

TABITHA EDITH LEE

Robotist and Ph.D. in Robotics Researcher

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RESEARCH INTERESTS

Causal robot learning for manipulation: the interplay of robot perception and control through the lens of causality to learn and leverage the causal structure of manipulation tasks as represented by data generating processes. Sim-to-real transfer learning of perception and control models, particularly under distribution shifts. Active perception and other methodologies that offer principled reasoning of information. Rigorous experimental validation and robust implementation of algorithms and technologies for robotic systems in laboratories, field environments, and the open world.

Keywords: robot learning, causality, sim-to-real transfer learning, manipulation, perception, field robotics

EDUCATION

Ph.D. in Robotics, expected Spring 2024 Aug. 2018 - present
Carnegie Mellon University, The Robotics Institute, School of Computer Science *Pittsburgh, PA*
Faculty Advisor: Prof. Oliver Kroemer
GPA: 4.08 (*cumulative including CMU M.S. in Robotics program*)
Future Faculty Program Candidate

M.S. in Robotics, August 2017 Aug. 2015 - Aug. 2017
Carnegie Mellon University, The Robotics Institute, School of Computer Science *Pittsburgh, PA*
Thesis Title: “State Estimation and Localization for ROV-Based Reactor Pressure Vessel Inspection Using a PTZ Camera”
Faculty Advisor: Prof. Nathan Michael
GPA: 4.05

Graduate Certificate in Artificial Intelligence, December 2014 June 2013 - Dec. 2014
Stanford University, Computer Science Department via Stanford Center for Professional Development *Stanford, CA*
Completed while working full-time in industry. All courses were taken for full graduate credit and could be transferred to Stanford’s computer science graduate programs.

M.S. in Aerospace Engineering, December 2010 Aug. 2007 - Dec. 2010
University of Maryland, Department of Aerospace Engineering *College Park, MD*
Thesis Title: “Design and Performance of a Ducted Coaxial Rotor in Hover and Forward Flight”
Faculty Advisor: Prof. J. Gordon Leishman
Relevant Courses: *Engineering Optimization; Computational Fluid Dynamics.*

B.S. in Aerospace Engineering with Honors in Aerospace Engineering, May 2007 Sept. 2003 - May 2007
University of Maryland, Department of Aerospace Engineering *College Park, MD*
Relevant Courses: *Flight Software Systems; Aerospace Computing; Control of Aerospace Systems.*

PUBLICATIONS

▷ **Robotics and Artificial Intelligence** (2013 - present)

Master’s Thesis:

- **T. E. Lee**, “State Estimation and Localization for ROV-Based Reactor Pressure Vessel Inspection Using a Pan-Tilt-Zoom Camera,” M.S. Thesis, Technical Report CMU-RI-TR-17-48, The Robotics Institute, Carnegie Mellon University, August 2017. Graduate Advisor: Prof. Nathan Michael. [[Paper](#)]

Conference Proceedings:

- **T. E. Lee***, S. Vats*, S. Girdhar, and O. Kroemer, “SCALE: Causal Learning and Discovery of Robot Manipulation Skills using Simulation,” accepted and will appear at the *Conference on Robot Learning (CoRL 2023)*, Atlanta, GA, November 6-9, 2023. *Equal contribution. [[Website](#)]
 - Acceptance rate: 39.9%.

