David Brandfonbrener

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Education

2018 - Current **New York University**, PhD student in the Computer Science department of the Courant Institute.
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

Reinforcement learning with function approximation, offline and off-policy settings, optimization, exploration, statistical guarantees, connections to causal inference and contextual bandits.

Generalization and transfer with neural networks, connections to representation learning.

Employment

2021 **Research intern**, Microsoft Research, supervised by Romain Laroche and Remi Tachet des Combes.

2019 **Research intern**, Facebook AI Research (FAIR), supervised by Alessandro Lazaric and Matteo Pirotta.

Awards

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

Papers

2021 **Offline COntextual Bandits with Overparameterized Models**, D. Brandfonbrener, W. Whitney, R. Ranganath, J. Bruna.
In submission, 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

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

2020 **Teaching assistant**, CSCI-GA-3033-020: Mathematics of Deep Learning.

Service

Reviewer, NeurIPS 2019-20, ICML 2020-21, ICLR 2020-21, AISTATS 2021.

Organizer, CILVR lab seminar 2019-present, NYU Reinforcement Learning reading group 2019-present.

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 - 2018 **Research Intern**, Yale, computational neuroscience, supervised by John Murray.

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.