

Bernadette M. Boscoe

Department of Computer Science
Southern Oregon University
Ashland, Oregon 97520

Employment

Southern Oregon University , Ashland, OR	
<i>Associate Professor, Computer Science</i>	2026 – present
<i>Assistant Professor, Computer Science</i>	2023 – 2026
Occidental College , Los Angeles, CA	2021 – 2023
<i>Visiting Assistant Professor, Computer Science</i>	
University of California, Los Angeles , Los Angeles, CA	2020 – 2021
<i>Postdoctoral Researcher, Physics and Astronomy</i>	
University of Washington , Seattle, WA	2019 – 2020
<i>Postdoctoral Researcher, Information School and eScience Institute</i>	

Education

University of California, Los Angeles , Los Angeles, CA	Ph.D., Information Studies
California State University, Northridge , Northridge, CA	M.S., Mathematics
Northampton Community College , Bethlehem, PA	A.S., Computer Science
Pratt Institute , Brooklyn, NY	B.F.A., Painting

Publications (peer reviewed)

Boscoe, B., Saikrishnan, S., Seenivasan, V., Stark, J., Lizarraga, A., Himes, M., Soriano, J., Allen, P.J., & Do, T. "AquiLLM: Evaluating Faithfulness in Open-Weight RAG-LLM Systems for Scientific Research," United States Research Software Engineer Association (US-RSE) Conference, San Jose, CA, 2026. *Accepted*.

Stark, J., Saikrishnan, S., Seenivasan, V., Boscoe, B., Lizarraga, A., & Do, T. "AquiLLM: An Architecture for Supporting Tacit Knowledge Capture in Research Groups," N-GEN AI 2026, Trento, Italy, September 2026. *Accepted*. arXiv:2608.08883. doi: 10.48550/arXiv.2608.08883.

Soriano, J., Do, T., Saikrishnan, S., Seenivasan, V., Boscoe, B., Singal, J., & Jones, E.. Improving Generalization and Uncertainty Quantification of Photometric Redshift Models. *The Astronomical Journal*, 171(2), 114. 2026. <https://doi.org/10.3847/1538-3881/ae2ffe>

Campbell, C., Boscoe, B., Do, T. "AquiLLM: a RAG Tool for Capturing Tacit Knowledge in Research Groups," US-RSE. Philadelphia, PA, 2025. arXiv: arXiv:2508.05648. doi: 10.48550/arXiv.2508.05648.

B. Boscoe, S. Johnson, A. Osbon, C. Campbell, and K. Mager, "GreenCrossingAI: A Camera Trap/Computer Vision Pipeline for Environmental Science Research Groups," in *Practice and Experience*

in Advanced Research Computing (PEARC) 2025: The Power of Collaboration, Columbus, OH, July 2025. doi: 10.1145/3708035.

V. Seenivasan, S. Saikrishnan, A. Lizarraga, J. Soriano, B. Boscoe, and T. Do, "Combining datasets with different ground truths using Low-Rank Adaptation to generalize image-based CNN models for photometric redshift prediction," (accepted), Conference on Neural Information Processing Systems (NeurIPS), Machine Learning and the Physical Sciences Workshop, San Diego, California, Dec. 2025.

A. Lizarraga, E. Jiang, J. Nowack, Y. Li, Y.N. Wu, B. Boscoe, T. Do, "Understanding Galaxy Morphology Evolution Through Cosmic Time via Redshift Conditioned Diffusion Models," Machine Learning for the Physical Sciences Workshop, NeurIPS 2024, Vancouver, B.C. arXiv: arXiv:2411.18440. doi: 10.48550/arXiv.2411.18440.

J. Soriano, S. Saikrishnan, V. Seenivasan, B. Boscoe, J. Singal, and T. Do, "Using different sources of ground truths and transfer learning to improve the generalization of photometric redshift estimation," Machine Learning for the Physical Sciences Workshop, NeurIPS 2024, Vancouver, B.C., arXiv: arXiv:2411.18054. doi: 10.48550/arXiv.2411.18054.

E. Jones, T. Do, B. Boscoe, J. Singal, Y. Wan, and Z. Nguyen, "Improving Photometric Redshift Estimation for Cosmology with LSST Using Bayesian Neural Networks," *ApJ*, vol. 964, no. 2, p. 130, Mar. 2024, <https://iopscience.iop.org/article/10.3847/1538-4357/ad2070>.

