU Robots Perceiving and Doing Lab Invited Talk	September 2022
Duke Technology Scholars Program Fireside Chat	June 2019, May 2022
CMU Eberly Center Spotlight on Graduate Teaching Panel	September 2021
Robotics Institute Summer Scholars Graduate Student Panel	July 2020, July 2021
CVPR Sight and Sound Workshop Invited Paper Talk	June 2021
The Nueva School Intersession Self-Supervised Machine Learning Talk	January 2021
University of Washington Reasoning, AI and VisioN Lab Recognition Lunch	November 2020
Robotics Institute DEI Town Hall Panel	September 2020
Castilleja Global Week AI Panel	January 2019
Quantitative Genomics Working Group Series at Harvard School of Public Health	April 2018
MIT Women in EECS Tech Talk	April 2017

Coursework and Skills

CMU Coursework: Deep Reinforcement Learning (10-703), Statistical Techniques in Robotics (16-831), Deep RL for Robotics (16-881), Math for Robotics (16-811), Mechanics of Manipulation (16-741)

MIT Coursework: Autonomous Vehicles (2.166), Computer Vision (6.819), ML for Healthcare (6.S897), NLP (6.806), Performance Engineering (6.172), Inference (6.008), Undergraduate Research (6.UAR)

Languages:	Python	C++	Java	MATLAB
Tools:	PyTorch/Torch	Tensorflow	JAX/Haiku	ROS

Outside Interests

Experimental baking, swing dancing, reading (Goodreads), and rowing (NCAA Division I, MIT 2017-2018).