

Benjamin (Min) Wesley Priest (they/them)

CONTACT INFORMATION

Postdoctoral Researcher
Center for Applied Scientific Computing
Lawrence Livermore National Laboratory
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E-mail: priest2@llnl.gov

RESEARCH INTERESTS

Efficient analysis of large, dynamic datasets: sketching, streaming algorithms, machine learning, high performance computing, graph algorithms, numerical linear algebra, compressed sensing, graph theory, optimization, network analysis, and theory of deep learning.

EDUCATION

Thayer School of Engineering at **Dartmouth College**, Hanover, VT, USA
Ph.D., Engineering **09/2015 – 02/2019**
- Advisor: Professor George Cybenko
- Thesis: Sublinear Approximations of Vertex Centrality in Evolving Graphs
The Ohio State University, Columbus, OH, USA
B.S., Mathematics **09/2007 – 06/2011**
B.S., Computer and Information Science **09/2007 – 06/2011**

RESEARCH EXPERIENCE

Lawrence Livermore National Laboratory, Livermore, CA, USA
Center for Applied Scientific Computing. Supervisors: Geoff Sanders, Michael Schneider and Roger Pearce
Computing Scientist **02/2021 – present**
PI and Co-I of multiple research projects investigating scalable graph analytics, machine learning, and statistical modeling on High-Performance Computing (HPC) systems. Supervised 2 postdocs and more than a dozen graduate students. Selected research contributions include novel algorithms and software for scalable Gaussian process (GP) estimation [1], cosmology, climate, and space domain modeling [2], distributed subspace embedding and sketches [3], and massive graph applications including distributed K nearest neighbors and distributed high-dimensional clustering.
Postdoctoral Researcher **04/2019 – 02/2021**
Developed novel sketching algorithms to cluster [3] and perform local query approximation [4] massive graphs on HPC. Solved reinforcement learning [5], image classification [6], and quantum machine learning [7] problems using GPs and neural kernels.
Computation Student Intern **05/2018 – 01/2019**
Designed novel HPC communication library to accelerate non-traditional communications [8]. Used cardinality sketches to estimate local triangle counts in distributed graphs [9].
Dartmouth College, Hanover, NH, USA
Thayer School of Engineering. Advisor: Professor George Cybenko
Research and Teaching Assistant **09/2015 – 02/2019**
Invented streaming approximation algorithms for several centrality indices on massive graphs using sketches. Designed game and graph-theoretic models for advanced persistent threats in cyber defense. Taught courses in machine learning and lead a team of TAs.
MIT Lincoln Laboratory, Lexington, MA, USA
Cyber Analytics and Decision Systems. Supervisor: Dr. Kevin M. Carter
Assistant Research Scientist **08/2011 – 07/2015**
Modeled computer networks using novel machine learning algorithms. Developed multi-agent systems for high-fidelity network simulations and cyber defense evaluation.
Air Force Institute of Technology, Wright-Patterson Air Force Base, OH, USA
Program Encryption Group. Supervisor: Professor J. Todd McDonald
Engineering Technician GS-05 **Summer, 2008 & 2009**
Developed encryption metrics for circuits using abstract interpretation semantic models

TECHNICAL
EXPERTISE

Mathematics

Applied Mathematics
Real Analysis
Measure Theory
Graph Theory
Combinatorics

Computer Science and Engineering

Distributed & parallel algorithms
Streaming algorithms & sketching
Data structures

Data Science and Processing

Probability & Random Variables
Statistics & Estimation
Machine learning & deep learning
Numerical Optimization
Stochastic Processes
Information Theory
Communication Theory

Programming and Scripting Languages

C/C++, Python, Bash,
Julia, Java, R, MATLAB

Distributed Computing

MPI, Hadoop MapReduce, Lustre

Analytical Software

Keras, TensorFlow, PyTorch, Mathematica

Utility Software

Git, GitHub/Gitlab/Bitbucket
L^AT_EX, B_IB_TE_X
Microsoft, LibreOffice, Google Suite