Boscoe, B., Do, T. "Navigating the Integration of Machine Learning into Domain Research," US-RSE Conference, Chicago, Illinois, October 2023, DOI 10.5281/zenodo.10420441.

Boscoe, B., Do, T. Jones, E., Li, Y., Alfaro, K. and Ma, C., "Elements of effective machine learning datasets in astronomy," NeurIPS, Machine Learning for the Physical Sciences Workshop, New Orleans, December 2022. doi: arXiv:2211.14401v2 [astro-ph.IM].

Singal, J., Silverman, G., Jones, E., Do, T., Boscoe, B., Wan, Y. "Machine Learning Classification to Identify Catastrophic Outlier Photometric Redshift Estimates" , *The Astrophysical Journal (ApJ)*, vol. 928, no. 1, p. 6, Mar. 2022, doi: 10.3847/1538-4357/ac53b5.

Jones, E., Do, T., Boscoe, B., Wan, Y., Nguyen, Z, Singal, J. "Photometric Redshifts for Cosmology: Improving Accuracy and Uncertainty Estimates Using Bayesian Neural Networks", NeurIPS , Machine Learning for the Physical Sciences Workshop, (Virtual) December 2021. arXiv:2202.07121v1 [astro-ph.CO].

Scroggins, M., Boscoe, B. (2020). "Once FITS, Always FITS? Astronomical Infrastructure in Transition," in *IEEE Annals of the History of Computing*, vol. 42, no. 2, pp. 42–54, Apr. 2020, doi: 10.1109/MAHC.2020.2986745.

Boscoe, B. (2020) *The What of Data: Defining Which Scientific Research is Appropriate to Share*. In A. Sundqvist, G. Berget, J. Nolin, and K. I. Skjerdingsstad (Eds.), *iConference: Sustainable Digital Communities* (pp. 687-694). Springer International Publishing. https://doi.org/10.1007/978-3-030-43687-2_58.

Scroggins, M., Pasquetto I., Geiger S., Boscoe, B., Darch, P., Cabasse-Mazel, C., Thompson, C., & Golshan, M. Borgman, C., (2020). Thorny problems in data (-intensive) science. *Commun. ACM* 63, 8 (August 2020), 30–32. doi:<https://doi.org/10.1145/3408047>.

Boscoe, B. (2019). In *Algorithmic Processes, When is Human Intervention Necessary for Transparency?*, Henning Blatt et al (eds), *Annu. Book Freedom Inf. Law (Jahrb. Für Informationsfreiheit Informationsrecht 2018)* Lexxion. Berlin, Germany.

Boscoe, B. (2019). Creating Transparency in Algorithmic Processes. *Delphi - Interdisciplinary Review of Emerging Technologies*, 2(1), 12-22. <https://doi.org/10.21552/delphi/2019/1/5>.

Wofford, M. F., Boscoe, B., Borgman, C. L., Pasquetto, I. V., & Golshan, M. S. (2019). "Jupyter notebooks as discovery mechanisms for open science: Citation practices in the astronomy community", in *IEEE Computing in Science & Engineering, Software and Data Citation*, vol. 22, no. 1, pp. 5-15, doi: 10.1109/MCSE.2019.2932067. Open access: <https://escholarship.org/uc/item/7zn2x3c8>.

B. Boscoe, "From Blurry Space to a Sharper Sky: Keeping Twenty-Three Years of Astronomical Data Alive," Ph.D Dissertation, University of California, Los Angeles, 2019. <https://escholarship.org/uc/item/2jv941sb>.

Boscoe, B. (2018). Machine Learning Algorithms: Transparent Checkpoints. For Transparency and Society - Between Promise and Peril, Herrenhausen Conference, Berlin-Brandenburg Academy of Sciences and Humanities (BBAW), Berlin, Germany.

(formerly B. Randles)

Pasquetto, I., Randles, B., & Borgman, C. (2017). On the Reuse of Scientific Data. *Data Science Journal*, 16(0). <https://doi.org/10.5334/dsj-2017-008>.

Randles, B. M., Pasquetto, I. V., Golshan, M. S., & Borgman, C. L. (2017). Using the Jupyter Notebook as a Tool for Open Science: An Empirical Study. In 2017 ACM/IEEE Joint Conference on Digital Libraries (JCDL) (pp. 1–2). <https://doi.org/10.1109/JCDL.2017.7991618>.

