

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.0000115> 2023. *Featured on SIAM front page news, 4-3-23*.
- Technical Reports **J. Keithley** and L. Nguyen, "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)**