

Scott Niekum

Associate Professor
Department of Computer Science
The University of Texas at Austin

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Academic Employment

- | | |
|---|-----------------------|
| Associate Professor
The University of Texas at Austin, Department of Computer Science | Sept. 2021 – present |
| Assistant Professor
The University of Texas at Austin, Department of Computer Science | Aug. 2015 – Aug. 2021 |
| Postdoctoral Research Fellow
Carnegie Mellon University, The Robotics Institute
Mentor: Prof. Christopher G. Atkeson | Aug. 2013 – Aug. 2015 |

Education

- | | |
|---|-------------------------|
| Doctor of Philosophy
Computer Science Department, University of Massachusetts Amherst
Dissertation: <i>Semantically Grounded Learning from Unstructured Demonstrations</i>
Advisor: Prof. Andrew G. Barto | Sept. 2009 – Sept. 2013 |
| Master of Science
Computer Science Department, University of Massachusetts Amherst | Feb. 2010 |
| Bachelor of Science with Honors
School of Computer Science, Carnegie Mellon University
Additional major in Cognitive Science | Sept. 2001 – May 2005 |

Teaching

- **The University of Texas at Austin**

- CS 395T: *Robot Learning (Graduate)*, Fall 2015, Fall 2016, Fall 2017
Average instructor rating: **4.9/5.0**
- CS 394R: *Reinforcement Learning (Graduate)*, Fall 2019, Spring 2022 (co-taught with Peter Stone)
Average instructor rating: **4.3/5.0**
- CS 343(H): *Artificial Intelligence (Undergraduate)*, Spring 2017, Spring 2018, Fall 2018, Spring

2019, Fall 2021

Average instructor rating: **4.4/5.0**

– UT Austin Online MS: *Reinforcement Learning*, Spring 2020, Fall 2020, Summer 2021

Average instructor rating: **4.8/5.0**

Awards and Honors

- **AFOSR Young Investigator Award**, 2019
- College of Natural Sciences Teaching Excellence Award, 2019.
- **National Science Foundation CAREER Award**, 2018.
- Robocup@Home Domestic Standard Platform League, Third Place. Nagoya, Japan, July 2017. (Team Co-PI)
- Peter O'Donnell, Jr. Computer Sciences Endowed Faculty Fellowship, Sept 1, 2015 – Aug 31, 2020.
- NSF Graduate Research Fellowship Program, honorable mention, 2009, 2010.
- Carnegie Mellon Alumni Award for Excellence in Undergraduate Research, 2005.

Grants and Other Funding

- **PI: Army Research Office**
Modularity, Constraints and Multimodality in Learning for Complex, Long-Horizon, Sequential Decision-Making
 Award amount: \$864,415
 Dates: Jan 1, 2021 – Dec 31, 2023
- **PI: AFOSR Young Investigator Award**
Robot Learning from Demonstration with Auxiliary Contextual Data
 Award amount: \$450,000
 Dates: Jan 1, 2020 – Dec 31, 2022
- **PI: Army Futures Command: Robotics Center of Excellence Grant**
Human-AI Collaborative Search
 Award amount: \$1,594,000
 Dates: Sept 1, 2019 – Aug 31, 2022
- **Co-PI: NSF – National Robotics Initiative 2.0**
 IIS-1638107: *Improving Robot Learning from Feedback and Demonstration using Natural Language*
 Award amount: \$749,411
 Dates: Sept 1, 2019 – Aug 31, 2022

- **PI: UT Austin Good Systems Grand Challenge**

Probabilistically Safe and Correct Imitation Learning

Award amount: \$100,000

Dates: June 1, 2019 – May 31, 2020

- **Co-PI: Amazon Research Award**

Language-Aided Learning from Demonstration

Award amount: \$55,000

Dates: Mar 1, 2019 – Feb 28, 2020

- **PI: NSF CAREER Award**

IIS-1749204: *Safe and Efficient Robot Learning from Demonstration in the Real World*

Award amount: \$524,605

Dates: June 1, 2018 – May 31, 2023

- **PI: NSF – Smart and Autonomous Systems**

IIS-1724157: *Socially-Aware Autonomy for Long-Term Deployment of Always-On Heterogeneous Robot Teams*