Operating Systems

Apple OS X
Linux, RedHat, and other UNIX variants

Interpersonal

Teamwork and communication
Leadership and mentoring
Public and technical speaking

PEER-REVIEWED
CONFERENCE
PUBLICATIONS

- [10] Trevor Steil, Tahsin Reza, **Benjamin W Priest**, and Roger Pearce. Embracing irregular parallelism in HPC with YGM. In *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, pages 1–13, 2023
- [11] Keita Iwabuchi, Trevor Steil, **Benjamin W Priest**, Roger Pearce, and Geoffrey Sanders. Towards a massive-scale distributed neighborhood graph construction. In *Proceedings of the SC’23 Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis*, pages 728–738, 2023
- [12] Imène R Goumiri, Amanda L Muyskens, **Benjamin W Priest**, and Robert E Armstrong. Light curve forecasting and anomaly detection using scalable, anisotropic, and heteroscedastic Gaussian process models. 2023
- [13] Rafael Bidese, Chinedu Eleh, Yunli Zhang, Roberto Molinari, Nedret Billor, **Benjamin W Priest**, Imène R Goumiri, Amanda L Muyskens, and Alec M Dunton. Stellar blend image classification using computationally efficient Gaussian processes (MuyGPs). *arXiv preprint arXiv:2208.14592*, 2022
- [14] Killian Wood, Alec M Dunton, Amanda Muyskens, and **Benjamin W Priest**. Scalable Gaussian process hyperparameter optimization via coverage regularization. *arXiv preprint arXiv:2209.11280*, 2022
- [15] Imène R Goumiri, Alec M Dunton, Amanda L Muyskens, **Benjamin W Priest**, and Robert E Armstrong. Light curve completion and forecasting using fast and scalable Gaussian processes (MuyGPs). In *Proceedings of the Advanced Maui Optics and Space Surveillance (AMOS) Conference*, 2022. *arXiv preprint arXiv:2208.14592*
- [16] Alec M Dunton, **Benjamin W Priest**, and Amanda Muyskens. Fast Gaussian process posterior mean prediction via local cross validation and precomputation. *arXiv preprint arXiv:2205.10879*, 2022
- [17] Trevor Steil, Tahsin Reza, Keita Iwabuchi, **Benjamin W Priest**, Geoffrey Sanders, and Roger Pearce. TriPoll: computing surveys of triangles in massive-scale temporal graphs with metadata. In *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, pages 1–12, 2021

