RICHARD KUBLIK, PH.D.

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I want to solve your most challenging scientific and technical problems. Due to my diverse background and passion for learning, I have an extensive, expanding toolkit and will construct the right solution for your problem, instead of just seeing every problem as a nail.

SKILLS

Data Science: Exploratory Analysis, PCA, Machine Learning (Classification, Clustering, Regression), Data Visualization
Libraries/Packages: numpy, scipy, scikit-learn, pandas, matplotlib, Jupyter Notebooks, R tidyverse, ggplot2, Three.js, D3.js
Applied Mathematics: Algorithm Development, Numerical Analysis, Mathematical Modeling & Simulation
Software Development: Python, R, Matlab, HTML5, JavaScript, C/C++, SQL, Amazon Web Services
Databases: MongoDB, mySQL, Cache, postgreSQL

EDUCATION

Ph.D. Northwestern University 2010
Engineering Sciences & Applied Mathematics
M.Sc. The University of British Columbia 2005
Applied Mathematics
B.Sc.(Hons.) The University of Alberta 2003
Mathematics
B.A. The King's University College 1998
Music

EXPERIENCE

Consultant 2017 - present
Data Scientist/Applied Mathematician *Dayton, OH*
I discover patterns and trends in data and convert these to actionable insights for my clients.

- Project Portfolio: http://portfolio.richard.crkublik.com
- Client project exploring website traffic data to determine patterns in readership. Created visualizations of aggregate trends in reader acquisition, bounce rates (global and per post)
- Exploratory analysis, feature engineering, and data visualizations in R
- Machine Learning in R and Python: regression, classification, segmentation/clustering
- Mathematical modeling: model development, analysis using dynamical systems approaches, and simulation techniques.
- Computational algorithm development: expertise in numerical analysis

Materials Resources LLC (MRL) 2013 - 2017
Principal Software Developer *Dayton, OH*
MRL is a scientific research start-up company focused on materials science data collection, analytics, and algorithm development. As the principal software developer, I converted research codes and algorithms into user-friendly web-based applications. By deploying these applications on Amazon Web Services (AWS), I made these tools available to our in-house team as well as providing access to external customers.

- Created data visualizations using D3.js, Three.js, Matplotlib
- Developed feature identification algorithms using clustering with scikit-learn
- Developed image segmentation algorithms using scikit-image
- Analyzed customer samples to determine outliers
- Designed a noSQL database using mongoDB to facilitate integration of many applications into a common platform
- Worked directly with the CEO to develop new applications from conception to deployment based on internal or customer needs.

Octet Research Inc. 2016 - 2017
Senior Research Associate *Remote*
Octet Research provides mathematical modeling and simulation services to pharmaceutical companies for optimal drug development. As part of the research team, I laid the groundwork for future growth.

- Analysis and simulation of ODE models for biological processes (including PK/PD, QSP)
- Developed training materials for Non-linear Mixed Effect modeling, and Visual Predictive Check (VPC) in Matlab

Epic 2012 - 2013
Software Developer: Beaker Clinical Laboratory Module *Madison, WI*
Epic is a leader in electronic medical records (EMR) software. I was part of a large cross-disciplinary team focused on helping our customers succeed.

- Contributed critical functionality to encode lab tests with LOINC identifiers, and share data using the HL7 standard.

The University of Texas at Austin 2011 - 2011
Lecturer *Austin, TX*

- Taught undergraduate courses in probability and differential equations

SELECTED PUBLICATIONS

- Kublik RA and Chopp DL (2016) A locally adaptive time stepping algorithm for the solution to reaction diffusion equations on branched structures. Advances in Computational Mathematics, 42:621-649.

  We developed a locally adaptive time stepping (LATS) algorithm that provides improved efficiency over the standard methods currently used in computational neuroscience. The underlying benefit of the LATS method is that the computational cost scales with the amount of activity in the neurons, and not with the size or number of cells. Thus for large systems with sparse activity, the LATS method provides a substantial reduction in computational cost compared to traditional methods.

  See `http://wp.me/p7nzXK-C` for a brief description of this project

- Maree AFM, Kublik R, Finegood DT, and Edelstein-Keshet L (2006) Modelling the onset of type 1 diabetes: can impaired macrophage phagocytosis make the difference between health and disease? Philosophical Transactions of the Royal Society A, 364:1267-1282.

  Type 1 Diabetes occurs when the immune system attacks and destroys the insulin producing beta-cells in the pancreas. One theory suggests that under specific conditions, a naturally occurring period of programmed cell death can cause the immune system to target the beta-cells. We constructed a mathematical model describing the early stages of type 1 diabetes to test this theory. Through a combination of numerical simulations and dynamical systems analysis, we determined conditions under which the model predictions support the initial theory.

  See `http://wp.me/p7nzXK-I` for a brief description of this project