Wen Sun

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Education

Ph.D. Candidate, 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.

Publications

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

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)*, 2019a.

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.

Preprints and Workshops

Wen Sun, Nan Jiang, Akshay Krishnamurthy, Alekh Agarwal, John Langford, "Model-Based Reinforcement Learning in Contextual Decision Processes," in *arXiv*, 2018

Wen Sun, Hanzhang Hu, Byron Boots, J. Andrew Bagnell, "Provably Efficient Imitation Learning from Observation Alone," in *Workshop on Imitation Learning and its Challenges in Robotics, NIPS*, 2018. (**Oral**)

Wen Sun, Alina Beygelzimer, Hal Daumé III, John Langford, Paul Mineiro, "Contextual Memory Tree," in *arXiv*, 2018.

Wen Sun, Arun Venkatraman, Geoff Gordon, Byron Boots, J. Andrew Bagnell, "Deeply AggreVaTeD: Differentiable Imitation Learning for Sequential Prediction," in *The Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM)*, 2017. (**Oral**)

(* indicates α-β order)

Research Experience

Research Intern
May-August, 2018
Microsoft Research, New York, USA
Advisors: Alekh Agarwal, Nan Jiang, Akshay Krishnamurthy, and John Langford

Studied sample complexity of Reinforcement Learning in Contextual Decision Processes (CDP) and developed a sample efficient model-based algorithm for CDPs.

Research Intern
May-August, 2017
Yahoo Research, New York, USA
Advisor: Alina Beygelzimer

Worked on a new problem named *Contextual Memory*. Designed and studied the feasibility of a learning memory controller which inserts new memories into an experience store of effectively unbounded size and optimizes queries for memories from the same experience store.

Research Intern
May-August, 2016
Microsoft Research, Redmond, USA
Advisors: Ashish Kapoor and Debadeepta Dey

Studied the problem of risk-aware contextual bandits. Developed an algorithm that explicitly considers risk constraints while learning. The developed algorithm achieves near-optimal regret in terms of maximizing reward while satisfying the risk constraints in average.

Teaching Experience

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

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

Model-Based Reinforcement Learning in Contextual Decision Processes
Microsoft Research, New York, August, 2018

Efficient Reinforcement Learning via Imitation
Microsoft Research, Montreal, August, 2018
AI Seminar, CMU, April, 2018
Simon Fraser University (SFU), Canada, 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

International Conference on Machine Learning (ICML), 2019

Neural Information Processing Systems (NIPS), 2016, 2018 (**Ranked among top 200 reviewers**)
International Conference on Artificial Intelligence and Statistics (AISTATS), 2019
Conference on Artificial Intelligence (AAAI), 2019
Asian Conference on Machine Learning (ACML), 2019
Conference of Robot Learning (CORL), 2018
Robotics: Science and Systems (RSS), 2016
International Conference on Intelligent Robots and Systems (IROS), 2014,2015,2016
International Conference on Robotics and Automation (ICRA), 2016, 2017, 2018