- [6] Imène R Goumiri, Amanda L Muyskens, Michael D Schneider, **Benjamin W Priest**, and Robert E Armstrong. Star-galaxy separation via Gaussian processes with model reduction. In *2020 Advanced Maui Optical and Space Surveillance Technologies Conference (AMOS)*, 2020
- [3] **Benjamin W Priest**, Alec Dunton, and Geoffrey Sanders. Scaling graph clustering with distributed sketches. In *2020 IEEE High Performance Extreme Computing Conference (HPEC)*, pages 1–7. IEEE, 2020
- [5] Imène R Goumiri, **Benjamin W Priest**, and Michael D Schneider. Reinforcement learning via Gaussian processes with neural network dual kernels. In *2020 IEEE Conference on Games (CoG)*, pages 1–8. IEEE, 2020
- [18] Trevor Steil, Scott McMillan, Geoffrey Sanders, Roger Pearce, and **Benjamin W Priest**. Kronecker graph generation with ground truth for 4-cycles and dense structure in bipartite graphs. In *2020 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, pages 237–246. IEEE, 2020
- [19] Roger Pearce, Trevor Steil, **Benjamin W Priest**, and Geoffrey Sanders. One quadrillion triangles queried on one million processors. In *2019 IEEE High Performance Extreme Computing Conference (HPEC)*, pages 1–5. IEEE, 2019
- [8] **Benjamin W Priest**, Trevor Steil, Geoffrey Sanders, and Roger Pearce. You’ve got mail (ygm): Building missing asynchronous communication primitives. In *2019 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, pages 221–230. IEEE, 2019
- [20] Trevor Steil, **Benjamin W Priest**, Geoffrey Sanders, Roger Pearce, Timothy La Fond, and Keita Iwabuchi. Distributed kronecker graph generation with ground truth of many graph properties. In *2019 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, pages 251–260. IEEE, 2019
- [9] **Benjamin W Priest**, Roger Pearce, and Geoffrey Sanders. Estimating edge-local triangle count heavy hitters in edge-linear time and almost-vertex-linear space. In *2018 IEEE High Performance extreme Computing Conference (HPEC)*, pages 1–7. IEEE, 2018
- [21] Luan Huy Pham, Massimiliano Albanese, and **Benjamin W Priest**. A quantitative framework to model advanced persistent threats. In *ICETE (2)*, pages 448–459, 2018
- [22] **Benjamin W Priest**, Era Vuksani, Neal Wagner, Brady Tello, Kevin M Carter, and William W Streilein. Agent-based simulation in support of moving target cyber defense technology development and evaluation. In *Proceedings of the 18th Symposium on Communications & Networking*, pages 16–23, 2015
- [23] Kevin M Carter, Rajmonda S Caceres, and **Benjamin W Priest**. Characterization of latent social networks discovered through computer network logs. In *Networks in the Social and Information Sciences workshop of the 29th Annual Conference on Neural Information Processing Systems*, 2015
- [24] **Benjamin W Priest** and Kevin M Carter. Characterizing latent user interests on enterprise networks. In *The Twenty-Seventh International Flairs Conference*, 2014
- [25] Kevin M Carter, Rajmonda S Caceres, and **Benjamin W Priest**. Latent community discovery through enterprise user search query modeling. In *Proceedings of the 37th international ACM SIGIR conference on Research & development in information retrieval*, pages 871–874, 2014

- [26] Kevin Gold, Zachary J Weber, **Benjamin W Priest**, Josh Ziegler, Karen Sittig, William W Streilein, and Mark Mazumder. Modeling how thinking about the past and future impacts network traffic with the gosmr architecture. In *Proceedings of the 2013 international conference on Autonomous agents and multi-agent systems*, pages 127–134. Citeseer, 2013
- [27] **Benjamin W Priest** and Kevin Gold. Utility discounting explains informational website traffic patterns before a hurricane. In *Proceedings of the 22nd International Conference on World Wide Web*, pages 53–54, 2013
- [28] Kevin Gold, **Benjamin W Priest**, and Kevin M Carter. An expectation maximization approach to detecting compromised remote access accounts. In *The Twenty-Sixth International FLAIRS Conference*, 2013

PEER-REVIEWED
JOURNAL
PUBLICATIONS

- [29] Imène Goumiri, Amanda L. Muyskens, **Benjamin W Priest**, Robert E. Armstrong, and J. Luc Peterson. Uncertainty quantification to detect resident space object anomalies. *The Defense Systems Information Analysis Center (DSIAC) Journal*, 8(2):TBD, 2024
- [30] Juliette Mukangango, Amanda L. Muyskens, and **Benjamin W Priest**. A robust approach to Gaussian process implementation. *Advances in Statistical Climatology, Meteorology and Oceanography*, TBD(TBD):TBD, 2024
- [31] James J Buchanan, Michael D Schneider, Robert E Armstrong, Amanda L Muyskens, **Benjamin W Priest**, and Ryan J Dana. Gaussian process classification for galaxy blend identification in LSST. *The Astrophysical Journal*, 924(2):94, 2022
- [2] Amanda L Muyskens, Imène R Goumiri, **Benjamin W Priest**, Michael D Schneider, Robert E Armstrong, Jason Bernstein, and Ryan Dana. Star–galaxy image separation with computationally efficient Gaussian process classification. *The Astronomical Journal*, 163(4):148, 2022

