Michael Wieck-Sosa

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EDUCATION

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

- GPA: 3.96/4.00 | Thesis topic: theory and methods for nonstationary nonlinear time series data

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

COURSEWORK

- **Statistics**: Statistical Machine Learning, Advanced Statistical Theory, Advanced Time Series Analysis, Regression Analysis
- **Computer Science**: Algorithms, Data Structures, Theory of Computation, Operating Systems, Computer Architecture, Artificial Intelligence, Machine Learning, Data Mining for Listening to the Social Universe, Numerical Linear Algebra
- **Math**: Stochastic Calculus, Measure-Theoretic Probability, Numerical Analysis, Functional Analysis, Measure Theory, Interacting Particle Systems, Geometric Flows, Lie Groupoids and Algebroids, Abstract Algebra, Topology, Real Analysis

PROGRAMMING LANGUAGES AND SOFTWARE

- Expert in Python: NumPy, pandas, scikit-learn, statsmodels, PyTorch, and TensorFlow
- Expert in R: dplyr, Rcpp, xts, zoo, caret, mgcv, glmnet, parallel, and ggplot2
- Proficient in C++: My undergraduate courses in Algorithms and Data Structures used C++
- Extensive experience with SQL, q/kdb+, Git, and Bash

DOCTORAL RESEARCH

Deep Learning for Nonstationary Nonlinear Time Series | Wei Biao Wu *2025+*

- Developing theory for estimating time-varying regression functions of nonstationary time series using deep neural networks

Simulation-Based Inference for Large-Scale Models of Complex Temporal Systems | Cosma Shalizi *2024+*

- Creating a method for inferring the parameters of analytically intractable models of nonstationary nonlinear time series

Identifying Relevant Forecasting Signals in Unstable Environments | Michel Haddad and Aaditya Ramdas *2024+*

- Developing a framework for detecting new forecasting signals that can be used with nonstationary nonlinear time series

Conditional Independence Testing for Nonstationary Nonlinear Time Series | Michel Haddad and Aaditya Ramdas *2023+*

- Creating a conditional independence test based on time-varying regression that is robust to nonstationarity and dependence

RESEARCH ASSISTANTSHIPS

Carnegie Mellon University | Simulation-Based Inference through Random Features | PI: Cosma Shalizi *Summers 2024+2025*

- Developing theory, methods, and software (Python and R) for estimating and inferring the parameters of simulation models
- Using optimization algorithms from PyTorch to optimize highly non-convex objective functions

National Center for Supercomputing Applications | Great Lakes to Gulf | Supervisor: Jong Lee *Sept. 2020-May 2022*

- Built confidence bands for trends in concentrations and fluxes of chemicals to measure changes in water quality over time
- Provided ggplot visualizations of these trends at 1000+ locations across the U.S. to enable data-driven decision-making

RESEARCH INTERNSHIPS

MIT Lincoln Lab | Defense Technology Division | Interceptor and Sensor Technology Group *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 | FORWARD Data Lab | Computer Science Department *Jan. 2021-May 2021*

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

INDUSTRY INTERNSHIPS

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

- Worked with macro traders and quants on a method for hedging derivatives portfolios via multi-period optimization
- Collaborated with energy derivatives traders on improving the statistical methods used in a systematic trading strategy

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

- Developed a method for adaptively selecting the parameters of a trade execution algorithm based on real-time market data

TEACHING ASSISTANTSHIPS

- For the MS in Computational Finance program: Simulation Methods for Option Pricing, Financial Time Series Analysis, Financial Data Science I and II, and the Machine Learning Capstone Project
- For the MS in Data Science program: Time Series Analysis
- For the BS in Statistics / StatML programs: Advanced Data Analysis

POSTERS AND TALKS

- 2025: Gave a talk about variable selection for large-scale forecasting for nonstationary time series to researchers at Amazon
- 2025: Presented on conditional independence testing at the Virtual Time Series Seminar's Workshop for Junior Researchers
- 2024: Poster about conditional independence testing at the NBER-NSF Time Series Conference at UPenn
- 2024: Gave a talk about nonstationary nonlinear time series theory, nonparametric estimation of time-varying regression functions, and conditional independence testing to the Statistics and Machine Learning Group at Carnegie Mellon University

PROFESSIONAL SERVICE

- 2024+: Chair of Statistics PhD student committee in charge of organizing events related to careers in industry and academia