

ANDREA BAJCSY

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RESEARCH INTERESTS I am broadly interested in the intersection of **human-robot interaction**, **control theory**, and **machine learning**.
My research focuses on combining data-driven human models and control theoretic-tools to develop robust human motion predictors and safe motion planners for robots operating in close physical proximity to people. A large component of my work involves designing robots which reason about the validity of their models *online* in light of new data.

EDUCATION **University of California, Berkeley**
Ph.D. in Electrical Engineering and Computer Science Expected 2022
Advisors: Anca D. Dragan & Claire J. Tomlin
University of Maryland, College Park
B.S. in Computer Science, Minor in Mathematics 2012-2016

WORK EXPERIENCE **NVIDIA Research**
Autonomous Vehicles Research Scientist Intern Summer 2021
Developed a framework for unifying industrial and academic autonomous vehicle safety concepts.

JOURNAL ARTICLES

- [1] **Learning the Correct Objective Online from Physical Human–Robot Interaction**
D.P. Losey, A. Bajcsy, M.K. O'Malley, A.D. Dragan.
International Journal of Robotics Research (IJRR), 2021. (*under review*)
- [2] **Efficient Dynamics Estimation with Adaptive Model Sets.**
E. Ratner, A. Bajcsy, C.J. Tomlin, A.D. Dragan.
IEEE Robotics and Automation Letters (RA-L), 2021.
- [3] **A Robust Control Framework for Human Motion Prediction**
A. Bajcsy, S. Bansal, E. Ratner, C.J. Tomlin, A.D. Dragan.
IEEE Robotics and Automation Letters (RA-L), 2020.
- [4] **Quantifying Hypothesis Space Misspecification in Learning from Human-Robot Demonstrations and Physical Corrections.**
A. Bobu, A. Bajcsy, J.F. Fisac, A.D. Dragan.
IEEE Transactions on Robotics (T-RO), 2020.
(*Honorable Mention for the 2020 IEEE T-RO Best Paper Award*)
- [5] **Confidence-Aware Motion Prediction for Real-Time Collision Avoidance.**
D. Fridovich-Keil, A. Bajcsy*, J.F. Fisac, S.L. Herbert, S. Wang, A.D. Dragan, C.J. Tomlin.*
International Journal of Robotics Research (IJRR), 2019.
- [6] **A User-Centered Design and Analysis of an Electrostatic Haptic Touchscreen System for Students with Visual Impairments**
A. Bateman, O. Zhao, A. Bajcsy, M. Jennings, B. Toth, A. Cohen, E. Horton, A. Khattar, R. Kuo, F. Lee, M.K. Lim, L. Migasiuk, R. Renganathan, A. Zhang, and M.A. Oliveira.
International Journal of Human-Computer Studies, 2017.

PEER-REVIEWED CONFERENCE PUBLICATIONS

- [1] **Towards the Unification and Data-Driven Synthesis of Autonomous Vehicle Safety Concepts.**
A. Bajcsy, K. Leung*, E. Schmerling, M. Pavone.*
Conference on Robot Learning (CoRL), 2021. (*under review*)
- [2] **Analyzing Human Models that Adapt Online.**
A. Bajcsy, A. Siththaranjan, C.J. Tomlin, A.D. Dragan.
International Conference on Robotics and Automation (ICRA), 2021.

* indicates equal contribution.

