

David Kent, Ph.D.

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Research Areas: Lifelong Learning, Human-Robot Interaction, Learning from Demonstration, Teleoperation, Mobile Manipulation, Crowdsourcing

EDUCATION

- Fall 2015 – **Georgia Institute of Technology – Atlanta, GA, USA**
Spring 2021 PhD in Robotics
Thesis – “Robot Manipulation Alongside and in Collaboration with People”
Advisor – Dr. Sonia Chernova
- 2012 – **Worcester Polytechnic Institute – Worcester, MA, USA**
2014 MS in Robotics Engineering
Thesis – “Construction of a 3D Object Recognition and Manipulation Database from Grasp Demonstrations”
- 2008 – **Worcester Polytechnic Institute – Worcester, MA, USA**
2012 BS in Robotics Engineering

WORK EXPERIENCE

- Spring 2021 - Present **Postdoctoral Researcher**
Computer and Information Science – University of Pennsylvania
- Fall 2015 – Spring 2021 **Graduate Research Assistant**
School of Interactive Computing – Georgia Tech
- Summer 2017 **Robotics Engineering Intern**
Fetch Robotics
- Developed fetch_grasp_suggestion, a human preference-guided pairwise ranking grasp calculator for the Fetch platform
 - Integrated autonomous grasp suggestion with programming by demonstration interface fetch_pbd
- 2014 - 2015 **Lab Manager**
Robot Autonomy and Interactive Learning Lab – WPI
- Lead software developer for mobile manipulation platform
 - Managed undergraduate and graduate student projects in artificial intelligence, computer vision, HRI interface development, navigation, and teleoperation

TEACHING EXPERIENCE

- Fall 2020 **Instructor of Record**
CS 3600 Introduction to Artificial Intelligence – Georgia Tech
- Fall 2020 **Tech to Teaching Certificate**
Multi-semester preparing future faculty program that includes pedagogy training and practice, Georgia Tech, Center for Teaching and Learning

Spring 2020	CIRTL Associate Level Certificate
Summer 2019	Bootcamp Course Design Summer Programming Bootcamp <ul style="list-style-type: none"> Designed curriculum for a week-long bootcamp teaching programming concepts to incoming students
Fall 2017	Graduate Teaching Assistant CS 7785 Introduction to Robotics Research – Georgia Tech <ul style="list-style-type: none"> Designed labs to create a new course for incoming robotics graduate students Guest lectured the Human-Robot Interaction course module
Spring 2016	Graduate Teaching Assistant CS 3630 Introduction to Robotics and Perception – Georgia Tech <ul style="list-style-type: none"> Designed labs to teach basic robotics concepts

PUBLICATIONS

* Presented

Conference Papers

- C1 Kevin Chen, Nithin Shrivatsav Srikanth, **David Kent**, Harish Ravichandar, and Sonia Chernova. Learning Hierarchical Task Networks with Preferences from Unannotated Demonstrations. *Conference on Robot Learning (CoRL)*, 2020.
- C2 Abhinav Jain, Daphne Chen, Dhruva Bansal, **David Kent**, Harish Ravichandar, and Sonia Chernova. Anticipatory Human-Robot Collaboration via Multi-Objective Trajectory Optimization. *Intelligent Robots and Systems (IROS), IEEE/RSJ International Conference on*, 2020.
- C3 **David Kent*** and Sonia Chernova. Human-Centric Active Perception for Autonomous Observation. *Robotics and Automation (ICRA), IEEE International Conference on*, 2020.
- C4 Siddhartha Banerjee, Angel Daruna, **David Kent**, Weiyu Liu, et al. Taking Recoveries to Task: Recovery-Driven Development for Recipe-based Robot Tasks. In *2019 International Symposium on Robotics Research (ISRR)*.
- C5 **David Kent***, Siddhartha Banerjee, and Sonia Chernova. Learning Sequential Decision Tasks for Robot Manipulation with Abstract Markov Decision Processes and Demonstration-Guided Exploration. *IEEE-RAS 18th International Conference on Humanoid Robots (Humanoids)*, 2018.
- C6 **David Kent*** and Russell Toris. Adaptive Autonomous Grasp Selection Via Pairwise Ranking. *Intelligent Robots and Systems (IROS), IEEE/RSJ International Conference on*, 2018.
- C7 **David Kent***, Carl Saldanha, and Sonia Chernova. A Comparison of Remote Robot Teleoperation Interfaces for General Object Manipulation. *Human-Robot Interaction (HRI), Conference on*, 2017.
- C8 Adrian Boteanu, **David Kent***, Anahita Mohseni-Kabir, Charles Rich, and Sonia Chernova. Towards Robot Adaptability in New Situations. In *2015 AAAI Fall Symposium Series*.

- C9 Russell Toris, **David Kent**, and Sonia Chernova. Unsupervised learning of multi-hypothesized pick-and-place task templates via crowdsourcing. *Robotics and Automation (ICRA), IEEE International Conference on*, 2014.
- C10 **David Kent** and Sonia Chernova. Construction of an object manipulation database from grasp demonstrations. *Intelligent Robots and Systems (IROS), IEEE/RSJ International Conference on*, 2014.
- C11 **David Kent***, Morteza Behrooz, and Sonia Chernova. Crowdsourcing the construction of a 3D object recognition database for robotic grasping. *Robotics and Automation (ICRA), IEEE International Conference on*, 2014.