Award amount: \$1,378,736

Dates: June 1, 2017 – May 31, 2021

- **Co-PI: Office of Naval Research**

Off-Policy Evaluation for Grounded Simulation Learning

Award amount: \$900,000

Dates: May 1, 2017 – April 30, 2021

- **PI: NSF – National Robotics Initiative**

IIS-1638107: *Scalable Robot Autonomy through Remote Operator Assistance and Lifelong Learning*

Award amount: \$486,276

Dates: Sept 1, 2016 – Aug 31, 2019

- **PI: NSF – Robust Intelligence**

IIS-1617639: *High Confidence, Efficient Learning Under Rich Task Specifications*

Award amount: \$470,000

Dates: Aug 1, 2016 – July 31, 2019

- **PI: NSF – National Robotics Initiative**

IIS-1208497: *Multiple Task Learning from Unstructured Demonstrations*

Award amount: \$499,911

Dates: Oct 1, 2012 – Sept 30, 2016

Invited Talks and Panels

- ICML Workshop on Human-AI Collaboration in Sequential Decision Making. *Quantifying Risk and Value Alignment of Policies*. Virtual. July 2021.

- University of Washington. *Scaling Probabilistically Safe Learning to Robotics*. Seattle, WA (virtual). January 2021.
- Simons Institute Deep Reinforcement Learning Workshop. *Is Safe Learning the Future of Reinforcement Learning?*. Berkeley, CA (virtual). October 2020.
- Carnegie Mellon University. *Scaling Probabilistically Safe Learning to Robotics*. Pittsburgh, PA (virtual). September 2020.
- ICRA Workshop on Interactive Robot Learning. *Scaling Probabilistically Safe Learning to Robotics*. Paris, France (virtual). June 2020.
- Stanford University. *Scaling Probabilistically Safe Learning to Robotics*. Palo Alto, CA (virtual). April 2020.
- McGill University. *Scaling Probabilistically Safe Learning to Robotics*. Montreal, Quebec (virtual). April 2020.
- University of Alberta. *Scaling Probabilistically Safe Learning to Robotics*. Edmonton, Alberta (virtual). March 2020.
- University of Southern California. *Scaling Probabilistically Safe Learning to Robotics*. Los Angeles, CA. February 2020.
- Brown University HCRI Seminar. *Scaling Probabilistically Safe Learning to Robotics*. Providence, RI. September 2019.
- Samsung AI Research. *Scaling Probabilistically Safe Learning to Robotics*. New York, NY. July 2019.
- University of California Berkeley. *Scaling Probabilistically Safe Learning to Robotics*. Berkeley, CA. April 2019.
- Toyota Technological Institute. *Scaling Probabilistically Safe Learning to Robotics*. Chicago, IL. November 2018.
- Time Machine AI Conference. *Where's my Robot: Challenges and Progress in Personal Robotics*. Austin, TX. November 2018.
- Army Research Lab. *Efficient and Safe Learning from Demonstration*. Adelphi, MD. November 2017.
- Distinguished Speaker, Association for Computing Machinery (ACM) Annual Banquet, Lamar University. *"But What About Skynet?": Separating Fact from Fiction in Artificial Intelligence*. Beaumont, TX. April 2017.
- Panelist, *Beyond BB-8: When Robots Start Acting Human*. South by Southwest Interactive Track. Austin, TX. March 2017.
- Panelist, *Science Writing: Inside AI*. National Association of Science Writers Conference. San Antonio, TX. October 2016.
- Northwestern University. *Discovering Structure in Robotics Tasks via Demonstrations and Active Learning*. Evanston, IL. October 2016.