- [3] **A Hamilton-Jacobi Reachability-Based Framework for Predicting and Analyzing Human Motion for Safe Planning.**
*S. Bansal**, **A. Bajcsy***, *E. Ratner**, *A.D. Dragan*, *C.J. Tomlin*.
 Conference on Robotics and Automation (ICRA), 2020.
- [4] **An Efficient Reachability-Based Framework for Provably Safe Autonomous Navigation in Unknown Environments.**
A. Bajcsy*, *S. Bansal**, *E. Bronstein*, *V. Tolani*, *C.J. Tomlin*.
 Conference on Decision and Control (CDC), 2019.
- [5] **A Scalable Framework For Real-Time Multi-Robot, Multi-Human Collision Avoidance**
A. Bajcsy*, *S.L. Herbert**, *D. Fridovich-Keil*, *J.F. Fisac*, *S. Deglurkar*, *A.D. Dragan*, *C.J. Tomlin*.
 International Conference on Robotics and Automation (ICRA), 2019.
- [6] **Learning under Misspecified Objective Spaces**
A. Bobu, **A. Bajcsy**, *J.F. Fisac*, *A.D. Dragan*.
 Conference on Robot Learning (CoRL), 2018. (*invited to special issue*)
- [7] **Probabilistically Safe Robot Planning with Confidence-Based Human Predictions**
*J.F. Fisac**, **A. Bajcsy***, *S.L. Herbert*, *D. Fridovich-Keil*, *S. Wang*, *C.J. Tomlin*, *A.D. Dragan*.
 Robotics: Science and Systems (RSS), 2018. (*invited to special issue*)
- [8] **Learning from Physical Human Corrections, One Feature at a Time**
A. Bajcsy, *D.P. Losey*, *M.K. O'Malley*, *A.D. Dragan*.
 International Conference on Human-Robot Interaction (HRI), 2018.
- [9] **Learning Robot Objectives from Physical Human Robot Interaction**
A. Bajcsy*, *D.P. Losey**, *M.K. O'Malley*, *A.D. Dragan*.
 Conference on Robot Learning (CoRL), 2017. (*oral, acceptance rate 10%*)
- [10] **A Review of Principles in Design and Usability Testing of Tactile Technology for Individuals with Visual Impairments**
E.L. Horton, *R. Renganathan*, *B.N. Toth*, *A.J. Cohen*, **A.V. Bajcsy**, *A. Bateman*, *M.C. Jennings*, *A. Khattar*, *R.S. Kuo*, *F.A. Lee*, *M.K. Lim*, *L.W. Migasiuk*, *A. Zhang*, *O.K. Zhao*, *M.A. Oliveira*.
 Assistive Technology, 2016.
- [11] **Systematic Measurement of Marginal Mark Types on Voting Ballots**
A. Bajcsy, *Y.S. Li-Baboud*, *M. Brady*.
 NIST IR 8069, 2015.
- [12] **Depicting Web Images for the Blind and Visually Impaired**
A. Bajcsy, *Y.S. Li-Baboud*, *M. Brady*.
 SPIE Newsroom, 2013.

 WORKSHOP
 PUBLICATIONS

- [1] **Introspective Human Motion Prediction for Safe Robot Autonomy**
A. Bajcsy.
 RSS Pioneers, RSS, 2020.
- [2] **A Robust Control Framework for Intent-Driven Human Motion Prediction**
A. Bajcsy, *S. Bansal*, *E. Ratner*, *C.J. Tomlin*, *A.D. Dragan*.
 Interaction and Decision-Making in Autonomous-Driving, ICRA, 2020.

TEACHING

- CS188: Introduction to Artificial Intelligence** UC Berkeley, 2020
Graduate Student Instructor. Taught a weekly one-hour discussion section, held weekly office hours.
- EE221A: Linear Systems Theory** UC Berkeley, 2019
Graduate Student Instructor. Taught a weekly two-hour discussion section for 50 PhD, masters, and undergraduate students. Graded homeworks, exams, and held weekly office hours.
- CMSC131: Object-Oriented Programming** University of Maryland, 2014
Undergraduate Teaching Assistant. Taught a weekly one-hour discussion section of 30 students and held office hours.

