

Nicholas E. Corrado

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🌐 <https://nicholascorrado.github.io> 🔗 <https://github.com/NicholasCorrado>

Education

- Present **University of Wisconsin – Madison**, Madison, WI
Doctoral Student, Advisor: *Josiah Hanna*, GPA: 3.8/4.0
Interests: reinforcement learning, robotics, data augmentation, representation learning
- 04/19 **University of Pittsburgh**, Pittsburgh, PA
BPhil in Physics, BS in Mathematics, Advisor: *Vladimir Savinov*, GPA: 3.9/4.0
Thesis: A Search for W_{bJ} in Decays of $\Upsilon(5S)$: An Analysis Design Study [[thesis](#)]

Experience

- 01/21 – **University of Wisconsin – Madison**, *Research Assistant*, Madison, WI.
Present Advisor: Josiah P. Hanna
- My research focuses on improving the data efficiency of reinforcement learning (RL) by controlling the distribution of data from which an RL agent learns.
 - Identified aspects of data augmentation that improve the data efficiency of RL and successfully applied these insights to a **real-world robotics task**.
 - Demonstrated that on-policy policy gradient algorithms are more data efficient with **adaptive, off-policy sampling** than on-policy sampling.
- 05/21 – **Sandia National Laboratories**, *Research Intern*, Albuquerque, NM.
11/23 Advisor: Drew Levin
- Deep reinforcement learning for power systems management.
 - From May 2022 - Nov 2023, I served as a consultant for reinforcement learning projects.
- 09/19 – **University of Wisconsin – Madison**, *Research Assistant*, Madison, WI.
09/20 Advisor: Jignesh Patel
- Built the query execution and storage engines of [Hustle](#), a scalable data platform built on top of Apache Arrow.
 - Designed a variant of the Lookahead Information Passing (LIP) query execution strategy with improved robustness in dynamic data environments for Hustle. [[github](#)]
- 10/16 – **University of Pittsburgh**, *Research Assistant*, Pittsburgh, PA.
08/19 Advisor: Vladimir Savinov
- Designed and optimized the first search for new hadronic W_{bJ} states in data collected by the Belle experiment. [[thesis](#)]
 - Created tools to monitor TOP Level-1 trigger performance for the Belle-II experiment.

Submitted Manuscripts

Nicholas E. Corrado & Josiah P. Hanna. On-policy policy gradient learning without on-policy sampling. Under Review. [\[arxiv\]](#)

Nicholas E. Corrado, Yuxiao Qu, John U. Balis, Adam Labiosa, & Josiah P. Hanna. Guided data augmentation for offline reinforcement learning and imitation learning. Under Review. [\[arxiv\]](#) [\[video\]](#)

Nicholas E. Corrado, Michael Livesay, Tyson Bailey, & Drew Levin. Reinforcement learning for automatic generation control using a Kuramoto-like model. Under Review.

Publications

ICLR 2024 **Nicholas E. Corrado** & Josiah P. Hanna. Understanding when dynamics-invariant data augmentations benefit model-free reinforcement learning updates. In Proceedings of the International Conference on Learning Representations (ICLR), 2024. [\[arxiv\]](#)

IEEE Smart-GridComm 2023 **Nicholas E. Corrado**, Michael Livesay, Jay Johnson, & Drew Levin. Deep reinforcement learning for distribution power system cyber-resilience via distributed energy resource control. In IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (IEEE SmartGridComm), 2023. [\[paper\]](#)

CoLLAs 2022 **Nicholas Corrado**, Yuxiao Qu, Josiah P. Hanna. Simulation-acquired latent action spaces for dynamics generalization. In Proceedings of the 1st Conference on Lifelong Learning Agents (CoLLAs), 2022. [\[paper\]](#) [\[website\]](#) [\[video\]](#)

Abstracts

MMLS 2023 **Nicholas E. Corrado** & Josiah P. Hanna. On-policy policy gradient learning without on-policy sampling. In Midwest Machine Learning Symposium (MMLS), 2023.