- INRIA Workshop on Algorithmic Human-Robot Interaction. *Non-Policy Learning from Demonstration and Interaction*. Paris, France. July 2016.
- TTI / Vanguard Conference on “Big Understanding”. *From Robot Learning to Embodied Understanding*. Austin, TX. February 2016.
- AI for Human-Robot Interaction Symposium, AAAI Fall Symposium Series. *Discovering Structure in Robotics Tasks via Demonstrations and Active Learning*. Arlington, VA. November 2015.
- Brown University. *Online Bayesian Changepoint Detection for Articulated Motion Models*. Providence, RI. October 2014.
- University of Michigan. *Online Bayesian Changepoint Detection for Articulated Motion Models*. Ann Arbor, MI. September 2014.
- Georgia Institute of Technology. *Online Bayesian Changepoint Detection for Articulated Motion Models*. Atlanta, GA. August 2014.
- University of Southern California. *Grounded Learning from Unstructured Demonstrations*. Los Angeles, CA. May 2014.
- Worcester Polytechnic Institute. *Online Bayesian Changepoint Detection for Articulated Motion Models*. Worcester, MA. May 2014.
- Carnegie Mellon University. *Semantically Grounded Learning from Unstructured Demonstrations*. Pittsburgh, PA. April 2013.
- Massachusetts Institute of Technology. *Semantically Grounded Learning from Unstructured Demonstrations*. Cambridge, MA. March 2013.

Professional Activities

Event Organizing

- Organizer, *RSS 2019 Workshop on Robust Autonomy: Safe Robot Learning and Control in Uncertain Real-World Environments*, July 2019.
- Co-chair, *AAAI 2017 video competition*, February 2017.
- Organizer, *RSS 2016 Workshop on Bootstrapping Manipulation Skills*, July 2016.
- Organizer, *AAAI 2015 Tutorial on Robot Learning from Demonstration*, January 2015.
- Organizer, *RSS 2013 Workshop on Human-Robot Collaboration*, June 2013.

Area Chair / Associate Editor

- Neural Information Processing Systems (NeurIPS): 2020
- International Conference on Learning Representations (ICLR): 2020

- IEEE International Conference on Robotics and Automation (ICRA): 2019
- AAAI Conference on Artificial Intelligence: 2018

Senior Program Committee

- AAAI Conference on Artificial Intelligence: 2017
- International Joint Conference on Artificial Intelligence (IJCAI): 2016

Conference Reviewing / Program Committee

- IEEE International Conference on Robotics and Automation (ICRA): 2021, 2018, 2017, 2016, 2015, 2014
- Neural Information Processing Systems (NeurIPS): 2019, 2018, 2015, 2011
- Robotics: Science and Systems (RSS): 2019, 2018, 2017, 2015, 2014
- The Multi-Disciplinary Conference on Reinforcement Learning and Decision Making (RLDM): 2019
- Conference on Robot Learning (CoRL): 2018
- International Conference on Intelligent Robots and Systems (IROS): 2018, 2017, 2015, 2014, 2013
- International Conference on Human Robot Interaction (HRI): 2017, 2012, 2013
- Autonomous Agents and Multi-Agent Systems (AAMAS): 2016, 2015, 2014
- International Conference on Humanoid Robots (Humanoids): 2014
- AAAI Special Robotics Track: 2013
- International Joint Conference on Artificial Intelligence (IJCAI): 2013
- AAAI Spring Symposium: 2013
- North East Student Colloquium on Artificial Intelligence: 2010

Journal Reviewing

- IEEE Transactions on Robotics (TRO): 2021
- International Journal of Robotics Research (IJRR): 2018, 2017, 2016
- IEEE Robotics and Automation Letters (RAL): 2015
- Artificial Intelligence (AIJ): 2014
- Frontiers in Computational Neuroscience: 2013
- IEEE Transactions on Autonomous Mental Development (TAMD): 2013
- IEEE Transactions on Systems, Man, and Cybernetics: 2013, 2012

- Journal of Machine Learning Research (JMLR): 2011
- Neurocomputing: 2010

Grant Reviewing

- Army Research Office: 2020
- National Science Foundation: 2016, 2018

Departmental and University Service

- Graduate Advisor for Master of Data Science online program (2021–present)
- Anna Hiss Robotics Building Space Committee, Member (2019–present)
- Faculty Evaluation Committee, Member (2019/2020)
- Faculty Search Committee, Chair (2018/2019)
- Doctoral Admissions Committee, Member (2017/2018)
- Faculty Evaluation Committee, Member (2017)
- College of Natural Sciences 21st Century Curriculum Planning Implementation Task Force (2016–2017)
- Doctoral Admissions Committee, Co-chair (2016/2017)
- Doctoral Admissions Committee, Member (2015/2016)
- Robotics Seminar Series, Co-organizer (2015–2018)