- S. Weichwald, S. W. Mogensen, **T. E. Lee**, D. Baumann, O. Kroemer, I. Guyon, S. Trimpe, J. Peters, and N. Pfister, “Learning by Doing: Controlling a Dynamical System using Causality, Control, and Reinforcement Learning,” *Proceedings of Machine Learning Research: NeurIPS 2021 Competition and Demonstration Track*, Vol. 176, pp. 246-258, 2022. [[Website](#)] [[Paper](#)] [[Code](#)]
- V. Zeng, **T. E. Lee***, J. Liang*, and O. Kroemer, “Visual Identification of Articulated Object Parts,” *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2021)*, hosted virtually from Prague, Czech Republic, September 27 - October 1, 2021. *Equal contribution. [[Website](#)] [[Paper](#)]
 - Acceptance rate: 45%.
- **T. E. Lee**, J. Zhao, A. S. Sawhney, S. Girdhar, and O. Kroemer, “Causal Reasoning in Simulation for Structure and Transfer Learning of Robot Manipulation Policies,” *2021 IEEE International Conference on Robotics and Automation (ICRA 2021)*, hosted virtually from Xi’an, China, May 30 - June 5, 2021. [[Website](#)] [[Paper](#)]
 - Acceptance rate: 48.0%.
- **T. E. Lee**, J. Tremblay, T. To, J. Cheng, T. Mosier, O. Kroemer, D. Fox, and S. Birchfield, “Camera-to-Robot Pose Estimation from a Single Image,” *2020 IEEE International Conference on Robotics and Automation (ICRA 2020)*, held virtually May 31 - June 4, 2020. [[Website](#)] [[Paper](#)] [[Code](#)] [[Blog](#)]
 - Acceptance rate: 42%.
- **T. E. Lee** and N. Michael, “State Estimation and Localization for ROV-Based Reactor Pressure Vessel Inspection,” *11th Conference on Field and Service Robotics (FSR 2017)*, Zürich, Switzerland, September 12-15, 2017. [[Paper](#)]
- **T. E. Lee**, N. Michael, and L. J. Petrosky, “Autonomous Inspection of Nuclear Reactor Pressure Vessels via a Remotely Operated Vehicle,” *American Nuclear Society Decommissioning and Remote Systems 2016*, Pittsburgh, PA, July 31 - August 4, 2016.
- J. C. Krainski, B. C. H. Chu, and **T. E. Lee**, “A Review of Various GNC Design Strategies and Flight Test Results for Boeing Autonomous/Unmanned Rotorcraft and Their Applicability to Future Rotorcraft Platforms,” *2014 Boeing GNC8 Conference*, St. Louis, MO, October 14-16, 2014.
- **T. E. Lee**, M. J. Cribbs, and J. C. Krainski, “Automated, Integrated UAV Health Monitoring System: Flight Test Case Study,” *AHS Specialists’ Meeting on Unmanned Rotorcraft and Network Centric Operations*, Scottsdale, AZ, January 22-24, 2013. [[Paper](#)]

Workshop Proceedings:

- A. Dahmani, E. Yiu, N. R. Ke, **T. E. Lee**, O. Kroemer, and A. Gopnik, “Toward Understanding Automated Causal Curriculum Learning in Humans and Reinforcement Learning Agents,” accepted and will appear at *The 6th International Workshop on Intrinsically Motivated Open-ended Learning (IMOL 2023)*, Paris, France, September 13-15, 2023.

Papers in Preparation (Currently Unpublished):

- **T. E. Lee**, N. Michael, *et al*, “Robust State Estimation and Localization for ROV-Based Nuclear Reactor Inspection Using a Pan-Tilt-Zoom Camera” (working title). In preparation for submission to the *Field Robotics* journal. Expanded version of M.S. thesis and concluding work in ROV localization research.

Additional Media:

- **T. E. Lee** and J. Svegliato, “Celebrating the Past, Present, and Future of Computing,” *AI Matters*, Vol. 3, Issue 3, Summer 2017, pp. 22-24, Association for Computing Machinery (SIGAI Chapter). [[Paper](#)]

▷ **Aerodynamics of Unmanned Aerial Vehicles** (2006 - 2010)

Master’s Thesis:

- **T. E. Lee**, “Design and Performance of a Ducted Coaxial Rotor in Hover and Forward Flight,” M.S. Thesis, Department of Aerospace Engineering, University of Maryland, 2010. Graduate Advisor: Prof. J. Gordon Leishman. [[Paper](#)]

Journal Articles:

- **T. E. Lee**, J. G. Leishman, and M. Ramasamy, “Fluid Dynamics of Interacting Blade Tip Vortices With a Ground Plane,” *Journal of the American Helicopter Society (JAHS)*, Vol. 55, No. 2, pp. 022005-1 - 022005-16, April 2010. [[Paper](#)]

- *JAHS* is the premier academic journal for the helicopter technical community.
- 150+ citations.

