Shawn T. O'Neil

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Shawn T. O'Neil
Translational and Integrative Science Lab
https://tislab.org

Center for Health AI
U. Colorado, Anschutz Medical Campus
https://medschool.cuanschutz.edu/ai

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T 989 476 0221

Professional Experience

University of Colorado, Anschutz Medical Campus **(2020—Present)**

Assistant Professor (Research) - Data Engineer

Systems and software engineering. Training Coordinator for the National COVID Cohort Collaborative (N3C). Mentoring and advising on machine-learning approaches for health informatics research. Member of https://tislab.org and the Center for Health AI at CU.

Oregon State U., Center for Genome Research and Biocomputing **(2012—2020)**

Senior Faculty Research Assistant - Advanced Cyberinfrastructure Teaching Facility (ACTF) Manager, Bioinformatics Trainer

Bioinformatics teaching and research. Developing curricula in data analysis and programming, Developing HPC and cluster-based (grid engine, kubernetes) teaching resources, analysis and software development for research projects, project management.

Education

University of Notre Dame **April, 2012**

Ph.D., Computer Science and Engineering

Dissertation: "Non-Model Transcriptomics: Applications, Assessments, and Algorithms"

Co-Advisors: Dr. Scott J. Emrich (Comp. Sci.), Dr. Jessica J. Hellmann (Biological Sci.)

M.S., Computer Science and Engineering **May, 2009**

Thesis: "Expert Advice and the Newsvendor Problem"

Advisor: Dr. Amitabh Chaudhary (Comp. Sci. and Eng.)

Northern Michigan University **May, 2005**

B.S., Computer Science (Minor in Mathematics)

Summa Cum Laude

Interests and Skills

Bioinformatics; machine learning and statistics; graph algorithms; online and predictive algorithms; education and pedagogy; Linux, POSIX tools (awk, sed, etc.); Docker, Kubernetes, NGINX, KVM, Git, JupyterHub; Python, R, Java, JavaScript, Ruby, Bash, others; cluster computing, HPC; LaTeX, markdown; CSS, HTML, Node.js; 3D modeling and printing.

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Books

A Primer for Computational Biology

by Shawn T. O'Neil, OSU Press, ISBN 978-0-87071-926-4

Published by the Oregon State University Press and Library, an open-access textbook covering skills needed for success in computational biology: the Unix/Linux command-line, programming in Python, and programming in R.

Bio/Recursion: Exploring CS and Bioinformatics in R

by Shawn T. O'Neil, Self Published

A self-published work introducing foundational computer science topics (recursion, memoization, dynamic programming) via examples in bioinformatics and the R programming language. Available at http://leanpub.com/biorecursion and on Amazon.

Selected Articles

See full publication list at https://scholar.google.com/citations?user=1368JzkAAAAJ

O'Neil ST, "TidyTensor: Utilities for multidimensional arrays as named hierarchical structures." Journal of Open Source Software (JOSS, In Review).

O'Neil ST, Zhao X, Sun D, Wei J. "Newsvendor problems with demand shocks and unknown demand distributions." *Decision Sciences*: 47(1), pp 125—156, 2016.

O'Neil ST. "Implementing persistent O(1) stacks and queues in R." *R Journal*: 7(1), pp 118—126, 2015.

O'Neil ST, Dzurisin JDK, Williams CM, Lobo NF, Higgins HK, Deines JM, Carmichael RD, Zeng E, Tan JC, Wu GC, Hellmann JJ. "Gene expression in closely-related species mirrors local adaptation: consequences for a warming world." *Molecular Ecology*: 23, pp 2686—2698, 2014.

O'Neil ST, Emrich SJ. "Assessing de novo transcriptome assembly metrics for consistency and utility." *BMC Genomics*: 14(1), pp 465+, 2013.

O'Neil ST, Emrich SJ. "Haplotype and minimum-chimerism consensus assembly of short sequence data." *BMC Genomics*: 13(Suppl 2):S4, 2012.