Outreach

- PI, UT Austin Freshman Research Initiative Stream: Robot Learning (2019–present)
- Faculty Volunteer, Women in CS Faculty Lunch Program (2019, 2017)
- Exhibitor, Explore UT (2018)
- Speaker, Code Longhorn computer science camp for underrepresented high school students (2016–2018)
- Speaker, First Bytes computer science camp for high school women (2016–2018)

Advising and Thesis Committees

PhD Supervisor: Completed (The University of Texas at Austin, unless stated otherwise)

- Daniel Brown, Department of Computer Science (Fall 2016–Summer 2020)
Safe and Efficient Inverse Reinforcement Learning
- Ajinkya Jain, Department of Mechanical Engineering (Spring 2016—Summer 2021)
Learning and Leveraging Kinematics for Robot Motion Planning Under Uncertainty
- Akanksha Saran, Department of Computer Science (Fall 2015–Fall 2021)
Leveraging Multimodal Human Cues to Enhance Robot Learning from Demonstration
- Yuchen Cui, Department of Computer Science (Fall 2015–Fall 2021)
Efficient Algorithms for Low-Effort Human Teaching of Robots

PhD Supervisor: Current

- Harshit Sikchi, Department of Computer Science (Fall 2020–)
- Christina Yuan, Department of Computer Science (Fall 2020–)
- Jordan Schneider, Department of Computer Science (Fall 2019–)
- Prasoon Goyal, Department of Computer Science (Co-advised with Ray Mooney, Spring 2017–)
- Caleb Chuck, Department of Computer Science (Fall 2017–)
- Wonjoon Goo, Department of Computer Science (Fall 2016–)

Master's Thesis Supervisor

- Joel Iventosch, Department of Computer Science
A Deep Learning Framework for Model-free 6 Degree of Freedom Object Tracking (Fall 2015—Spring 2017)

Undergraduate Honors Turing Thesis Supervisor

- Rohan Ramchand, Department of Computer Science
An Artificial Intelligence Approach to Redistricting (Spring 2017–Fall 2018)

Doctoral Committee Member

- Yinan Zhao, Information School. Supervisor: Danna Gurari
Learning to manipulate images with image segmentation, search and synthesis
- Farzan Memerian, Institute for Computational Engineering and Sciences. Supervisor: Ufuk Topcu
Side Information, Robustness and Self-Supervision in Imitation Learning

- Mahsa Ghasemi, Institute for Computational Engineering and Sciences. Supervisor: Ufuk Topcu
Efficient, Reliable, and Interpretable Decision Making for Human Autonomy Co-Existence
- Saurabh Arora, Department of Computer Science, University of Georgia. Supervisor: Prashant Doshi
Framework and Algorithms for Inverse Reinforcement Learning
- Aishwarya Padmakumar, Computer Science. Supervisor: Raymond Mooney
Dialog as a Vehicle for Lifelong Learning of Grounded Language Understanding Systems
- Yu-Chuan Su, Computer Science. Supervisor: Kristen Grauman
Learning for 360 Video Compression, Recognition, and Display
- Bo Xiong, Computer Science. Supervisor: Kristen Grauman
Learning to Compose Photos from Passive Cameras
- Josiah Hanna, Computer Science. Supervisor: Peter Stone
Data Efficient Reinforcement Learning with Off-Policy and Simulated Data
- Matthew Horn, Mechanical Engineering. Supervisor: Sheldon Landsberger
Trust and Safety in Robotic Applications
- Adam Allevato, Electrical and Computer Engineering. Supervisor: Andrea Thomaz
- Pravesh Ranchod, Computer Science, University of the Witwatersrand. Supervisor: George Konidaris
Skill Discovery from Multiple Related Demonstrators
- Lijia Liu, Computer Science. Supervisor: Dana Ballard
Cognitive Control of Motor Synergies
- Alex Broad, Department of Electrical Engineering and Computer Science, Northwestern University.
Supervisor: Brenna Argall
Model-Based Shared Control of Human-Machine Systems with Unknown Dynamics
- Jesse Thomason, Computer Science. Supervisor: Raymond Mooney
Continuously Improving Natural Language Understanding for Robotic Systems through Semantic Parsing, Dialog, and Multi-modal Perception
- Sanmit Narvekar, Computer Science. Supervisor: Peter Stone
Curriculum Learning in Reinforcement Learning
- Elad Liebman, Computer Science. Supervisor: Peter Stone
Sequential Decision Making in Artificial Musical Intelligence
- Dinesh Jayaraman, Computer Science. Supervisor: Kristen Grauman
Embodied Learning For Visual Recognition
- Jake Menashe, Computer Science. Supervisor: Peter Stone
Intrinsically-motivated Hierarchical Reinforcement Learning
- Suyog Jain, Computer Science. Supervisor: Kristen Grauman
Active Image and Video Segmentation
- Patrick MacAlpine, Computer Science. Supervisor: Peter Stone
Multilayered Skill Learning and Movement Coordination for Autonomous Robotic Agents in Spatial Domains

