Dylan P. Losey

Contact

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Research Interests

Human-robot interaction, machine learning, and control theory, with applications in personal and assistive robots.

Current Position

Virginia Tech
Assistant Professor — August 2020 – Present
Department of Mechanical Engineering

Education

Stanford University
Postdoctoral Scholar in Computer Science — 2019 – 2020
Advisor: Dorsa Sadigh

Rice University
Ph.D. in Mechanical Engineering — 2018
M.S. in Mechanical Engineering — 2016
Dissertation: *Responding to Physical Human-Robot Interaction*
Advisor: Marcia K. O'Malley

Vanderbilt University
B.E. in Mechanical Engineering — 2014

Honors & Awards

National Science Foundation
CAREER Award — 2024

Virginia Tech
Outstanding New Assistant Professor Award — 2023

IEEE/RSJ International Conference on Intelligent Robots and Systems
Best RoboCup Paper Award, Finalist — 2021

Conference on Robot Learning
Best Paper Award — 2020

Robotics: Science and Systems
Best Student Paper Award, Finalist — 2020

ACM/IEEE International Conference on Human-Robot Interaction
Best Paper Award, Honorable Mention — 2020

Rice University, Department of Mechanical Engineering
Outstanding Ph.D. Thesis Award — 2019

IEEE/ASME Transactions on Mechatronics
Best Paper Award 2017

IEEE Conference on Biomedical Robotics and Biomechatronics
Best Student Paper Award, Finalist 2016

National Science Foundation Graduate Research Fellowship 2014

Rice University Graduate Research Fellowship 2014

Vanderbilt University Dynamics & Controls Award 2014

Vanderbilt University Cornelius Vanderbilt Scholarship 2010

Teaching

ME 4824: Introduction to Human-Robot Interaction 2022 – 2023
Course Developer and Instructor, Virginia Tech

ME 5824 / CS 5844: Algorithmic Human-Robot Interaction 2022 – 2023
Course Developer and Instructor, Virginia Tech

ME 4524: Robotics and Automation 2021 – 2023
Instructor, Virginia Tech

ME 5704 / ECE 5704: Robotics and Automation 2023
Instructor, Virginia Tech

ME 3534: Controls Engineering I 2024
Instructor, Virginia Tech

ME 4015/16: Engineering Design and Project 2020, 2022 – 2023
Advisor, Virginia Tech

Advising & Mentoring

Current Postdoctoral Scholars
Heramb Nemlekar

Current Ph.D. Students
Ananth Jonnavittula, Soheil Habibian, Shaunak Mehta, Sagar Parekh, Shahab Sagheb, Balamurugan Ramachandran

Current M.S. Students
Benjamin Christie, Joshua Hoegerman, Maya Keely

Past Undergraduate Students
James Mullen (Ph.D. student at University of Maryland)

Outreach

Women in Mechanical Engineering Tea (WeMET) 2022 – Present
I founded and sponsor this program at Virginia Tech. WeMET provides an opportunity for female graduate students across different research groups to get to know each other, socialize, discuss the highs and lows of graduate school, and foster diversity. Participants meet monthly and chat over tea.

Stanford AI Mentor 2019 – 2020
I mentored in this SAIL program, where we connected underrepresented minorities and female undergraduate students interested in AI with Ph.D. students to meet monthly and discuss research and career choices.

AI4ALL 2019 – 2020
I shared our lab's research in human-robot interaction with female high-schools students participating in AI4ALL, and lectured on how we write code to control robots at Stanford University.

TOMODACHI-STEM 2018
I mentored a female undergraduate student from Japan throughout a mechantronics research project as a part of this Rice University program meant to provide an introduction to higher education and opportunities for cultural engagement.

