Adam A. Smith

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Dept. of Mathematics and Computer Science
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Education

PhD Computer Science
2009, University of Wisconsin, Madison
Dissertation: *"Classification and Alignment of Gene-Expression Time-Series Data"*

MS Computer Science
2002, University of Wisconsin, Madison
Thesis: *"Spread Spectrum Watermark Estimation Through Autocorrelation"*

BA Computer Science/Mathematics and Physics with Honors
summa cum laude
1999, Lewis & Clark College
Thesis: *"A Computer Model of the Solar Magnetic Field"*

Research Interests

My chief interests are in data science, machine learning, and their applications in bioinformatics. My doctoral research involved modeling, aligning, and classifying high-dimensional time series data, with a particular emphasis on gene-expression data. More recently I have been working on using deep neural networks to automatically extract and classify biomedical data.

Publications

Adam A. Smith and Drew Kristensen. *"Deep Learning to Extract Laboratory Mouse Ultrasonic Vocalizations from Scalograms."* Presented at *2017 IEEE Conference on Bioinformatics and Biomedicine (BIBM)*. Published in *Proceedings of 2017 IEEE BIBM*, December 2017.

Adam A. Smith and Ursula Whitcher. *"Making a hash of things."* *Math Horizons*, November 2015.

Adam A. Smith. *"Hidden Markov models and mouse ultrasonic vocalizations."* *ACM XRDS*, Volume 21, No. 4, Summer 2015.

Adam A. Smith, Aaron Vollrath, Christopher A. Bradfield, and Mark Craven. *"Clustered alignments of gene-expression time series data."* Presented at *2009 Conference on Intelligent Systems for Molecular Biology (ISMB)* (18% podium acceptance rate). Published in *Bioinformatics*, 25(12): i119-i1127, May 2009.

Aaron Vollrath, Adam Smith, Mark Craven, and Christopher Bradfield. *"Edge3: A web-based solution for management and analysis of agilent two color microarray experiments."* *BMC Bioinformatics* 10: 280+, 2009.

Adam A. Smith and Mark Craven. *"Fast multisegment alignments for temporal expression profiles."* Presented at *2008 International Conference on Computational Systems Bioinformatics* (22% podium acceptance rate). Published in *Computational Systems Bioinformatics Proceedings*, volume 7, pages 315-326, 2008 Imperial College Press.

Adam A. Smith, Aaron Vollrath, Christopher A. Bradfield, and Mark Craven. *"Similarity queries for temporal toxicogenomic expression profiles."* *PLoS Computational Biology*, 4(7):e1000116, July 2008.

Herschel B. Snodgrass and Adam A. Smith. *"On the use of correlations to determine the motions and properties of mesoscale magnetic features in the solar photosphere." Astrophysical Journal*, 546:528-541, January 2001.

Herschel B. Snodgrass and Adam A. Smith. *"The effects of meridional motion on the determination of rotation by tracer tracking." Solar Physics*, 191(1):21-35, January 2000.

Courses Taught

I was the primary instructor for all of the following courses, at the *University of Puget Sound* and *Lewis & Clark College*.

- Computer Science I (Introduction to CS)
- Computer Science II (Data Structures)
- Computer Science 0 (Survey for Nonmajors)
- Computer Science for Natural Scientists
- Computer Architecture & Assembly Language
- Algorithms
- Advanced Algorithms
- Artificial Intelligence
- Operating Systems
- Bioinformatics Algorithms
- Capstone for Computer Science Major

Independent Student Projects Overseen

Drew Kristensen, *"Identifying Mouse Ultrasonic Vocalizations"*, Summer 2016-2017.

Justin Brush, *"Bioinformatics Algorithms"*, Spring 2017.

Conner Madigan, *"A Graphical Multiband Equalizer Application for Android Devices"*, Fall 2015.

Matthew Moreno, *"Automated Extraction of Mouse Vocalizations from Noisy Recordings"*, Summer 2015.

Schyler Evans, *"An Exploration of Blender"*, Spring 2015.