- Kai-Yang Chiang, Computer Science. Supervisor: Inderjit Dhillon
Analysis of Dyadic Interactions Using Machine Learning Methods
- Piyush Khandelwal, Computer Science. Supervisor: Peter Stone
On-Demand Coordination of Multiple Service Robots
- Reza Mahjourian, Computer Science. Supervisor: Risto Miikkulainen
Neuroevolutionary Planning for Robotic Control
- Aditya Rawal, Computer Science. Supervisor: Risto Miikkulainen
Evolving Neural Networks for Sequence Processing
- Parham Pournazari, Mechanical Engineering. Supervisor: Eric van Oort
Real-time Learning of Dynamical Drilling Models for Event Detection and Robust Optimal Control

Master's Committee Member

- Brahma Pavse, Computer Science. Supervisor: Peter Stone
Reducing Sampling Error in Batch Temporal Difference Learning
- Prabhat Nagarajan, Computer Science. Supervisor: Peter Stone
Nondeterminism as a Reproducibility Challenge for Deep Reinforcement Learning

Undergraduate Honors Turing Thesis Committee Member

- Antony Yun, Computer Science. Supervisor: Raymond Mooney
Evaluating the Robustness of Natural Language Reward Shaping Models to Spatial Relations
- David Wang, Computer Science. Supervisor: Philipp Krahenbuhl
Using Deep Neural Networks to Predict Chess Player Skill
- Brahma Pavse, Computer Science. Supervisor: Peter Stone
Reinforced Inverse Dynamics Modeling for Learning from a Single Observed Demonstration
- Harsh Goyal, Computer Science. Supervisor: Peter Stone
Holistic Action Transforms
- Kamil Ali, Computer Science. Supervisor: Philipp Krahenbuhl
Can We Predict Actions Independent of the Actor?

Publications

Strongly Peer-Reviewed Journal and Conference Publications

1. C. Yuan, Y. Chandak, S. Giguere, P.S. Thomas, and **S. Niekum**. *SOPE: Spectrum of Off-Policy Estimators*. Neural Information Processing Systems (NeurIPS), December 2021.

