Marc Kjerland, PhD

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Computational scientist with expertise modeling high-dimensional and multi-scale systems

Skills

- Nonlinear and multiscale systems
- Algorithm development
- Numerical analysis
- High-performance computing
- Scientific visualization
- Geophysical modeling
- Machine learning
- Applied linear algebra
- GIS and geospatial analysis
- Peer-reviewed publication

Research Experience

2017 **University of Illinois at Chicago**, *Institute for Environmental Science and Policy*, Chicago, IL.

- Developed novel metric for sustainable performance of urban institutions
- Generated insights using data analysis and visualization methods
- Applied methodology to case study and co-authored technical report for peer review

2015 – 2017 **Kyoto University**, *Disaster Prevention Research Institute*, Kyoto, Japan.

- Developed coastal flooding simulations using meteorological and topographical data
- Quantified hazard impacts of changing typhoon distributions in northwest Pacific
- Implemented novel multi-scale methods in high-performance computing

2014 – 2015 **University of Illinois at Chicago**, *Institute for Environmental Science and Policy*, Chicago, IL.

- Evaluated institutional performance in data-driven urban sustainability framework
- Implemented multivariate regression, non-parametric performance metrics, and trend analysis

2010 – 2014 **University of Illinois at Chicago**, *Department of Mathematics*, Chicago, IL.

- Analyzed dynamics of multiscale systems in chaotic and periodic regimes
- Generated ensemble solutions to evaluate reduced-dimension perturbation response

Education

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

2005 **Emphasis on computer science and numerical analysis**, *B.S., Mathematics*, University of Minnesota, Twin Cities.

Technical skills

Programming languages: Python, C/C++, Fortran, Matlab/Octave

Python packages: numpy, pandas, scipy, scikit-learn (sklearn), matplotlib, seaborn, jupyter, gdal

Natural languages: English, French, German, Japanese

Other: LaTeX, Bash scripting, OpenMP, GitHub, QGIS, Excel, Photoshop