Shawn T. O'Neil

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

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

shawn@tislab.org
http://shawntoneil.com
T 541 250 6755

Professional Experience

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

Assistant Professor of Research, Department of Biomedical Informatics, Center for Health AI

Research, teaching, mentoring, and development of supervised and unsupervised machine-learning, AI, and statistical approaches for health informatics.

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

Senior Faculty Research Assistant; Manager, Advanced Cyberinfrastructure Teaching Facility (ACTF); Lead 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

Ph.D., Computer Science and Engineering **April, 2012**

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

Thesis: "Expert Advice and the Newsvendor Problem" **May, 2009**

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

Northern Michigan University

B.S., Computer Science (Minor in Mathematics) **May, 2005**

Summa Cum Laude

Interests

Biomedical informatics; machine learning, statistics, deep learning, model interpretability; graph algorithms; online and real-time algorithms; education and pedagogy; Linux, Docker, Kubernetes, Git; Python, R, SQL, JavaScript, POSIX tools, et al.; distributed computing, HPC, Apache Spark; REST API development, FastAPI, Node.js; data visualization, ggplot2, shiny, p5.js, Streamlit, Gradio; FPV drones, artistic programming, 3D modeling and printing.

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Peer-Reviewed Articles

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

O'Neil ST, Madlock-Brown C, Wilkins KJ, et al. "Finding Long-COVID: Temporal Topic Modeling of Electronic Health Records from the N3C and RECOVER Programs." In submission, medRxiv: https://doi.org/10.1101/2023.09.11.23295259.

Salah HM, Fudim M, O'Neil ST, et al. "Post-recovery COVID-19 and incident heart failure in the National COVID Cohort Collaborative (N3C) study." *Nature Communications:* 13(1), 2022.

O'Neil ST, "TidyTensor: Utilities for multidimensional arrays as named hierarchical structures." *Journal of Open Source Software*: 6(66), 2021.

Annalora AJ, O'Neil ST, Bushman JD, et al. "A k-mer based transcriptomics approach for antisense drug discovery targeting the Ewing's family of tumors." *Oncotarget:* 9(55), 2018.

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

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

O'Neil ST, Dzurisin JDK, Williams CM, et al. "Gene expression in closely-related species mirrors local adaptation: consequences for a warming world." *Molecular Ecology:* 23, 2014.

Gouthu S, O'Neil ST, Di Y, Ansariola M, et al. "A comparative study of ripening among berries of the grape cluster reveals an altered transcriptional programme and enhanced ripening in delayed berries." *Journal of Experimental Botany:* 65(20), 2014.

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

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

O'Neil ST, Emrich SJ. "Robust haplotype reconstruction of eukaryotic read data with Hapler." *Proc. International Conference on Computational Advances in Bio and Medical Sciences (ICCABS)*, 2011.

O'Neil ST, Chaudhary A, Chen DZ, Wang H. "The topology aware file distribution problem." *Journal of Combinatorial Optimization*: 11(3), 2011.

O'Neil ST, Dzurisin DK, Carmichael RD, Lobo NF, Emrich SJ, Hellmann JJ. "Population-level transcriptome sequencing of nonmodel organisms *Erynnis propertius* and *Papilio zelicaon*." *BMC Genomics*: 11, 2010.

O'Neil ST, Chaudhary A. "Comparing online learning algorithms to stochastic approaches for the multi-period news vendor problem." *Proc. Algorithm Engineering and Experiments (ALENEX)*, 2008.

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Books

Researcher's Guide to N3C: A National Resource for Analyzing Real-World Health Data

O'Neil ST, Beasley W, Loomba J, Patrick S, Wilkins KJ, Crowley KM. (Eds.) DOI: 10.5281/zenodo.7749367 (2023)

An edited volume with researcher resources for the National COVID Cohort Collaborative, 35+ contributors.

Bio/Recursion: Exploring CS and Bioinformatics in R

O'Neil ST, Self Published (2018)

Introduces 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.

A Primer for Computational Biology

O'Neil ST, OSU Press, ISBN 978-0-87071-926-4 (2017)

Published by the Oregon State University Press and Library, an open-access textbook covering skills needed for success in computational biology.