2. I. Durugkar, M. Tec, **S. Niekum**, and P. Stone. *Adversarial Intrinsic Motivation for Reinforcement Learning*. Neural Information Processing Systems (NeurIPS), December 2021.
3. Y. Chandak, **S. Niekum**, B. Castro da Silva, E. Learned-Miller, E. Brunskill, and P.S. Thomas. *Universal Off-Policy Evaluation*. Neural Information Processing Systems (NeurIPS), December 2021.
4. A. Jain, S. Giguere, R. Lioutikov, and **S. Niekum**. *Distributional Depth-Based Estimation of Object Articulation Models*. Conference on Robot Learning (CoRL), November 2021.
5. M. Kim, **S. Niekum**, and A. Deshpande. *SCAPE: Learning Stiffness Control from Augmented Position Control Experiences*. Conference on Robot Learning (CoRL), November 2021.
6. W. Goo and **S. Niekum**. *You Only Evaluate Once: A Simple Baseline Algorithm for Offline RL*. Conference on Robot Learning (CoRL), November 2021.
7. F. Memarian, W. Goo, R. Lioutikov, **S. Niekum**, and U. Topcu. *Self-Supervised Online Reward Shaping in Sparse-Reward Environments* IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), September 2021.
8. Y. Cui, P. Koppol, H. Admoni, **S. Niekum**, R. Simmons, A. Steinfeld, and T. Fitzgerald. *Understanding the Relationship between Interactions and Outcomes in Human-in-the-Loop Machine Learning*. International Joint Conference on Artificial Intelligence (IJCAI), August 2021.
9. D.S. Brown, J. Schneider, A. Dragan, and **S. Niekum**. *Value Alignment Verification*. International Conference on Machine Learning (ICML), July 2021.
10. J.P. Hanna, **S. Niekum**, and P. Stone. *Importance sampling in reinforcement learning with an estimated behavior policy*. Machine Learning Journal (MLJ), June 2021.
11. A. Jain, R. Lioutikov, C. Chuck, and **S. Niekum**. *ScrewNet: Category-Independent Articulation Model Estimation From Depth Images Using Screw Theory*. IEEE International Conference on Robotics and Automation (ICRA), June 2021.
12. A. Saran, R. Zhang, E.S. Short, and **S. Niekum**. *Efficiently Guiding Imitation Learning Algorithms with Human Gaze*. International Conference on Autonomous Agents and Multiagent Systems (AAMAS), May 2021.
13. O. Kroemer, **S. Niekum**, and G. Konidaris. *A Review of Robot Learning for Manipulation: Challenges, Representations, and Algorithms*. Journal of Machine Learning Research, 22(30):1-82, January 2021.
14. D.S. Brown, **S. Niekum**, and M. Petrik. *Bayesian Robust Optimization for Imitation Learning*. Neural Information Processing Systems (NeurIPS), December 2020.
15. Y. Cui, Q. Zhang, A. Allievi, P. Stone, **S. Niekum**, and W. Knox. *The EMPATHIC Framework for Task Learning from Implicit Human Feedback*. Conference on Robot Learning (CoRL), November 2020.
16. P. Goyal, **S. Niekum**, and R. Mooney. *PixL2R: Guiding Reinforcement Learning Using Natural Language by Mapping Pixels to Rewards*. Conference on Robot Learning (CoRL), November 2020.
17. C. Chuck, S. Chockchowwat, and **S. Niekum**. *Hypothesis-Driven Skill Discovery for Hierarchical Deep Reinforcement Learning*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), October 2020.