ARXIV
PAPERS

- [32] Ukamaka V. Nnyaba, Hewan M. Shemtaga, David W. Collins, Amanda L. Muyskens, **Benjamin W Priest**, and Nedret Billor. Enhancing electrocardiography data classification confidence: A robust gaussian process approach (MuyGPs). *arXiv preprint arXiv:2409.04642*, 2024
- [33] Chinedu Eleh, Yunli Zhang, Rafael Bidese, **Benjamin W Priest**, Amanda L. Muyskens, Roberto Molinari, and Nedret Billor. Stellar blend image classification using computationally efficient Gaussian processes. *arXiv preprint arXiv:2407.19297*, 2024
- [34] Jason Bernstein, Alec M Dunton, and **Benjamin W Priest**. An analysis of the johnson-lindenstrauss lemma with the bivariate gamma distribution. *arXiv preprint arXiv:2305.17123*, 2023
- [1] Amanda Muyskens, **Benjamin W Priest**, Imène Goumiri, and Michael Schneider. MuyGPs: Scalable Gaussian process hyperparameter estimation using local cross-validation. *arXiv preprint arXiv:2104.14581*, 2021
- [7] Matthew Otten, Imène R Goumiri, **Benjamin W Priest**, George F Chapline, and Michael D Schneider. Quantum machine learning using Gaussian processes with performant quantum kernels. *arXiv preprint arXiv:2004.11280*, 2020
- [4] **Benjamin W Priest**. Degreesketch: Distributed cardinality sketches on massive graphs with applications. *arXiv preprint arXiv:2004.04289*, 2020

TECH REPORTS

- [35] K Wood, AM Dunton, A Muyskens, and BW Priest. Bayesian hyperparameter optimization in gaussian processes using statistical coverage. Technical report, Lawrence Livermore National Lab.(LLNL), Livermore, CA (United States), 2022
- [36] Andrei Filippov, Imène R Goumiri, and **Benjamin W Priest**. Genetic algorithm for hyperparameter optimization in Gaussian process modeling. Technical report, Lawrence Livermore National Lab.(LLNL), Livermore, CA (United States), 2020

WORKING PAPERS

- [37] Edem Boahen, **Benjamin W Priest**, T. S. Jayram, and Geoffrey Sanders. On the cluster recovery of power iteration algorithms for realistic stochastic block models. **In preparation**
- [38] Nate Veldt, **Benjamin W Priest**, Keita Iwabuchi, and Trevor Steil. Metric spanning tree completion. **In preparation**
- [39] **Benjamin W Priest**, Keita Iwabuchi, and Trevor Steil. Toward extreme-scale clustering of high-dimensional data. **In preparation**
- [40] Gregory Sallaberry, Robert E. Armstrong, **Benjamin W Priest**, Michael D. Schneider, and Amanda L. Muyskens. A scalable Gaussian process approach to shear mapping with MuyGPyS. **In preparation**
- [41] Keita Iwabuchi, Trevor Steil, **Benjamin W Priest**, Geoffrey Sanders, and Roger Pearce. Communication-optimized scalable distributed k-nearest neighbors graph construction. **In preparation**
- [42] **Benjamin W Priest**, Trevor Steil, Geoffrey Sanders, and Keita Iwabuchi. Fast approximate k-nearest neighbors recovery of graphs using subspace embeddings on graph exponents. **In preparation**
- [43] Amanda Muyskens, **Benjamin W Priest**, Imène R Goumiri, and Michael D Schneider. An analysis of the sensitivity of kernel hyperparameters on the kriging weights. **In preparation**

OTHER CONFERENCE PUBLICATIONS

- [44] **Benjamin W Priest** and George Cybenko. Approximating centrality in evolving graphs: toward sublinearity. In *Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Security, Defense, and Law Enforcement Applications XVI*, volume 10184, pages 58–66. SPIE, 2017
- [45] **Benjamin W Priest** and George Cybenko. Efficient inference of hidden markov models from large observation sequences. In *Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Security, Defense, and Law Enforcement Applications XV*, volume 9825, pages 179–187. SPIE, 2016