- M. Ramasamy, **T. E. Lee**, and J. G. Leishman, “Flowfield of a Rotating-Wing Micro Air Vehicle,” *AIAA Journal of Aircraft*, Vol. 44, No. 4, pp. 1236-1244, July 2007. [[Paper](#)]
- 100+ citations.

Conference Proceedings:

- **T. E. Lee**, J. G. Leishman, and O. Rand, “Design and Testing of a Ducted Coaxial Rotor System for Application to an Unmanned Aerial Vehicle,” *66th Annual National Forum of the American Helicopter Society International*, Phoenix, AZ, May 11-13, 2010. [[Paper](#)]
- **T. E. Lee**, J. G. Leishman, and M. Ramasamy, “Fluid Dynamics of Interacting Blade Tip Vortices With a Ground Plane,” *64th Annual National Forum of the American Helicopter Society International*, Montréal, Canada, April 29 - May 1, 2008. [[Paper](#)]
- M. Ramasamy, J. G. Leishman, and **T. E. Lee**, “Flow Field of a Rotating-Wing Micro Air Vehicle,” *62nd Annual National Forum of the American Helicopter Society International*, Phoenix, AZ, May 9-11, 2006. [[Paper](#)]

PATENTS AND PATENT APPLICATIONS

- J. Tremblay, S. Birchfield, and **T. E. Lee**, “Pose Determination Using One or More Neural Networks,” Patent Application 16/657,220. Filed October 2019 by NVIDIA. Published as U.S. Patent Application 2021/0118166 A1 on April 22, 2021.
- N. Michael, **T. E. Lee**, and C. Boirum, “State Estimation and Localization for ROV-Based Structural Inspection,” Patent Application 16/610,647. Filed May 2018 by Carnegie Mellon University. Published as U.S. Patent Application 2020/0068125 A1 on February 27, 2020. Published as U.S. Patent 11,310,417 on April 19, 2022.

SELECTED PRESENTATIONS

Excluding presentations for conference papers and internal lab presentations.

▷ **Invited**

- “Transfer Learning for Robots and for Humans,” *GENDiR Seminar Series*, Gender Diversity in Robotics, University of Michigan, April 12, 2023. [[Link](#)]
- “Causal Reasoning in Simulation for Structure and Transfer Learning of Robot Manipulation Policies,” *Intelligent Control Lab*, The Robotics Institute, Carnegie Mellon University, February 17, 2022.
- “Causal Reasoning in Simulation for Structure and Transfer Learning of Robot Manipulation Policies,” *AI in Robotics Seminar*, Robotics Institute, Dept. of Computer Science, University of Toronto, October 25, 2021. [[Link](#)] [[Video](#)]
- “State Estimation and Localization for ROV-Based Reactor Pressure Vessel Inspection Using a Pan-Tilt-Zoom Camera,” *Student Seminar Series*, Maryland Robotics Center, University of Maryland, February 14, 2020.
- “Scalable Robot Learning through Relevance: A High-Level Research Vision,” *CGA Group*, The Robotics Institute, Carnegie Mellon University, November 22, 2019.

▷ **Departmental**

- “Causal Robot Learning for Manipulation,” The Robotics Institute, Carnegie Mellon University, September 30, 2022. [[Link](#)]
- Seminar served as my Ph.D. in Robotics thesis proposal.
- “Causal Reasoning in Simulation for Structure and Transfer Learning of Robot Manipulation Policies,” The Robotics Institute, Carnegie Mellon University, April 26, 2021.
- Seminar served as my Ph.D. in Robotics speaking qualifier.
- “State Estimation and Localization for ROV-Based Reactor Pressure Vessel Inspection Using a Pan-Tilt-Zoom Camera,” *Field Robotics Center Seminar*, The Robotics Institute, Carnegie Mellon University, August 4, 2017. [[Slides](#)]
- Seminar served as my M.S. in Robotics thesis defense.

