Matt McManus

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

SUMMARY

ML Engineer with proven experience leading AI/ML initiatives at Bridgewater Associates. Deep expertise in LLMs, reinforcement learning, and quantitative finance. Skilled at developing proprietary AI models for systematic investment strategies and scalable infrastructure. Adept at deploying 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: Inertial Navigation System Drift Reduction Using Scientific Machine Learning
- Research: LLM-Driven Macro Forecasting, RL for LLMs, Scientific ML

Massachusetts Institute of Technology — Cambridge, MA
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, leveraging **LLMs** and **RL** to generate alpha in systematic trading strategies
- 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 supporting **factor discovery** and **regime detection**, processing petabytes of alternative 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 max drawdown by **20%**
- Researched alternative data including **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**
- Built automated trading strategies and backtesting frameworks for digital assets

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, MLflow
- **Infrastructure:** AWS, Docker, Kubernetes, Git, CI/CD, Spark, Redis, PostgreSQL, Airflow
- **Finance:** Quantitative Research, Factor Models, Backtesting, Risk Management, Market Microstructure, Options Pricing

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