Steven Haworth

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EXPERIENCE

UNDERGRADUATE RESEARCH | Assistant

May 2024 - Present | Madison, WI

- Used EEG-data to create Bayesian Networks of brain connectivity, modeling graph measures of the BNs resulted in ROC's of up to 0.88
- Performed topological data analysis on matrices derived from neural time series to compute temporal features with predictive power
- Performed time-to-event analysis on EEG data, optimizing a 72-hour prediction window to identify predictors of seizure recurrence

MULTI-INSTITUTIONAL EEG FORECASTING | Researcher

Sep 2024 – Present | Partially Remote

- Collaborated with Beth Israel Deaconess and UW–Madison to forecast epileptiform activity using large-scale EEG data
- Queried and joined >30 TB of neural time series and metadata on AWS S3 with Excel-based subject logs using Apache Spark
- Tuned & optimized a deep temporal embedding model in PyTorch to compress high-dimensional EEG time series into vector space
- Applied UMAP on learned embeddings to generate low-dimensional features for seizure risk classification up to 11 hours ahead
- Engaged in biweekly cross-institutional code reviews and research presentations to improve model quality and interpretability

UW–MADISON STATISTICS DEPARTMENT | Course Helper

Jan 2024 – Present | Madison, WI

- Collaborated with faculty to develop an instructional R package for first-year statistical programming students
- Designed an interactive interface for students to upload data and visualize a plethora of regression techniques from their curriculum
- Implemented methods including Tukey's biweight and quantile regression to illustrate robustness under heteroskedasticity
- Optimized the package for clarity and reproducibility in classroom settings; tested cross-platform compatibility (Windows, Mac, Linux)

PROJECTS

FINANCIAL MARKET SIMULATION | Independent Research

January 2025 – April 2025 | UW–Madison

- Built a generative framework combining a denoising diffusion probabilistic model (DDPM) with a dynamic Bayesian network (DBN) to simulate realistic S&P 500 return trajectories
- Calibrated volatility via a cosine noise schedule and HMM-based sequence penalty; restored distributional realism with a Gaussian variance bump to match real market deviation
- Evaluated realism using a custom Turing test pipeline; reduced AUC scores to 0.66–0.75 and outperformed GARCH and TimeGAN in stylized-fact metrics

DOTDATA HACKATHON | Geospatial Risk Modeling

March 2022 | Madison, WI

- Applied unsupervised learning to geospatial data from Chicago to identify high-risk zones using multi-dimensional clustering
- Built a driver alert system that discretely notifies users when entering predicted risk zones to enhance road safety

EDUCATION

UNIVERSITY OF WI-MADISON

B.A. Data Science
May 2025 | Madison, WI
M.S. Data Science
May 2027 | Madison, WI
Dean's List Spring 2024

SKILLS

PROGRAMMING

2.5+ years:
Python • R
2+ years:
SQL • MATLAB
0.5+ years:
C • C++ • Julia

TECHNOLOGY & TOOLS

Data & ML: Python, R, SQL, CQL, Pandas, NumPy, SK-Learn, TensorFlow, PyTorch
Distributed Systems: Spark, Apache Kafka, AWS, Docker
Visualization: Tableau, Matplotlib, Seaborn, Google Data Studio
DevOps & Workflow: Git, GitHub, GitLab, Jupyter, VS Code

KEY COURSES

Big Data Systems
Machine Learning
Database Design
Artificial Intelligence

CERTIFICATES

Google Data Analytics
Supervised Learning Algorithms
Udemy Python Bootcamp: Zero-to-Hero
Udemy SQL Bootcamp: Zero-to-Hero

LINKS

Github:// **sehaworth**
LinkedIn:// **sehaworth02**
Email:// **sehaworth**

SOCIETIES

Undergraduate Data Science club (.Data)
Wisconsin AI Safety-Initiative (WAISI)
Wisconsin Student-Union (MemU)
Student Leadership Council