ACADEMIC ORGANIZATION: COMPETITIONS AND WORKSHOPS

- Organizer for “Causality for Robotics” IROS 2023 Workshop** Feb. 2023 - Oct. 2023
- Lead organizer for the “Causality for Robotics: Answering the Question of Why” workshop that will appear at IROS 2023 on October 5, 2023 in Detroit, MI. [[Website](#)]
 - *Organizers:* Tabitha Edith Lee, Sarvesh Patil, and Oliver Kroemer (Carnegie Mellon University); Zizhao Wang, Caleb Chuck, Jiaheng Hu, and Yuke Zhu (University of Texas at Austin).
- Organizer for “Learning By Doing” NeurIPS 2021 Competition** Apr. 2021 - Dec. 2021
- NeurIPS 2021 competition designed to bring together researchers and practitioners in causality, reinforcement learning, and control. These fields are individually concerned with controlling dynamical systems, yet their approaches are often compartmentalized. This competition was constructed to fit the mathematical frameworks of all three fields. Competition consisted of two parallel tracks: 1) CHEM: open-loop control of a chemical process; 2) ROBO: closed-loop control of an articulated robot. Participants uploaded submissions via CodaLab for automated grading. [[Website](#)]
 - Primarily contributed via problem design and implementation for Track ROBO, implementation of CodaLab infrastructure, and open-sourcing the competition software. [[Code](#)]
 - Competition resulted in one academic publication.
 - *Organizers:* Sebastian Weichwald, Niklas Pfister, and Jonas Peters (University of Copenhagen); Dominik Baumann and Sebastian Trimpe (RWTH Aachen University); Isabelle Guyon (Université Paris-Saclay, ChaLearn); Tabitha Edith Lee and Oliver Kroemer (Carnegie Mellon University); Søren Wengel Mogensen (Lund University).

INDUSTRY EXPERIENCE

- Lockheed Martin Corporation** May 2023 - present
Research Science Engineer Intern, Lockheed Martin Space Pittsburgh, PA
- Developed causal learning algorithms and capabilities for the Lockheed Martin Space Advanced Technology Center during Summer 2023 internship.
- NVIDIA** May 2019 - Sept. 2019
Robotics Research Intern, Seattle Robotics Laboratory Seattle, WA
- Developed perception and state estimation algorithms during Summer 2019 internship. Developed approach for camera-to-robot three-dimensional pose estimation using deep learning-based detection of keypoints using only one image. Conducted experimental evaluation of robustness and accuracy, demonstrating better performance than leading algorithm used in practice. Developed software tools and capabilities using Python and PyTorch.
 - Internship research resulted in one academic publication and one U.S. patent application.
 - Research code was open-sourced in June 2020 and has received 100+ stars [[Code](#)]
- Uber Advanced Technologies Group** June 2018 - Aug. 2018
Software Engineering Intern, AVMaps and Localization Pittsburgh, PA
- Developed localization algorithms and capabilities for Uber ATG’s self-driving cars during Summer 2018 internship.
- The Boeing Company: Boeing Research and Technology** Jan. 2013 - Jan. 2015
Control Systems Engineer (Test & Evaluation Engineer) Huntington Beach, CA
- Technical Lead for the hardware and software development and validation of a motor controller for an innovative, electric helicopter actuator. Contributions consisted of software improvements, motor performance testing and validation in a laboratory environment, documenting software and test results, and creating operations procedures.
- The Boeing Company: A160 Unmanned Helicopter Program** Nov. 2009 - Dec. 2012
Data and Software Systems Engineer (Test & Evaluation Engineer) Irvine, CA & Huntington Beach, CA
- Technical Lead for the Autonomous Health Monitoring System, a cross-platform software suite for real-time anomaly detection of aircraft telemetry using classical, rule-based artificial intelligence. Implemented detection algorithms and frameworks in C++. Scope of work encompassed entire software lifecycle from design to deployment. Software logged over 200 hours of aircraft time and was well-received by software end users (flight engineers and operators).

- Work with the Autonomous Health Monitoring System yielded two publications. This project also served as my technical pivot from unmanned aerial vehicle aerodynamics to robotics and artificial intelligence.
- Contributed to program-critical Root Cause and Corrective Action analyses as the flight data representative.

