

Summary

- 9 years scientific research experience in informatics, biology, and social media domains
- 8 years professional software industry and consulting experience
- Researcher and engineer of complex, scalable, and data-driven algorithms and machine learning techniques
- Experienced presenter and innovator; excellent ability to communicate complex ideas to stakeholders and derive requirements

Research

Deep Learning and Streaming Analytics, Pacific Northwest National Labs 2015 - Present

Applying deep learning to streaming data for image classification and geolocation inference. Developing deep learning models for breast cancer malignancy prediction from MRIs. Architected novel document recommendation APIs.

Big Data Visual Analytics, University of Washington 2009 - 2014

Developed API to interactively stream and manipulate large datasets. Developed a Data Intensive Visualization Engine (DIVE) to perform big data visual analytics. Designed novel approach to automatically generate dynamic ontologies from Microsoft .NET assemblies.

Protein Structure Prediction, University of Washington 2009 - 2014

Data mined, analyzed and visualized a large data warehouse of molecular dynamic simulations (www.dynameomics.org). Designed novel fragment and rotamer libraries for protein structure prediction. Predicted peptide structures and transition state ensembles.

Medical Image Segmentation, San Francisco State University 2006 - 2008

Implemented and evaluated state-of-the-art image segmentation algorithms for classification of periapical lesions in 3D CT scans. Improved best-performing algorithm using machine learning.

Professional Experience

Senior Data Scientist, Pacific Northwest National Labs 2015 - Present

Successfully delivering innovative, data-driven research and architectures to many sponsors across multiple projects. Developing and directing research on social media as deputy research team lead. Principal Investigator for collaboration researching deep learning for medical imaging domain. Engaged in a variety of projects as a researcher, software architect, and data scientist.

Lead Data Scientist, Radius Inc. 2013 - 2015

Effectively provided scientific expertise for current customers and acquisition of new business. Researched novel approaches to Internet of Things (IoT) domain using machine learning and distributed computing platforms. Developed cloud-based solutions to establish and promote intellectual property. Architected API and backend solutions for clients.

Expertise

Data Mining
Streaming Analytics
Software Engineering
Machine Learning
Deep Learning
Big Data
Visual Analytics

Domains

Bioinformatics
Structural Biology
Medical Imaging
Agriculture
Social Media

Tools

Java
C#
ASP.NET
Python
SQL
NoSQL
Hadoop
Apache Nifi
Tensorflow
R
Matlab
Tableau
Excel
Photoshop
Illustrator
Windows Server
Linux Server
Microsoft Azure
Amazon AWS

Professional Experience (Continued)

Software Application Engineer, SAIC Programmed financial and human resource web-based applications for government clients. Designed reporting tools for business development. Developed and administered web portal interfaces.	2006 - 2008
Lead Systems Administrator, SAIC Architected and deployed software and hardware solutions for internal and external clients. Evaluated third-party software for integration into business operations.	2003 - 2006
Technical Consultant, Octagon Information Services	2002

Patents

Rysavy S, Bromley D, Daggett V, 2014. Methods for Efficient Streaming of Structured Information. 2014. <i>US Patent Application 20160103912 filed June 2014.</i> Patent Pending.	2014
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Education

University of Washington School of Medicine Advisor: Valerie Daggett	Ph.D. Biomedical and Health Informatics	2008 - 2014
San Francisco State University College of Science and Engineering Advisor: Kazunori Okada	M.S. Computer Science	2006 - 2008
Iowa State University College of Engineering	B.S. Computer Engineering	1998 - 2002

Academic Experience

Mentor, Pacific Northwest National Labs	2015 - Present
Mentor, University of Washington	2011 - 2014
Reviewer, Computers in Biology and Medicine	2011 - 2012
Teaching Associate, San Francisco State University	2007 - 2008

