

Wen Sun

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Education

Ph.D. in Robotics, Robotics Institute, School of Computer Science, Carnegie Mellon University, USA.

M.S. Computer Science, University of North Carolina at Chapel Hill, USA, 2014.

B.S with Distinction, Computer Science, Simon Fraser University, Canada, 2012.

B.E. Computer Science, Zhejiang University, China, 2012

Employment

July 2020 - present: **Assistant Professor**, Computer Science Department, Cornell University

July 2019 - June 2020: **Postdoctoral Researcher**, Microsoft Research at New York City

August 2014 - June 2019: **Research Assistant**, Robotics Institute, Carnegie Mellon University

Publications

Monograph

Alekh Agarwal, Nan Jiang, Sham Kakade, Wen Sun, "Reinforcement Learning: Theory and Algorithms" (link to the working draft)

Pre-print

Rahul Kidambi, Jonathan Chang, Wen Sun, "Optimism is All You Need: Model-Based Imitation Learning From Observation Alone", *arXiv:2102.10769; Under review*

Xuezhou Zhang, Yiding Chen, Xiaojin Zhu, Wen Sun, "Robust Policy Gradient against Strong Data Corruption", *arXiv: 2102.05800; under review*

Simon Du, Sham M. Kakade, Jason D. Lee, Shachar Lovett, Gaurav Mahajan, Wen Sun, Ruosong Wang, "What Structural Conditions Permit Generalization in Reinforcement Learning", *under review*

Luke Wang, Yiwei Bai, Wen Sun, Thorsten Joachims, "Fairness of Exposure in Stochastic Bandits", *arXiv:2103.02735; under review*

Masatoshi Uehara, Masaaki Imaizumi, Nan Jiang, Nathan Kallus, Wen Sun, Tengyang Xie, "Finite Sample Analysis of Minimax Offline Reinforcement Learning: Completeness, Fast Rates and First-Order Efficiency", *arXiv: 2102.02981; Under review*

Thodoris Lykouris, Max Simchowitz, Aleksandrs Slivkins, Wen Sun, "Corruption robust exploration in episodic reinforcement learning", *arXiv: 1911.08689; Under review*

Journal Publications

Wen Sun, Jur van den Berg, Ron Alterovitz, "Stochastic Extended LQR: Optimization-based Motion Planning under Uncertainty," in *IEEE Transactions on Automation Science and Engineering (TASE)*, 2016.

Wen Sun, Sachin Patil, Ron Alterovitz, "High-Frequency Replanning Under Uncertainty Using Parallel Sampling-Based Motion Planning," in *IEEE Transactions on Robotics (TRO)*, 2015.

Refereed Conference Proceedings

Alekh Agarwal*, Mikael Henaff*, Sham Kakade*, Wen Sun*, "PC-PG: Policy Cover Directed Exploration for Provable Policy Gradient Learning," in *Neural Information Processing Systems (NeurIPS)* 2020

Alekh Agarwal*, Sham Kakade*, Akshay Krishnamurthy*, Wen Sun*, "FLAMBE: Structural Complexity and Representation Learning of Low Rank MDPs," in *Neural Information Processing Systems (NeurIPS)* 2020 (Oral)

Sham Kakade*, Akshay Krishnamurthy*, Kendall Lowrey*, Motoya Ohnishi*, Wen Sun*, "Information Theoretic Regret Bounds for Online Nonlinear Control," in *Neural Information Processing Systems (NeurIPS)* 2020

Wenhao Luo, Wen Sun, Ashish Kapoor, "Multi-Robot Collision Avoidance under Uncertainty with Probabilistic Safety Barrier Certificates," in *Neural Information Processing Systems (NeurIPS)* 2020 (Spotlight)

Kiante Brantley*, Miroslav Dudik*, Thodoris Lykouris*, Sobhan Miryoosefi*, Max Simchowitz*, Aleksandrs Slivkins*, Wen Sun*, "Constrained Episodic Reinforcement Learning in Concave-convex and Knapsack Settings," in *Neural Information Processing Systems (NeurIPS)* 2020

Yuda Song, Aditi Mavalankar, Wen Sun, Sicun Gao, "Provably Efficient Model-based Policy Adaptation," in *International Conference on Machine Learning (ICML)*, 2020

