

Lily Xu

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EDUCATION	Harvard University , Cambridge, MA PhD Candidate, School of Engineering and Applied Sciences Advised by Prof. Milind Tambe	2019 – present
	Dartmouth College , Hanover, NH A.B. with Honors in Computer Science, minor in Spanish <i>Magna cum laude</i>	2014 – 2018
HONORS AND AWARDS	Google PhD Fellowship INFORMS Doing Good with Good OR Competition Winner AAAI Best Paper Award Runner Up Harvard University Certificate of Distinction in Teaching Certificate of Appreciation from the SMART Consortium Five Citations for Academic Excellence at Dartmouth College <i>Special distinction rarely awarded by faculty members “for meritorious characteristics not indicated adequately by academic grades.”</i> Computational Photography (Wojciech Jarosz, CS 89.15) Latin American Film (Silvia Spitta, Spanish 63.01) Computer Graphics (Emily Whiting, CS 77) Object-Oriented Programming (Travis Peters, CS 10) Introduction to Programming and Computation (Hany Farid, CS 1) Adobe Women-In-Technology Scholarship – Honorable Mention Rick Angulo World Experience Award <i>For “intellectual openness, enthusiasm, and impressive academic performance” following a study abroad program in Cusco, Peru. Award in \$1,500.</i> James O. Freedman Presidential Scholar Willis S. Fitch '17 Metropolitan Washington Scholarship Bank of America’s Joe Martin Scholarship	2022 2021 2021 2021 2018 2014 – 2018 2017 2016 2016 2015 2014
PUBLICATIONS	Ranked Group Fairness in Combinatorial Bandit Allocation <i>Under review</i> Lily Xu, Arpita Biswas, Fei Fang, Milind Tambe Robust Restless Bandits: Tackling Interval Uncertainty with Deep Reinforcement Learning <i>Under review</i> Jackson A. Killian, Lily Xu, Arpita Biswas, Milind Tambe Coordinating Followers to Reach Better Equilibria: End-to-End Gradient Descent for Stackelberg Games <i>AAAI-22: Proc. 36th AAAI Conference on Artificial Intelligence</i> Kai Wang, Lily Xu, Andrew Perrault, Michael K. Reiter, Milind Tambe Robust Reinforcement Learning Under Minimax Regret for Green Security <i>UAI-21: Proc. 37th Conference on Uncertainty in Artificial Intelligence</i> Lily Xu, Andrew Perrault, Fei Fang, Haipeng Chen, Milind Tambe Oral Presentation (6.17% of submissions)	

Envisioning Communities: A Participatory Approach Towards AI for Social Good

AIES-21: Proc. 4th AAAI/ACM Conference on AI, Ethics, and Society

Elizabeth Bondi*, **Lily Xu***, Diana Acosta-Navas, Jackson A. Killian

**Equal contribution*

Dual-Mandate Patrols: Multi-Armed Bandits for Green Security

AAAI-21: Proc. 35th AAAI Conference on Artificial Intelligence

Lily Xu, Elizabeth Bondi, Fei Fang, Andrew Perrault, Kai Wang, and Milind Tambe

Best Paper Award Runner Up Top 6 of 1692 accepted papers (top 0.08% of submissions)

Stay Ahead of Poachers: Illegal Wildlife Poaching Prediction and Patrol Planning Under Uncertainty with Field Test Evaluations

ICDE-20: Proc. 36th IEEE International Conference on Data Engineering 2020

Lily Xu*, Shahrzad Gholami*, Sara Mc Carthy, Bistra Dilkina, Andrew Plumptre, Milind Tambe, Rohit Singh, Mustapha Nsubuga, Joshua Mabonga, Margaret Driciru, Fred Wanyama, Aggrey Rwetsiba, Tom Okello, Eric Enyel

**Equal contribution*

WORKSHOP PAPERS **Enhancing Poaching Predictions for Under-Resourced Wildlife Conservation Parks Using Remote Sensing Imagery**

NeurIPS Workshop on Machine Learning for Development 2020

Rachel Guo, **Lily Xu**, Andrew Plumptre, Drew Cronin, Francis Okeke, and Milind Tambe