Borgman, C. L. , Golshan, M., Sands, S.E., Wallis, J.C., Cummings, R.L., Randles, B.M. (2016). Data Management in the Long Tail: Social and Technical Opportunities. In *Proceedings of the 11th International Digital Curation Conference*. Amsterdam. <http://www.ijdc.net/article/view/11.1.128/432>.

Yoon, D., Chen, N., Randles, B., Cheatle, A., Lockenhoff, C. E., Jackson, S. J., Sellen, S. & Guimbretiere, F. (2016, February). RichReview++: Deployment of a Collaborative Multi-modal Annotation System for Instructor Feedback and Peer Discussion. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing* (pp. 195-205). ACM. <https://dl.acm.org/doi/10.1145/2818048.2819951>.

Posters

Nunn, K., Boscoe, B., Johnson, S., Mager, K., Campbell, C., "Teaching Scalable Wildlife Image Processing with NAIRR Jetstream2 GPUs to Undergraduates," National Artificial Intelligence Research Resource (NAIRR) Conference, Arlington, VA, 2026.

Boscoe, B., Kim, D., "Assessing MegaDetector's Performance in Rural Oregon: Identifying Biases in Wildlife Detection," Accelerating Statistical Inference and Experimental Design with Machine Learning Workshop, Issac Newton Institute for Mathematical Sciences, Cambridge, UK, 2025.

Nowack, J., Saikrishnan, S., Seenivasan, V., Do, T. Boscoe, B., Chen, Z., Campbell, C., "Dual-Branch Neural Networks for Galaxy Redshift Estimation," The United States Research Software Engineer Association (US-RSE) Conference, Philadelphia, 2025.

Campbell, C., Boscoe, B., Do, T. A Retrieval Augmented Generation Tool for Research Groups. Gateways 2024, Bozeman, MT.

Boscoe, B. "Scaling Up: Incorporating HPC Experience into Undergraduate Data Science Course using Gateways", ADMI (Association of Computer Science Departments at Minority Institutions) Science Gateways and High Performance Computing, Atlanta, GA, April, 2024.

Boscoe, B., Cheng, H., "Introducing Parallel Programming to Undergraduates using ChatGPT". EduPar-24, NSF-TCPP Workshop on Parallel and Distributed Computing Education, San Francisco, CA, May, 2024.

Boscoe, B. "Incorporating HPC Experience into Undergraduate Education using Gateways", Faculty Hackathon, SGX3 Science Gateways Conference, Pittsburgh, PA, October 2023.

E. Jones, T. Do, Y. Wan, Z. Nguyen, B. Boscoe, and J. Singal, "Photometric Redshifts for Cosmology: Improving Accuracy and Uncertainty Estimates Using Bayesian Neural Networks," presented at the Institut d'Astrophysique de Paris, Paris, October, 2021.

Boscoe, B. (2021). From a Legacy System to an Open Source Library: What can we learn about sustaining software tools over decades? SIAM CSE21 Conference, minisymposium PP7: Software Productivity and Sustainability for CSE. <https://doi.org/10.6084/m9.figshare.14052224.v3>.

Randles, B. M. , Sands, A.E. & Borgman, C. L. (2016). Too Big to Share? Scaling up knowledge transfer workflows in computational sciences. Force 16 Conference, Portland, Oregon.

Randles, B., Yoon, D., Cheatle, A., Jung, M., & Guimbretiere, F. (2015, March). Supporting Face-to-Face Like Communication Modalities for Asynchronous Assignment Feedback in Math Education. In Proceedings of the Second (2015) ACM Conference on Learning@ Scale (pp. 321-326). ACM.

Invited Talks

"AI education and research with national infrastructure: lessons from AquILLM and NAIRR." Invited talk presented at the CIAO Cyberinfrastructure Alliance for Oregon Workshop, Portland, OR, April 2026.

"AquILLM- a RAG-LLM for Capturing Tacit Knowledge in Research Groups," at CounterBalance - Institutions and Interpretive Authority: A Showcase of Digital Tools, Santa Fe Institute, February 2026.

"Arrays from the Sky: Astronomy and Data Science/Computer Science Collaborations", Willamette University, Salem, OR, September 2024.