HONORS & AWARDS	Robotics: Science and Systems (RSS) Pioneers	2020
	<i>Selected for workshop bringing together top early career researchers in robotics.</i>	
	National Science Foundation Graduate Research Fellowship	2016
	<i>Three-year research fellowship with annual stipend of \$34,000 for graduate students in STEM disciplines.</i>	
	Berkeley EECS Excellence Award	2016
	<i>One-year fellowship with a stipend of \$26,000 during the academic year, plus \$4,000 over the summer</i>	
ORGANIZED WORKSHOPS & SEMINARS	Student Researchers of the Year Award , University of Maryland	2016
	<i>Awarded to five undergrad researchers in all disciplines at University of Maryland.</i>	
	CRA Outstanding Undergraduate Research Award Honorable Mention	2015
	Brendan Iribe Scholar , University of Maryland	2015
	<i>Awarded yearly to one undergraduate student in Computer Science.</i>	
	Robotics for People: Perspectives on Interaction, Learning, and Safety	2021
	Co-Organizer, RSS Workshop	
	RSS Pioneers	2021
	Co-General Chair, RSS Workshop	
	3rd Workshop on Long-term Human Motion Prediction	2021
	Co-Organizer, ICRA Workshop	
	DREAM/CPAR Seminar	2019 - Present
	Lead Organizer, UC Berkeley	
	<i>Weekly seminar hosting professors/professionals in robotics, control, human-centered autonomy.</i>	
2nd Workshop on Robust Autonomy	2020	
Lead Organizer, RSS Workshop		
Robust Autonomy: Safe Robot Learning and Control in Uncertain Real-World Environments	2019	
Co-organizer, RSS Workshop		
Semiautonomous Seminar	2018 - 2019	
Co-organizer, UC Berkeley		
<i>Weekly robotics and controls seminar for students and professors internal and external to Berkeley</i>		
INVITED TALKS	Analyzing Human Models that Adapt Online	
	George Pappas Laboratory, University of Pennsylvania	2021
	Introspective Human Motion Prediction for Safe Robot Autonomy	
	Autonomy Talks , ETH Zurich	2020
	Sam Burden Laboratory, University of Washington	2020
	Robotics Seminar , Stanford University	2020
	Safe Robots Which Learn From (and About) Humans	
	AI4ALL , UC Berkeley	2021
	BAIR / Transfer-to-Excellence Research Experience for Undergraduates , UC Berkeley	2021
	Innovative Robotics Symposium , University of Chicago Laboratory School	2020
	An Efficient Reachability-Based Framework for Provably Safe Autonomous Navigation in Unknown Environments	
	Safety-Critical Robotic Systems Class, Princeton University	2020
	A Robust Control Framework for Human Motion Prediction	
	Berkeley DeepDrive , UC Berkeley	2020
	Confidence-Aware Motion Prediction for Real-time Collision Avoidance	
	Robotics Seminar , Northwestern University	2019
	Intelligent Systems Division , National Institute for Standards and Technology (NIST)	2019
Long-Term Human Motion Prediction Workshop , ICRA	2019	
Probabilistically Safe Robot Planning with Confidence-Based Human Predictions		
Berkeley Artificial Intelligence Research (BAIR) Seminar Series , UC Berkeley	2018	

Learning Robot Objectives from Physical Human-Robot Interaction

	Bay Area Robotics Symposium (BARS) , UC Berkeley	2017
	Berkeley DeepDrive , UC Berkeley	2017
RESEARCH MENTORSHIP	Ran (Thomas) Tian (PhD student at UC Berkeley) <i>Research on safety for autonomous vehicles.</i>	2021 - Present
	Regina Wang (Undergraduate at UC Berkeley) <i>Research on hierarchical inverse reinforcement from human interaction.</i>	2021 - Present
	Anand Siththaranjan (now PhD student at UC Berkeley) <i>Research on using reachability to analyze human motion models that adapt online.</i>	2019 - Present
	Charles Tang (now software engineer at Applied Intuition) <i>Research on providing online safety guarantees around learning-enabled motion planners.</i>	2019 - 2021
	Sampada Deglurkar (now PhD student at UC Berkeley) <i>Advised independent research project on learning constraints from human interaction.</i>	2018 - 2020
	Eli Bronstein (now software engineer at Waymo Research) <i>Research on online reachability for sensing-constrained systems (now a CDC 2019 paper).</i>	2019
OUTREACH	creAltivity <i>Invited talk at the AI Ethics Lab to students from underrepresented backgrounds.</i>	2021
	AI4ALL mentor and speaker <i>Summer camp on AI for underrepresented high school students</i>	2020 - 2021
	Berkeley Artificial Intelligence Research mentor <i>Mentoring underrepresented students in research and career planning</i>	2019
	Girls in Engineering Camp <i>Taught summer camp students about self-driving cars</i>	2018 - 2019
	Girl Scouts Engineering Fun Day	2018
REVIEW ACTIVITIES	RSS: Robotics: Science and Systems	
	RA-L: IEEE Robotics and Automation Letters	
	T-RO: IEEE Transactions on Robotics	
	IROS: IEEE International Conference on Intelligent Robots and Systems	
	ICRA: IEEE International Conference on Robotics and Automation	
	HRI: IEEE International Conference on Human-Robot Interaction	
	AuRo: Autonomous Robots	
	CoRL: Conference on Robot Learning	
	ICCPs: IEEE International Conference on Cyber-Physical Systems	

August 3, 2021