

# Marc Kjerland, PhD

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(pronounced "chair"land)

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## Skills

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

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## Experience

- 2019 – Present **Bank of America, VP (Senior Data Scientist)**, Global Technology & Ops.
- Developing statistical and machine learning models for market forecasting
  - Built reinforcement learning model for market risk application using custom Keras neural network and compute layers
  - Developed interpretable multi-label classifier for regulatory compliance, complementing internal expert model
  - Building automation library for model documentation integrating API calls and LaTeX templates
  - Lead R&D support for stochastic risk models using dimension reduction and non-linear transformations for signal extraction
- 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.
- 2014–2015
- 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

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## 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*.

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## Technical skills

Computing languages: Python, SAS, C/C++, Fortran, Matlab/Octave, SQL

Python packages: pandas, numpy, scipy, scikit-learn (sklearn), matplotlib, seaborn, keras, tensorflow, h2o, jupyter, etc

Natural languages: English, French, German, Japanese

Other: Excel, L<sup>A</sup>T<sub>E</sub>X, Bash, GitHub, QGIS, JSON, web scraping

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## Research Papers

- 2020 **(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.*