Malcolm Hsu

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TECHNICAL SKILLS

Programming Languages: Python (Advanced), SQL (Advanced), R (Advanced), Stata (Advanced)
AI/Machine Learning: PyTorch, TensorFlow, Hugging Face Transformers, LLM Training & Fine Tuning, RAG development, Natural Language Processing, Neural Networks
Data Analytics: Time Series Analysis (ARIMA, TAR, VAR), Regression Analysis, Spectral Analysis, Cross Validation, Markov Models, Clustering
Data Engineering/Databases: API Integration, Web Scraping, Window Functions, Triggers, Big Data Processing, Data Cleaning
Applications/Tools: Tableau (Advanced), Microsoft Excel (Advanced), GitHub
Libraries/Packages: Pandas, NumPy, SciPy, Scikit-learn, matplotlib, ggplot2

PROJECTS & RESEARCH

AI Forecaster for TSMC Equity & Tariffs

- Utilized a staggered DiD method across TSMC and global companies to understand the causal effects of historical tariff policies.
- Fine-tuned a multimodal language model trained on a tariff language corpus to study the economic implications for trading systems.

Time Series Forecasting of U.S. Firearm Patents

- Designed and cross validated TAR, VAR, and Markov models to identify innovation cycles and forecast arm development.
- Identified key macroeconomic variables that align with fluctuations in patent filing and military activity.

Predictive Framework for Run Production in the MLB

- Developed decision trees and outcome states to predict run expectancy and game outcomes based on situational data.

Player Development Predictive Modeling

- Created data pipelines using biomechanic video and ball-tracking data to personalize training and forecast athlete performance metrics.

EDUCATION

Brandeis University, School of Business and Economics — **Waltham, MA**
Candidate for Master of Science in Business Analytics (STEM-Designated) — 08/2025 - 05/2026
Concentration: Artificial Intelligence
Relevant Coursework: Generative AI, Machine Learning, Advanced Data Analytics, Advanced Quantitative Analysis in Finance, Market Research

Wesleyan University — **Middletown, CT**
Bachelor of Arts in Mathematics and in Economics — 09/2022 - 05/2025
Relevant Coursework: Applied Time Series Analysis, Advanced Econometrics, Probability, Advanced Topics in Real Analysis

WORK EXPERIENCE

Wesleyan University, Quantitative Analysis Center — **Middletown, CT**
Research Fellow — 01/2025 - Present

- Built TAR, VAR, and Markov models and implemented econometric regressions to analyze and forecast 200 years of U.S. firearm patents, identifying innovation state spaces and significant macroeconomic indicators.
- Created interactive visualizations and dashboards mapping patent trends to major historical events, improving research accessibility for both technical and non-technical audiences.
- Trained and developed a domain-specific LLM and RAG to automate data collection and increase extraction accuracy.
- Presented findings to professionals and currently contributing to various forthcoming academic publications with Wesleyan's Center for the Study of Guns & Society.
- Leveraged APIs to merge complex media datasets with global firearm patents for an upcoming Vanity Fair publication.

Brandeis University — **Waltham, MA**
Research Assistant — 06/2025 - Present

- Processed, and cleaned large baseball datasets from FanGraphs, Baseball Reference, and RetroSheet using Python and SQL.
- Developed run expectancy and scoring probability predictive models using machine learning methods to quantify the impact of in-game offensive decision making.
- Created instructional materials and presentations on Sabermetrics for academic use.
- Contributing to an academic paper accepted for MIT's Sloan Sports Analytics Conference (2026).

Kinetic Performance Institute — **Morgan Hill, CA**
Lead Data Analyst — 12/2023 - 05/2025

- Identified key performance indicators from data collection platforms to inform decision makers and support coaching decisions.
- Designed athlete performance dashboards using R/Python visualization libraries, enabling coaches to monitor real-time trends.
- Engineered ETL pipelines integrating ball-tracking and biomechanics data (Trackman, NewtForce, Edgertronic), enabling deeper insights.
- Build predictive models to recommend individualized training regimens, increasing training efficiency for athletes.

ACTIVITIES/AWARDS

Activities: Varsity Baseball Captain (Brandeis University, Wesleyan University 2022 - Present), Co-founder of Brandeis Sports Analytics Club (2025 - Present)
Awards: San Francisco Giants Ambassador All-Star Award (2022 for Outstanding Community Service)