Vitae

SHANE T. BARRATT

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EDUCATION

PhD in Electrical Engineering, 2017-2021
Stanford University.

MS in Electrical Engineering, 2017-2019
Stanford University.

BS *phi beta kappa* in Electrical Engineering & Computer Sciences, 2013-2017
University of California, Berkeley. GPA 3.98/4.0.

PAPERS

S. Barratt and S. Boyd (2022). Stochastic control with affine dynamics and extended quadratic costs. IEEE Transactions on Automatic Control. [code]

A. Agrawal, S. Barratt, and S. Boyd (2021). Learning convex optimization models. IEEE/CAA Journal of Automatica Sinica. [code]

S. Barratt and S. Boyd (2021). Fitting feature-dependent Markov chains. Manuscript. [code]

J. Tuck, S. Barratt, and S. Boyd (2021). A distributed method for fitting Laplacian regularized stratified models. Journal of Machine Learning Research. [code, talk]

S. Barratt, G. Angeris, and S. Boyd (2021). Optimal representative sample weighting. Statistics and Computing. [code]

S. Barratt, G. Angeris, and S. Boyd (2021). Automatic repair of convex optimization problems. Optimization and Engineering. [code]

S. Barratt and S. Boyd (2021). Covariance prediction via convex optimization. Manuscript. [code]

J. Tuck, S. Barratt, and S. Boyd (2021). Portfolio construction using stratified models. Machine Learning in Financial Markets: A Guide to Contemporary Practice. [code]

S. Barratt (2021). Convex optimization and implicit differentiation methods for control and estimation. PhD Thesis.

S. Barratt and S. Boyd (2021). Least squares auto-tuning. Engineering Optimization. [code]

S. Barratt, G. Angeris, and S. Boyd (2020). Minimizing a sum of clipped convex functions. Optimization Letters. [code]

S. Barratt, J. Tuck, and S. Boyd (2020). Convex optimization over risk-neutral probabilities. Manuscript. [code]

M. Palan, S. Barratt, A. McCauley, D. Sadigh, V. Sindhwani, and S. Boyd (2020). Fitting a linear control policy to demonstrations with a Kalman constraint. Proceedings of Machine Learning Research. [code]

S. Barratt and S. Boyd (2020). Multi-period liability clearing via convex optimal control. Manuscript. [code]

S. Barratt, Y. Dong, and S. Boyd (2020). Low rank forecasting. Manuscript. [code]

S. Boyd, A. Agrawal, and S. Barratt (2020). Embedded convex optimization for control. Plenary lecture, IEEE Conference on Decision and Control. [video, code]

A. Agrawal, S. Barratt, S. Boyd, and B. Stellato (2020). Learning convex optimization control policies. Proceedings of Machine Learning Research. [code]

S. Barratt and S. Boyd (2019). Fitting a Kalman smoother to data. Proceedings of the American Control Conference. [code]

A. Agrawal, B. Amos, S. Barratt, S. Boyd, S. Diamond, and J. Zico Kolter (2019). Differentiable convex optimization layers. Advances in Neural Information Processing Systems. [code, poster]

S. Barratt, M. Kochenderfer, and S. Boyd (2019). Learning probabilistic trajectory models of aircraft in terminal airspace from position data. IEEE Transactions on Intelligent Transportation Systems. [code]

A. Agrawal, S. Barratt, S. Boyd, E. Busseti, and W. Moursi (2019). Differentiating through a cone program. Journal of Applied and Numerical Optimization. [code]

R. Sharma, S. Barratt, S. Ermon, and V. Pande (2018). Improved training with curriculum GANs. Manuscript.

Y. Kim, A. Qadir, A. Narayanaswamy, R. Murty, S. Barratt, and G. Nychis (2018). Systems and methods for discovering automatable tasks. US Patent.

S. Barratt and R. Sharma (2018). Optimizing for generalization in machine learning with cross-validation gradients. Manuscript.

S. Barratt (2018). On the differentiability of the solution to convex optimization problems. Manuscript.

S. Barratt and R. Sharma (2018). A note on the inception score. ICML Workshop on Theoretical Foundations and Applications of Deep Generative Models.

C. de Vrieze, S. Barratt, D. Tsai, and A. Sahai (2018). Cooperative multi-agent reinforcement learning for low-level wireless communication. Manuscript.

S. Barratt (2018). Direct model predictive control. ICML Workshop on Planning and Learning.

S. Barratt (2017). InterpNET: neural introspection for interpretable deep learning. Neurips Interpretable ML Symposium.

S. Barratt (2017). Active robotic mapping through deep reinforcement learning. Manuscript.

A. Lee, M. Goldstein, S. Barratt, and P. Abbeel (2015). A non-rigid point and normal registration algorithm with applications to learning from demonstrations. International Conference on Robotics and Automation.

RESEARCH EXPERIENCE

Stanford University Convex Optimization Group (Prof. Stephen Boyd), Department of Electrical Engineering, Stanford University, 2018-2021.

Stanford Intelligent Systems Laboratory (Prof. Mykel Kochenderfer), Department of Aeronautics and Astronautics, Stanford University, 2017-2018.

Berkeley Wireless Research Center (Prof. Anant Sahai), Department of Electrical Engineering, University of California, Berkeley, 2016-2017.

Robot Learning Lab (Prof. Pieter Abbeel), Department of Computer Science, University of California, Berkeley, 2014.

INDUSTRY EXPERIENCE

Founder & CEO, Prop Trading Firm, New York, NY, 2022.

Research Intern & Consultant - Blackrock (AI Lab), Palo Alto, CA, 2020-2021. Worked on retirement planning, securities lending, and risk modeling.

Consultant, SF Giants, San Francisco, CA, 2020-2021. Worked on game modeling and optimal pitch selection.

Software Engineering Intern - Lyft Level 5 (self-driving division), Palo Alto, CA, 2019. Worked on motion planning algorithms.

Platform Engineering Intern - Software Robotics Corporation (SoRoCo), Cambridge, MA, 2016. Worked on U.S. Patent 20180113780 (Systems and methods for discovering automatable tasks).

Hardware Engineering Intern - Skybox Imaging, Google Inc., Mountain View, 2015. Worked on U.S. Patent 9509894 (Capturing images using controlled vibration).

Wireless Testing Intern - Qualcomm-Atheros, Sunnyvale, 2012.

TEACHING EXPERIENCE

Course Assistant - EE 364A, Convex Optimization, Department of Electrical Engineering, Stanford University, 2019.

Teaching Assistant - EE 16B, Designing Information Devices and Systems II, Department of Electrical Engineering, University of California, Berkeley, 2016.

Student Instructor - EE 98, IEEE Micromouse, Department of Electrical Engineering, University of California, Berkeley, 2015.

AWARDS AND HONORS

NSF Graduate Research Fellowships Program, 2017-2020.

Phi Beta Kappa Society, 2017.

Regent's and Chancellor's Undergraduate Scholarship, 2013-2017.

Dean's Honors, 2013-2017.

Best Amazon Hack, CalHacks, 2015.

Best Berkeley Student Hack, CalHacks, 2015.

First Place, Capital One Engineering Summit Hackathon, 2015.

Kraft Award for Freshmen, 2013.