Formal Seminars

"Honest Talk about Graduate School" (panel). Organizer. September 18, 2017. Mathematics & Computer Science Seminars, University of Puget Sound, Tacoma, WA.

"Revisiting Turing's computable numbers, in Python". September 28, 2015. Mathematics & Computer Science Seminars, University of Puget Sound, Tacoma, WA. Given again March 2016. Mathematical Sciences Seminars, Lewis & Clark College, Portland, OR.

"Automated identification of mouse ultrasonic vocalizations". January 29, 2015. Thompson Hall Science & Mathematics Seminars, University of Puget Sound, Tacoma, WA.

Grants

2015-2016 Lind-Van Enkevort Fund. *"Instructional Applets in JavaScript".* Monies used to hire students, to create intelligent animations of common computer science algorithms.

Appointments Held

Assistant Professor
University of Puget Sound (Fall 2013 - present)
Designed and taught undergraduate courses in artificial intelligence, algorithms, operating systems, computer architecture and assembly language, intro programming. 6 courses/year.

Visiting Assistant Professor
Lewis & Clark College (Fall 2012 - Summer 2013)
Designed and taught undergraduate courses in computational biology, algorithms, operating systems, computer architecture and assembly language, intro programming, and computer science for non-majors. 8 courses/year including summer.

Postdoctoral Fellow
Oregon Health & Science University (Summer 2010 - Summer 2012)
Developed machine-learning algorithms to isolate the vocalizations of mice and classify them, with the goal of improving mouse models of mental illness.

Adjunct Professor
Lewis & Clark College (Fall 2009 - Summer 2012)
Designed and taught undergraduate courses in computational biology, computer architecture and assembly language, intro programming, and computer science for non-majors.

Other Teaching Experience

ACM-ICPC Coach
University of Puget Sound and Lewis & Clark College (Fall 2012 - present)
Acted as mentor to student teams participating in the ACM's yearly International Collegiate Programming Contest.

Delta Certificate
University of Wisconsin, Madison (Spring 2006 - Fall 2009)
Supplementary certificate in math and science pedagogy offered by the University of Wisconsin. Completed additional teaching classes, interned with a local science museum, and created original teaching software.
`http://www.delta.wisc.edu/`

Instructor, Computational Biology and Biostatistics Summer Research Program
University of Wisconsin, Madison (Summer 2004)
Created and taught an intensive one-week bioinformatics course for undergraduates in a summer research program.

Exploration Station, Science Expeditions
University of Wisconsin, Madison (Spring 2006)
Developed and crewed an educational booth at a yearly science outreach fair. Used hands-on demonstrations to teach children about infrared and ultraviolet light.

University Service

Lind-Van Enkevort Committee
University of Puget Sound (Fall 2015 - Spring 2017)
Committee to distribute funds to professors for worthy educational and enriching projects in the UPS Math/CS Dept.

Academic Standards Committee
University of Puget Sound (Fall 2014 - Spring 2017)
Committee overseeing instructional standards, hearing petitions from students for spe-

cial circumstances.

Faculty Search Committees
University of Puget Sound (Fall 2013 - present)
Contributing member of six different academic search committees (three in math, two in computer science, one in biology).

ACM-ICPC Site Director
University of Puget Sound (Fall 2013 - present)
Oversaw the execution of the qualifying round of the ACM's yearly International Collegiate Programming Contest in western Washington.

Mentor, Computational Biology and Biostatistics Summer Research Program
University of Wisconsin, Madison (Summer 2007)
Acted as advisor to an undergraduate conducting original research related to mine, during a ten-week summer research program.

Public Service

Career and Technical Education Computer Science Advisory Committee
Tacoma Public Schools (Fall 2015 - present)
Advisory committee overseeing computer science classes taught in Tacoma's public schools, providing computer science resources to high schools.

South Sound Circles
Tacoma (Fall 2014 - present)
Continuing education for Tacoma-area middle school and high school math teachers.

Awards & Honors

Phi Beta Kappa (1999)
Barry M. Goldwater Scholar (1998)
Sigma Pi Sigma (Physics Honor Society) (1997)