Professional Activities

Journal Associate Editor
ACM Transactions on Human-Robot Interaction (THRI) 2021 – Present
IEEE Robotics and Automation Letters (RA-L) 2020 – 2023

Conference Associate Editor
IEEE International Conference on Intelligent Robots and Systems (IROS) 2021, 2022
IEEE International Symposium on Multi-Robot and Multi-Agent Systems (MRS) 2021

Center for Human-Computer Interaction 2021 – Present
Member of the Virginia Tech Center for Human-Computer Interaction (CHCI)

Workshop Organizer
ICRA: *Communicating Robot Learning across Human-Robot Interaction* 2023
RSS: *Emergent Behaviors in Human-Robot Systems* 2020

Editorial Board
Stanford Artificial Intelligence Lab (SAIL) Blog 2019 – 2020

External Reviewer for Conferences, Journals, and Grant Panels
- NSF Proposal Panels
- International Journal of Robotics Research
- IEEE Transactions on Robotics
- IEEE Robotics and Automation Letters
- IEEE/ASME Transactions on Mechatronics
- ACM Transactions on Human-Robot Interaction
- Conferences including ICRA, RSS, CoRL, IROS, HRI, and ICORR

Invited Talks

UT Austin, Oden Institute Seminar 2024
Robots that Learn to Influence Humans

Rice University, Mechanical Engineering Seminar 2024

UT Knoxville, MABE Distinguished Seminar Series 2024

Boeing Distinguished Researcher and Scholar Seminar 2023

University of Waterloo, Mechanical Engineering Seminar 2023

Vanderbilt University, Mechanical Engineering Seminar 2022

Worcester Polytechnic Institute, Robotics Engineering Colloquium 2022

Commonwealth Cyber Initiative (CCI), Integrated Security Seminar 2022

UC Berkeley, CITRIS People and Robots Seminar Series 2022

Purdue University, Robotics Seminar 2021
Interactive, Inclusive, and Revealing Robot Learners

UIUC, Human-Centered Autonomy Lab 2021

Virginia Tech, Center for Human-Computer Interaction 2021

University of Virginia, ESE Colloquium 2021

UC Berkeley, InterACT Lab 2021
Towards Inclusive and Revealing Robot Learners

UC Berkeley, Learning for Dynamics and Control Group 2020
Latent Roles and Strategies in Multi-Agent Interaction

ICRA, Workshop on Interactive Robot Learning 2020
Personalizing Robots through Learned Latent Actions

University of North Carolina, Department of Computer Science 2020
Personalizing Robots with Mechanics and Learning

University of Washington, Department of Mechanical Engineering 2020

Boston University, Department of Mechanical Engineering 2020

Notre Dame, Department of Aerospace and Mechanical Engineering 2020

Virginia Tech, Department of Mechanical Engineering 2020

Stanford University, Robotics Seminar 2020

Amazon Research Awards 2019
Controlling Assistive Robots with Learned Latent Actions

MIT, Computer Science & Artificial Intelligence Lab 2019
Personalizing Robots with Physics and Intelligence