18. A. Jain and **S. Niekum**. *Learning Hybrid Object Kinematics for Efficient Hierarchical Planning Under Uncertainty*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), October 2020.
19. D.S. Brown, R. Coleman, R. Srinivasan, and **S. Niekum**. *Safe Imitation Learning via Fast Bayesian Reward Inference from Preferences*. International Conference on Machine Learning (ICML), July 2020.
20. R. Zhang, A. Saran, B. Liu, Y. Zhu, S. Guo, **S. Niekum**, D. Ballard, M. Hayhoe. *Human Gaze Assisted Artificial Intelligence: A Review*. International Joint Conference on Artificial Intelligence (IJCAI), July 2020.
21. D.S. Brown, W. Goo, and **S. Niekum**. *Better-than-Demonstrator Imitation Learning via Automatically-Ranked Demonstrations*. Conference on Robot Learning (CoRL), October 2019.
22. A. Saran, E.S. Short, A.L. Thomaz, and **S. Niekum**. *Understanding Teacher Gaze Patterns for Robot Learning*. Conference on Robot Learning (CoRL), October 2019.
23. P. Goyal, **S. Niekum**, and R. Mooney. *Using Natural Language for Reward Shaping in Reinforcement Learning*. International Joint Conference on Artificial Intelligence (IJCAI), August 2019.
24. D.S. Brown, W. Goo, P. Nagarajan, and **S. Niekum**. *Extrapolating Beyond Suboptimal Demonstrations via Inverse Reinforcement Learning from Observations*. International Conference on Machine Learning (ICML), June 2019.
25. J.P. Hanna, **S. Niekum**, and P. Stone. *Importance Sampling Policy Evaluation with an Estimated Behavior Policy*. International Conference on Machine Learning (ICML), June 2019.
26. W. Goo and **S. Niekum**. *One-Shot Learning of Multi-Step Tasks from Observation via Activity Localization in Auxiliary Video*. IEEE International Conference on Robotics and Automation (ICRA), May 2019.
27. Y. Cui, D. Isele, **S. Niekum**, and K. Fujimura. *Uncertainty-Aware Data Aggregation for Deep Imitation Learning*. IEEE International Conference on Robotics and Automation (ICRA), May 2019.
28. D.S. Brown and **S. Niekum**. *Machine Teaching for Inverse Reinforcement Learning: Algorithms and Applications*. AAAI Conference on Artificial Intelligence, February 2019.
29. A. Jain and **S. Niekum**. *Efficient Hierarchical Robot Motion Planning Under Uncertainty and Hybrid Dynamics*. Conference on Robot Learning (CoRL), October 2018.
30. D.S. Brown, Y. Cui, and **S. Niekum**. *Risk-Aware Active Inverse Reinforcement Learning*. Conference on Robot Learning (CoRL), October 2018.
31. A. Saran, S. Majumdar, E.S. Short, A.L. Thomaz, and **S. Niekum**. *Human Gaze Following for Human-Robot Interaction*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), October 2018.
32. Y. Cui and **S. Niekum**. *Active Reward Learning from Critiques*. IEEE International Conference on Robotics and Automation (ICRA), May 2018.

33. R.A. Gutierrez, V. Chu, A.L. Thomaz, and **S. Niekum**. *Incremental Task Modification via Corrective Demonstrations*. IEEE International Conference on Robotics and Automation (ICRA), May 2018.
34. D.S. Brown and **S. Niekum**. *Efficient Probabilistic Performance Bounds for Inverse Reinforcement Learning*. AAAI Conference on Artificial Intelligence, February 2018.
35. M. Alshiekh, R. Bloem, R. Ehlers, B. Könighofer, **S. Niekum**, and U. Topcu. *Safe Reinforcement Learning via Shielding*. AAAI Conference on Artificial Intelligence, February 2018.
36. A. Saran, B. Lakic, S. Majumdar, J. Hess, and **S. Niekum**. *Viewpoint Selection for Visual Failure Detection*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), September 2017.
37. H.A. Poonawala, M. Alshiekh, **S. Niekum**, and U. Topcu. *Classification Error Correction: A Case Study in Brain-Computer Interfacing*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), September 2017.
38. J.P. Hanna, P.S. Thomas, P. Stone, and **S. Niekum**. *Data-Efficient Policy Evaluation Through Behavior Policy Search*. International Conference on Machine Learning (ICML), August 2017.
39. J.P. Hanna, P. Stone, and **S. Niekum**. *Bootstrapping with Models: Confidence Intervals for Off-Policy Evaluation*. International Conference on Autonomous Agents and Multiagent Systems (AAMAS), May 2017.
40. P. Khandelwal, E. Liebman, **S. Niekum**, and P. Stone. *On the Analysis of Complex Backup Strategies in Monte Carlo Tree Search*. International Conference on Machine Learning (ICML), June 2016.
41. P.S. Thomas, **S. Niekum**, G. Theodorou, and G.D. Konidaris. *Policy Evaluation Using the Omega-Return*. Advances in Neural Information Processing Systems (NeurIPS), December 2015.
42. **S. Niekum**, S. Osentoski, C.G. Atkeson, and A.G. Barto. *Online Bayesian Changepoint Detection for Articulated Motion Models*. IEEE International Conference on Robotics and Automation (ICRA), May 2015.
43. K. Hausman, **S. Niekum**, S. Osentoski, and G. Sukhatme. *Active Articulation Model Estimation through Interactive Perception*. IEEE International Conference on Robotics and Automation (ICRA), May 2015.
44. **S. Niekum**, S. Osentoski, G.D. Konidaris, S. Chitta, B. Marthi, and A.G. Barto. *Learning Grounded Finite-State Representations from Unstructured Demonstrations*. International Journal of Robotics Research (IJRR), January 2015.
45. **S. Niekum**, S. Osentoski, S. Chitta, B. Marthi, and A.G. Barto. *Incremental Semantically Grounded Learning from Demonstration*. Robotics: Science and Systems (RSS), June 2013.
46. **S. Niekum**, S. Osentoski, G.D. Konidaris, and A.G. Barto. *Learning and Generalization of Complex Tasks from Unstructured Demonstrations*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), October 2012.
47. **S. Niekum** and A.G. Barto. *Clustering via Dirichlet Process Mixture Models for Portable Skill Discovery*. Advances in Neural Information Processing Systems (NeurIPS), December 2011.

