Will Hardt

(845) 490-1445 | hardtwill@gmail.com | LinkedIn | Personal Website | Github

SUMMARY

Collaborative problem solver with a Ph.D. in mathematics (UW-Madison Aug '23). Precise communicator and quick learner of new ideas and technologies. Have experience analyzing large financial datasets, building data science tools/ML models, and communicating results to a non-technical investment team, using Looker dashboards.

SKILLS

- **Languages & Platforms:** Python, Java, SQL, BigQuery, Looker Dashboard
- **Python Libraries:** numpy, pandas, scikit-learn, matplotlib, seaborn
- **Machine Learning:** XGBoost, random forest, linear models, NLP
- **Other:** Git version control, web scraping

INDUSTRY EXPERIENCE

Two Sigma Investments: **New York, NY** (Remote)   May 2023 - October 2023
Strategic Data Science PhD Consultant
- Building data science tools to inform Private Equity investment decisions
- Enhanced an XGBoost model for forecasting consumer green energy adoption over next 10 years
    - Added macro features to model and validated model's performance
- Calculated market concentration metrics from raw data
    - Utilized web scraping, NLP, and LLMs to build market concentration databases in target industries

Jane Street Capital: New York, NY   May 2022 - August 2022
Quantitative Trading Intern
- Built and analyzed linear regression models to predict investment grade bond yields using Python and SQL
- Discovered and quantified heteroskedasticity in models of commodity markets using Python and SQL

SELECTED PROJECTS

Predicting Patient Copay at Pharmacies for CoverMyMeds [Github link]   2022
- Trained random forest model to predict patient copay at pharmacies using demographic and insurance features
- Obtained an RMSE of $15.60 compared to $40.50 in the baseline model

LEADERSHIP

Undergraduate Mentoring Program (UMP)   2022
- Advised 2 math undergraduates on applying to grad school, internships, REUs, etc.

Committee for TA Policies and Procedures (CTAPP)   2021–2022
- Represented TAs in discussions of department policy
- Reviewed and provided feedback on ~30 TAs' evaluations

Directed Reading Program (DRP)   2019-2021
- Mentored 6 undergraduate math students over 4 semesters in advanced independent study

PUBLICATIONS

- Hardt, W. *Around Smyth's Conjecture* (Ph.D. dissertation) (2023) [Link]
- Hardt, W. and Yin, J. *Linear Relations Among Galois Conjugates Over $F_q(t)$* (2022) [Link]
- Hardt, W. and Yin, J. *On an Algorithm Converging to Hyperstochastic Tensors* (2022) [Link]
- Gollakota, A., Hardt, W., and Miklós, I. *Packing Tree Degree Sequences* (2020)   [Link]
- Gaetz, M., Hardt, W., and Sridhar, S. *Support Equalities Among Ribbon Schur Functions* (2019) [Link]

TEACHING

- TA for ~50 students in Mathematical Foundations of Machine Learning (graduate course)   2023
- TA for ~500 students in Calculus I, Calculus II, Discrete Math, and Linear Algebra over 8 semesters   2018-2022
- Instructor of Record for ~20 students in Preparatory Algebra   2020

EDUCATION

University of Wisconsin - Madison, Ph.D. in Mathematics   August 2023
   Advisor: Jordan Ellenberg
   Dissertation Title: *Around Smyth's Conjecture*
Carleton College, B.A. in Mathematics, *magna cum laude*   2018
   Distinction for senior thesis on *Gröbner bases and Hilbert's Nullstellensatz*
Budapest Semesters in Mathematics   Fall 2016
   Achieved honors for receiving an A/A+ in 4+ classes