



Owen Kelly, Ph.D.

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC

Ottawa, Ontario, Canada

Senior Data Scientist

Based in Ottawa, Canada, Dr. Kelly supports E3's Integrated Systems Planning practice with specific expertise in data analytics and machine learning. He brings a breadth of experience in numerical and statistical modeling across several industries, including energy, insurance, biomedical, and telecom. Prior to E3, Dr. Kelly's contributions span energy analytics, portfolio risk, instrumentation, sensor data fusion, and physics simulations.

Dr. Kelly has built and deployed real-time electricity demand and generation forecasts for utilities in Maharashtra, Ontario, and Alberta; led colleagues in designing a microgrid control policy for a Scottish wind farm; in mortgage insurance, he has established compute infrastructure for rare event simulations, modeled unemployment dynamics with machine learning, and established new model governance practices and trained model developers on related tooling; in biomedical engineering, Dr. Kelly wrote the signal processing for a respiratory wellness sensor. He holds a patent on using coresets to accelerate dispatch optimizations. Dr. Kelly holds a Ph.D. in Electrical and Computer Engineering from Rice University with a focus on statistical signal processing.

BLUWAVE-AI

Ottawa, ON

Senior Data Scientist then Machine Learning Engineer

2019 – October 2024

- Specified, built and deployed a conformalized LGBM time series forecast of an electric utility load to a Grafana dashboard
- Originated and deployed Ontario load forecast model, supervised developers of model components
- Worked with clients to frame economic dispatch for 7 MW microgrid including wind SCADA, grid constraints, price ambiguity, PV and BESS
- Built and evaluated time series load forecasters at 400 MW city utility in India
- Re-engineered forecast model to swap weather sources without downtime
- Regular model code reviews (git/Bitbucket) and feature release planning
- Supervised 3 colleagues re PV/Wind/price forecast implementation
- Implemented microgrid controller as MILP in python/pyomo/Gurobi
- Wrote a python library for persistence forecast
- Specified outlier detection of transport data via graph theoretic minimal flow decomposition
- Patent on accelerating energy system optimizations

CANADA MORTGAGE AND HOUSING CORP

Ottawa, ON

Senior Specialist, Enterprise Modeling

2016 – 2019

- Implemented models for mortgage default in R, python, PowerBI

- Defined a new Markov-like model of employment states based on Statistics Canada MicroData extracts
- Advised on high performance statistical simulation infrastructure (Linux)
- Uncovered 10x speedup by profiling a mortgage portfolio simulator (R)
- Project leader for model change management vision and deployment (git)

APPTION

Data Science contractor

Ottawa, ON

2016

- Identified data issues blocking proof of concept fraud detection system

BIOPEAK

Data Processing Architect then Director of Engineering

Ottawa, ON

2006 – 2015

- Defined BioFusion multichannel electrophysiology data processing strategy with consultants
- Wrote end to end CCD simulation of custom near infra-red spectrometer
- Developed analysis/visualization stacks for 3 hardware iterations
- Selected software, hardware, i/o standards stack: Qt / Python / Bluetooth / Antlr / ragel / embedded C / STM32
- Attended ergonomic experiments and analyzed BioFusion recordings

NORTEL NETWORKS

Senior Wireless Engineer

Ottawa, ON

1999 – 2005

- Formulated and solved best system-wide geographic rollout order for a capital upgrade via data driven Markov Control Theory
- Enabled CDMA systems studies by extending TDMA simulator in C++

WIRELESS INFORMATION NETWORKS LAB, RUTGERS

Postdoctoral Fellow

New Brunswick, NJ

1996 – 1998

- Wrote 3 papers on wireless protocol optimization and parallel simulation

S L ROSS ENVIRONMENTAL RSCH

GIS Consultant

Ottawa, ON

June 1989 – July 1990

- Wrote geo-referenced oil spill and forest fire simulations

Education

Rice University

PhD, Electrical and Computer Engineering

MS, Electrical and Computer Engineering

Houston, TX

May 1996

May 1994

University of Waterloo

BASc, Systems Design Engineering

Waterloo, ON

May 1989

Publications

1. Kelly, O., Sadeghianpourhamami, N., et al. (2021). "Systems and methods for accelerated computations in data-driven energy management systems." United States Patent No. US-20230009568-A1.
2. Kelly, O. (2016). "PAC-Bayes bounds for structure learning of observable operator models." Presentation at Machine Learning Ottawa.
3. Ahmad, S., Batkin, I., Kelly, O., Dajani, H. R., Bolic, M., & Groza, V. (2013). "Multiparametric physiological analysis in obstructive sleep apnea simulated with Mueller Maneuver." *IEEE Transactions on Instrumentation and Measurement*.
4. Kelly, O. E., Wright, H. E., Bryenton, A., & Kenny, G. P. (2011). "ECG performance of a multi-parameter monitor suitable for harsh environments." *Proceedings of the 14th International Conference on Environmental Ergonomics*.
5. Babich, F., Kelly, O. E., & Lombardi, G. (2000). "Generalized Markov modeling for flat fading." *IEEE Transactions on Communications*, April.
6. Kelly, O. E., Lai, J., Mandayam, N. B., et al. (2000). "Scalable parallel simulations of wireless networks with WiPPET." *Mobile Networks and Applications*, September.
7. Veeravalli, V., & Kelly, O. E. (1997). "Locally optimal handoff algorithm for cellular communications." *IEEE Transactions on Vehicular Technology*, August.