

Daniel Packer

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Profile

Daniel is an Applied Mathematics PhD candidate at the Ohio State University specializing in Data Science and Machine Learning. His work interweaves mathematical theorems, abstract problem solving, and real-world application. He solves practical data science and machine learning problems using bespoke, rigorous, and principled approaches.

Skills

- Programming languages: **Python** (advanced), **R** (advanced), Lean (intermediate), React/NodeJS/Flask (intermediate), MATLAB (intermediate), LaTeX, Scala (beginner).
- Python libraries: NumPy, SciPy, **JAX**, **TensorFlow/Keras**, **PyTorch**, scikit-learn, pandas, pymc.
- Clear quantitative communication, translates concisely in and out of technical language.
- Builds rapport and collaborative spirit easily. Delegates quickly when necessary.

Experience

Graduate Intern - Model Risk Management January 2023 - Present
Nationwide Online

- Analyzed model risks for key business applications on the order of hundreds of millions of dollars.
- Developed company guidelines for machine learning model development.
- Worked on small teams to develop company-wide literature on AI financial/reputational/model risks.

Graduate Summer Intern - Explainable AI June 2022 - August 2022
MinedXAI Hybrid

- Worked closely on a small team to develop a model to identify various heart conditions from EKG readings.
- Built an explainable architecture that justifies predictions in human readable terms
- Used cutting-edge symmetry-based machine learning research alongside topological data analysis methods.

Algorithms for Threat Detection 2021 May 2021 - October 2021
Pennsylvania State Applied Research Laboratory Online

- Won first place in the final competition with an F1 score of 0.76 versus second place score of 0.69.
- Built a Python code base to detect anomalies in sparsely observed traffic data (only 1% of observations seen).
- Optimized classification methods: logistic regression, random forests, DFTs, and more for our

Data Science Bootcamp 2020 May 2020 - June 2020
The Erdős Institute Columbus, OH

- Developed machine learning paradigm for analyzing chess playstyles.
- Implemented hard-coded features and neural network layers, using libraries such as tensorflow and scikit-learn.

Publications/Preprints

Gromov-Wasserstein distance between spheres [1] 2023
Max Filtering with Reflection Groups [2] 2023
Group Invariant Max Filtering [3] 2022
Pencils is NP-Complete [4] 2018

Awards and Honors

Goss Prize Awarded January 2023
Ohio State Mathematics Department
First Year Graduate Teaching Award Awarded September 2021
Ohio State Mathematics Department
Division of Science, Mathematics, and Computation Award Awarded May 2018
Bard College at Simon's Rock

Education

Ph.D. in Applied Mathematics August 2019 - Present
Ohio State University
B.A. in Mathematics with Physics Minor September 2014 - May 2018
Bard College at Simon's Rock Summa Cum Laude with High Honors Thesis