Harvard University, Materials Science and Mechanical Engineering 2019

Boston University, Center for Information & Systems Engineering 2019

UIUC, Departments of Mechanical Engineering & Computer Science 2019

Responding to Physical Human-Robot Interaction

Stanford University, Robotics Seminar 2019

Journal Papers

25. Maya Keely, Yeunhee Kim, Shaunak A. Mehta, Joshua Hoegerman, Robert R. Sanchez, Emily Paul, Camryn Mills, Dylan P. Losey, and Michael D. Bartlett, "Unifying rigid and soft grippers for object manipulation during human-robot interaction," 2023 (in preparation).
24. Soheil Habibian, Antonio Valdivia, Laura Blumenschein, and Dylan P. Losey, "A review of communicating robot learning during human-robot interaction," *The International Journal of Robotics Research*, 2023 (in review).
23. Shahabedin Sagheb, Soham Gandhi, and Dylan P. Losey, "Should collaborative robots be transparent?," *International Journal of Social Robotics*, 2023 (in review).
22. Benjamin A. Christie and Dylan P. Losey, "LIMIT: Learning interfaces to maximize information transfer," *ACM Transactions on Human-Robot Interaction*, 2023 (in review).
21. Ananth Jonnavittula, Shaunak A. Mehta, and Dylan P. Losey, "SARI: Shared autonomy across repeated interaction," *ACM Transactions on Human-Robot Interaction*, 2023 (in press).
20. Shaunak A. Mehta and Dylan P. Losey, "Unified learning from demonstrations, corrections, and preferences during physical human-robot interaction," *ACM Transactions on Human-Robot Interaction*, 2023 (in press).
19. Ryan Wright, Sagar Parekh, Robin White, and Dylan P. Losey, "Safely and autonomously cutting meat with a collaborative robot arm," *Scientific Reports*, vol 14, pp. 299, 2024.
18. Shaunak A. Mehta, Forrest Meng, Andrea Bajcsy, and Dylan P. Losey, "StROL: Stabilized and robust online learning from humans," *IEEE Robotics and Automation Letters*, vol. 9, no. 3, pp. 2303-2310, 2023.
17. Michael Hagenow, Emmanuel Senft, Nitzan Orr, Robert Radwin, Michael Gleicher, Bilge Mutlu, Dylan P. Losey, and Michael Zinn, "Coordinated multi-robot shared autonomy based on scheduling and demonstrations," *IEEE Robotics and Automation Letters*, vol. 8, no. 12, pp. 8335-8342, 2023.
16. Joshua Hoegerman and Dylan P. Losey, "Reward learning with intractable normalizing functions," *IEEE Robotics and Automation Letters*, vol. 8, no. 11, pp. 7511-7518, 2023.
15. Sagar Parekh, and Dylan P. Losey, "Learning latent representations to co-adapt to humans," *Autonomous Robots*, vol. 47, pp. 771–796, 2023.
14. Antonio Valdivia, Soheil Habibian, Carly Mendenhall, Francesco Fuentes, Ritish Shailly, Dylan P. Losey, and Laura Blumenschein, "Wrapping haptic displays around robot arms to communicate learning," *IEEE Transactions on Haptics*, vol. 16, no. 1, pp. 57-72, 2023.
13. Soheil Habibian, Ananth Jonnavittula, and Dylan P. Losey, "Here's what I've learned: Asking questions that reveal reward learning," *ACM Transactions on Human-Robot Interaction*, vol. 11, no. 4, pp. 1-28, 2022.
12. Soheil Habibian and Dylan P. Losey, "Encouraging human interaction with robot teams: Legible and fair subtask allocations," *IEEE Robotics and Automation Letters*, vol. 7, no. 3, pp. 6685-6692, 2022.

11. Dylan P. Losey, Andrea Bajcsy, Marcia K. O'Malley, and Anca D. Dragan, "Physical interaction as communication: Learning robot objectives online from human corrections," *The International Journal of Robotics Research*, vol. 41, no. 1, pp. 20-44, 2022.
10. Erdem Biyik, Dylan P. Losey, Malayandi Palan, Nicholas C. Landolfi, and Dorsa Sadigh, "Learning reward functions from diverse sources of human feedback: Optimally integrating demonstrations and preferences," *The International Journal of Robotics Research*, vol. 41, no. 1, pp. 45-67, 2022.
9. Dylan P. Losey, Hong Jun Jeon, Mengxi Li, Krishnan Srinivasan, Ajay Mandlekar, Animesh Garg, Jeannette Bohg, and Dorsa Sadigh, "Learning latent actions to control assistive robots," *Autonomous Robots*, vol. 46, pp. 115–147, 2022.
8. James F. Mullen Jr, Josh Mosier, Sounak Chakrabarti, Anqi Chen, Tyler White, and Dylan P. Losey, "Communicating inferred goals with passive augmented reality and active haptic feedback," *IEEE Robotics and Automation Letters*, vol. 6, no. 4, pp. 8522-8529, 2021.
7. Dylan P. Losey and Marcia K. O'Malley, "Learning the correct robot trajectory in real-time from physical human interactions," *ACM Transactions on Human-Robot Interaction*, vol. 9, no. 1, pp. 1-19, 2019.
6. Dylan P. Losey, Laura Blumenschein, Janelle Clark, and Marcia K. O'Malley, "Improving short-term retention after robotic training by leveraging fixed-gain controllers," *Journal of Rehabilitation and Assistive Technologies Engineering*, vol. 6, pp. 1-13, 2019.
5. Dylan P. Losey and Marcia K. O'Malley, "Enabling robots to infer how end-users teach and learn through human-robot interaction," *IEEE Robotics and Automation Letters*, vol. 4, no. 2, pp. 1956-1963, 2019.
4. Dylan P. Losey and Marcia K. O'Malley, "Trajectory deformations from physical human-robot interaction," *IEEE Transactions on Robotics*, vol. 34, no. 1, pp. 126-138, 2018.
3. Dylan P. Losey, Craig G. McDonald, Edoardo Battaglia, and Marcia K. O'Malley, "A review of intent detection, arbitration, and communication aspects of shared control for physical human-robot interaction," *Applied Mechanics Reviews*, vol. 70, no. 1, 2018.
2. Dylan P. Losey, Andrew Erwin, Craig G. McDonald, Fabrizio Sergi, and Marcia K. O'Malley, "A time domain approach to control of series elastic actuators: Adaptive torque and passivity-based impedance control," *IEEE/ASME Transactions on Mechatronics*, vol. 21, no. 4, pp. 2085-2096, 2016. **(Best Paper Award)**.
1. Ali Utku Pehlivan, Dylan P. Losey, and Marcia K. O'Malley, "Minimal assist-as-needed controller for upper limb robotic rehabilitation," *IEEE Transactions on Robotics*, vol. 32, no. 1, pp. 113-124, 2016.

