

Marc Kjerland, PhD

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(pronounced "chair"land)

Skills

- Machine learning & deep learning
- Numerical & statistical modeling
- High-performance computing
- Nonlinear dynamics and chaos
- Algorithm development
- Data-driven insights

Experience

- 2022 – Present **KeyBank**, *Sr Quantitative Associate*, Model Risk.
- Validating machine learning models especially for fraud detection
 - Evaluating conceptual soundness and model performance
- 2019 – 2022 **Bank of America**, *VP (Senior Data Scientist)*, Global Markets.
- Developed machine learning framework for market forecasting and reporting
 - Built reinforcement learning model for hedging application using custom Keras neural network and compute layers
 - Developed interpretable multi-label classifier to reduce human workload in securities compliance
 - Created automation library for model documentation integrating API calls and LaTeX templates
 - Derived evolving PCA methodology for robust covariance matrix estimation from noisy market data
- 2018 – 2019 **Verisk Analytics**, *Data Scientist*, Insurance Analytics.
- Headed a personal lines modeling project with six data scientists, from data processing to model iteration to detailed documentation
 - Built countrywide and state-specific models with data-driven recommendations for product owners
 - Delivered rigorous technical presentations to stakeholders with model improvement of 40–80%
- 2017, **University of Illinois at Chicago**, *Postdoctoral Fellow*, Institute for Environmental Science and Policy.
- Developed novel non-parametric performance metrics for urban sustainability
 - Published results and methodology using linear optimization and time series analysis
- 2015 – 2017 **Kyoto University**, *Postdoctoral Researcher*, Disaster Prevention Research Inst.
- Developed open-source module for large multiscale storm surge simulations using complex meteorological data
 - Quantified hazard impacts of changing typhoon distributions in Pacific Ocean using Monte Carlo simulation

Education

- 2015 **PhD, Applied Mathematics**, *University of Illinois at Chicago*.
Thesis: Linear response closure approximations for multiscale systems

2005 **B.S., Mathematics**, *University of Minnesota, Twin Cities*.

Technical skills

Computing languages: Python, SAS, C/C++, Fortran, Javascript, SQL

Natural languages: English, French, German, Japanese

Other: Excel, L^AT_EX, Bash, Git, QGIS, JSON

Research Papers

- 2023 **(In progress)**, *Storm surge modeling and impact analysis for historical storms in the Caribbean*.
- 2019 **Journal of Cleaner Production**, *Sustainability Assessment of Universities as Small-Scale Urban Systems: A Comparative Analysis Using Fisher Information and Data Envelopment Analysis*. Vol 212.
- 2017 **Proceedings of Coastal Dynamics 2017**, *Estimating climate change impacts on storm surge using adaptive mesh refinement*.
- 2016 **Hydrological Research Letters**, *Impact assessment of climate change on coastal hazards in Japan*. Vol 10.
- 2016 **Communications in Mathematical Sciences**, *The response of reduced models of multiscale dynamics to small external perturbations*. Vol 14, No 3.