Eli Brignac

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Education

M.S. Data Science, University of Delaware – GPA 3.5/4 Aug. 2024 - May. 2025

– Selected Coursework: Statistical Learning, Advanced Machine Learning, Machine Learning, AI, Data Mining, Databases, Optimization, Applied Multivariate Statistics, Advanced Regression, Regression, Financial Markets

B.S. Computer Science, University of Delaware – GPA: 3.8/4 – Honors College Aug. 2021 - May. 2024

– Selected Coursework: Parallel Computing, Algorithms, Data Structures, Probability Theory, Linear Algebra, Numerical Analysis, Mathematical Statistics, Multi-variable Calculus, Discrete Mathematics

Experience

Data Science Intern, Frederick National Laboratory – Remote Aug. 2024 - May. 2025

– Collaborated on GGMD – *Generalized Generative Molecular Design: A Modular Tool for De Novo Drug Design* using evolutionary algorithms to generate molecules for drug discovery.

– Wrote 12,000+ lines of Python and PyTorch code for GGMD's core framework, visualization suite, and performance analysis.

– Improved model convergence speed by 20% by creating a new mutation module.

– Reduced user analysis time by an estimated 90% by building a scalable visualization suite for GGMD with Pandas and Matplotlib, enabling efficient result interpretation and top molecule assessment.

– Evaluated model performance, analyzing a dataset of over 300GB of model output to establish robust best practices for model use and and to improve molecular generation ability.

– Presented work at Supercomputing Conference 2024 (SC24), Computational Approaches for Cancer Workshop (CAFCW24).

AI Researcher (Graduate), University of Delaware – Newark, DE May. 2024 - May. 2025

– Investigating if the output of popular LLM's accurately reflects the real world and/or are biased across groups based on implicit and explicit identifiers of gender, race, and age. Measuring Categorical word frequencies of document-sized LLM output, using binomial tests to calculate the significance of results (Paper under peer review).

Data Science Intern, Electric Power Research Institute (EPRI) – Remote May. 2024 - Aug. 2024

– Used hierarchical clustering, K-means, and LLMs to cluster 700+ hydrogen-specific skills into 26 categories. Presented skill mappings and workforce recommendations to Delaware state senators using Tableau.

– Built a PostgreSQL database on AWS to query and visualize the data of over 20 hydrogen workforce reports

Machine Learning Research Assistant, University of Delaware – Newark, DE Dec. 2022 - May. 2024

– Built a retrieval-augmented generation pipeline using LangChain to extract Alzheimer's related text from academic sources, aiming to surpass general-purpose LLMs in Alzheimer's expertise. Funded by a $100,000 AWS Health Equity Initiative grant.

– Implemented 2D skeleton extraction and optical flow for pose estimation in 1,315 video segments, contributing to a privacy-preserving autism therapy dataset. Published *MMASD: Multimodal Dataset for Autism Intervention Analysis* (*ACM-ICMI'23*)—14 citations, 421 downloads and counting.

Data Science Intern, Labware – Wilmington, DE June. 2023 - Aug. 2023

– Developed PyTorch code to fine-tune a 1.5B-parameter LLM and implement retrieval-augmented generation using LangChain for a company-specific debugging assistant, using internal software documentation as the knowledge base.

– Achieved 78% accuracy and 92% precision by fine-tuning a BERT model to classify support tickets as developer issues.

Honors

– **1st Place –** University of Delaware Data Science Visualization Competition – Python 2025
– **Top 12% –** Kaggle competition playground series April 2025 (3,310 total teams) – Python 2025
– **Emerging Leaders Panelist –** ACM/IEEE Supercomputing Conference 2024 (SC24) 2024
– **1st Place –** University of Delaware Data Science Visualization Competition – Python 2024
– **1st Place –** University of Delaware HenHacks Hackathon – Best Use of AI in Education – Python 2024
– **Kevin Miner Scholarship –** Recognition from UD for leadership and service benefiting people with disabilities 2023

Skills

– **Languages / Tools:** Python, SQL, R, C++, Pandas, Scikit Learn, Numpy, PyTorch, Matplotlib, Tableau, LangChain, Git
– **Certifications:** Google Data Analytics Professional Certificate – Jan 2024 – (8 course series on Coursera)