ACADEMIC RESEARCH EXPERIENCE

- Graduate Research Assistant** Sept. 2018 - present
Carnegie Mellon University: Intelligent Autonomous Manipulation Lab (Prof. Oliver Kroemer) *Pittsburgh, PA*
- Causal robot learning research interleaves various machine learning approaches (structure, transfer, reinforcement) within the framework of causality for robot manipulation in both perception and control. Investigated how to leverage both model-based and model-free paradigms for greater sample efficiency in robot learning for manipulation through the Planning Integrated with Lifelong Learning for Advanced Robotics (PILLAR) project.
 - IAM Lab is a member of the NVIDIA AI Labs (NVAIL) program. Co-authored NVAIL proposal with Jacky Liang and Oliver Kroemer.
 - Pre-thesis and thesis research has yielded four academic publications to date.

- Principal Systems/Software Engineer** Aug. 2017 - May 2018
Graduate Research Assistant Sept. 2015 - Aug. 2017
Carnegie Mellon University: Resilient Intelligent Systems Lab (Prof. Nathan Michael) *Pittsburgh, PA*
- Led the development of a computer vision-based localization system for a submersible robot that inspects nuclear reactors. As principal engineer, successfully transitioned this technology that was invented as a graduate student to a software system that will be utilized commercially for nuclear reactor inspections.
 - Developed and tested real-time, robust perception and localization capabilities in C++ using the Robot Operation System (ROS) and leveraging the Eigen and OpenCV open-source libraries. Representative capabilities include fiducial marker detection and tracking, automated control of a pan-tilt-zoom camera via visual servoing, reactor landmark detection, online initialization, fault detection, and the underlying state estimation framework of an extended Kalman filter.
 - Developed system simulation that models the vision-based perception system, robot dynamics, and infrastructure geometry. Simulator generates synthetic camera images to enable prototyping of perception and estimation algorithms.
 - Development included both implementing novel capabilities and robustifying existing algorithms in C++/ROS. Testing included extensive unit and regression software testing (Python), as well as rigorous system testing using a mockup nuclear reactor in an underwater setting.
 - This work yielded three academic publications and one U.S. patent.

- Glenn L. Martin Graduate Assistantship (Graduate Research Assistant)** Aug. 2007 - Nov. 2009
University of Maryland: Alfred Gessow Rotorcraft Center (Prof. J. Gordon Leishman) *College Park, MD*
- Conducted graduate thesis research in the design, test, and evaluation of a ducted coaxial rotor unmanned aerial vehicle (UAV) platform. Designed and constructed 14" diameter UAV, duct, and test stand. Quantified UAV performance in hover and forward flight by conducting wind tunnel experiments for various hardware configurations.
 - Graduate research in aerodynamics for application to unmanned aerial vehicles yielded four academic publications.

- Minta Martin Intern (Undergraduate Research Intern)** June 2005 - Aug. 2007
University of Maryland: Alfred Gessow Rotorcraft Center (Prof. J. Gordon Leishman) *College Park, MD*
- Conducted experimental research in rotating-wing aerodynamics for miniature aerial platforms (micro-air vehicles [MAV]). Designed and constructed MAV (approx. 6" diameter). Quantified MAV thrust and torque performance.
 - Undergraduate research resulted in two academic publications.

STUDENT ADVISING

▷ Supervision

- **Siddharth Girdhar**, CMU undergraduate in Computer Science, Sept. 2020 - Dec. 2022. Co-supervised with Ben Eysenbach, Oliver Kroemer, and Ruslan Salakhutdinov. Research area in representation learning for dynamic models. Collaborated on accepted CMU Summer Undergraduate Research Fellowship (SURF) proposal to obtain Sid's research funding for Summer 2021. Assisted and co-authored research in Ph.D. thesis research in causal robot learning for manipulation.
- **Vicky Zeng**, CMU undergraduate in Artificial Intelligence, May 2020 - May 2021. Co-supervised with Jacky Liang and Oliver Kroemer. Research area in vision-based deep learning for predicting object articulation. Co-authored accepted CMU Summer Undergraduate Research Fellowship (SURF) proposal to obtain Vicky's research funding for Summer 2020. Collaboration resulted in one first-author conference paper for Vicky.