Kiante Brantley, Wen Sun, Mikael Henaff, "Disagreement-Regularized Imitation Learning," in *International Conference on Representation Learning (ICLR)*, 2020 (Spotlight)

Liyiming Ke, Sanjiban Choudhury, Matt Barnes, Wen Sun, Gilwoo Lee, Siddhartha Srinivasa, "Imitation Learning as f-Divergence Minimization," in *International Workshop on the Algorithmic Foundations of Robotics (WAFR)*, 2020

Huaian Diao*, Rajesh Jayaram*, Zhao Song*, Wen Sun*, David P. Woodruff*, "Optimal Sketching for Kronecker Product Regression and Low Rank Approximation," in *Neural Information Process Systems (NeurIPS)*, 2019

Yuzhe Ma, Xuezhou Zhang, Wen Sun, Jerry Zhu, "Policy Poisoning in Batch Reinforcement Learning and Control," in *Neural Information Process Systems (NeurIPS)*, 2019

Wen Sun, Anirudh Vemula, Byron Boots, J. Andrew Bagnell, "Provably Efficient Imitation Learning from Observation Alone," in *International Conference on Machine Learning (ICML)*, 2019 (Long Talk)

Wen Sun, Alina Beygelzimer, Hal Daumé III, John Langford, Paul Mineiro, "Contextual Memory Tree," in *International Conference on Machine Learning (ICML)*, 2019 (Long Talk)

Wen Sun, Nan Jiang, Akshay Krishnamurthy, Alekh Agarwal, John Langford, "Model-based RL in CDPs: PAC bounds and Exponential Improvements over Model-free Approaches," in *Conference on Learning Theory (COLT)*, 2019.

Anirudh Vemula, Wen Sun, J. Andrew Bagnell, "Contrasting Exploration in Parameter and Action Space: A Zeroth-Order Optimization Perspective," in *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2019.

Wen Sun, Geoffrey Gordon, Byron Boots, J. Andrew Bagnell, "Dual Policy Iteration," in *Neural Information Processing Systems (NeurIPS)*, 2018

Ahmed Hefny, Zita Marinho, Wen Sun, Siddhartha Srinivasa, Geoffrey Gordon, "Recurrent Predictive State Policy Networks," in *International Conference on Machine Learning (ICML)*, 2018

Wen Sun, J. Andrew Bagnell, Byron Boots, "Truncated Horizon Policy Search: Combining Reinforcement Learning and Imitation Learning," in *International Conference on Learning Representation (ICLR)*, 2018.

Huaian Diao*, Zhao Song*, Wen Sun*, David Woodruff*, "Sketching for Kronecker Product Regression and P-splines," in *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018. (Oral)

Wen Sun, Arun Venkatraman, Geoff Gordon, Byron Boots, J. Andrew Bagnell, "Deeply AggreVaTeD: Differentiable Imitation Learning for Sequential Prediction," in *International Conference on Machine Learning (ICML)*, 2017.

Wen Sun, Debadeepta Dey, Ashish Kapoor, "Safety-Aware Algorithms for Adversarial Contextual Bandits," in *International Conference on Machine Learning (ICML)*, 2017.

Arun Venkatraman, Nicholas Rhinehart, Wen Sun, Lerrel Pinto, Martial Hebert, Byron Boots, Kris M. Kitani, J. Andrew Bagnell, "Predictive-State Decoders: Encoding the Future into Recurrent Networks," in *Neural Information Processing Systems (NIPS)*, 2017

Wen Sun, Niteesh Sood, Debadeepta Dey, Gireeja Ranade, Siddharth Prakash, Ashish Kapoor, "No-Regret Replanning Under Uncertainty," in *International Conference on Robotics and Automation (ICRA)*, 2017

Hanzhang Hu, Wen Sun, Arun Venkatraman, Martial Hebert, and J. Andrew Bagnell, "Online Gradient Boosting on Stochastic Data Streams", in *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2017.

Wen Sun, Arun Venkatraman, Byron Boots, J. Andrew Bagnell, "Learning to Filter with Predictive State Inference Machines," in *International Conference on Machine Learning (ICML)*, 2016.

Wen Sun, Roberto Capobianco, Geoffrey J. Gordon, J. Andrew Bagnell, Byron Boots, "Learning to Smooth with Bidirectional Predictive State Inference Machines," in *Uncertainty in Artificial Intelligence (UAI)*, 2016.