Presentations

B. Boscoe, "AquILLM: A RAG tool for capturing tacit knowledge in research groups". Santa Fe Institute, May 2025.

B. Boscoe, A. Cheatle, "Green crossings: Student/Machine Learning in the Life Sciences". 4S Conference, Amsterdam, July 2024.

B. Boscoe, "To Have and Have Not: Addressing inequities for learners accessing computational science environments," presented at ICCS 2022: International Conference on Computational Science, London, United Kingdom, June 2022.

B. Boscoe, "Three workflow add-ons to improve machine learning reproducibility in astronomy," presented at the ADASS XXXI (Astronomical Data Analysis Software and Systems), Capetown, South Africa and Online, Oct. 2021.

Boscoe, B. Research Software Engineers as Maintainers: Keeping Code Alive. RSE-HPC 2020: Research Software Engineers in HPC- Creating Community, Building Careers, Addressing Challenges, part of SC2020, SuperComputing Conference. November 2020.

Boscoe, B. Machine Learning in Astronomy: Galaxies ML. UC Southern Hub: Frontiers in Machine Learning for the Physical Sciences. Virtual Symposium, October 2020.

Boscoe, B. Data and Code Practices in Astronomy. The iSchool colloquium series, University of Washington, Seattle, October 2019.

Boscoe, B. From Blurry Space to a Sharper Sky: Twenty three years of astronomical data. Galactic Center Workshop, UCLA, December 2018.

Boscoe, B. An Alternative Assessment of AI. Adria Information Disorder AI Tools Workshop. School of Communication and Media, Social Centre of Primorska, Koper, Slovenia, June 2018.

Boscoe, B. To Ditch, or Not to Ditch (the FITS): The file format dilemma in astronomy. European Southern Observatory, Garching, Germany, June 2018.

Boscoe, B. Spacetime and Codetime: Twenty years of data reuse. Galactic Center Group Annual Workshop, UCLA, December 2017.

Boscoe, B. Spacetime and Codetime: Astronomical algorithms evolving through dimensions of temporality and materiality. In Panel Making Algorithms: Inscriptions, Benchmarks and Computers. 4S, Boston, Massachusetts, September 2017.

Boscoe, B. Citing the Jupyter Notebook in the Scientific Publication Process. With Hope Chen (Harvard University) and Catherine Zucker (Harvard University). JupyterCon, New York, New York, August 2017.

Boscoe, B. Sharing Your Code: Factors on going public. At Python in Astronomy, Lorentz Center, Leiden, The Netherlands, May 2017.

Boscoe, B. Scaling Up: Growing data infrastructures of the Galactic Center Group. Galactic Center Group Annual Workshop, UCLA, November 2016.

Workshops/Panels

Building RAG-LLMs Workshop, Southern Oregon University, Ashland, Oregon, September 2024.

Nordic ProbaAI, Probabilistic AI Workshop, Copenhagen, June 2024.

Geoscience Data Commons Workshop, NCAR (National Center for Atmospheric Research) Boulder, CO, May 2024.

Maintaining FITS in Two Careers. Panel discussion, Maintaners III: Practice ,Policy and Care. Gallaudet University, Washington D.C., October 2019.

Open Source Software Health Index Workshop, Harvard University IQSS, Cambridge, MA, June 2019.

Second US Research Software Sustainability Institute (URSSI) Workshop. Chicago, IL, October 2018.

First US Research Software Sustainability Institute (URSSI) Workshop. Berkeley, CA, April 2018.

Geometry of Redistricting Workshop by Metric Geometry and Gerrymandering Group of Tufts University. University of San Francisco, CA, March 2018.

Diversity and Inclusion in Scientific Computing (DISC) Unconference Workshop. At PyData Conference, New York City, November 2017.

Cheatle, A., and Randles, B. (2015). Incorporating Feminist Perspectives to Develop and Sustain Inclusionary Practices in Open Online Education Environments. Position paper for the workshop on Feminism and Feminist Approaches in Social Computing, Computer Supported Cooperative Work Conference, Vancouver, B.C.

Datasets

T. Do, B. Boscoe, E. Jones, Y. Q. Li, and K. Alfaro, "GalaxiesML: a dataset of galaxy images, photometry, redshifts, and structural parameters for machine learning," 2024, arXiv: arXiv:2410.00271. doi: 10.48550/arXiv.2410.00271.

