

Dave Williams

Data and Research Scientist

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Profile

Data scientist with domain expertise in applying cloud computing and statistical modeling to engineering, scientific, and real-world problems. Work in team-contexts to create and modify scientific software libraries to process and understand noisy data generated by stochastic real-world processes. Able to seek input from outside experts to create domain-crossing solutions designed to scale.

Education

Ph.D. in Biophysics, 2012
University of Washington, Seattle, WA

B.A. in Physics, 2006
Reed College, Portland, OR

Areas of expertise

Data exploration

- Analysis of large datasets
- Dimensionality reduction
- Effective visualization

Modeling & simulation

- Stochastic simulation
- Agent & individual models

Project direction

- Proposal writing
- Training and pedagogy
- Group culture development

Technical skills

- | | | |
|----------------------|-------------------|---------------|
| • Sci Python stack | • AWS | • MATLAB |
| • ML Python stack | • Docker | • Mathematica |
| • Python library dev | • Git & GitHub | |
| • Python packaging | • Data versioning | |

Experience

Scientist, Modeling and ML Group

04/2017 – Present

Allen Institute for Cell Science, Seattle, WA

Developed and refined, in collaboration with institute stakeholders, a five-year scientific research, team development, and staffing plan for the biophysical modeling group. Addressed the physics of stem cells via multi-scale biophysical modeling using spatial-agent and spatial-temporal neural net approaches.

- Designed and wrote three novel libraries to explain observed biological variation and behavior.
- Identified external users not being served by existing manual data distribution methods. Collaboratively lead the effort to put our high-dimensional image data behind APIs to enable automated reproducible open-science workflows.
- Gave semi-annual national presentations of team and individual research.

- Managed research and relationships with external collaborators, designed and lead graduate student research.
- Led hiring and on boarding of five new team members, established viability of first projects and team cohesion.

Data Science Postdoctoral Fellow **09/2014 - 04/2017**

eScience Institute, Balazinska & Daniel Labs, University of Washington, Seattle, WA

Designed and executed large-scale computational and real-world biophysical experiments.

- Created Bayesian machine vision package for analyzing X-ray diffraction images cutting analysis time over 100 fold.
- Mentored students in techniques including model reduction and evolutionary programming.

NSF Mathematical Biology Postdoctoral Fellow **06/2012 - 09/2014**

Harvard University, Cambridge, MA

Described animal visual navigation during flight via custom miniature tracking sensors.

- Developed new statistical characterizations of spatial networks.
- Publicized work through NPR, BBC News, National Geographic, etc.

Intern **06/2008 - 09/2008**

Microsoft Research, Redmond, WA

Designed benefit evaluations for scientific cloud computing

Graduate Research Assistant **08/2006 - 06/2012**

Regnier Lab, University of Washington, Seattle, WA

Created and published spatial graph models of muscle proteins and their interactions.

- Built one of the first AWS clusters at UW, AWS evangelist to scientific community
- Developed intro seminars on Python and microcontrollers for biologists.

NRC Licensed Reactor Operator **06/2002 - 06/2006**

Reed Research Reactor, Reed College, Portland, OR

Operated a non-power generating nuclear reactor. Analyzed archaeological and chemical samples.

- Designed and prototyped new material handling apparatus.

Selected awards & grants

Multi-University Grant (Co-PI), Army Research Office **2014–2018**

Title: Muscle's energetic versatility arises from its crystalline and multi-component structure

Moore / Sloan Data Science & WRF Innovation in Data Science Postdoctoral Fellowship **2014–2017**

NSF Postdoctoral Fellowship in Mathematical Biology **2012–2014**

Amazon Web Services Grants for Research **2010, 2015**

Publications & presentations

- Six first author publications, including publication at VLDB 2015 workshop
- Published in high impact journals such as Science and PNAS
- More than 20 invited seminars and presentations at national meetings