BOOK CHAPTERS

- [46] Geoffrey Sanders, Roger Pearce, **Benjamin W Priest**, and Trevor Steil. Massive-scale distributed triangle computation and applications. In *Massive Graph Analytics*, pages 127–158. Chapman and Hall/CRC, 2022
- [47] **Benjamin W Priest**, George Cybenko, Satinder Singh, Massimiliano Albanese, and Peng Liu. Online and scalable adaptive cyber defense. In *Adversarial and Uncertain Reasoning for Adaptive Cyber Defense*, pages 232–261. Springer, 2019

CONFERENCE
TALKS

Benjamin W Priest. Scaling Graph Clustering with Distributed Sketches. At: *2020 High Performance Extreme Computing Conference*, HPEC 2020. Waltham, CA, USA (virtual conference), 21–25 September 2020.

Benjamin W Priest. Approximating centrality in evolving graphs: toward sublinearity. At: *2017 SPIE Defense + Security Conference*, SPIE D+S. Anaheim, CA, USA, 9–13 April 2017.

Benjamin W Priest. Efficient Inference of hidden Markov models from large observations sequences. At: *2016 SPIE Defense + Security Conference*, SPIE D+S. Anaheim, CA, USA, 17–21 April 2016.

Benjamin W Priest. Agent-based simulation in support of moving target cyber defense technology development and evaluation. At: *18th Symposium on Communications & Networking, 2015 ACM Spring Simulation Multi-Conference*, CNS/SpringSim. Alexandria, VA, USA, 12–15 April 2015.

Benjamin W Priest. Characterizing latent user interests on enterprise networks. At: *2014 International Florida Artificial Intelligence Research Society Conference*, FLAIRS. Pensacola Beach, FL, USA, 21–23 May 2014.

INVITED TALKS

Benjamin W Priest. High-fidelity enterprise network emulation using the GOSMR architecture. In: *2014 MIT Lincoln Laboratory Cyber and Net-Centric Workshop*, CNW. June, 2014.

POSTER
PRESENTATIONS

Benjamin W Priest. Estimating edge-local triangle count heavy hitters in edge-linear time and almost-vertex-linear space. At: *GraphChallenge Workshop at the IEEE High Performance Extreme Computing Conference*, HPEC. 25–27 September 2018.

Benjamin W Priest. Efficient Sublinear Estimation of Local Triangle Count Heavy Hitters. At: *2018 Summer Student Poster Symposium at Lawrence Livermore National Laboratory*. 9 August 2018.

Benjamin W Priest. Characterization of latent social networks discovered through computer network logs. At: *Networks in the Social and Information Sciences workshop of the 29th Annual Conference on Neural Information Processing Systems*, NIPS. Montreal, Canada, 12 December 2015.

Benjamin W Priest. Utility discounting explains informational website traffic patterns before a hurricane. At: *22nd International World Wide Web Conference*, WWW. 2013. Rio de Janeiro, Brazil, 13–17 May 2013.

PROJECT
PROPOSALS

In Preparation
N/A

Awarded

Co-I, “FOCUS: Framework for Optimal Climate-Infrastructure Solutions and Decision Support”,

- LLNL LDRD 25-SI-XXX,
- \$3,450,000/yr.
- October 1, 2024 to September 30, 2027.

PI, “Hierarchical Graph-Based Clustering in Distributed Memory”,

- LDRD 24-ERD-024
- \$600,000/yr.
- October 1, 2023 to September 30, 2026.

Co-I, “HPC-Enabled Detection System for Petabyte Scale Astronomy Surveys”,

- LLNL LDRD 23-ERD-028
- \$700,000/yr.
- October 1, 2022 to September 30, 2025.

Co-I, “MuyGPs: Non-Stationary Gaussian Processes at HPC Scales”,

- LLNL LDRD 22-ERD-028
- \$850,000/yr.
- October 1, 2021 to September 30, 2024.
- Co-I**, “Scalable Uncertainty Quantification Using Gaussian Processes Surrogate Models”,
 - LLNL LDRD 21-FS-037
 - \$100,000/yr.
 - January 1, 2021 to September 30, 2021.
- Co-I**, “Interactive Exploratory Graph-Enabled Data Analytics at HPC Scales”,
 - LLNL LDRD 21-ERD-020
 - \$500,000/yr.
 - October 1, 2020 to September 30, 2023.
- PI**, “Scalable Approximate Graph Clustering”,
 - LLNL LDRD 20-ERD-037
 - \$150,000/yr.
 - February 1, 2020 to September 30, 2020.