Refereed Conference Proceedings

29. Maya N. Keely, Heramb Nemlekar, and Dylan P. Losey, "Kiri-Spoon: A Soft Shape-Changing Utensil for Robot-Assisted Feeding," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024 (in review).
28. Shaunak A. Mehta, Yeunhee Kim, Joshua Hoegerman, Michael D. Bartlett, and Dylan P. Losey, "RISO: Combining rigid grippers with soft switchable adhesives," *IEEE International Conference on Soft Robotics (RoboSoft)*, 2023.

27. Shahabedin Sagheb, Ye-Ji Mun, Neema Ahmadian, Benjamin A. Christie, Andrea Bajcsy, Katherine Driggs-Campbell, and Dylan P. Losey, "Towards robots that influence humans over long-term interaction," *IEEE International Conference on Robotics and Automation (ICRA)*, 2023.
26. Sagar Parekh, Soheil Habibian, and Dylan P. Losey, "RILI: Robustly influencing latent intent," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022.
25. Antonio Alvarez Valdivia, Ritish Shailly, Naman Seth, Francesco Fuentes, Dylan P. Losey, and Laura H. Blumenschein, "Wrapped haptic display for communicating physical robot learning," *IEEE/RAS International Conference on Soft Robotics (RoboSoft)*, 2022.
24. Ehsan Yousefi, Dylan P. Losey, and Inna Sharf, "Assisting operators of articulated machinery with optimal planning and goal inference," *IEEE International Conference on Robotics and Automation (ICRA)*, 2022.
23. Shaunak A. Mehta, Sagar Parekh, and Dylan P. Losey, "Learning latent actions without human demonstrations," *IEEE International Conference on Robotics and Automation (ICRA)*, 2022.
22. Ananth Jonnavittula and Dylan P. Losey, "Communicating robot conventions through shared autonomy," *IEEE International Conference on Robotics and Automation (ICRA)*, 2022.
21. Ananth Jonnavittula and Dylan P. Losey, "Learning to share autonomy across repeated interaction," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021. **(Best RoboCup Paper Finalist)**
20. Siddharth Karamcheti, Albert J. Zhai, Dylan P. Losey, and Dorsa Sadigh, "Learning visually guided latent actions for assistive teleoperation," *Learning for Dynamics & Control (L4DC)*, 2021.
19. Ananth Jonnavittula and Dylan P. Losey, "I know what you meant: Learning human objectives by (under) estimating their choice set," *IEEE International Conference on Robotics and Automation (ICRA)*, 2021.
18. Mengxi Li, Alper Canberk, Dylan P. Losey, and Dorsa Sadigh, "Learning human objectives from sequences of physical corrections," *IEEE International Conference on Robotics and Automation (ICRA)*, 2021.
17. Annie Xie, Dylan P. Losey, Ryan Tolsma, Chelsea Finn, and Dorsa Sadigh, "Learning Latent Representations to Influence Multi-Agent Interaction," *Conference on Robot Learning (CoRL)*, 2020. **(Best Paper Award)**
16. Mengxi Li, Dylan P. Losey, Jeannette Bohg, and Dorsa Sadigh, "Learning user-preferred mappings for intuitive robot control," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2020.
15. Hong Jun Jeon, Dylan P. Losey, and Dorsa Sadigh, "Shared autonomy with learned latent actions," *Robotics: Science and Systems (RSS)*, 2020. **(Best Student Paper Finalist)**
14. Dylan P. Losey, Krishnan Srinivasan, Ajay Mandlekar, Animesh Garg, and Dorsa Sadigh, "Controlling assistive robots with learned latent actions," *IEEE International Conference on Robotics and Automation (ICRA)*, 2020.
13. Minae Kwon, Erdem Biyik, Aditi Talati, Karan Bhasin, Dylan P. Losey, and Dorsa Sadigh, "When humans aren't optimal: Robots that collaborate with risk-aware humans," *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pp. 43-52, 2020. **(Best Paper Honorable Mention)**

