Jeffrey Keithley

Curriculum Vitae

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Education

2026 **Doctor of Philosophy (Expected)**, *Computer Science*, The University of Iowa, Advisors: Dr. Sriram Pemmaraju and Dr. Bijaya Adhikari
3.89/4.33 GPA

2020 **Bachelor of Science**, *Mathematics*, New Mexico Tech, (Presidential Scholarship and Tech Scholar designation)
3.91/4.00 GPA

Experience

2021–present **Research Assistant**, *Computational Epidemiology Research Group*, The University of Iowa, Iowa City, Iowa

- Temporal vaccine allocation with respect to varying spatial scales under a meta-population disease model.
  Key skills: complex network analysis, disease modeling, resource allocation, submodular optimization, approximation algorithm guarantees, network data exploration/processing
- Online hospital room assignment to minimize infection spread between room clusters.
  Key skills: online algorithms, optimization

2020–present **Research Assistant**, *Analytics, Intelligence, and Technology Division*, Los Alamos National Laboratory, Los Alamos, New Mexico

- Analysis and forecasting of COVID-19 hospitalizations
  Key skills: data exploration/processing/visualization, time series analysis/forecasting
- Modeling genetic patterns of migration for cholera spread
  Key skills: meta-population disease models, data gathering/exploration
- Modeling mosquito borne illness under climate change
  Key skills: object oriented programming, large scale code development, data fusion

Summer 2023 **REU Computing for Health and Well-being Co-mentor**, *Department of Computer Science*, The University of Iowa, Iowa City, Iowa
Guiding an undergraduate student in a project which models equity in vaccine allocation.

Spring 2023 **Teaching Assistant**, *Department of Computer Science*, The University of Iowa, Iowa City, Iowa
Led discussion sections guiding students in solving problems for a data structures and algorithms class

Summer 2020 **Summer Intern**, *Computational Physics Summer School*, Los Alamos National Laboratory, Los Alamos, New Mexico
Performed research in applying deep neural networks to photon and neutron transport simulation
Key skills: computational nuclear physics, recurrent neural networks

Summer 2019 **Summer Intern**, *Parallel Computing Research Internship*, Los Alamos National Laboratory, Los Alamos, New Mexico
Performed bench-marking study in FORTRAN stencil kernel performance and collaborated with other project teams to generalize results
Key skills: high performance computing, cache performance, FORTRAN

2017–2020 **Teaching Assistant**, *Departments of Mathematics and Computer Science*, New Mexico Tech, Socorro, New Mexico

- Grader, TA, and tutor for a C programming class (2017)
- Grader for vector analysis and calculus III (2018, 2020)
- Teaching Assistant for calculus I (2019)

Publications

Peer-Reviewed Journal Articles

M. Wilinski, L. Castro, **J. Keithley**, C. Manore, J. Campos, E. Romero-Severson, D. Domman, A. Lokhov, "Congruity of genomic and epidemiological data in modeling of local cholera outbreaks," 2022. *Under review.*

I. Trejo, M. Barnard, J. Spencer, **J. Keithley**, K. Martinez, I. Crooker, N. Hengartner, E. Romero-Severson, C. Manore, "Changing temperature profiles and the risk of dengue outbreaks," PLOS Clim 2(2): 0000115. https://doi.org/10.1371/journal.pclm.00001152023, 2023. *Featured on SIAM front page news, 4-3-23.*

Technical Reports

L. Nguyen, **J. Keithley**, D. Armstrong, E. Nelson, and G. Maskaly. "Deep Neural Networks for Photon and Neutron Transport," LANL CompPhys Workshop Final Report, 2020, LA-UR-20-28407.

Presentations

Invited Talks

Designing Near-Optimal Spatial Vaccine Allocation Strategies, *CDC MInD Meeting*, Feb 2023

Mosquito-borne Disease Forecasting under Climate Change, *"What's Up with LANL Students?" Series*, Jul 2021

UI CS department colloquium panel on securing internships, *Iowa City, Iowa*, Oct 2022

Conference Talks

Vaccine Allocation Approximation Guarantees for Curbing Outbreaks, *INFORMS Annual Meeting*, Oct 2022

Conference Posters

Getting the Most out of Your Stencil Kernel on CPUs and GPUs, *LANL Student Symposium*, Aug 2019

Honors and Awards

Civil Air Patrol Mitchell Award, *2014*

Scientific Service

Peer Review

Association for the Advancement of Artificial Intelligence (AAAI) (2021)
Knowledge Discovery and Data Mining (KDD) (2021)
KDD EpiDAMIK Workshop (2022)
International Joint Conference on Artificial Intelligence (IJCAI) (2022, 2023)
SIAM International Conference on Data Mining (SDM) (2021, 2022)
Data Mining and Knowledge Discovery (DAMI) (2022)