John Aaron Gowins

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GOAL

Continue to apply and advance software development and data expertise to reach consumers, gain insights, and drive improvements in decision making.

CORE SKILLS

Topics: predictive modeling, machine learning, natural language processing, software development, version control, visualizations, oral/written presentations

Analytics: Python, R, C++, Java, SAS, Matlab, Tableau, LaTeX, Git

Data: Hadoop, Apache Spark, SQL, MongoDB, Spotfire, KNIME

Development: HTML/CSS/JS, AngularJS, Bootstrap, NodeJS, R/Shiny, ZMQ

EXPERIENCE

National Institutes of Health **September 2014-August 2016**
Carson Chow, Ph.D. Kevin Hall, Ph.D. NIDDK
Postbaccalaureate Intramural Research Fellow

- Developing mechanistic models that simulate energy use and mass deposition during childhood growth. Part of an interdisciplinary effort sponsored by the Bill and Melinda Gates Foundation to address growth stunting and associated cognitive deficiencies worldwide.
- Using relevant published physiological data to train and optimize an ODE model with dozens of parameters. Working in a secure virtual environment with highly proprietary and sensitive data.
- Uncovered new and valuable insights into the energy metabolism of growth faltering subjects that redefined the goals and direction of several teams of mathematicians and statisticians involved in the Gates Foundation effort.
- Selected to participate in the assessment of visualization software across the Gates Foundation effort. Learned to use each competing BI visualization tool, then created dummy data and analyses to assess their effectiveness and flexibility in common use cases. Presented feedback to a management team that informed a purchasing decision.
- Developed tools to present model functionality and allow members of the Gates Foundation to access and interact with the model through dashboards and applications.
- Presented findings to an audience of experts at the Gates Foundation, many of whom became collaborators, and to an open audience at the NIH as part of the 2015 Post-Baccalaureate Seminar Series.
- Currently preparing documents for publication, as well as for a section of an upcoming Springer textbook on mathematical modeling. A Nature series is planned for the Gates Foundation effort.

Author **October 2015-Present**

- Contributed R programming tutorials for datascienceplus.com and r-bloggers.com, viewed by thousands of programmers with positive feedback. link
- Interviewed by OnlineEducation.com for data science expertise, particularly related to utilizing and preparing online learning tools. link

National Institutes of Health **May-August 2014**
Yi-Kuo Yu, Ph.D. Gelio Alves, Ph.D. NCBI
Participant at the 2014 OITE Summer Internship Program

- Developed sophisticated algorithms to compare amino acid sequences to GC-MS data to identify the proteins that were present in a digested sample.
- Required extensive transformation of messy raw files into analyzable formats, and automation of those tasks. Linked disparate data via non-obvious keys.
- Deployed C++ code in a Unix environment using Make to build executables, DDD to employ debugging, and Git for version control.

Virginia Polytechnic and State University **May-August 2013**
Reinhard Laubenbacher, Ph.D. Shernita Lee, Ph.D. Virginia Bioinformatics Institute
Participant at the 2013 Modeling and Simulation of Systems Biology Summer REU

- Discovered a novel transcriptional response by employing a computational model of gene expression interactions. Our work became part of Dr. Lee's successful Ph.D. portfolio, and is under review for publication.
- Invited to deliver oral presentations at a number of undergraduate research conferences, including at the Mathematical Biosciences Institute at The Ohio State University, and the National Institute for Mathematical and Biological Synthesis at the University of Tennessee, Knoxville.

Hillside Custom Homes, Inc. **September 1999 - January 2011**
President and Founder

- Principal general contractor and owner, providing custom home construction from concept to completion. Negotiated all purchases and sales. Drafted and executed contracts.
- Worked with designers and architects, created and adhered to budgets and schedules, secured financing.
- Assembled and managed teams of subcontractors. Provided quality control and ensured compliance with building codes and design boards. Arbitrated disputes and managed disbursements.
- Implemented marketing strategies to connect with new customers and sell projects already underway. Designed signs and logos, distributed flyers, and published magazine ads.
- Delivered polished finished products, processed and executed punch lists and change orders. Supplied warranties and addressed necessary repairs.

EDUCATION

Western State Colorado University **May, 2014**
Bachelor of Arts in Mathematics

PROJECTS

PubMed Search Application link

- Developed and deployed a web application that performs user specified PubMed data analyses using the RISmed package in R.
- Users can search authors, topics, acronyms, etc., and the R backend provides a bar plot of number of publications per year, a wordcloud, the top ten authors associated with that keyword, the top ten journals, and the ten most recent article titles.

- Users can specify two time spans to compare the twenty most frequent words in the abstracts for those periods.
- Users can also enter an author's name, and the app calculates popular scholar indices; h-index, m-quotient, and g-index.

Online Survey Application link

- Developed and deployed a web application that presents users with a questionnaire and collects responses.
- Combines all responses, displays a table, allows users to download the responses.

Data Science Capstone Project: Word Predictor Application link

- Developed and deployed a web application which uses an n-gram model to suggest the next word in a sentence.
- Mimics the sentence autocomplete function of SwiftKey using a variance of the "stupid backoff" algorithm.

Miscellaneous Selected Projects

- CDC/NHANES childhood height correlates • twitter sentiment analyses ZMQ Request/Reply NY Times API keyword search • stock trader dashboard

CERTIFICATES

Johns Hopkins Data Science Specialization

- 9 courses plus a capstone project over 40 weeks. Provides the foundation for modern statistical modeling and machine learning in R.
- Covers obtaining data in various formats (XML, JSON, csv, API's, etc.), and loading, organizing, and cleaning up messy and raw data.
- Dedicates four-week-long sections to both exploratory data analysis, and producing reproducible research.
- Presents the development and assessment of regression models, clustering, classification, decision trees/random forests, neural networks, and more.
- Covers common statistical analyses, emphasizing best practices and avoiding pitfalls. Stresses calibration/validation paradigm and cross validation strategies. Develops and optimizes model ensembles.
- Creates several UI interactive data products using R Markdown and Shiny.

Hadoop Platform and Application Framework/Introduction to Big Data Analytics

- Overview and hands-on training for using Apache Hadoop in an Oracle VM. Includes sections on HDFS MapReduce, HBase, Hive SQL, Cloudera Impala, Pig, plus an in-depth treatment of Spark. Intro's to KNIME and Splunk.

Machine Learning Foundations: A Case Study Approach

- Uses GraphLab and the SFrame packages in Python to develop machine learning models. Presents regression, clustering, deep learning neural network image classification, and a recommender engine.