MMLS 2023 **Nicholas E. Corrado**, Yuxiao Qu, John U. Balis, Adam Labiosa, & Josiah P. Hanna. Guided data augmentation for offline reinforcement learning and imitation learning. In Midwest Machine Learning Symposium (MMLS), 2023.

APS Meeting 2018 **Nicholas Corrado** & Vladimir Savinov. Search for $\Upsilon(5S) \rightarrow \gamma W_{bJ}$. American Physical Society (APS) Meeting, 2018. [\[abstract & slides\]](#)

Technical Reports

Belle Collaboration **Nicholas Corrado** & Vladimir Savinov. Search for $\Upsilon(5S) \rightarrow \gamma W_{bJ}$. Belle Collaboration. Belle Note 1522, 2019. [\[paper\]](#)

Honors & Awards

- 2023 **Sandia Employee Recognition Award.** Awarded to < 10% of the Sandia workforce
- 2019 **UW-Madison CS Department Scholarship (\$3000).** Awarded to top graduate applicants.
John O. Blumberg Memorial Scholarship (\$1000). Awarded to the top math major.
Pennsylvania Space Grant Consortium Scholarship (third time, \$1500). Research funding.
- 2018 Emil Sanielevici Scholarship (\$4000). Research funding.
Pennsylvania Space Grant Consortium Scholarship (second time, \$1500). Research funding.
APS DPF Travel Award (\$200)
J&M Bigos Memorial Scholarship (\$10,000). Awarded for academic excellence.
Sigma Pi Sigma Physics Honor Society
- 2017 **Peter F.M. Koehler Award (\$500).** Awarded to the top physics major.
Brackenridge Summer Research Fellowship (\$3500). Research funding.
Rebecca Dytman Scholarship (\$10,000). Awarded for academic excellence in physics and astronomy.
Pennsylvania Space Grant Consortium Scholarship (first time, \$1500). Research funding.

Advising

Nora Tseng (Undergraduate, University of Wisconsin-Madison, 2024-present)
Yuxiao Qu (Undergraduate, University of Wisconsin-Madison, 2021-2023). **Current Position: PhD @ Carnegie Mellon University.**

Talks

- 2023 On-Policy Policy Gradient Reinforcement Learning Without On-Policy Sampling (University of Edinburgh RL Reading Group)

Teaching Experience

- Fall 2023 Completed Research Mentor Program (University of Wisconsin – Madison, Delta Program)
- Fall 2021 Teaching Assistant for *Mathematical Foundations of Machine Learning* (University of Wisconsin – Madison, CS 761)
- Fall 2021 Head Teaching Assistant for *Intro to Computer Systems* (University of Wisconsin – Madison, CS 354)

- Spring 2021 Teaching Assistant for *Problem Solving for Engineers*
(University of Wisconsin – Madison, CS 310)
- Fall 2020 Teaching Assistant for *Discrete Mathematics*
(University of Wisconsin – Madison, CS 240)
- Fall 2018 Teaching Assistant for *Quantum Mechanics*
(University of Pittsburgh, PHYS 1370)

Service

- Academic Service Graduate Student Mentor, Wisconsin Science and Computing Emerging Research Stars (WISCERS) (2024)
- Workshops Sandia Machine Learning and Deep Learning (MLDL) Workshop. Designed and organized a reinforcement learning competition (2022).
- Reviewing Senior Reviewer, RLC (Reinforcement Learning Conference) 2024
Reviewer, ICML (International Conference on Machine Learning) 2024
Reviewer, ICLR 2024
Reviewer, AAAI 2024
Reviewer, ICRA 2024
Reviewer, NeurIPS 2023

Technical Skills

- Languages Python, C++, C, familiar with Matlab, Java, Verilog
- Other PyTorch, Apache Arrow, ROOT