MICHAEL WIECK-SOSA

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EDUCATION

Carnegie Mellon University | PhD in Statistics | Advisors: [Aaditya Ramdas](#)   *May 2027*
- GPA: 3.98/4.00 | Thesis topics: estimation of time series models, testing for structure, and prediction with transformers

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

PROGRAMMING LANGUAGES AND SOFTWARE

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

COURSEWORK

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

DOCTORAL RESEARCH

Deep Learning for Nonstationary Nonlinear Time Series | Wei Biao Wu
- Developing theory for estimating regression functions of nonstationary time series using deep neural networks

Goodness-of-Fit Testing and Simulation-Based Inference through Random Features | Cosma Shalizi
- Building a framework for testing whether the law of a process is in a model class and getting confidence sets for parameters

Simulation-Based Estimation of Dynamic Models by Matching Random Features | Cosma Shalizi
- Creating a likelihood-free method for estimating the parameters of complicated models for time series

Identifying Relevant Forecasting Signals in Unstable Environments | Michel Haddad and Aaditya Ramdas
- Developing a method for selecting variables for forecasting with nonstationary nonlinear time series

Conditional Independence Testing for Nonstationary Nonlinear Time Series | Michel Haddad and Aaditya Ramdas
- Creating a conditional independence test based on regression that is robust to nonstationarity and temporal dependence

GRADUATE RESEARCH ASSISTANTSHIPS

Carnegie Mellon University | Simulation-Based Inference | [NSF Grant](#) | PI: Cosma Shalizi   *June 2024-May 2026*
- Developing theory, methods, and software in Python and R for estimating and inferring the parameters of dynamic models
- Using optimization algorithms to optimize highly non-convex objective functions to fit complicated models for time series
- Applied methods to time series models, state-space models, SDEs, ODEs, and dynamical systems with observational noise

University of Illinois at Urbana-Champaign | FORWARD Data Lab | Computer Science Department *Jan. 2021-May 2021*
- Discovered patterns in cross-platform dynamics on Twitter, Facebook, and Reddit with Hawkes processes using Python

National Center for Supercomputing Applications | Great Lakes to Gulf Project | 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
- Used parallel computing to construct these confidence bands for 1000+ locations in the U.S. and made visualizations using R

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 hedging method for derivatives portfolios via multi-period optimization
- Collaborated with energy derivatives traders on improving the statistical techniques used in a new trading strategy

J.P. Morgan | Quantitative Research | Markets Summer Associate | Received Return Offer *June 2022-Aug. 2022*
- Developed method for adaptively selecting parameters of trade execution algorithms based on real-time data
- Built pipeline for processing market microstructure data using q/kdb+ and making predictions using scikit-learn in Python
- Applied Bayesian optimization to efficiently tune the hyperparameters of machine learning models for regression, classification, and quantile regression, by using a walk-forward cross-validation method for time series
- Designed walk-forward and Monte Carlo backtesting frameworks to test the validity of my method

RESEARCH INTERNSHIPS

MIT Lincoln Lab | Sensor Technology Group *May 2021-July 2021*
- Implemented optical tracking methods in MATLAB to track objects in space and ran simulations to compare approaches

Corteva Agriscience | R&D Division *June 2020-Aug. 2020*
- Applied spatiotemporal Gaussian mixture models, dimensionality reduction, and clustering techniques using Python to analyze environmental changes based on time series of 50+ weather and soil features from 1,000+ sensor sites across the U.S.
- Built an interactive Dash application to visualize changes in environments over space and time

Fordham University | Robotics and Computer Vision Lab | Computer Science Department *Aug. 2019-March 2020*
- Created a real-time tracking system in Python using deep learning-based object detection in collaboration with zoologists

TEACHING ASSISTANTSHIPS

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

POSTERS AND TALKS

- 2025: In-person talk about simulation-based inference by matching random features at the Statistical Methods for the Physical Sciences (STAMPS) Research Center's local meeting at Carnegie Mellon University
- 2025: Poster on simulation-based inference by matching random features at the Statistical Methods for the Physical Sciences (STAMPS) Research Center's Workshop on Neural Simulation-Based Inference at Carnegie Mellon University
- 2025: Online talk about variable selection for large-scale forecasting for nonstationary time series to researchers at Amazon
- 2025: Online talk on conditional independence testing at the Virtual Time Series Seminar's Workshop for Junior Researchers
- 2024: Poster on conditional independence testing at the NBER-NSF Time Series Conference at University of Pennsylvania
- 2024: In-person 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

- 2024-2025: Chair of Statistics PhD student committee focused on research career events in industry and academia