▷ Service

- **Akshay Dharmavaram**, CMU M.S. in Robotics. Served as student member of M.S. committee. Research area: graph neural networks and multi-agent imitation learning.
- **Sudharshan Suresh**, CMU Ph.D. in Robotics. Currently serving as student member of Ph.D. research qualifier committee. Research area: state estimation and mapping for manipulation.
- **Steven Lee**, CMU M.S. in Robotics. Served as student member of M.S. committee. Research area: representation learning for accurate arrangement of food items. May 2021.

TEACHING EXPERIENCE

Course Developer for 15-920:

“Diversity, Equity, and Inclusion in Computer Science and Society”

Mar. 2021 - Aug. 2021

Carnegie Mellon University, School of Computer Science

Pittsburgh, PA

- Course co-developer for 15-920 (Fall 2021), a six-week, expanded version of 15-996 pilot (held Spring 2021).

Course Developer and Discussion Moderator for 15-996:

“Diversity, Equity, and Inclusion in Computer Science and Society”

Sept. 2020 - Mar. 2021

Carnegie Mellon University, School of Computer Science

Pittsburgh, PA

- Course co-developer for 15-996, a 3-week pilot course in diversity, equity, and inclusion (DEI) first-year Ph.D. in Computer Science students. This mandatory course was designed entirely from the ground up by Ph.D. students, for Ph.D. students. The course goal was to facilitate understanding of DEI concepts to impart students with the tools to improve the inclusivity of the computer science community. The course centered peer group discussions to provide space to share lived experiences and discuss course topics through moderated peer group discussions, while interleaving humanities and social justice literature in the course readings and lecture. In this way, the course was designed for DEI topics to be accessible, personally meaningful, and actionable for all students from all backgrounds.
- Held in Spring 2021, 15-996 was a pilot for an expanded version of the course to occur in following years.
- Facilitated 15-996 peer group discussions and provided feedback to student homeworks as discussion moderator.
- Presented an invited talk entitled “The Impostor Phenomenon,” February 21, 2021.

Teaching Assistant for 16-740: “Learning for Manipulation”

Aug. 2020 - Dec. 2020

Carnegie Mellon University, The Robotics Institute

Pittsburgh, PA

- Continued software development and hardware maintenance of LoCoBot robot platforms used in Spring 2019 offering of “Robot Autonomy” to provide students with hands-on experience with robot learning.
- Designed tutorials and homeworks to facilitate student technical learning goals.

Teaching Assistant for 16-662: “Robot Autonomy”

Jan. 2019 - May 2019

Carnegie Mellon University, The Robotics Institute

Pittsburgh, PA

- Led the procurement, assembly, and maintenance of ten LoCoBot robot platforms, one per student group, for student hands-on learning of robot algorithms and capabilities.

- Designed homeworks and in-class laboratories to facilitate student technical learning goals.

Teaching Fellow for ENES 100: “Introduction to Engineering Design”

Jan. 2007 - May 2007

University of Maryland, A. James Clark School of Engineering

College Park, MD

- Assisted with lectures and provided project oversight to promote understanding of engineering fundamentals for 38 students enrolled in “Introduction to Engineering Design,” the first-year engineering class.

Teaching Assistant for EDCP 470: “Introduction to Student Personnel”

Jan. 2006 - May 2006

University of Maryland, Department of Resident Life

College Park, MD

- Led recitation sections with two co-instructors for 20 enrolled students in the training class for Resident Assistants.
- Facilitated discussions on community development, diversity, leadership, conflict management, and peer mediation.

AWARDS AND ACCOLADES

Industry Recognition:

- Promoted to Engineer 3 in recognition of effectiveness and impact on the Boeing A160 program (The Boeing Company: April 2012).
- Received six peer-nominated recognition awards (Pride@Boeing) for outstanding job performance and program impact (The Boeing Company: March 2012, April 2012, October 2012, July 2013, May 2014 (2x)).

