MICHAEL WIECK-SOSA

MWIECKSOSA.GITHUB.IO • GITHUB.COM/MWIECKSOSA • MWIECKSOSA@CMU.EDU

EDUCATION

Carnegie Mellon University | PhD in Statistics | Advisors: [Aaditya Ramdas](#) and [Cosma Shalizi](#) *May 2027*
- GPA: 3.98/4.00 | Thesis topic: theory and methods for high-dimensional time series

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**: Advanced Statistical Theory, Advanced Time Series Analysis, Mathematical Statistics, Intermediate Statistics, 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 and Lie Algebroids, Topology, Abstract Algebra, Numerical Analysis, Numerical Linear Algebra, Real Analysis, Linear Algebra, Mathematical Modeling

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

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 Nonstationary Models by Matching Random Features | Cosma Shalizi *2024+*
- Creating a method for estimating and inferring the parameters of nonstationary models with intractable likelihoods

Identifying Relevant Forecasting Signals in Unstable Environments | Michel Haddad and Aaditya Ramdas *2024+*
- 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 *2023-2025*
- Created a conditional independence test based on time-varying regression that is robust to nonstationarity and dependence

GRADUATE RESEARCH ASSISTANTSHIPS

Carnegie Mellon University | Simulation-Based Inference through Random Features | PI: Cosma Shalizi *2024+*
- 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
- Applied to stochastic differential equations and deterministic dynamical systems with complicated 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

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 environment types 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

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 methods used in a trading strategy using Python

J.P. Morgan | Quantitative Research | Markets Summer Associate | Received Return Offer *June 2022-Aug. 2022*
- Developed method for selecting parameters of trade execution algorithms based on real-time data using q/kdb+ and Python

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