Awards and Honors

Lab Directed Research and Development Award	2017 - 2019
NIH National Library of Medicine Biomedical Informatics Training Grant	2008 - 2012
University of Washington Top Scholar Award	2008
Distinguished Achievement Award for Academic Excellence	2008
Achievement Rewards for College Scientists (ARCS) Scholarship	2007 - 2008
SAIC Systems Administration Award	2004
Iowa State College of Engineering Scholarship	1998 - 2000

Presentations and Posters

- University of Washington eScience Institute Data Science Conference, Seattle WA.** Poster 2014
Presentation: "DIVE: A Data Intensive Visualization Engine"
- University of Washington eScience Institute Seminar.** Oral Presentation: "DIVE: Data Intensive Visualization Engine for Molecular Simulation Data" 2013
- National Library of Medicine Informatics Trainee Conference, Bethesda, MD.** Poster 2011
Presentation: "DIVE: A Data Intensive Visualization Engine"
- 20th Annual CSU Biotechnology Symposium, Oakland CA.** Oral and Poster Presentation: 2008
"Segmentation of Periapical Lesions toward Dental Computer-Aided Diagnosis"

Publications

- Towse CL, **Rysavy S**, Daggett V. Describing the Coverage of Protein Fold Space and Incorporating Dynamics using the Proteomic Ramachandran Plot (PRplot): A Dymeomics Case Study. *Structure*, In preparation.
- Rysavy S**, Towse CL, Daggett V. New Dynamic Rotamer Libraries: Data-Driven Analysis of Side Chain Conformational Propensities. *Structure*, 24 (1): 187-199, 2016.
- Okada K, **Rysavy S**, Flores A, Linguraru MG. Noninvasive Differential Diagnosis of Dental Periapical Lesions in Cone-Beam CT Scans. *Medical Physics*, 42(4): 1653-1665, 2015.
- Rysavy S**, Beck DAC, Daggett V. Dymeomics: Data-Driven Methods and Models for Utilizing Large-Scale Protein Structure Repositories for Improving Fragment-Based Loop Prediction. *Protein Science*, 23(11): 1584-1595, 2014.
- Merkley ED, **Rysavy S**, Kahraman A, Hafen R, Daggett V, Adkins J. Distance Restraints from Cross-Linking Mass Spectrometry: Mining a Molecular Dynamics Simulation Database to Evaluate Lysine-Lysine Distances. *Protein Science*, 23(6): 747-759, 2014.
- Rysavy S***, Bromley D*, Daggett V. DIVE: A Graph-based Visual Analytics Framework for Big Data. *IEEE Computer Graphics and Applications*, 34(2): 26-37, 2014. **Featured Publication**
- Bromley D*, **Rysavy S***, Su R, Toofanny RD, Schmidlin T, Daggett V. DIVE: A Data Intensive Visualization Engine. *Bioinformatics*, 30(4): 593-595, 2014.
- Bromley D, **Rysavy S**, Beck DAC, Daggett V. DIVE: A Data Intensive Visualization Engine. Proceedings of the Microsoft eScience Conference, 2010.
- Van der Kamp MW, Schaeffer RD, Jonsson AL, Scouras AD, Simms AM, Toofanny RD, Benson NC, Anderson PC, Merkley ED, **Rysavy S**, Bromley D, Beck DAC, Daggett V. Dymeomics: A Comprehensive Database of Protein Dynamics. *Structure*, 18: 423-435, 2010. **Journal Cover**
- Flores A, **Rysavy S**, Enciso R, Okada K. Non-Invasive Differential Diagnosis of Dental Periapical Lesions in Cone-Beam CT. *Proceedings of the Sixth IEEE International Conference on Symposium on Biomedical Imaging*, 566-569, 2009.
- Rysavy S**, Flores A, Enciso R, Okada K. Classifiability Criteria for Refining of Random Walks Segmentation. *Proceedings of 19th International Conference on Pattern Recognition*, 2008.
- Rysavy S**, Flores A, Enciso R, Okada K. Segmentation of Large Periapical Lesions toward Dental Computer-Aided Diagnosis in Cone-Beam CT Scans. *Proceedings of SPIE Medical Imaging*, 6914: 142-152, 2008.

* Co-first Authors