Invited Presentations, Awards

O'Neil ST. "Data, Knowledge, and Intelligence: What's Next for Health Informatics?" American Association of Medical Colleges, Group on Information Resources (AAMC-GIR). Invited plenary session, 2023.

O'Neil ST, Madlock-Brown C, Wilkins K, Zareie P, McGrath B. "Finding Long COVID: Topic modeling of post-infection trends in patient EHR profiles." ROCKY Bioinformatics conference. Accepted abstract presentation, 2022.

O'Neil ST. "Teaching and Using R: A CS Perspective." Cascadia R Conference. Accepted abstract presentation, 2017.

O'Neil ST. "Assessing De-Novo Transcriptome Assemblies." Association of Biomolecular Research Facilities (ABRF). Accepted abstract presentation, 2017.

Hellman J, O'Neil S, Emrich S, Dzurisin J, Williams C. "Related insects show differing amounts of population differentiation and localization of transcribed genes in response to climate." Arthropod Genomics Symposium. Accepted abstract presentation, 2013.

O'Neil ST, Chaudhary A. "Comparing online learning algorithms to stochastic approaches for the multi-period newsvendor problem." Algorithm Engineering and Experiments (ALENEX). Presentation on accepted conference paper, 2008.

Awards: U. Notre Dame: Eck Institute for Global Health Bioinformatics Fellow (2010), Kaneb Center Outstanding Graduate Student Teacher (2008), Arthur J. Schmitt Fellow (2006).

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Leadership, Service, and Professional Experience

Organizing

AI/ML Workshop Organization (2018 to Present)
Exploring AI; lead workshop organizer, supported by the Research Informatics Office at CU Anschutz, 2023. Deep Learning Day; lead workshop organizer and presenter for University of Oregon graduate Bioinformatics program, 2018. Deep Learning in the Life Sciences; lead workshop organizer for the International Conference on Biomedical Ontology (ICBO), 2018.

Training Coordinator, National COVID Cohort Collaborative (2020 to Present)
Generated training and documenting for the multi-institution 3000+ member research collaborative, co-lead for the Education & Training Domain Team, organized and facilitated community peer support through work groups, office hours, and collaborative projects, primary editor on the Researchers Guide to N3C (see books).

Founder/Organizer, Bioinformatics Users' Group, Oregon State U. (2012 to 2018)
Regular meeting group for researchers dedicated to discussing bioinformatics topics and applications; upwards of 40 regularly attending members.

Co-Founder/Organizer, Society of Schmitt Fellows, U. Note Dame (2009 to 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/Organizer, Notre Dame/Michiana Science Cafe, U. Notre Dame (2009 to 2011)
A monthly venue for scientists and engineers to present interesting topics to the local community.

Teaching

Primary Instructor, Personalized & Genomic Medicine Program. CU Anschutz (2022 to Present).
Developed and taught Methods and Challenges in Observational Health Data Analysis.

Primary Instructor; MCB, Statistics, and CGRB, Oregon State U. (2012 to 2020)
Developed and taught multiple 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 Introduction to Unix/Linux, Command-Line Data Analysis, Data Programming in R, Introduction to Python, Simulating Natural Systems, Recursion & Dynamic Programming for Sequence Analysis, and Deep Learning for Life Scientists.

Primary Instructor; Craft Center, Oregon State U. (2016 to 2020)
Developed and taught community courses at the OSU Craft Center: Artistic Programming, 4 Hours of Code, and Introduction to 3D Modeling and Printing.

Primary Instructor; Computer Science and Engineering, U. Notre Dame (2010 to 2011)
Developed Basic Computing for Bioinformatics, offered to Biology graduate students, staff, and faculty focused on applied computational science.

Teaching Assistant; Computer Science and Engineering, U. Notre Dame (2008 to 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 (2008)
Software development for the supply chain optimization and inventory control team. Designed and implemented tools for visibility into Amazon.com's complex supply chain.

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Certifications and Professional Development

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

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

Search Advocate (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 (2017—present).