William McGloin

wtmcgloin@gmail.com wmcgloin.com LinkedIn

Education

Georgetown University, Washington, D.C.
M.S. in Data Science and Analytics (DSAN), GPA: 4.0 Aug. 2023 – May 2025

- Focus Areas: Deep Learning, Survival Analysis, Reinforcement Learning, NLP, Generative AI

Villanova University, Villanova, PA
B.B.A. magna cum laude, Economics & Business Analytics, GPA: 3.78 Aug. 2017 – May 2021

- Minor: Political Science Concentration: Politics, Philosophy, and Economics (PPE)
- Study Abroad: University of Cambridge (PPE); Instep–Wake Forest University

Research Interests

My research focuses on modeling complex, uncertain systems for high-stakes decision-making. I am particularly interested in (1) deep survival modeling and rare event prediction; (2) sequential decision-making under partial observability; (3) uncertainty-aware and interpretable machine learning; and (4) AI systems that structure and reason over complex data (e.g., LLM-based architectures).

Publications & Manuscripts

Ziogas, I., McGloin, W., et al. *FrailNet: A Deep Learning Approach to Predicting Conflict*. Manuscript in preparation; target submission to *Nature Computational Science* (2026).

Research Experience

Graduate Researcher, Massive Data Institute May 2024 – Sept. 2025 (research ongoing)
Advisor: Ioannis Ziogas

- Developed *FrailNet*, a novel deep learning framework for rare event prediction that integrates Cox proportional hazards modeling with LSTM layers, entity-specific frailty terms, and autoencoder-based reconstruction to handle complex missingness patterns in longitudinal data.
- Designed custom loss functions balancing survival likelihood maximization with input reconstruction accuracy; engineered temporal feature representations for dyadic relationships in conflict data spanning 200+ years.
- Applied FrailNet to predict interstate conflict onset using Correlates of War data; achieved strong performance with C-index values of 0.88–0.96 across conflict types, demonstrating consistent 15–20% improvements over traditional Cox models and four deep learning baselines (DeepSurv, DeepHit, LSTM-based models).
- Framed model outputs for decision-making under uncertainty, translating hazard estimates into interpretable risk signals.

- Conducted extensive model validation including ablation studies isolating contributions of individual components, robustness checks on synthetic datasets, and temporal cross-validation to assess generalization.

Research Collaborator, Autonomous Lunar Systems Project, Georgetown University Sept. 2024 – May 2025
Collaborators: Dr. James Hickman (Georgetown), Dr. Prabal Saxena (NASA Goddard)

- Developing reinforcement learning agents for autonomous lunar rover navigation and resource detection in collaboration with Georgetown faculty and NASA-affiliated researchers.
- Implementing policy gradient and actor-critic methods to address challenges of partial observability, sparse rewards, and safety constraints in hazard avoidance and route planning tasks.
- Designing custom simulation environments and reward structures to balance exploration efficiency with risk mitigation in uncertain lunar terrain.

Research Project: LLM-Based Code Analysis Systems Jan. 2025 – May 2025

- Designed an agent-based code analysis system using LangGraph, integrating retrieval-augmented generation and graph-based representations (Neo4j) to extract and query semantic relationships across large codebases.
- Developed modular pipelines for parsing, embedding, and linking code elements, improving interpretability and navigation of complex repositories.

Presentations & Conferences

- *Moon Rover Automation via Reinforcement Learning*, StatConnect 2025, George Mason University
- *FrailNet: Deep Learning for Survival Analysis*, Massive Data Institute Research Showcase, Georgetown
- *Code Analysis Agent for Large Codebases*, invited presentation to Amazon Web Services (AWS)

Selected Projects

COVID-19 Economic Relief Analysis – Finalist, Adam Smith Student Research Competition (2021)

- Analyzed determinants of Paycheck Protection Program loan distribution using regression models; identified firm-level and regional factors influencing relief allocation efficiency.

Houston Astros Sign-Stealing Analysis

- Analyzed audio recordings to detect trash can bangs used for sign stealing. Modeled the impact on team success by estimating run contributions and win probability changes by player.

Teaching Experience

Teaching Assistant, Georgetown University Jan. 2024 – Dec. 2024

- Assisted instruction for Computer Vision, Geographic Information Systems, and Data Science & Climate Change, supporting 100+ graduate students across three courses.

- Led recitation sections and tutorials on convolutional neural networks, explainable AI methods, policy gradient algorithms, and geospatial data analysis.
- Held weekly office hours and mentored students on course projects involving deep learning implementations and statistical modeling.

Entrepreneurship & Applied Experience

Co-Founder, Top Shelf Designs, LLC June 2020 – Present

- Co-founded a startup designing and manufacturing custom dorm shelving products; managed operations and product development.
- Introduced demand forecasting models and inventory tracking systems, reducing production time by 50% and cost of goods sold by 25%.

Service & Outreach

Student Ambassador, Georgetown University Sept. 2023 – Sept. 2024

- Supported graduate admissions outreach, open houses, and recruitment events for prospective DSAN students.

Admissions Assistant, Villanova University 2019 – 2021

- Assisted admissions staff with prospective student engagement and campus events.

Honors, Awards & Scholarships

- Exceptional Master's Student Award, Georgetown University (2025)
- Top Returning Student Scholarship, DSAN Program, Georgetown University
- Ambassador Charles A. Heimbold Jr. Endowed Scholarship, Villanova University
- Villanova Student Entrepreneurship Competition, Finalist (2021)
- Adam Smith Student Research Competition, Finalist (2021)
- Villanova Innovation, Creativity, and Entrepreneurship Institute Award (2021)
- Omicron Delta Epsilon, International Economics Honor Society

Technical Skills

Programming: Python, R, SQL, Bash, LaTeX, STATA
Statistical & ML: PyTorch, TensorFlow, scikit-learn, RLlib, Gymnasium, LangChain
Data Systems: PostgreSQL, PySpark, Docker, AWS
Visualization & Frontend: Matplotlib, ggplot2, Plotly, React, Next.js, Quarto