48. G.D. Konidaris, **S. Niekum**, and P.S. Thomas. *TD_γ: Reevaluating Complex Backups in Temporal Difference Learning*. Advances in Neural Information Processing Systems (NeurIPS), December 2011.
49. **S. Niekum**, A.G. Barto, L. Spector. *Genetic Programming for Reward Function Search*. IEEE Transactions on Autonomous Mental Development, vol.2, no.2, pp.83-90, June 2010.
50. D.R. Thompson, **S. Niekum**, T. Smith, and D. Wettergreen. *Automatic Detection and Classification of Geological Features of Interest*. IEEE Aerospace Conference, March 2005.
51. T. Smith, **S. Niekum**, D.R. Thompson, and D. Wettergreen. *Concepts for Science Autonomy During Robotic Traverse and Survey*. IEEE Aerospace Conference, March 2005.

Lightly Peer-Reviewed Workshops, Symposia, and Posters

52. A. Saran. R. Zhang, E. Schaertl, and **S. Niekum**. Efficiently Guiding Imitation Learning Algorithms with Human Gaze. AAAI Workshop on Reinforcement Learning in Games, February 2020.
53. D.S. Brown and **S. Niekum**. Deep Bayesian Reward Learning from Preferences. NeurIPS Workshop on Safety and Robustness in Decision Making, December 2019.
54. C. Chuck, S. Chockchowwat, and **S. Niekum**. Hypothesis Driven Exploration for Deep Reinforcement Learning. ICML Workshop on Exploration in RL, June 2019.
55. A. Saran. E. Schaertl, A.L. Thomaz, and **S. Niekum**. Enhancing Robot Learning with Human Social Cues. HRI Pioneers Workshop, March 2019.
56. A. Saran. E. Schaertl, S. Majumdar, A.L. Thomaz, and **S. Niekum**. Real-time Human Gaze Following For Human-Robot Interaction. HRI Workshop on Social Robots in the Wild, March 2018.
57. D.S. Brown and **S. Niekum**. Toward Probabilistic Safety Bounds for Robot Learning from Demonstration. AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction, November 2017.
58. Y. Cui and **S. Niekum**. Active Learning from Critiques via Bayesian Inverse Reinforcement Learning. Robotics: Science and Systems (R:SS) Workshop on Mathematical Models, Algorithms, and Human-Robot Interaction, July 2017.
59. T.K. Faulkner, A.L. Thomaz, and **S. Niekum**. Robot Dialog Optimization via Modeling of Human Belief Updates. Robotics: Science and Systems (R:SS) Workshop on Robot Communication in the Wild, July 2017.
60. R.A. Gutierrez, V. Chu, A.L. Thomaz, and **S. Niekum**. Incremental Task Model Updates from Demonstration. Robotics: Science and Systems (R:SS) Workshop on Mathematical Models, Algorithms, and Human-Robot Interaction, July 2017.
61. A. Jain and **S. Niekum**. Belief Space Planning under Approximate Hybrid Dynamics. Robotics: Science and Systems (R:SS) Workshop on POMDPs in Robotics, July 2017.
62. A. Saran and **S. Niekum**. Visual Grounding of Spatial Relationships for Failure Detection. Robotics: Science and Systems (R:SS) Workshop on Spatial-Semantic Representations in Robotics, July 2017.

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