Ronald J. Nowling

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Education

University of Notre Dame, Notre Dame, IN

- Ph.D. in Computer Science & Engineering — July 2016
- M.S. in Computer Science & Engineering — May 2015
- Research areas: Math Modeling, Computational Physics, Machine Learning, Bioinformatics, Distributed Systems

Eckerd College, St. Petersburg, FL

- B.S. Computer Science, Mathematics — May 2010
- Thesis: *Nature-inspired Metaheuristics for Combinatorial Optimization Problems*

Professional Experience

Data Science Engineer, AdRoll, Inc. — August 2016 – Present

- Worked on all aspects of ML-powered, low-latency, distributed systems for predicting conversions, product recommendations, and estimating bid prices for advertisements.
- Constructed distributed data and feature engineering pipelines to feed models.
- Implemented and tested new ML algorithms and models.
- Developed experiment tracking and automation systems and associated documentation to enable internal feature-engineering "Kaggle" competition.

Software Engineer, Red Hat, Inc. — June 2014 – August 2016

- Engaged in internal consulting around scalable data processing and applications of machine learning
- Proposed and developed method for building customer profiles from interests in knowledgebase article using topic modeling and page view data. Prototyped in Python with scikit-learn and implemented in Apache Spark for production. Presented results at Spark Summit East 2016 and engaged with internal customers to apply pipeline to business problems.
- Consulted on identification of duplicate articles to support a customer portal search engine. Established clear requirements and consistent guidelines for evaluating methods. Demonstrated simple, first-pass method for identifying duplicate articles and proposed extensions to reduce false positives.
- Ported pipeline for transforming, cleaning, and summarizing page view data to Apache Spark, reducing run times from days to 1 hour.

- Contributed new features and fixes to Apache Spark including performance improvements and new features to machine learning algorithms, random data generators, and tests.
- RPM packaging, integration testing, and deployment of internal analytics stack based on Apache Spark, Apache Mesos, and Gluster. Provisioning, configuration, and administration of team's Linux clusters with Ansible.

Research Assistant, University of Notre Dame August 2010 – July 2016

- Applied machine learning and stochastic models to bioinformatics problems. I demonstrated that machine learning algorithms can work as well as specialized bioinformatics algorithms, enabling scientists to reduce development and maintenance costs by using existing libraries. I used numerical experiments to identify sources of bias when using Random Forests for variable selection and presented solutions that work with existing implementations.
- Derived, implemented, and validated stochastic differential equations and numerical linear algebra algorithms for computational chemistry. Implemented models using parallel, distributed, and GPU programming.
- Served as TA for 3 semesters of Programming Paradigms. Designed and graded assignments, tutored students, and gave guest lectures. Recipient of the GAANN Fellowship (Fall 2012 – Spring 2014) and Kaneb Center Outstanding Teaching Assistant Award (2012).

Simbios OpenMM Visiting Scholar, Stanford University July 30 – August 24, 2012

- GPU implementations of numerical linear algebra algorithms for computational chemistry

Undergraduate Research Assistant, University of Connecticut Summers 2005 – 2010

- Collaborated on development of database-driven, Java applications for conversion and processing of molecular structure data

Ford Scholar and Research Assistant, Eckerd College Summer 2007 – Spring 2010

- Used Genetic Algorithms to solve combinatorial optimization problems; developed novel encoding scheme
- Replaced proprietary file format with SQLlite in DARWIN, software for semi-automated identification and cataloging of dolphins using computer vision techniques

Professional Service and Volunteer Efforts

Committer / PMC Member, Apache BigTop March 2015 – Present

Advisor, Nevada Institute of Personalized Medicine August 2015 – Present

Co-organizer, Milwaukee Big Data Meetup March 2016 – Present

Co-organizer, Wisconsin Big Data Conference May 2016 – Present

Research Volunteer, Prof. Xie's Group, UW Milwaukee January 2017 – Present

Oral Presentations

RJ Nowling. Real-World Lessons in Machine Learning Applied to Spam Classification. Milwaukee Big Data Meetup (May 2017), Milwaukee, USA.

RJ Nowling. Insights into Customer Behavior from Clickstream Data. Spark Summit East (February 2016), New York City, USA.