Best Lightning Paper

Game Theory on the Ground: The Effect of Increased Patrols on Deterring Poachers

Working paper

Appeared at Harvard CRCS Workshop on AI for Social Good 2020

Lily Xu, Andrew Perrault, Andrew Plumptre, Margaret Driciru, Fred Wanyama, Aggrey Rwetsiba, and Milind Tambe

A High-Performance Graph Model for Near-Optimal Payments for Ecosystem Services

Working paper

Appeared at Mechanism Design for Social Good (MD4SG) Workshop 2020

Florian Berlinger*, **Lily Xu***, Yiling Chen

**Equal contribution*

RESEARCH
EXPERIENCE

Harvard University, Cambridge, MA

Doctoral Research Assistant

Advised by Prof. Milind Tambe

2019 – present

University of Southern California, Los Angeles, CA

Doctoral Research Assistant

Advised by Prof. Bistra Dilkina and Prof. Milind Tambe

2018 – 2019

Dartmouth College, Hanover, NH

Undergraduate Senior Thesis Researcher

Advised by Prof. Amro Farid

2017 – 2018

	<i>Presidential Scholar Research Assistant</i>	2016 – 2017
	Advised by Prof. Emily Whiting and Prof. David Kotz	
WORK EXPERIENCE	Google , Seattle, WA <i>Software Engineering Intern</i>	Summer 2017
	Dyn, Inc. , Hanover, NH <i>Data Analytics Research Intern</i>	Spring 2016
TEACHING EXPERIENCE	<i>Guest Lecturer</i> University of Pennsylvania, OIDD 941. Recent Advances in Data-Driven Decision-Making Harvard University, CS 96. Machine Learning for Social Impact University of Southern California, ISE 599. Analytics for Social Impact Harvard Business School, HBSMBA 2231. From Data to Decisions Cornell Tech, ORIE 5355/INFO 5370. People, Data, Systems Wellesley University, CS 115. Computing for the Socio-Techno Web Australian National University, CECS8001. Building Cyber-Physical Systems University of Pittsburgh, CS 1699. AI for Good: Ethics and Implications University of Michigan, SI 431. Algorithms and Society Harvard University, CS 182. Artificial Intelligence Dartmouth College, CS 11. Foundations of Applied Computer Science	Spring 2022 Spring 2022 Spring 2022 Fall 2021 Fall 2021 Fall 2021 Fall 2021 Spring 2021 Spring 2021 Fall 2020 Spring 2018
	Harvard University <i>Head Teaching Fellow</i> CS 182: Artificial Intelligence	Fall 2020
	Dartmouth College <i>Teaching Assistant, Department of Computer Science</i> CS 31: Algorithms CS 11: Foundations of Applied Computer Science CS 10: Object-Oriented Programming CS 10: Object-Oriented Programming CS 1: Intro to Programming and Computation CS 1: Intro to Programming and Computation CS 1: Intro to Programming and Computation CS 1: Intro to Programming and Computation CS 1: Intro to Programming and Computation	Winter 2017 Spring 2018 Spring 2016 Spring 2015 Spring 2018 Fall 2017 Spring 2017 Winter 2016 Fall 2015
	<i>Teaching Assistant, Tuck School of Business</i> Tuck FWP: Fundamentals of Web Programming Tuck DSA: Data Structures and Analytics	Spring 2017 Spring 2017
STUDENTS MENTORED	Christopher Ong '23, Harvard College Rachel Guo '22, Harvard College <i>NCWIT Collegiate Award Winner</i> <i>CRA Outstanding Undergraduate Researcher Award — Honorable Mention</i> Emilia Cabrera '21, Harvard College (co-advised w/ Haipeng Chen) <i>Thesis: Protecting the Lion's Share: Mitigating Illegal Wildlife Poaching with Multi-Agent Reinforcement Learning</i> April Chen '22, Harvard College	Spring 2022 – Summer 2020 – Fall 2020 – Fall 2021 Summer 2021

Adobe Research Women-In-Technology Scholarship Winner
 Ezenia Diaz-Lembert '23, Harvard College

