Sequoia Andrade
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EDUCATION

University of California, Berkeley August 2024-Present
Ph.D. Statistics
Related Coursework: Theoretical Statistics, Probability Theory, Applied Statistics, Statistical Consulting, Case Studies in Prediction, Policy, and AI

San Francisco State University May 2024
M.S. Statistical Data Science
GPA: 4.0 (Distinguished Student Award)
Related Coursework: Probability Models, Advanced Probability Models, Categorical Data Analysis, Database Management Systems, Topics in Big Data, Statistical and Machine Learning, Computational Statistics
Thesis: A Statistical Analysis of Wildland and Prescribed Fires in the Changing California Climate

Santa Clara University June 2020
B.S. Mathematics (applied emphasis), Psychology
GPA: 3.71 (Magna Cum Laude)
Related Coursework: Probability and Statistics I (Probability Theory), Probability and Statistics II (Statistics), Advanced Calculus, Ordinary Differential Equations, Partial Differential Equations, Combinatorics, Numerical Analysis, Advanced Linear Algebra, Research Methods, Object Oriented Programming

FELLOWSHIPS

National Science Foundation Graduate Research Fellowship Program (NSF GRFP)
Awarded: 2022 | On reserve: 2022-2024 |Funded years: 2024-2027
UC Berkeley Chancellor's Fellowship
Awarded: 2024

SKILLS

Machine Learning: classification and regression, natural language processing, computer vision, neural networks (fully connected, convolutional, recurrent), self-supervised learning, supervised learning
Programming: Rust, Python (Sklearn, Pandas, Transformers, Tensorflow, Pytorch, Ray), R, SQL, GDAL, Scala, Google Earth Engine, Julia, SPSS, C++, MATLAB, Javascript
Research: Public presentations with slides and posters, literature review, team coordination, time management, project scheduling, scientific writing, peer review

RESEARCH EXPERIENCE

Graduate Student Research Fellow, University of California, Berkeley 2024-Present
Department of Statistics

- Translated Julia research code base into a reusable, modular Python package for carbon emission inversion modeling and increased computational efficiency by leveraging matrix sparsity
- Implemented non-parametric statistics to analyze the effect of bomb threats on polling places in Georgia in the 2024 general election, which led to a conference presentation and publication
- Authored two Expert Declarations filed as evidence in a complaint for a Racial Justice Act violation lawsuit based on non-parametric simulation-based statistical inference and non-parametric combination of tests

Graduate Student, San Francisco State University 2022-2024
Department of Mathematics
Advisor: Dr. Alexandra Piryatinska

- Created novel dataset suitable for studying the effect of prescribed fires on wildfires while controlling for climate variables by fusing disparate data sources from 2015-2022
- Performed cross-correlation time series analysis to identify relevant variables
- Utilized non-parametric statistical tests and regression models to evaluate the effect of prescribed burn treatment on wildfire size

Research Engineer, NASA Ames Research Center 2020-Present
Open Data Integration for Wildfire Response (ODIN-Fire)

- Developed cloud and smoke classification model to improve satellite-based wildfire detection
- Trained and evaluated fully connected neural network for image segmentation to classify smoke from cloud using Tensorflow and self-supervised pre-training
- Deployed model on python server and displayed results in a javascript application using actor-based messaging system in Scala
- Resulted in multiple presentations and journal manuscript in progress

Manager for Intelligent Knowledge Access (MIKA)

- Developed and applied Hazard Extraction and Analysis of Trends (HEAT) algorithm for use on large datasets containing both qualitative and quantitative data
- Implemented transformer-based natural language processing algorithms for information discovery, custom named-entity recognition, classification, and topic modeling
- Leveraged statistical analysis methods to interpret findings, identify significant predictors of hazard occurrence, and examine significant differences
- Resulted in four peer-reviewed journal publications

Intern, NASA Ames Research Center 2020
System Modeling and Analysis of Resilience in Scalable Traffic Management for Emergency Response Operations (SMARt-STEReO)

