

# MICHAEL ALEXANDER WIECK-SOSA

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## 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

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

- Creating method for inferring the 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 | [Paper](#) *Jan. 2023-Present*

- Developed a signal discovery framework for time series that are noisy, high-dimensional, nonstationary, and nonlinear

## 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, Tidiverse, 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