Spring 2021

PROFESSIONAL
SERVICE

Initiative Organization

Co-organizer, Mechanism Design for Social Good (MD4SG)	March 2021 –
Co-lead, MD4SG Community Engagement	Oct 2020 – Apr 2021
Co-organizer, MD4SG Working Group on Environment	Jan 2020 – Apr 2021

Program Organization

Co-organizer, Harvard CRCS Social Impact Seminar Series	Spring 2022
Social events co-chair, ACM EAAMO	October 2021
Co-organizer, Harvard CRCS Rising Stars Speaker Series	April 2021
Co-organizer, CompSust Open Graduate Seminar (COGS)	Spring 2020
Social co-chair, Fourth Workshop on MD4SG	August 2020
Lead organizer, Harvard CRCS Rising Stars Workshop	March 2020
Co-organizer, Computational Sustainability Doctoral Consortium	October 2019

Program Committee

Conferences

ACM Conference on Fairness, Accountability, and Transparency (FAccT)	2022
Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO)	2021
ACM SIGCAS Conference on Computing and Sustainable Societies (COMPASS)	2021
AAAI Conference on Artificial Intelligence (AISI track)	2020, 2021

Workshops

Black in AI Workshop @ NeurIPS	2020, 2021
Machine Learning for the Developing World (ML4D) @ NeurIPS	2020, 2021
Machine Learning for Public Health (ML4PH) @ NeurIPS	2021
Data-Driven Humanitarian Mapping @ KDD	2021
Autonomous Agents for Social Good (AASG) Workshop @ AAMAS	2021
AI for Social Good Workshop @ IJCAI	2020
Resistance AI @ NeurIPS	2020
Fourth Workshop on Mechanism Design for Social Good (MD4SG)	2020
AI for Social Good Workshop @ Harvard CRCS	2020
Workshop on Humanitarian Mapping @ KDD	2020

Reviewer

Caltech Computer Vision for Ecology (CV4Ecology) Summer School	2022
ICML, <i>subreviewer</i>	2021
NeurIPS, <i>subreviewer</i>	2020
IJCAI Special Track on CompSust and Human Well-being, <i>subreviewer</i>	2020
COMPASS, <i>subreviewer</i>	2019
Bloomberg Data for Good Exchange (D4GX), <i>subreviewer</i>	2019

INVITED TALKS

Learning, Planning, and Optimization Under Uncertainty for Wildlife Conservation

INFORMS 2021 Doing Good with Good OR Finalist	October 2021
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Robust Reinforcement Learning Under Minimax Regret for Green Security

Google Research India, AI for Social Good	January 2022
Uncertainty in Artificial Intelligence (UAI) Conference	July 2021

PAWS: AI to Predict and Plan Against Poaching

International Congress for Conservation Biology, Kigali, Rwanda	December 2021
IUCN World Conservation Congress, Marseille, France	September 2021
WILDLABS Tech Tutors: Season Three	September 2021
AI for Climate, Mexico Lightning Talks Series powered by Huawei	July 2021
SMART Partnership, Webinar for International Women's Day	March 2021
WWF Webinar on SMART	April 2020

Dual-Mandate Patrols: Multi-Armed Bandits for Green Security

Beijing Academy of Artificial Intelligence	March 2021
University College London, AI Society journal club	February 2021
Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI-21)	February 2021
CompSust Doctoral Consortium	October 2020
CRCS AI for Social Good Workshop	July 2020
AI and Social Good Symposium, Carnegie Mellon University	April 2020
EconCS Seminar, Harvard University	March 2020

Poaching Prediction and Patrol Planning Under Uncertainty

CRCS Rising Stars Workshop	March 2020
IEEE International Conference on Data Engineering (ICDE-20)	April 2020
PhD on Tap, Harvard University	February 2020
CompSust Doctoral Consortium, Carnegie Mellon University	October 2019
KDD Data Mining and AI for Conservation Workshop	August 2019
AAMAS Strategic Reasoning for Societal Challenges Workshop	May 2019

