Victoria Dean

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Education

Carnegie Mellon University 2018 – 2023 (expected)
PhD student in Robotics, School of Computer Science (GPA: 4.11/4.0)
Advised by Abhinav Gupta

Massachusetts Institute of Technology 2013 – 2017
Bachelor of Science, Computer Science and Engineering

Research and Industry Experience

CMU Robotics Institute, Graduate Student Researcher 2018 – present
Studying exploration and task transfer in reinforcement learning and robotics in Abhinav Gupta's lab.

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 deep models to exploit underused signals present in videos, including visual dynamics and audio.

Deep Genomics, Research Intern Summer 2016
Developed a CNN for an RNA pattern recognition task that gave a 1.2x improvement in sensitivity. Won 2nd best paper at the Machine Learning for Computational Biology workshop at NeurIPS 2016.

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.

FIRST Robotics Team 1700, Programming Lead, Coach 2009 – 2014, 2018
Mentored all-girls high school robotics team, Castilleja Gatorbotics. Previously as a student, developed PID controllers and image tracking to identify and automatically aim at basketball hoops.

UC Santa Cruz Astronomy Research Internship 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.

Teaching

Ethics and Robotics (16-735), Instructor of Record — Spring 2021
Designed and taught seminar with Professor Illah Nourbakhsh. Created module design project to develop ethics curricula for other courses in collaboration with 11 Carnegie Mellon CS faculty.

Deep RL for Robotics (16-881), Head Teaching Assistant — Spring 2020
Led discussions and presentations on Deep RL and Robotics in seminar course with Professor David Held.

Introduction to Deep Learning (6.S191), Lecturer and Co-Chair — January 2017
Organized MIT's first deep learning course. My multi-modal learning lecture has over 22,000 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 technical school in Prato, Italy.

Society of Women Engineers, Lead Instructor — 2014 – 2017
Developed and taught #HelloWorld, an MIT program encouraging middle school girls to pursue CS. Still run every semester, the 7-week course enables students to build websites using HTML, CSS, and JS.

Introduction to EECS (6.01), Student Lab Assistant — Spring 2014
Led MIT students through course labs on topics ranging from probability to PID control on real robots.

Advising

Gaoyue Zhou, RI MS Student	2022
Shaden Alshammari, Robotics Institute Summer Scholar	2022
Krishna Patel, Undergraduate Researcher	2022
Jacob Adkins, Robotics Institute Summer Scholar	2021
Maxine Lui, Undergraduate Researcher	2021
Eliot Xing, Robotics Institute Summer Scholar	2020-2021

Publications

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

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.

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

V. Dean, Y. Shavit, and 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.

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, 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 (poster) workshops, NeurIPS 2016.

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

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

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

Service and Outreach

CMU Robotics Institute Faculty Hiring Committee, Committee Member 2021

Contributed to faculty hiring committee through entire process, including reading packets, interviewing all 16 candidates selected for visits, and soliciting and consolidating feedback from the department.

CMU AI mentorship program, Organizer 2018 – 2021

Founded program with goal of involving more women and underrepresented minorities in AI research. In the first two years, paired 109 minority undergraduates with PhD student mentors.

CMU SCS Dean's Advisory Committee, Committee 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.

CMU 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 travel grants for students from Mexico, Ghana, Uganda, and Ethiopia.

Code for Good, Founder 2014 – 2017

Founded MIT group connecting students and nonprofits on technical projects. Since its founding, hundreds of students have worked with 40+ nonprofits through a course (6.S187) and a consulting program.

Invited Talks/Panels

Duke Technology Scholars Program Fireside Chat	May 2022
Robotics Institute Summer Scholars Graduate Student Panel	July 2021
CVPR Sight and Sound Workshop Invited Paper Talk	June 2021
Reasoning, AI and VisioN (RAIVN) Lab Recognition Lunch at University of Washington	November 2020
Robotics Institute DEI Town Hall Panel	September 2020
Robotics Institute Summer Scholars Graduate Student Panel	July 2020
Duke Technology Scholars Program Fireside Chat	June 2019
Castilleja Global Week AI Panel	January 2019
Program in Quantitative Genomics Working Group Series at Harvard School of Public Health	April 2018
MIT Women in EECS Tech Talk	April 2017

Honors and Awards

NSF Graduate Research Fellowship Program Awardee	2020
Cisco Undergraduate Research and Innovation Scholar	2015 – 2016
2nd Place Oral Presentation at NeurIPS Machine Learning in Computational Biology Workshop	2016
Dropbox Engineering Prize at Stanford TreeHacks	2015
Winner of MIT Education DesignShop	2014
Intel Science Talent Search Semifinalist (One of 300)	2013

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/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).