Matt McManus

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Citizenship: U.S Citizen | **Location:** New York, NY

SUMMARY

ML Engineer leading AI/ML initiatives at Bridgewater Associates. Expert in LLMs, RL, and quantitative finance. Develops proprietary AI models for systematic investing and scalable infrastructure. Deploys ML systems managing $150B+ AUM.

EDUCATION

Massachusetts Institute of Technology   Cambridge, MA
Master of Engineering in Computer Science, GPA: 5.0/5.0   *Aug. 2023 - Jun. 2024*
- Thesis: Navigation drift reduction using Scientific ML; Research: LLM macro forecasting, RL for LLMs

Bachelor of Science in Mathematics & Computer Science   *Sep. 2019 - Feb. 2024*
- Activities: MIT Varsity Squash, Phi Kappa Theta, MIT Pokerbots President, MIT Bitcoin Club, HKN Tutor

EXPERIENCE

Bridgewater Associates   New York, NY
ML Engineer / Research Scientist - AIA Labs   *Sept. 2024 - Present*
- Lead development of proprietary AI models for macro-investing using **LLMs** and **RL** to generate alpha
- Built "no-peek" data-windowing pipeline keyed to news_end_date, speeding thematic analysis **4x**
- Developing transformer now-casting models blending alt-data with market signals; cut GDP-RMSE **15%**
- Build quantitative research infrastructure for **factor discovery** and **regime detection**, processing petabytes of data for **$150B+ AUM**
- Collaborate with Daniel Kang to benchmark internal temporal search system for systematic investing

Investment Engineer Intern   *Jun. 2023 - Aug. 2023*
- Developed quantitative models for systematic investment strategies using **Python/Julia**, improving Sharpe ratio by **15%** and reducing drawdown by **20%**
- Research on alternative data and **NLP** sentiment analysis, generating **3** alpha signals with IR > 0.8
- Built portfolio optimization algorithms and backtesting frameworks for multi-asset strategies

Two Sigma   New York, NY
Quantitative Research (Part-time)   *Jan. 2023 - Jun. 2024*
- Conducted fast-cycle experiments on **factor discovery** and **regime detection** for systematic trading
- Developed ML models for alternative data analysis and signal generation, improving alpha decay by **30%**
- Researched high-frequency market microstructure patterns for alpha generation

MIT Julia Lab   Cambridge, MA
Research Assistant   *Sep. 2022 - May 2024*
- Developed physics-informed **neural-ODE** framework reducing navigation drift by **60%** in GPS-denied environments
- Collaborated with aerospace industry partners on real-world deployment and validation

Delphi Digital   New York, NY
Quantitative Analyst   *May 2022 - Aug. 2022*
- Created risk framework for new DeFi protocol, analyzing statistical and **ML techniques** for quantitative risk assessment
- Conducted quantitative analysis of crypto markets and DeFi protocols using **Python/SQL**

PROJECTS & RESEARCH

Scientific ML for INS: Developed neural-ODE methodology reducing navigation drift by **60%** using physics-informed ML
Multi-Agent RL: Built cyber security simulator for agents learning via **reinforcement learning** and implicit communication
Deep Network Interpolation: Created novel algorithm outperforming current models for low-complexity DNN solutions
LLM Macro Forecasting: Applied LLMs to economic forecasting, achieving **25%** improvement in prediction accuracy

TECHNICAL SKILLS

Programming: Python, Julia, C++, Scala, Java, Go, SQL/Spark, JavaScript, R
ML/AI: PyTorch, TensorFlow, JAX, Hugging Face, Transformers, Reinforcement Learning, Scientific ML, XGBoost
Infrastructure: AWS, Docker, Kubernetes, Git, CI/CD, MLflow, Spark, Redis, PostgreSQL
Finance: Quantitative Research, Factor Models, Backtesting, Risk Management, Market Microstructure

LEADERSHIP & ACHIEVEMENTS

MIT Pokerbots President: Led 7-person team running AI poker competition for **250+** students, secured **$100k+** sponsorships
MIT Varsity Squash: Achieved National Team Ranking of **16th** in U.S. (2023-2024), 4-year starter
Publications: Evaluating GPT-3 Performance in Cybersecurity Scenarios - Computers & Security Journal
Honors: MIT Pokerbots 1st Place, HackMIT Award Winner, Summa Cum Laude