OUTREACH**Speaking: Public Events**

AI LA Earth Summit	April 2021
South by Southwest (SXSW), Wildlife AI Panel	March 2021
World Science Festival, Science and Storytime	June 2019

Speaking

Harvard Tech for Social Good, <i>panelist</i>	April 2021
Harvard SEAS PhD Admitted Students Open House, <i>panelist</i>	March 2021
Harvard SEAS Research Labs Open House	November 2020
GirlsComputingLeague, AIInnovation Business Summit	September 2020
IEEE Computer Society, Women in Computing, Kerala Chapter	September 2020
Data Science Africa, Tutorial on MD4SG and the Environment	July 2020
Ledyard Canoe Club, Inclusivity in the Outdoors	July 2020
Dartmouth Women in Computer Science, <i>panelist</i>	May 2020
Harvard SEAS Diversity, Inclusivity, and Belonging, <i>panelist</i>	May 2020
Center for Initiatives in Jewish Education, high school student visit	March 2020
L.A. Unified School District (LAUSD), African American Family Day	May 2019
Zoo Magnet High School, College and Career Day	November 2018

Mentoring

InTouch Peer Mentor, Harvard University	2020 –
Women in STEM Mentor, Harvard University	2019 – 2020
Women in Computer Science, Dartmouth College	2017 – 2018

Volunteering

Graduate Council Outreach Committee, Harvard University	2020
A Guide to Your PhD, Harvard SEAS	October 2020
Project Teach, Harvard University	April 2020
Cambridge Public Schools STEAM It Up!	October 2019

	Hustle N' Code Hackathon, <i>technical lead</i>	December 2018
	<i>Hustle N' Code is a Los Angeles hackathon for youth in public housing.</i>	
	<i>My team won first place, and the four students each received a laptop.</i>	
PRESS	Voice of America (VOA) News , Wildlife Rangers Use AI to Predict Poachers' Next Moves.	January 2022
	Harvard SEAS , Computer Conservation.	November 2021
	AIhub , Interview with Lily Xu.	October 2021
	Rethinking Economics NL , Disruptive Technologies podcast series.	May 2021
	Engadget , PAWS anti-poaching AI predicts where illegal hunters will show up next.	March 2021
	Mongabay , Where to patrol next: 'Netflix' of ranger AI serves up poaching predictions.	November 2020
	Harvard SEAS , Preventing poaching.	June 2020
	BBC Sounds , How tech is tackling wildlife trafficking.	June 2020
	BBC World Service , Using technology to take on poachers.	August 2019
	USC Viterbi Magazine , AI is for Animals.	April 2019
NON-ACADEMIC LEADERSHIP	Ledyard Canoe Club at Dartmouth , <i>Secretary, Canoeing Leader</i>	2014 – 2018
	<ul style="list-style-type: none"> Co-governed club functions for over 100 undergraduates. Managed club assets that include \$1M in endowments, a student-run rental business with annual revenues of \$50K, and boats and equipment valued at \$150K. Co-organized an Explorers Symposium featuring ten notable speakers, including Olympic racers and members of National Geographic-sponsored expeditions. Led a group of twenty-eight students on a nine-day, 220-mile canoe expedition. Voted by my peers to receive the Jay Evans '49 Award for service and commitment to the club. 	
	Fusion Dance Ensemble , <i>Director</i>	2014 – 2018
	<ul style="list-style-type: none"> Led a group of fourteen dancers. Choreographed, taught, and performed contemporary and hip-hop dances, with over 20 performances each year. 	
	Dartmouth Sophomore Trips , <i>Co-director</i>	2015 – 2016
	<ul style="list-style-type: none"> Planned the Sophomore Trips program for 130 undergraduates across 14 three-day outdoor trips throughout New Hampshire and Vermont. 	
	Dartmouth First-Year Trips , <i>Grant Crew Volunteer</i>	Summer 2015
	<ul style="list-style-type: none"> Served on a nine-person crew for a 21-day, round-the-clock commitment to assist with five-day outdoor orientation trips for 1,000 incoming students. 	
PERSONAL	Residential member, Los Angeles Eco Village	2018 – 2019