

David Brandfonbrener

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Education

- 2018 - **New York University**, PhD student in the Computer Science department of the Courant Institute.
Current Advised by Joan Bruna in the CILVR group
- 2014-18 **Yale University**, Bachelor of Arts in Mathematics (Intensive) with distinction and Bachelor of Arts in Computer Science with distinction, GPA: 3.90/4.0, magna cum laude.
Senior theses advised by Andrew Barron, Dana Angluin, and Pat Devlin

Research Interests

Deep reinforcement learning, data efficiency, offline and off-policy settings, exploration, optimization and statistical guarantees, applications in robotics.

Connecting RL and supervised learning, imitation learning, contextual bandits, generalization.

Employment

- 2022 **Google Robotics (NYC)**, research internship, working on offline RL from teleoperated data for robotic manipulation with Jake Varley and Stephen Tu.
- 2021 **Microsoft Research (Montreal, virtual)**, research internship, worked on uncertainty quantification for offline RL with Romain Laroché and Rémi Tachet des Combes.
- 2019 **Facebook AI Research (Paris)**, research internship, worked on regret bounds for randomized RL with function approximation with Alessandro Lazaric and Matteo Pirodda.

Awards

- 2019-22 **National Defense Science and Engineering Graduate (NDSEG) Fellowship**.

Papers

- 2022 **When Does Return-Conditioned Supervised Learning Work for Offline RL?**, D. Brandfonbrener, A. Bietti, J. Buckman, R. Laroché, J. Bruna.
In submission,
<https://arxiv.org/abs/2206.01079>
- 2022 **Incorporating Explicit Uncertainty Estimates into Deep Offline Reinforcement Learning**, D. Brandfonbrener, R. Tachet des Combes, R. Laroché.
In submission,
<https://arxiv.org/abs/2206.01085>
- 2022 **Don't Change the Algorithm, Change the Data: Exploratory Data for Offline Reinforcement Learning**, D. Yarats*, D. Brandfonbrener*, H. Liu, M. Laskin, P. Abbeel, A. Lazaric, L. Pinto.
In submission,
<https://arxiv.org/abs/2201.13425>
- 2021 **Offline RL Without Off-Policy Evaluation**, D. Brandfonbrener, W. Whitney, R. Ranganath, J. Bruna.
Conference on Neural Information Processing Systems (NeurIPS) 2021 (*spotlight, top 3%*),
<https://arxiv.org/abs/2106.08909>

* denotes equal contribution

- 2021 **Quantile Filtered Imitation Learning**, D. Brandfonbrener, W. Whitney, R. Ranganath, J. Bruna.
The Offline Reinforcement Learning Workshop at NeurIPS 2021,
<https://arxiv.org/abs/2112.00950>
- 2021 **Offline Contextual Bandits with Overparameterized Models**, D. Brandfonbrener, W. Whitney, R. Ranganath, J. Bruna.
International Conference on Machine Learning (ICML) 2021,
<https://arxiv.org/abs/2006.15368>
- 2021 **Evaluating Representations by the Complexity of Learning Low-loss Predictors**, W. Whitney, M.J. Song, D. Brandfonbrener, J. Altosaar, K. Cho.
Neural Compression: From Information Theory to Applications Workshop at ICLR 2021,
<https://arxiv.org/abs/2009.07368>
- 2021 **PsychRNN: An Accessible and Flexible Python Package for Training Recurrent Neural Network Models on Cognitive Tasks**, D. Ehrlich, J. Stone, D. Brandfonbrener, A. Atanasov, J. Murray.
ENeuro, Volume 8, Issue 1, Society for Neuroscience,
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7814477/>
- 2020 **Frequentist Regret Bounds for Randomized Least-Squares Value Iteration**, A. Zanette*, D. Brandfonbrener*, E. Brunskill, M. Pirotta, A. Lazaric.
International Conference on Artificial Intelligence and Statistics (AISTATS) 2020,
<https://arxiv.org/abs/1911.00567>
- 2020 **Geometric Insights into the Convergence of Nonlinear TD Learning**, D. Brandfonbrener, J. Bruna.
International Conference on Learning Representations (ICLR) 2020,
<https://arxiv.org/abs/1905.12185>
- 2018 **Two-vertex Generators of Jacobians of Graphs**, D. Brandfonbrener, P. Devlin, N. Friedenberg, Y. Ke, S. Marcus, H. Reichard, and E. Sciamma.
The Electronic Journal of Combinatorics, 25 (2018),
<https://arxiv.org/abs/1708.03069>

Teaching

- 2021 **Teaching assistant**, DS-GA-3001: Tools and Techniques for Machine Learning.
- 2020 **Teaching assistant**, CSCI-GA-3033-020: Mathematics of Deep Learning.

Service

Outstanding reviewer (or equivalent), ICLR 2021, ICLR 2022.
Reviewer, NeurIPS 2019-22, ICML 2020-22, ICLR 2020-22, AISTATS 2021.
Organizer, CILVR lab seminar 2019-2021, NYU Reinforcement Learning reading group 2019-2021.

Other Research Activities

- 2020 **Summer School**, Machine Learning Summer School, Tübingen (virtual).
- 2018 **Undergraduate Computer Science Thesis**, Yale, supervised by Andrew Barron and Dana Angluin.
- 2016 - **Research Intern**, Yale, computational neuroscience, supervised by John Murray.
2018
- 2017 **Undergraduate Math Thesis**, Yale, supervised by Pat Devlin.
- 2017 **Math REU**, Yale, funded through the Math Department's SUMRY program.
- 2016 **Research Intern**, Northwestern, supervised by Konrad Kording.
- 2015 **Math REU**, Yale, funded through the Math Department's SUMRY program.