Ariel Anders PhD

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Experience

Researcher with the Learning and Intelligent Systems, CSAIL MIT   2012-2019

- I researched robot manipulation for household helpers when there is considerable uncertainty due to inaccurate sensing, imperfect actuation, and lack of knowledge of the environment properties (eg. mass and pressure distribution of objects). The majority of my research projects were implemented on a Willow Garage PR2 robot, which I programmed using the Robot Operating system (ROS), python, and C++.

Autonomous Vehicles Course Instructor, MIT   2016-2017

- The MIT RACECAR is an open-source platform for robotics research and education; it has state-of-the-art sensors and computing hardware, placed on top of a powerful 1/10-scale mini race car. I instructed multiple team and project based courses with the MIT RACECAR: TA for MIT 6.141/16.405 (Spring 2016 & 2017), Lead Associate Instructor (2016) and Technical Instructor (2017) for MIT BeaverWorks Summer Institute.

- I implemented laboratory assignments, provided office hours, and gave lectures on planning and computer vision. I received the MIT EECS Frederick C. Hennie III Teaching Award recipient in Spring 2017.

Researcher with the Bionics Lab, UC Santa Cruz   2010-2012

- Advised by Jacob Rosen. Research focus: CAD/CAM applications in dentistry, autonomous control with mechanical systems, and UI development for robotic programs. Developed a workflow to execute dental crowning and implant placement procedures on static dental models that I verified experimentally. Worked on a system to implement dynamic dental procedures.

Education

Computer Science SM and PhD, Massachusetts Institute of Technology   2012-2019

Graduate research advised by Leslie P. Kaelbling and Tomas Lozano-Perez on reliably arranging objects using conformant planning. More information about my doctorate thesis is available here: https://arii.github.io/phd/

Computer Engineering BS, University of California: Santa Cruz   2008-2012

Capstone team project: improving the performance of arithmetic functions for Oracle numbers within the Oracle Database; this project was implemented in C and used code profilers to find performance bottle necks and applied vectorized hardware instructions (SSE) and different number representations to achieve speedup.

Skills

Languages Python, C, C++, Matlab, shell script, Javascript, Swift. **OSs** Unix, Linux, Mac, Windows
Robot platforms Denso VM-series, PR2, TurtleBot, DuckieBot, 6.141 Racecar, Kinova Movo
Embedded Systems Arduino, Raspberry Pi, Jetson TX1 and TK1, Pandaboard, Microchip PIC 32, Virtex5 FPGA, and 68HC11E1 Microcontroller

Selected Publications

- **Anders, Ariel S.**, Leslie P. Kaelbling, and Tomas Lozano-Perez. 2018. "Reliably Arranging Objects in Uncertain Domains." In *IEEE Conference on Robotics and Automation (ICRA)*.
- **Anders, Ariel**, and Sertac Karaman. 2017. "Visual Servoing." In *EAAI-17: The 7th Symposium on Educational Advances in Artificial Intelligence*.
- Preston, Daniel J., **Ariel Anders**, Banafsheh Barabadi, Evelyn Tio, Yangying Zhu, DingRan Annie Dai, and Evelyn N. Wang. 2016. "Electrowetting-on-Dielectric Actuation of a Vertical Translation and Angular Manipulation Stage." *Applied Physics Letters* 109 (24):244102.
- Amato, C., G.D. Konidaris, **A. Anders**, G. Cruz, J.P. How, and L.P. Kaelbling. 2015. "Policy Search for Multi-Robot Coordination Under Uncertainty." In *Robotics: Science and Systems XI (RSS)*.

Fellowships, Grants, and Awards

Research Fellowships
- GEM Ph.D. Engineering Fellowship Sponsored by Intel, Summer 2014
- Edwin S. Webster Graduate Fellowship in Electrical Engineering, Spring 2013
- Lemelson Minority Graduate Fellowship, Fall 2012
- Minority Access to Research Careers, Summer 2010- Spring 2012
- Summer Undergraduate Research Fellowship in Information Technology, Summer 2010.

Grant Recipient
- 2017 Earth Day Mini Grant
  Award for developing new fume hood technologies, in partnership with LEAC at MIT.
- 2017 MIT Green Labs Innovation Award
  $5000 Award received in collaboration with Daniel Preston and the Device Research Lab for developing most innovative technology to improve sustainability efforts at campus at MIT.
- 2016 MIT EHS Green Labs Award
  Received $1000 in seed funding to create green lab technology. Award received in collaboration with Daniel Preston and the Device Research Lab.
- MindHandHeart Innovation Fund Grant Recipient, Fall 2015
  "Removing SAD from Winter", *Planning for public artificial lightbox locations on campus for people with Seasonal Affective Disorder*
- University Center of Exemplary Mentoring at MIT Scholar, Innaugural class of 2015.

Academic Honors and Scholarships
- MIT Graduate Women of Excellence, class of 2017 Honorees
- University of California Regent Scholarship, Fall 2010-Spring 2012
- Mantey Undergraduate Leadership Award, Spring 2011
- ARGV Scholarship, Spring 2010

Tech Competitions
- *Boop*, 4th place Assistive Technology Hackathon, Spring 2016
- *lingui-sense*, 1st place at Make Cool Shmit, Spring 2016
- *Haptic++*, 2nd place at Meet++ Hackathon, Spring 2016
- *Beer Bots,* 2nd place at CSAIL Research Highlights, Spring 2015