Jake Callahan

EDUCATION

Doctor of Philosophy , The University of Arizona	Tucson, AZ
Applied Mathematics	2023–Present
Master of Science, Brigham Young University	Provo, UT
Mathematics	2021–2023
 Thesis: "Hamiltonian Monte Carlo for Reconstructing Historical Earthquake-Induced Tsunamis." Advisor: Jared Whitehead 	
Bachelor of Science , Brigham Young University	Provo, UT
Mathematics: Applied and Computational Emphasis	2016–2020

PUBLICATIONS

Journal Articles

- J. Callahan, M. Kevin, R. Villareal, and T. Catanach, "Analysis and optimization of seismo-acoustic monitoring networks with Bayesian optimal experimental design", *Geophysical Journal International*, vol. 240, no. 3, pp. 1802–1824, Jan. 2025, ISSN: 1365-246X. eprint: https://academic.oup.com/gji/article-pdf/240/3/1802/61489819/ggae458.pdf.
- [2] A. King, J. Murri, J. Callahan, A. Russell, and T. J. J. and, "Mathematical analysis of redistricting in utah", *Statistics and Public Policy*, vol. 9, no. 1, pp. 136–148, 2022. eprint: https://doi.org/10.1080/2330443X.2022.2105770.

In Preparation

[3] A. Chin, J. Callahan, J. Pacheco, and T. Catanach, "Reverse Sequential Monte Carlo for Efficient Bayesian Optimal Experimental Design"", *Under review.*, 2025.

Conference Proceedings

[4] J. Callahan and T. Catanach, "Importance sampling in Bayesian OED for sensor placement", in Computer Science Research Institute Summer Proceedings 2021, The Computer Science Research Institute at Sandia National Laboratories, Albuquerque, NM, 2021, pp. 283–292.

Invited Presentations and Posters

[5] T. Catanach, J. Callahan, K. Monogue, and R. Villareal, "Bayesian OED for sensor placement: Analysis and optimization of seismo-acoustic monitoring networks with Bayesian optimal experimental design", SIAM Conference on Computer Science and Engineering, Amsterdam, The Netherlands, 2023.

Contributed Presentations and Posters

- [6]J. Callahan, J. Whitehead, R. Harris, T. Paskett, C. Noorda, and R. Wonnacott, "Markov-chain Monte Carlo methods for reconstructing historical earthquake-induced tsunamis", American Geological Union Fall Meeting, Chicago, IL, USA, 2022.
- J. Callahan, J. Whitehead, R. Harris, T. Paskett, C. Noorda, and R. Wonnacott, "Markov-chain Monte [7]Carlo methods for reconstructing historical earthquake-induced tsunamis", Geological Society of America Connects, Denver, CO, USA, 2022.

TEACHING

- Graduate Student Instructor, The University of Arizona Fall 2023 – present College Algebra (Math 112): Instructor of record; Design & deliver lectures; create & grade assessments; hold weekly office hours
- Graduate Teaching Assistant, The University of Arizona Fall 2024–Spring 2025 Theoretical Foundations of Applied Math (Math 584). Graduate-level Real Analysis and Probability Theory; core requirement for the Applied Math program. Led recitation sessions, graded assignments, & held regular office hours.
- Graduate Student Instructor, Brigham Young University Spring 2022 Quantitative Reasoning (Math 102): Instructor of record; developed lectures, exams & homework; led recitations; held office hours
- Graduate Teaching Assistant, Brigham Young university Fall 2021 – Spring 2023 Theory of Analysis 2 (Math 342) & Calculus 1 (Math 112): led recitations; graded coursework; held office hours

WORK EXPERIENCE

Sandia National Laboratories Research and Development Intern, Computer Science Research Institute — Supervisor: Tommie Catanach	Livermore, CA May 2021–present
Utah National Guard	Spanish Fork, UT
Soldier	August 2020–August 2023
Orderboard, Inc.	Orem, UT
Data Scientist	May 2019–May2021
Honeywell, Inc	Charlotte, NC
Automation and Cognitive Services Intern	Summer 2020

MINI-SYMPOSIA ORGANIZED

Is Quantifiable Uncertainty Achievable? A (mostly) Bayesian Perspective	Logan, UT
SIAM Northern States Section Conferences	April 2023

- 6 speakers, co-organized with Jared Whitehead and Raelynn Wonnacott

WORKSHOPS ATTENDED

•	Uncertainty Quantification Summer School	August 2023
	University of Southern California, CA, USA	
	Summer School on the Theory and Application of Lattices	August 2023

August 2023

EXTRACURRICULAR ACTIVITIES

- Society for Industrial and Applied Mathematics (SIAM)
- American Mathematical Society (AMS)