- Collaborated with other interns to develop a simulation model of wildfire propagation and response using Python
- Identified research questions on system performance and resilience and tested research questions using statistics (t-test, ANOVA)
- Resulted in four publications, including one peer-reviewed journal publication and two technical reports

TEACHING EXPERIENCE

Graduate Student Instructor, UC Berkeley 2025-2026
Courses: Reproducible and Collaborative Data Science, Data Analysis and Machine Learning for Real-World Decision Making
Peer Educator, Santa Clara University 2020
Course: Precalculus
Tutor, Santa Clara University 2019-2020
Course: Precalculus
Academic Coach, Cardinal Education 2019-2020
Courses: Precalculus, AP Calculus B/C, Algebra II, Algebra I, Chemistry, Neuroscience

MENTORING EXPERIENCE

Mentor to UC Berkeley Statistics Undergraduate students 2025-2026
Mentor to Mason Lee through NASA internship program 2023
Mentor for Teens in AI Bay Area Hackathon 2023
Mentor to Cindy Valdez through NASA internship program 2021-2022

PUBLICATIONS

Peer-reviewed Journal Publications:

1. Andrade, Sequoia R., Shafiei,Nastaran, Mehlitz, Peter C. “Smoke or cloud: Real-time satellite image segmentation in a wildfire data integration application”. *Computers & Geosciences* 204 (2025): 105960.
2. Andrade, Sequoia R., and Walsh, Hannah S. "Machine learning framework for Hazard Extraction and Analysis of Trends (HEAT) in wildfire response." *Safety science* 167 (2023): 106252.
3. Andrade, Sequoia, and Walsh, Hannah S. "Natural-Language-Processing-Enabled Quantitative Risk Analysis of Aerial Wildfire Operations." *Journal of Aerospace Information Systems* (2023): 1-13.
4. Andrade, Sequoia R., and Hulse, Daniel E., "Evaluation and Improvement of System-of-Systems Resilience in a Simulation of Wildfire Emergency Response," in *IEEE Systems Journal*, vol. 17, no. 2, pp. 1877-1888, June 2023, doi: 10.1109/JSYST.2022.3169125.
5. Andrade, Sequoia R., and Walsh, Hannah S. "Discovering a failure taxonomy for early design of complex engineered systems using natural language processing." *Journal of Computing and Information Science in Engineering* 23.3 (2023): 031001.
6. Andrade, Sequoia R., and Walsh, Hannah S. “MIKA: Manager for Intelligent Knowledge Access Toolkit for Engineering Knowledge Discovery and Information Retrieval”. 2023. *INCOSE International Symposium*, 33: 1659-1673. https://doi.org/10.1002/iis2.13105

Conference Publications:

1. Andrade, Sequoia and Stark, Philip "Does Extending Polling Hours Compensate for Bomb Threats? Evidence from the 2024 Election in Georgia, USA", *E-Vote-ID*. October 2025
2. Mbaye, Seydou; Hulse, Daniel; Irshad, Lukman; Walsh, Hannah, Andrade, Sequoia "Towards Computational Functional Hazard Assessment (CFHA): A Gap Analysis and Concept for Emerging Aviation Systems," AIAA 2025-1411, *AIAA SciTech 2025 Forum.* January 2025.
3. Andrade, Sequoia R.; Mbaye, Seydou; Davies, Misty; Jones, Garfield, "Evaluating Faulty State Occurrence in Wildfire UAS Missions Using Markov Chains," AIAA 2024-4365. *AIAA AVIATION 2024 Forum*. July 2024.
4. Andrade, Sequoia R., and Walsh, Hannah S. "SafeAeroBERT: Towards a Safety-Informed Aerospace-Specific Language Model," AIAA 2023-3437. *AIAA AVIATION 2023 Forum*. June 2023.
5. Andrade, Sequoia R., and Walsh, Hannah S. "What Went Wrong: A Survey of Wildfire UAS Mishaps through Named Entity Recognition," *2022 IEEE/AIAA 41st Digital Avionics Systems Conference (DASC)*, Portsmouth, VA, USA, 2022, pp. 1-10, doi: 10.1109/DASC55683.2022.9925798. *Awarded 2nd Best of Conference.*
6. Walsh, Hannah S., and Andrade, Sequoia R.. "Semantic Search With Sentence-BERT for Design Information Retrieval." International Design Engineering Technical Conferences and Computers and Information in Engineering Conference. Vol. 86212. American Society of Mechanical Engineers, 2022.
7. Andrade, Sequoia R., and Walsh, Hannah S. "Machine Learning Enabled Quantitative Risk Assessment of Aerial Wildfire Response." AIAA AVIATION 2022 Forum. 2022.
8. Andrade, Sequoia R., and Walsh, Hannah S. "Knowledge discovery for early failure assessment of complex engineered systems using natural language processing." International Design Engineering Technical Conferences and Computers and Information in Engineering Conference. Vol. 85376. American Society of Mechanical Engineers, 2021.
9. Andrade, Sequoia R., and Walsh, Hannah S. "Wildfire Emergency Response Hazard Extraction and Analysis of Trends (HEAT) through Natural Language Processing and Time Series." 2021 IEEE/AIAA 40th Digital Avionics Systems Conference (DASC). IEEE, 2021.
10. Andrade, Sequoia R., et al. "The system modeling and analysis of resiliency in stereo (smart-stereo)." AIAA AVIATION 2021 FORUM. 2021.

Technical Reports:

1. Andrade, Sequoia, Hulse, Daniel E., Irshad, Lukman, & Walsh, Hannah S., "Supporting Hazard Analysis for Wildfire Response Using fmdtools and MIKA." 2022.
2. Lehman, Sarah M., Slagel, Tanner J., Andrade, Sequoia, Walsh, Hannah, Goodloe, Alwyn, Brandt, Summer L., & Neogi, Natasha. "NASA System-Wide Safety Wildland Firefighting Operations Workshop Report" (No. NASA/TM-20220014721). 2022.
3. Hulse, Daniel E., Andrade, Sequoia R., Spirakis, Eleni, Walsh, Hannah S., and Davies, Misty D. "SMARt-STEReO: Preliminary Model Description." 2020.
4. Walsh, Hannah S., Spirakis, Eleni, Andrade, Sequoia, R., Hulse, Daniel E., & Davies, Misty D. "SMARt-STEReO: Preliminary concept of operations" (No. NASA/TM-20205007665). 2020.

Presentations:

1. Andrade, Sequoia; Asimow, Naomi; Giordano, Ryan; Cohen, Ronald, "Towards Accelerated CO_2 Inversion Modeling for Understanding Uncertainties through Multicore Processing and a Reusable Code Base." American Geophysical Union Annual Meeting. 2025.
2. Andrade, Sequoia; Mehlitz, Peter; Nastaran; Coughlan, Joseph; Brat, Guillaume , "Improving Satellite-Based Hotspot Detection Through Deep Learning-Enabled Smoke Recognition." American Geophysical Union Annual Meeting. 2024.
3. Andrade, Sequoia and Piryatinska, Alexandra., "Towards a Statistical Analysis of Wildland and Prescribed Fires in the Changing California Climate." CSU Mathematical Sciences Conference. 2023.
4. Andrade, Sequoia and Walsh, Hannah., "Natural Language Processing Techniques for Intelligent Knowledge Management of Safety Reports." NASA Data Science Summit. 2022.

CERTIFICATIONS

AWS Cloud Practitioner 2022
Unsupervised Data Science for Aviation, NASA 2022
Advanced Data Science for Aviation, NASA 2021
Data Science for Aviation, NASA 2021

LEADERSHIP

Treasurer, Statistics Graduate Student Association 2025
UC Berkeley
Treasurer, Association for Women in Mathematics 2019-2020
Santa Clara University
President, Pi Mu Epsilon, Eta Chapter 2019-2020
Santa Clara University