O'Neil ST, Chaudhary A, Chen DZ, Wang H. "The topology aware file distribution problem." *Journal of Combinatorial Optimization*: 11(3), pp 1—15, 2011. (Also presented at The 17th Annual International Computing and Combinatorics Conference (COCOON); LNCS 6842: pp 366—378, 2011.)

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Selected Posters, Presentations, Awards

O'Neil ST, Brenberg T, Colaco A, McLachlan J, Emrich SJ. "Reconstructing Ancient Barcode DNA With Hapler." Notre Dame CSE Student Research Symposium. November 7, 2011. Poster. *Chosen best poster by student vote*.

O'Neil ST, Chaudhary A. "Comparing online learning algorithms to stochastic approaches for the multi-period newsvendor problem." Proceedings of the 9th Workshop on Algorithm Engineering and Experiments (ALENEX). January 19, 2008. Presentation.

University of Notre Dame: Eck Institute for Global Health Bioinformatics Fellow, Kaneb Center Outstanding Graduate Student Teacher Award, Arthur J. Schmitt Fellow.

Northern Michigan University: Merit Excellence Award, Summa Cum Laude.

State of Michigan: Merit Award and Competitive Scholarship.

Service and Other Professional Experience

Organizing

Founder, Bioinformatics Users' Group, OSU (Winter 2012 to Spring 2018)
Regular meeting group for researchers dedicated to discussing bioinformatics topics and applications; upwards of 40 regularly attending members.

Founder, Society of Schmitt Fellows, ND (Fall 2009 to Summer 2012)
Organized the first chapter for the student organization representing graduate students receiving the Arthur J. Schmitt fellowship at the University of Notre Dame.

Co-Founder, Notre Dame/Michiana Science Cafe, ND (Spring 2009 to Fall 2011)
A monthly venue for scientists and engineers to present interesting topics to the local community.

Teaching

Instructor; MCB, Statistics, and CGRB, OSU (Winter 2012 to Present)
Developed and taught multiple special-topics courses in computational biology for the Molecular and Cellular Biology graduate program, the Statistics department, and the Center for Genome Research and Biocomputing. Notable entries include *Data Programming in R*, *Introduction to Python*, *Simulating Natural Systems*, and *Recursion & Dynamic Programming for Sequence Analysis.*

Instructor; Craft Center, OSU (Fall 2016 to Present)
Developed and taught community courses at the OSU Craft Center: Artistic Programming, 4 Hours of Code, and Introduction to 3D Modeling and Printing.

Instructor; Basic Computing for Bioinformatics, ND (Fall 2010 to Fall 2011)
Developed a course in the Computer Science department at Notre Dame offered to Biology graduate students, staff, and faculty, focused on applied computational science.

Teaching Assistant; Multiple Courses, ND (Fall 2008 to Fall 2010)
Discrete Mathematics, Linear Programming, Multimedia Systems. Won Outstanding Graduate Student Teacher Award for work in Discrete Mathematics.

Industry Experience

Internship, Amazon.com, Software Development Engineer (Summer 2008)
Software development for the supply chain optimization and inventory control team. Worked on tools for visibility and analysis of Amazon.com's complex supply chain. (Declined offer.)

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Certifications and Professional Development

Leadership Collaborative I (Winter 2017/2018)
Practicum in developing and implementing leadership: vision, inspiration, organization. Served as mentor for 2019 iteration.

Project Management: Foundations and Best Practices (Fall 2016), High Performance Teamwork (Spring 2017)
BioPro workshops offered by the Oregon Bioscience Association. Techniques and principles in effective project management and team dynamics in professional organizations.

Search Advocate (Fall 2017)
Certifying faculty and staff to assist hiring committees in effectively and equitably selecting top-qualified candidates, and promoting OSU's mission of diversity and inclusion.

State of OR Certified Search and Rescue Type 2, Ham licensed KI7RDM.