DANIEL RITTER

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EDUCATION

PhD in Computer Science, Cornell University — September 2024 - Present
MSc in Advanced Computer Science, The University of Oxford — November 2022
BA in Computer Science, BA in Political Science, Brown University — May 2021
Cumulative GPA: 4.0 | Honors: Magna Cum Laude, Phi Beta Kappa

WORK EXPERIENCE

Research Assistant/Software Engineer
Harvard Medical School, Debbie Marks Lab | Boston, MA — September 2022 - July 2024

- Developed hybrid approach to modeling protein fitness combining protein-family specific models with unsupervised large language models
- Created a large scale benchmark for evaluating protein fitness models
- Applied protein fitness models to predict likelihood of COVID19 viral escape
- Collaborated with Boston Department of Veteran's Affairs on applying sequence models to medical record data for cancer risk prediction

Teaching Assistant
Brown University | Providence, RI — September 2019 - May 2021

- Assisted in developing and grading course material, slides, and assignments
- Conducted weekly TA hours and labs to support student learning
- Managed undergraduate TA staff as a head teaching assistant

Machine Learning Fellow
Kern Systems | Boston, MA — June 2020 - August 2020

- Worked on machine learning compression systems for use in a DNA storage pipeline

Image Analysis Intern
Perspectum Diagnostics | San Francisco, CA / Oxford, UK — June 2019 - August 2019

- Applied deep learning methods to problems in digital pathology
- Improved nuclei detection in biopsy slides significantly with novel CNN methods

RESEARCH EXPERIENCE

Master's Dissertation
Oxford University — October 2021 - October 2022

- Evaluated effectiveness and validity of various interpretability methods for large language models
- Supervised by Yarin Gal and collaborated with Been Kim

Honors Thesis
Brown University — September 2020 - May 2021

- Advised by Michael Littman and collaborated with Mark Ho
- Proposed method for scaling up multi-agent planning through planning in simplified sub-games

DeepLTLf Project
Brown University — September 2019 - May 2021

- Developed specialized neural architecture for learning linear temporal logic formulae

PUBLICATIONS

1. Ritter, D., et al. (2023). ProteinGym: Large-Scale Benchmarks for Protein Fitness Prediction and Design. *NeurIPS 2023*.
2. Thadani, N., et al. (2023). Learning from Prepandemic Data to Forecast Viral Escape. *Nature*.
3. Notin, P., et al. (2022). TranceptEVE: Combining Family-specific and Family-agnostic Models of Protein Sequences for Improved Fitness Prediction. *NeurIPS Workshop*.
4. Ritter, D., et al. (2022). Assessing the Interpretability of Large Language Models. *University of Oxford MsC Thesis*.
5. Ritter, D., et al. (2021). Multiagent Planning via Partial Coordination in Markov Games. *Brown University Honor's Thesis*.
6. Walke, H., et al. (2021). Learning Finite Linear Temporal Logic Specifications with a Specialized Neural Operator. *ArXiv preprint*.

SKILLS

Machine Learning | Deep Learning | Python | PyTorch | Research | Natural Language Processing | Computational Biology | TensorFlow | Data Analysis | Statistical Modeling | Scientific Writing | Experiment Design | Version Control (Git) | Linux/Unix