Wen Sun, J. Andrew Bagnell, "Online Bellman Residual and Temporal Difference Algorithms with Predictive Error Guarantees," in *Sister-Conference Best Paper Track, Joint Conference on Artificial Intelligence (IJCAI) 2016*.

Arun Venkatraman, Wen Sun, Martial Hebert, Byron Boots, and J. Andrew Bagnell, "Inference Machines for Nonparametric Filter Learning," in *International Joint Conference on Artificial Intelligence (IJCAI)*, 2016.

Arun Venkatraman, Wen Sun, Martial Hebert, J. Andrew Bagnell, Byron Boots, "Online Instrumental Variable Regression with Applications to Online Linear System Identification," in *AAAI Conference on Artificial Intelligence (AAAI)*, 2016.

Wen Sun, J. Andrew Bagnell, "Online Bellman Residual Algorithms with Predictive Error Guarantees," in *Uncertainty in Artificial Intelligence (UAI)*, 2015. (Best Student Paper Award)

Wen Sun, Islam Khalil, Sarthak Misra, Ron Alterovitz, “Motion Planning for Paramagnetic Microparticles under Motion and Sensing Uncertainty,” in *International Conference on Robotics and Automation (ICRA)*, 2014.

Wen Sun, Luis Torres, Jur van den Berg, Ron Alterovitz, “Safe Motion Planning for Imprecise Robotic Manipulators by Minimizing Probability of Collision,” in *International Symposium of Robotics Research (ISRR)*, 2013.

(* indicates α - β order)

Teaching Experience

Instructor: CS 4789 Introduction to Reinforcement Learning, Cornell, Spring 2021.

Instructor: CS 6789 Foundations of Reinforcement Learning, Cornell, Fall 2020.

Teaching Assistant: ROB 16831 Statistical Techniques in Robotics, CMU, Fall 2017.

Guest Lecturer: ROB 16831 Statistical Techniques in Robotics, CMU, Fall 2017 & 2018, Spring 2018.

Invited Talks

Exploration and Robustness in Policy Gradient Learning

BLISS Seminar, UC Berkeley; SILO seminar, University of Wisconsin-Madison; AI seminar, Cornell; Robotics seminar, Cornell; ORIE Colloquium, Cornell; Facebook AI Research (FAIR), 2020

Towards Generalization and Efficiency in Reinforcement Learning

Microsoft Research Redmond, Feb, 2019

UW at Madison, Penn, CMU, UMD, UM at Ann Arbor, UNC Chapel Hill, Duke, UCSD, Cornell, March, 2019
Stanford, July, 2019

Learning from Limited Experts

Workshop on Imitation Learning and Its Challenges in Robotics, NeurIPS, December, 2018

Efficient Reinforcement Learning via Imitation

Microsoft Research, Montreal, August, 2018

AI Seminar, CMU, April, 2018

Simon Fraser University (SFU), April, 2018

Differentiable Imitation Learning and Sequential Prediction

University of Southern California (USC), December, 2017

AI Seminar, CMU, March, 2017

Online Bellman Residual Algorithms with Provably Guarantees

Microsoft Research, Redmond, June, 2016

Professional Service

Journal and Conference Article Reviewing

Reviewer, Operation Research, 2021

Senior Program Committee, Association for the Advancement of Artificial Intelligence, AAAI, 2020, 2021

Reviewer, Journal of Artificial Intelligence Research, 2020

Reviewer, Symposium on Foundations of Computer Science (FOCS), 2019

Reviewer, International Conference on Machine Learning (ICML), 2019, 2020

Reviewer, Neural Information Processing Systems (NIPS), 2016, 2018 (**Ranked among top 200 reviewers**), 2019, 2020

Reviewer, International Conference on Artificial Intelligence and Statistics (AISTATS), 2019

Reviewer, Conference on Artificial Intelligence (AAAI), 2019

Reviewer, Asian Conference on Machine Learning (ACML), 2019

Reviewer, Conference of Robot Learning (CORL), 2018

Reviewer, Robotics: Science and Systems (RSS), 2016

Reviewer, International Conference on Intelligent Robots and Systems (IROS), 2014,2015,2016

Reviewer, International Conference on Robotics and Automation (ICRA), 2016, 2017, 2018