Collegiate Awards:

- **NCWIT Collegiate Award Honorable Mention** (National Center for Women & Info. Tech.: Spring 2022)
 - The NCWIT Collegiate Award “honors the outstanding computing achievements of undergraduate and graduate women, genderqueer, or non-binary students” based on “technical contributions to projects that demonstrate a high level of innovation and potential impact.” [\[Link\]](#)
 - Selected as one of 80 Finalists for the NCWIT Collegiate Award. [\[Link\]](#)
 - Of 80 Finalists, selected as one of 15 Winner or Honorable Mention recipients. [\[Link\]](#)
 - Submitted project: “Structural Sim-to-Real Transfer of Robot Manipulation Policies using Causal Reasoning”
- **Graduate Student Service Award** (Carnegie Mellon University: Spring 2022)
 - Recognizes “exemplary teaching by and service to graduate students and Carnegie Mellon.”
 - Awarded as a part of the group of 15 Ph.D. students who led the 15-996 course effort.
- **A. James Clark School of Engineering Dean’s Award** (A. James Clark School of Engineering: Spring 2007)
 - Represents the most prestigious award for a senior engineering undergraduate who has “demonstrated scholastic excellence, outstanding service, and outstanding leadership to the Clark School of Engineering.”
- **President Emeritus H. C. Byrd Citizenship Prize** (University of Maryland: Spring 2007)
 - Represents the most prestigious leadership award for a senior undergraduate who has “typified the model citizen and has contributed significantly to the general advancement of the interests of the University.”
- **General Russell E. Dougherty National Leader of the Year Finalist** (Omicron Delta Kappa: Spring 2007)
 - Recognizes the most influential “leader among leaders” of all Omicron Delta Kappa chapters in the nation. One of four finalists that each was selected Leader of the Year for their local chapter and chapter’s region.
- **Outstanding Ambassador Award** (Clark School Ambassadors: Spring 2007)
- **Spirit of Maryland Award** (University of Maryland: Fall 2006)
 - Recognizes a member of the senior undergraduate class who has demonstrated “outstanding scholarship, leadership, campus involvement, community service, and communication skills.”
- **Student Honor Award** (University of Maryland Alumni Association, Engineering Chapter: Spring 2006)
 - Recognizes an engineering undergraduate “who has shown keen interest, development, and accomplishment in leadership, academics, teamwork, and active participation in student engineering organizations.”
- **Patricia Mielke Citizenship Award** (College Park Scholars: Fall 2005)
- **Dean’s Award for Academic Excellence** (College Park Scholars: Fall 2005)

Academic Fellowships and Scholarships:

- Inclusion@RSS 2021 Fellow (Robotics: Science and Systems (RSS): July 2021)
- ACM SIGAI Student Scholar (ACM Special Interest Group on Artificial Intelligence (SIGAI): Summer 2017)
 - Selected as one of two graduate students to represent SIGAI at the Association for Computing Machinery’s *Celebration of 50 Years of the A.M. Turing Award* in San Francisco, CA, June 23 - 24, 2017.
- **Siebel Scholar Fellowship in Computer Science** (Siebel Scholars Foundation: Fall 2016)
 - Recognizes “the most talented students at the world’s leading graduate schools of business, computer science, bioengineering, and energy science... based on academic excellence and leadership potential.” [\[Link\]](#) [\[Profile\]](#)
 - Class of 2017 represents nearly 100 graduate students, with 37 students representing computer science disciplines.
- Glenn L. Martin Graduate Assistantship, a half-fellowship, half-research assistantship (Department of Aerospace Engineering: Fall 2007 - Fall 2008)
- Vertical Flight Foundation Scholarship (American Helicopter Society International: Spring 2008)
- Young Alumni Club Scholarship (University of Maryland Alumni Association: Fall 2008)
- Chuck and Judy Sturtz Leadership Scholarship (University of Maryland: Spring 2007)
- Clark School Ambassadors Scholarship (A. James Clark School of Engineering: Spring 2005 - Spring 2007)
- Glenn L. Martin Scholarship (Department of Aerospace Engineering: Fall 2005 - Fall 2006)
- Aerospace Engineering Scholarship (Department of Aerospace Engineering: Fall 2004 - Spring 2005)
- William J. Higgins New Member Scholarship (Primannum Honor Society: Spring 2004)

Academic Honors and Honor Societies:

- Aerospace Engineering Honors Program
- Tau Beta Pi, the National Engineering Honor Society
- Omicron Delta Kappa, the National Leadership Honor Society
- Sigma Gamma Tau, the National Honor Society in Aerospace Engineering
- Primannum Honor Society (Alpha Lambda Delta and Phi Eta Sigma)
- College Park Scholars Citation in “Science, Discovery, and the Universe”

SERVICE AND LEADERSHIP ACTIVITIES

Robotics and Machine Learning academic community:

- Reviewer for the International Journal of Robotics Research (IJRR) (2023).
- Reviewer for the IEEE Robotics and Automation Letters (RA-L) (2021, 2022, 2023).
- Reviewer for the NeurIPS Competition Track (2022, 2023).
- Reviewer for the IEEE International Conference on Robotics and Automation (ICRA) (2022, 2023).
- Reviewer for the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) (2021, 2023).
- Reviewer for the International Conference for Machine Learning (ICML) (2020, 2021).
 - Recognized as Top 33% Reviewer for ICML 2020 by meta-reviewers for providing high-quality author feedback.

School of Computer Science (SCS) community:

- Served on the SCS DEI Seminar Series Planning Committee. (Fall 2021 - Spring 2022)
- Spoke at SCS First Year Student Orientation about DEI initiatives and support groups available for SCS undergraduates. (Fall 2021)
- Served as co-leader for SCS Dean’s Ph.D. Advisory Committee. This committee serves Ph.D. students by working to improve the Ph.D. experience through enacting change and advocating to the SCS Dean on behalf of all SCS Ph.D. students. Committee launched and collaborated on initiatives for anti-racism, social connectedness, personal wellness, a mandatory anti-bias course (15-996 and subsequent courses), and undergraduate research engagement. Co-led growth of committee from 10 to 40 members. (Spring 2020 - Spring 2021)
- Mentored three undergraduate students interested in artificial intelligence research through the SCS Undergraduate AI Mentoring program. (Fall 2018 - Spring 2020)

Field Robotics Center (FRC) and Robotics Institute (RI) community:

- Assisted with RI Open House activities for admitted Ph.D. in Robotics students. (Spring 2019)
- Led data recovery effort as a member of the FRC Computing Committee for three NetApp servers used for the DARPA Urban Challenge. (Spring 2016)

A. James Clark School of Engineering community:

- Team Leader for the University of Maryland’s graduate submission to the 2012 AHS Student Design Competition as a part of ENAE 634: “Helicopter Design.” (Spring 2008)
- Tau Beta Pi (President: Fall 2006 - Spring 2007, Induction Chair: Spring 2006)
 - Organized the Tau Beta Pi District 4 Regional Conference at the University of Maryland. (March 31, 2007)
 - Participated in Hurricane Katrina Relief Trip to serve Turkey Creek Community in Gulfport, MI. (Spring 2007)
- Recruitment and outreach for the A. James Clark School of Engineering through the Clark School Ambassadors program. (Special Programs Coordinator: Spring 2007, Founding Member: Spring 2005)
 - Participated in over 100 hours of recruitment and outreach activities.
- Engineering Student Council (Secretary: Fall 2004)

University of Maryland community:

- Omicron Delta Kappa (Webmaster: Spring 2008, Newsletter Editor and Ritualist: Fall 2006 - Spring 2007)
- Resident Assistant (Spring 2005 - Spring 2006)
- Orientation Advisor - worked primarily with incoming engineering students (Summer 2004)

TECHNICAL SKILLS

Programming Languages	Python, C++
Software Libraries	OpenAI Gym, OpenCV, PyTorch, Eigen
Frameworks and Tools	NVIDIA Isaac Gym, Robot Operating System (ROS), MATLAB, L ^A T _E X
Platforms	Linux (Ubuntu)

PROFESSIONAL AFFILIATIONS

- American Institute of Aeronautics and Astronautics (**AIAA**)
 - Senior Member
- Association for the Advancement of Artificial Intelligence (**AAAI**)
- Association for Computing Machinery (**ACM**)
 - Special Interest Group on Artificial Intelligence (**SIGAI**)
- Institute of Electrical and Electronics Engineers (**IEEE**)
 - Robotics and Automation Society (**RAS**)

(CV last updated: August 31, 2023)