Grants/Awards

NSF CRII: OAC: AquilLLM: A knowledge-based AI tool to keep data alive. Award 2448094, 2025-2027. \$164,123.

Alfred P. Sloan award, AquilLLM: a RAG-LLM to preserve tacit knowledge in research groups, 2024. PI. \$245,004.

NAIIR Classroom Pilot Award, NSF, 2024 (Compute credits)

ACCESS-CI Workshop Grant for RAG-LLM Workshop. PI. \$28,000.

Wildlabs and Arm award for project "GreenCrossingAI", 2024. PI. \$10,000.

NSF-ACCESS Allocations credit award for "Getting Undergraduates Started with HPC and GPUs", 2023-present

SIAM Early Career Travel Award (NSF funded), SIAM Conference on Computer Science and Engineering, March 2021.

Dissertation Proposal Award, Department of Information Studies, UCLA, 2018.

URSSI (US Research Software Sustainability Institute) first and second workshops, travel grants, April and October 2018.

Herrenhausen Conference: Transparency and Society- Between Promise and Peril. Travel grant. Berlin, Germany, June 2018.

Geometry of Redistricting Workshop. Travel grant. University of San Francisco, CA, March 2018.

Diversity and Inclusion in Scientific Computing (DISC) Unconference Workshop. Travel grant. New York, New York, November 2017.

JupyterCon Travel grant. New York, New York, August 2017.

Python In Astronomy Travel grant. Leiden, The Netherlands, May 2017.

The Pipeline Workshop: Diversifying the HPC Workforce. Travel grant. University of New Mexico, January, 2017.

WSSSPE 3 Travel grant. Workshop on Sustainable Software for Science: Practice and Experiences. Boulder, CO, 2015.

PUMP Scholarship, Preparing Undergraduates through Mentoring toward PhDs (PUMP) Program, 2008-2009.

Elizabeth Greenshields Foundation Award for Emerging Artists, 1999.

Teaching

Southern Oregon University:

CS 256 Computer Science I
 CS 200 Introduction to Computer Science
 CS 210 Introduction to Web Development
 CS 333 Web Development II
 CS 259 Object-Oriented Programming (C++)
 CS 317 Introduction to Data Science
 CS 480 Machine Learning
 CS 250 Discrete Math

Occidental College:

Databases, Java, Data Science, Computer Organization, Computer Science I, Operating Systems

UCLA:

Machine Learning for the Physical Sciences, Internet and Society

California State University, Northridge:

Algebra I, Algebra II, Calculus for Business Applications

Selected Professional Experience

FourthBrain, Remote 2021

Curriculum Manager and Lead Instructor, Machine Learning Engineer Program (Contract)
 Curriculum development and instruction in machine learning, deep learning, data engineering, MLOps, and cloud-based AI systems.

Cornell University, Ithaca, NY 2012–2015

Instructional & Research Technologist, Academic Technologies
 Developed computational tools and supported faculty in research computing, programming, and instructional technology.

Service

2024-Present	SOU Technology Council
2025	NAIRR Pilot Program Committee
2025- 2026	NSF CISE Reviewer
2024-Present	Reviewer, NAIRR Pilot Program
2025	Reviewer, PEARC 25
2024	Reviewer, Alfred P. Sloan Foundation
2024	Reviewer, US-RSE Conference
2023	Reviewer, JASIST
2019	Reviewer, iConference
2018	Reviewer, iConference
2018	Reviewer, Data Science Journal
2018	Reviewer, SciPy Conference

Press

- Undergraduate Student Leads LLM workshop in Oregon
(<https://access-ci.org/undergraduate-student-leads-llm-workshop-in-oregon/>)
- SOU's Boscoe Awarded Second Tacit Knowledge Grant
(<https://news.sou.edu/2025/05/sous-boscoe-awarded-second-tacit-knowledge-grant/>)
- SOU Computer Scientist Receives Sloan Grant for Tacit Knowledge Research
(<https://news.sou.edu/2024/10/sou-computer-scientist-receives-sloan-grant-for-tacit-knowledge-research/>)
- SOU Students Support Wildlife Project on I-5
(<https://sou.edu/academics/sou-students-support-wildlife-project-on-i-5/>)
- US NAIRR Pilot Brings Cutting-edge AI Resources to Researchers (NSF Science Matters)
(<https://www.nsf.gov/science-matters/us-nairr-pilot-brings-cutting-edge-ai-resources-researchers>)