Andrea Bajcsy

Contact

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Education

University of California, Berkeley
Ph.D. in Electrical Engineering and Computer Science — Expected 2022
Advisors: Anca D. Dragan & Claire J. Tomlin
Thesis: *Bridging Safety and Learning in Human-Robot Interaction*

University of Maryland, College Park
B.S. in Computer Science, Minor in Mathematics — 2012 - 2016

Internships

NVIDIA Research
Autonomous Vehicles Research Scientist Intern — Spring 2021

Max Planck Institute for Intelligent Systems
Autonomous Motion Group Research Intern — Summer 2016

Journal Articles

[J1] D.P. Losey, A. Bajcsy, M.K. O'Malley, A.D. Dragan. "Physical Interaction as Communication: Learning Robot Objectives Online from Human Corrections". *International Journal of Robotics Research (IJRR)*, 2021.

[J2] E. Ratner, A. Bajcsy, C.J. Tomlin, A.D. Dragan. "Efficient Dynamics Estimation with Adaptive Model Sets". *IEEE Robotics and Automation Letters (RA-L)*, 2021.

[J3] A. Bajcsy, S. Bansal, E. Ratner, C.J. Tomlin, A.D. Dragan. "A Robust Control Framework for Human Motion Prediction." *IEEE Robotics and Automation Letters (RA-L)*, 2020.

[J4] A. Bobu, A. Bajcsy, J.F. Fisac, A.D. Dragan. "Quantifying Hypothesis Space Misspecification in Learning from Human-Robot Demonstrations and Physical Corrections." *IEEE Transactions on Robotics (T-RO)*, 2020.
(Honorable Mention for the 2020 IEEE T-RO Best Paper Award)

[J5] D. Fridovich-Keil*, A. Bajcsy*, J.F. Fisac, S.L. Herbert, S. Wang, A.D. Dragan, C.J. Tomlin. "Confidence-Aware Motion Prediction for Real-Time Collision Avoidance." *International Journal of Robotics Research (IJRR)*, 2019.

[J6] 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, M.A. Oliveira. "A User-Centered Design and Analysis of an Electrostatic Haptic Touchscreen System for Students with Visual Impairments." *International Journal of Human-Computer Studies*, 2017.

Conference Publications

[C1] R. Tian*, L. Sun*, A. Bajcsy*, M. Tomizuka, A.D. Dragan. "Safety Assurances for Human-Robot Interaction via Confidence-aware Game-theoretic Human Models." *International Conference on Robotics and Automation (ICRA)*, 2022.

[C2] A. Bajcsy, A. Siththaranjan, C.J. Tomlin, A.D. Dragan. "Analyzing Human Models that Adapt Online." *International Conference on Robotics and Automation (ICRA)*, 2021.

[C3] S. Bansal*, A. Bajcsy*, E. Ratner*, A.D. Dragan, C.J. Tomlin. "A Hamilton-Jacobi Reachability-Based Framework for Predicting and Analyzing Human Motion for Safe Planning." *Conference on Robotics and Automation (ICRA)*, 2020.

[C4] A. Bajcsy*, S. Bansal*, E. Bronstein, V. Tolani, C.J. Tomlin. "An Efficient Reachability-Based Framework for Provably Safe Autonomous Navigation in Unknown Environments." *Conference on Decision and Control (CDC)*, 2019.

* indicates equal contribution.

[C5] A. Bajcsy*, S.L. Herbert*, D. Fridovich-Keil, J.F. Fisac, S. Deglurkar, A.D. Dragan, C.J. Tomlin. "A Scalable Framework For Real-Time Multi-Robot, Multi-Human Collision Avoidance." *International Conference on Robotics and Automation (ICRA)*, 2019.

[C6] A. Bobu, A. Bajcsy, J.F. Fisac, A.D. Dragan. "Learning Under Misspecified Objective Spaces." *Conference on Robot Learning (CoRL)*, 2018.
(invited to special issue)

[C7] J.F. Fisac*, A. Bajcsy*, S.L. Herbert, D. Fridovich-Keil, S. Wang, C.J. Tomlin, A.D. Dragan. "Probabilistically Safe Robot Planning with Confidence-Based Human Predictions." *Robotics: Science and Systems (RSS)*, 2018.
(invited to special issue)

[C8] A. Bajcsy, D.P. Losey, M.K. O'Malley, A.D. Dragan. "Learning from Physical Human Corrections, One Feature at a Time." *International Confernece on Human-Robot Interaction (HRI)*, 2018.

[C9] A. Bajcsy*, D.P. Losey*, M.K. O'Malley, A.D. Dragan. "Learning Robot Objectives from Physical Human Robot Interaction." *Conference on Robot Learning (CoRL)*, 2017.
(oral, acceptance rate 10%)

[C10] 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. "A Review of Principles in Design and Usability Testing of Tactile Technology for Individuals with Visual Impairments." *Assistive Technology*, 2016.

[C11] A. Bajcsy, Y.S. Li-Baboud, M. Brady. "Systematic Measurement of Marginal Mark Types on Voting Ballots." *NIST IR 8069*, 2015.

