Michael Alexander Wieck-Sosa

mwiecksosa.github.io • github.com/mwiecksosa • mwiecksosa@cmu.edu

EDUCATION

Carnegie Mellon University | PhD in Statistics | Advisor: Aaditya Ramdas *May 2027*

- GPA: 3.96/4.00 | Areas: adaptive forecasting, nonstationary time series analysis, causal discovery, causal inference

University of Illinois at Urbana-Champaign | MS in Statistics *May 2022*

- GPA: 3.95/4.00 | Awards: 2-year teaching assistantship with full tuition waiver and stipend

Fordham University | BS in Mathematics with Minors in Computer Science and Economics *May 2020*

- GPA: 3.77/4.00 | Awards: *magna cum laude* | GRE: 170/170 Quantitative, 163/170 Verbal, 4.5/6.0 Writing

DOCTORAL RESEARCH

Random Features for Parameter Inference with Models of Complex Systems | Cosma Shalizi *March 2024-Present*

- Creating method for inferring parameters of models of nonstationary processes by matching random features of the data
- Proving that $2d+1$ random Fourier features of a high-dimensional process are sufficient to infer a d-dimensional parameter

Assumption-Weak Discovery of Forecasting Signals | Aaditya Ramdas | Preliminary Draft *Jan. 2023-Present*

- Developed a framework for detecting forecasting signals from high-dimensional nonstationary nonlinear time series

INDUSTRY EXPERIENCE

J.P. Morgan | Quantitative Research | Markets Summer Associate | Received Return Offer *June 2023-Aug. 2023*

- Worked with macro index traders to develop a multi-period hedging optimization method for derivatives portfolios
- Collaborated with energy derivatives traders to improve the statistical methods used in a systematic trading strategy

J.P. Morgan | Quantitative Research | Markets Summer Associate | Received Return Offer *June 2022-Aug. 2022*

- Worked with equity derivatives traders to analyze market anomalies and discover patterns in trading performance
- Developed a conditional optimization method for the parameters of a trade execution algorithm using real-time tick data

RESEARCH EXPERIENCE

MIT Lincoln Lab | Interceptor and Sensor Technology Group | Summer Research Intern *May 2021-July 2021*

- Implemented signal processing methods for tracking objects in outer space and ran simulations to evaluate different methods

University of Illinois at Urbana-Champaign | Computer Science Department | Graduate Research Assistant *Jan. 2021-May 2021*

- Discovered patterns in the cross-platform dynamics of posts on Twitter, Facebook, and Reddit using Hawkes processes

National Center for Supercomputing Applications | Great Lakes to Gulf | Graduate Research Assistant *Sept. 2020-May 2022*

- Built confidence bands for trends in concentrations and fluxes of chemicals to measure water quality changes across the US

COURSEWORK AND TEACHING

- **Statistics**: Machine Learning, Time Series, Regression Analysis, Statistical Theory, Statistical Computing
- **Computer Science:** Algorithms, Data Structures, Operating Systems, Computer Architecture, Artificial Intelligence
- **Math:** Stochastic Calculus, Measure-Theoretic Probability, Numerical Analysis, Functional Analysis, Measure Theory, Interacting Particle Systems, Abstract Algebra, Topology, Geometric Flows, Lie Groupoids and Lie Algebroids
- **Teaching:** Time Series, Advanced Data Analysis, Financial Data Science, Financial Machine Learning Project Supervision

PROGRAMMING AND SOFTWARE

- Extensive experience with Python, R, SQL, proficient in C++, q/kdb+, and extensive experience with NumPy, Pandas, Scikit-learn, PyTorch, TensorFlow, Tidyverse, Rcpp, AWS EC2, Slurm, Linux, Bloomberg Terminal, Bloomberg API

POSTER PRESENTATIONS

- *Assumption-Weak Discovery of Forecasting Signals*, 2024 NBER-NSF Time Series Conference at UPenn