12. Dylan P. Losey, Mengxi Li, Jeannette Bohg, and Dorsa Sadigh, "Learning from my partner's actions: Roles in decentralized robot teams," *Conference on Robot Learning (CoRL)*, 2019.
11. Erdem Biyik, Malayandi Palan, Nicholas C. Landolfi, Dylan P. Losey, and Dorsa Sadigh, "Asking easy questions: A user-friendly approach to active reward learning," *Conference on Robot Learning (CoRL)*, 2019.
10. Dylan P. Losey and Dorsa Sadigh, "Robots that take advantage of human trust," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.
9. Dylan P. Losey and Marcia K. O'Malley, "Including uncertainty when learning from human corrections," *Conference on Robot Learning (CoRL)*, pp. 123-132, 2018.
8. Andrea Bajcsy, Dylan P. Losey, Marcia K. O'Malley, and Anca D. Dragan, "Learning from physical human corrections, one feature at a time," *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, 2018.
7. Andrea Bajcsy, Dylan P. Losey, Marcia K. O'Malley, and Anca D. Dragan, "Learning robot objectives from physical human interaction," *Conference on Robot Learning (CoRL)*, pp. 217-226, 2017.
6. Dylan P. Losey and Marcia K. O'Malley, "Effects of discretization on the K-width of series elastic actuators," *IEEE International Conference on Robotics and Automation (ICRA)*, pp. 421-426, 2017.
5. Ali Utku Pehlivan, Dylan P. Losey, Chad G. Rose, and Marcia K. O'Malley, "Maintaining subject engagement during robotic rehabilitation with a minimal assist-as-needed (mAAN) controller," *IEEE International Conference on Rehabilitation Robotics (ICORR)*, pp. 62-67, 2017.
4. Dylan P. Losey, Laura H. Blumenschein, and Marcia K. O'Malley, "Improving the retention of motor skills after reward-based reinforcement by incorporating haptic guidance and error augmentation," *IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, pp. 865-871, 2016.
3. Dylan P. Losey, Craig G. McDonald, and Marcia K. O'Malley, "A bio-inspired algorithm for identifying unknown kinematics from a discrete set of candidate models by using collision detection," *IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, pp. 418-423, 2016. **(Best Student Paper Award Finalist)**
2. Ben D. Kramer, Dylan P. Losey, and Marcia K. O'Malley, "SOM and LVQ classification of endovascular surgeons using motion-based metrics," *Workshop on Self-Organizing Maps (WSOM)*, pp. 227-237, 2016.
1. Dylan P. Losey, Peter A. York, Philip J. Swaney, Jessica Burgner, and Robert J. Webster III, "A flexure-based wrist for needle-sized surgical robots," *SPIE Medical Imaging*, pp. 86711G, 2013.