[C12] A. Bajcsy, Y.S. Li-Baboud, M. Brady. "Depicting Web Images for the Blind and Visually Impaired." *SPIE Newsroom*, 2013.

Pre-Prints

[P1] A. Bajcsy*, K. Leung*, E. Schmerling, M. Pavone. "Towards the Unification and Data-Driven Synthesis of Autonomous Vehicle Safety Concepts." arXiv: https://arxiv.org/abs/2107.14412

Workshop Publications

[W1] A. Bajcsy. "Introspective Human Motion Prediction for Safe Robot Autonomy." RSS Pioneers, RSS, 2020.

[W2] A. Bajcsy, S. Bansal, E. Ratner, C.J. Tomlin, A.D. Dragan. "A Robust Control Framework for Intent-Driven Human Motion Prediction." 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

Rising Stars Academic Career Workshop in EECS 2021
Selective, intensive workshop for historically marginalized graduate students and postdocs interested in pursuing academic careers in EE, CS, AI, and decision-making.

Honorable Mention for the 2020 IEEE T-RO Best Paper Award 2020
For the paper "Quantifying Hypothesis Space Misspecification in Learning from Human-Robot Demonstrations and Physical Corrections"

Robotics: Science and Systems (RSS) Pioneers 2020
Selected for workshop bringing together top early career researchers in robotics.

National Science Foundation Graduate Research Fellowship 2016
Three-year research fellowship of $34,000 yearly for graduate students in STEM.

Berkeley EECS Excellence Award 2016
One-year fellowship of $26,000 during the academic year, $4,000 over the summer.

Student Researchers of the Year Award, University of Maryland 2016
Awarded to five undergrad researchers in all disciplines at University of Maryland.

CRA Outstanding Undergraduate Research Award Honorable Mention 2015

Brendan Iribe Scholar, University of Maryland 2015
Awarded yearly to one undergraduate student in Computer Science.

Workshops & Seminars

4th Workshop on Long-term Human Motion Prediction 2022
Co-Organizer, ICRA Workshop

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

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

Invited Talks

Bridging Safety and Learning in Human-Robot Interaction

Department Seminar, Carnegie Mellon University 2022

Department Seminar, Northwestern University 2022

Department Seminar, Brown University 2022

Department Seminar, Georgia Tech 2022

Department Seminar, University of Washington 2022

Department Seminar, University of Pennsylvania 2022

Department Seminar, Harvard 2022

Department Seminar, MIT 2022

Department Seminar, UC Santa Barbara 2022

Department Seminar, University of Michigan 2022

Department Seminar, Cornell 2022

Department Seminar, UC Los Angeles 2022

Frontiers in CMS Symposium, Caltech 2022

Multi-Agent Reinforcement Learning Seminar, UC Berkeley 2022

Robotics Colloquium, University of Washington 2021

MAE 207: Safety for Autonomous Systems, University of California San Diego 2021

Analyzing Human Models that Adapt Online

Intelligent Control Lab, Carnegie Mellon University 2021

George Pappas Laboratory, University of Pennsylvania 2021

Introspective Human Motion Prediction for Safe Robot Autonomy

CS188: Introduction to Artificial Intelligence, UC Berkeley 2020

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

ELE 539: 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

CS287H: Algorithmic Foundations of Human-Robot Interaction, UC Berkeley 2021

Bay Area Robotics Symposium (BARS), UC Berkeley 2017

Berkeley DeepDrive, UC Berkeley 2017

Research Mentorship

Ran (Thomas) Tian (PhD student at UC Berkeley) 2021 - Present
Safety for robots interacting with humans.

Regina Wang (Undergraduate at UC Berkeley) 2021 - Present
Active robot learning.

Anand Siththaranjan (now PhD student at UC Berkeley) 2019 - Present
Reachability to analyze human motion models that adapt online.

Charles Tang (now software engineer at Applied Intuition) 2019 - 2021
Providing online safety guarantees around learning-enabled motion planners.

Sampada Deglurkar (now PhD student at UC Berkeley) 2018 - 2020
Learning intent and constraints from human interaction.

Eli Bronstein (now software engineer at Waymo Research) 2019
Safe navigation in unknown environments via online algorithms for HJ reachability.

Outreach

Machine learning @ Berkeley 2021
Invited talk on human motion prediction for the Berkeley undergraduate machine learning club.

creAItivity 2021
Invited talk at the AI Ethics Lab to students from underrepresented backgrounds.

BAIR & TTE Research Experience for Undergrads 2021
Mentoring and invited talk at the Berkeley AI Research & Tranfer-To-Excellence program.

AI4ALL mentor and speaker 2020 - 2021
Summer camp on AI for underrepresented high school students

Berkeley Artificial Intelligence Research mentor 2019
Mentoring underrepresented students in research and career planning

Girls in Engineering Camp 2018 - 2019
Taught summer camp students about self-driving cars

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

ACC: American Control Conference

May 31, 2022