RJ Nowling. Synthetic Data Generation for Realistic Analytics Examples and Testing. Apache: Big Data Europe (October 2015), Budapest, Hungary.

RJ Nowling. A domain-driven, generative data model for BigPetStore. The 4th IEEE International Conference on Big Data and Cloud Computing (December 2014), Sydney, Australia.

Publications

* denotes equal contribution

RJ Nowling and J Vyas. "A domain-driven, generative data model for BigPetStore." *Proceedings of the 4th IEEE International Conference on Big Data and Cloud Computing*, 2014.

JC Sweet, **RJ Nowling**, TM Cickovski, CR Sweet, VS Pande, and JA Izaguirre. "Long Timestep Molecular Dynamics on the Graphical Processing Unit." *J. Chem. Theory Comput.*, 9(8):3267–3281, 2013.

RJ Nowling*, JL Abrudan*, DA Shoue, B Abdul-Wahid, M Wadsworth, G Stayback, FH Collins, MA McDowell, and JA Izaguirre. "Identification of Novel Arthropod Vector GPCRs." *Parasit. Vectors*, 6:150, 2013.

HJC Ellis, G Weatherby, **RJ Nowling**, J Vyas, M Fenwick, and MR Gryk. "A Software Architecture for NMR Spectral Data Translation." *CISE*, 15(1):76-83, 2013.

RJ Nowling and TM Cickovski. "Prototype to Release: Software Engineering for Scientific Software." *Biomedical Computation Review*, Fall 2012.

RJ Nowling, J Vyas, G Weatherby, MW Fenwick, HJC Ellis, and MR Gryk. "CONNJUR Spectrum Translator: An open-source application for reformatting NMR spectral data." *J Bio NMR*, 50:83-89, 2011.

RJ Nowling and H Mauch. "Priority Encoding Scheme for Solving Permutation and Constraint Problems with Genetic Algorithms and Simulated Annealing." *Proceedings of the 8th International Conference on Information Technology - New Generations*, 2011.

HJC Ellis, J Vyas, **RJ Nowling**, TO Martyn and MR Gryk. "Iterative Development Of An Application To Support Nuclear Magnetic Resonance Data Analysis Of Proteins." *Proceedings of the 8th International Conference on Information Technology - New Generations*, 2011.

J Vyas*, **RJ Nowling***, T Meusberger, D Sargeant, K Kadaveru, MR Gryk, V Kundeti, S Rajasekaran, and MR Schiller. “MimoSA: a system for minimotif annotation.” *BMC Bioinformatics*, 11:328, 2010.

J Vyas, **RJ Nowling**, MW Maciejewski, S Rajasekaran, MR Gryk, and MR Schiller. “A proposed syntaxfor Minimotif Semantics, version 1.” *BMC Genomics*, 10:360, 2009.

Poster Presentations

RJ Nowling. BigTop Bazaar: Simulating Customer Dynamics Driven By Booth Preferences at a Conference. Poster Presented at the 2015 Annual Conference of the Great Lakes Section of the Society for Industrial and Applied Math (2015), Grand Rapids, MI.

RJ Nowling, M Wadsworth, JL Abrudan, DA Shoue, B Abdul-Wahid, GM Stayback, FH Collins, MA McDowell, and JA Izaguirre. Identifying GPCRs in the Genome of the Sand Fly *P. papatasi* using Ensemble*. Poster Presentation at the 7th Annual Arthropod Genomics Symposium (2013), Notre Dame, IN.

RJ Nowling, CR Sweet, and JA Izaguirre. Extending Long Timestep Molecular Dynamics (LTMD) to Explicit Solvent. Poster Presentation at the Midwest Theoretical Chemistry Conference (2013), Urbana-Champaign, IL.

RJ Nowling, JL Abrudan, DA Shoue, B Abdul-Wahid, M Wadsworth, GM Staybak, FH Collins, MA McDowell, and JA Izaguirre. Evaluation and Development of GPCR Classifiers for Vectors. Poster Presentation at the Second Annual Eck Institute for Global Health Research Retreat (2013), Notre Dame, IN.