Journal Articles

- J1 **David Kent**, Carl Saldanha, and Sonia Chernova. Leveraging depth data in remote robot teleoperation interfaces for general object manipulation. *The International Journal of Robotics Research*, vol. 39, no. 1, 2020.
- J2 **David Kent** and Sonia Chernova. Construction of a 3D Object Recognition and Manipulation Database from Grasp Demonstrations. *Autonomous Robots*, vol. 40, no. 1, 2016.
- J3 Russell Toris, **David Kent**, and Sonia Chernova. The robot management system: A framework for conducting human-robot interaction studies through crowdsourcing. *Journal of Human-Robot Interaction*, vol. 3, no. 2, 2014.

Workshop Papers

- W1 **David Kent*** and Sonia Chernova. Schedule-based Motion Prediction for Human-Centric Autonomous Observation. In *Long-term Human Motion Prediction Workshop (LHMP) at ICRA*, 2019.
- W2 **David Kent***, Siddhartha Banerjee, and Sonia Chernova. Learning Real-World Sequential Decision Tasks with Abstract Markov Decision Processes and Demonstration-Guided Exploration. In *Robotics: Science and Systems Workshop on Learning from Demonstration for High Level Robotic Tasks (RSSWLfD18)*, 2018.
- W3 **David Kent**, Ung Hee Lee, Sarah Elliot, and Russell Toris. Leveraging Autonomous Segmentation and Grasp Calculation for Programming by Demonstration. In *The Third Workshop on Machine Learning in Planning and Control of Robot Motion (MLPC18) at ICRA*, 2018.
- W4 **David Kent***. Leveraging the Crowd to Capture Highly Variable Task Models. In *HRI2017 Pioneers Workshop*, 2017.
- W5 **David Kent** and Sonia Chernova. Construction of a 3D Object Recognition and Manipulation Database from Grasp Demonstrations. In *Robotics: Science and Systems Workshop on Human versus Robot Grasping and Manipulation*, 2014.

SERVICES

Institutional Service

Spring '18, **Robotics Qualifying Exam Prep, Volunteer**
'19, '20

Spring '17, **Robotics Prospective PhD Student Visit Week, Volunteer**
'18, '19

2017-2018 **RoboGrads, Vice President of Communications**

- Maintained website, mailing lists, and discussion groups for robotics graduate students
- Organized academic events and social events for Georgia Tech's graduate robotics community

Spring '17 **Fernbank Museum Robot Day, Volunteer**

Conference Reviewer

- ICRA (2021, 2020, 2019, 2016)
- HRI (2021, 2017)
- HRI Pioneers Workshop (2021)
- UIST (2020)
- ISRR (2019)
- IROS (2019, 2018)
- AAAI (2017)

Open Source Contributions

- Author and maintainer of 10+ open source ROS packages for robot control, manipulation, perception, and teleoperation

Professional Memberships

- Institute of Electrical and Electronics Engineers (IEEE)
- Association for Computing Machinery (ACM)

AWARDS

- | | |
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| 2020 | Best Paper in Service Robotics at ICRA 2020, Finalist
see Conference Paper C3, above |
| 2019 | FetchIt! Challenge at ICRA 2019, 1st Place
Team Captain, Georgia Tech DeRAILers |
| 2014 | WPI GRAD Day Poster Presentations, 2nd Place
for MS students in Engineering |

PROJECTS

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|-----------|---|
| 2016 | Treeminder: SMS-based Goal Completion for the United Way Achievement Club
HCI Course Project – Georgia Tech <ul style="list-style-type: none"> • Identified and analyzed a community motivation and personal goal support problem for recently homeless veterans • Designed, prototyped, and tested a communication-based application to help recently ex-homeless veterans reintegrate with society |
| 2013-2014 | Construction of a 3D Object Recognition and Manipulation Database from Grasp Demonstrations
MS Thesis – Worcester Polytechnic Institute <ul style="list-style-type: none"> • Designed and implemented a system for constructing an object recognition and manipulation database from crowdsourced data • Developed a graph-based point cloud registration algorithm for small objects • Showed grasps learned from expert and non-expert users can outperform purely vision-based grasp planners |

- 2011-2012 **Autonomous Multi-Robot Soccer**
BS Major Qualifying Project – Worcester Polytechnic Institute
- Designed and implemented computer vision, probabilistic localization, and multi-robot coordination algorithms for an autonomous soccer team of four humanoid robots (Aldebaran NAOs)
 - Competed in the 2011 international RoboCup Standard Platform League competition and the 2011 and 2012 RoboCup US Open competitions
- 2011 **Conducting an Effective Housing Survey to Inform Planning in the Royal Borough of Kingston**
BS Interactive Qualifying Project – Worcester Polytechnic Institute
- Worked with a small group of students on an interdisciplinary project for the Royal Borough of Kingston government in London, UK
 - Designed and performed a cross-departmental survey of new housing in the borough

MENTORING

- Spring '19-
Summer
'20 **Nithin Shrivatsav Srikanth**
MS Electrical Engineering
- Spring '19-
Spring '20 **Abhinav Jain**
MS Computer Science
- Fall 2019 **Kevin Chen**
BS Computer Science, now Software Engineer at Waymo
- Summer
2017 **Sae Buck Lim Won**
BS Computer Science
- Spring '16-
Fall '17 **Carl Saldanha**
MS Computer Science, now Robotics Engineer at Fetch Robotics
- Spring '16 **Weiyu Liu**
BS Computer Science, now Robotics PhD Student at Georgia Tech