Declined

- PI**, “Efficient Data Reduction via Active Learning Augmented Coresets”,
 - DOE ASCR DE-FOA-0003266
 - \$1,000,000/yr.
 - FY 25-27.
- Co-I**, “Scalable Physics-Constrained Emulation of Stochastic Moments of Quantum Processing Units”,
 - DOE ASCR DE-FOA-0003300
 - \$500,000/yr.
 - FY 25-26.
- Co-I**, “Science with LSST Year 1 Data”,
 - LLNL LDRD ER
 - \$1,000,000/yr.
 - FY 25-27.
- Co-I**, “Decentralized Strategic Decision Making via Linearly Solvable Markov Games”,
 - LLNL LDRD ER
 - \$600,000/yr.
 - FY 25-27.
- Co-I**, “Uncertainty-Aware Realtime Algorithmic Calibration in Distributed Computing Environments”,
 - DOE ASCR DE-FOA-0003266
 - \$1,200,000/yr.
 - FY 24-27.
- PI**, “Scalable and Highly Concurrent Sampling Algorithms for Scale-Free Graphs”,
 - DOE ASCR DE-FOA-0002722
 - \$800,000/yr.
 - FY 23-25.
- Co-I**, “Probabilistic AI Pipeline Modules for Rubin LSST Dark Energy”,
 - DOE ASCR DE-FOA-0002705
 - \$1,000,000/yr.
 - FY 23-25.
- Co-PI**, “Scalable Single-Pass Compressive Autoencoders”,
 - LLNL LDRD Feasibility Study
 - \$150,000/yr.
 - FY 23.
- Co-I**, “EpochGrafts: Relational Data Fusion via Dynamic Graph Analysis”,
 - LLNL LDRD ER
 - \$500,000/yr.

- FY 22-24.
- PI**, “Scalable Non-stationary Approximate Gaussian Processes”,
 - DOE ASCR DE-FOA-0002493
 - \$800,000/yr.
 - FY 22-24.
- PI**, “Distributed Memory Sketching Algorithms at HPC Scales”,
 - DOE ASCR DE-FOA-0002497
 - \$400,000/yr.
 - FY 22-23.
- PI**, “*croquis*: Distributed Subspace Embeddings for High Performance Computing”,
 - LLNL ISCP Tech Base
 - \$100,000/yr.
 - FY 21-22.

MENTORSHIP

Postdocs

- Grace Li**, Postdoc in Applied Mathematics.
- Lawrence Livermore National Laboratory
 - Distributed memory graph algorithms, clustering, and analysis.
 - Exascale energy grid expansion modeling under topological uncertainty.
 - 2024-current.
- Alec Dunton**, Postdoc in Applied Mathematics.
- Lawrence Livermore National Laboratory
 - Fast and scalable Gaussian process approximation in distributed memory.
 - 2021-2023.

Post-Bacs and Post-Masters

- Gregory Sallaberry**, Post Master’s in Astronomy.
- Lawrence Livermore National Laboratory.
 - Modeling billion-scale cosmic lensing shear models with scalable Gaussian processes.
 - 2023-2024.
- Keegan Kresge**, Post Baccalaureate in Mathematics.
- DOD.
 - K-Nearest Neighbors performance of exponentiated subspace embeddings on large graphs.
 - Summer 2023.

Students

- Edem Boahen**, PhD student in Mathematics.
- Michigan State University.
 - Clustering guarantees for power iteration algorithms on degree-corrected stochastic block models.
 - Primary Advisor: Mark Iwen.
 - Summer 2024-present.
- Sunanda Thirunabukkarasu (Mila Arasu)**, BS student in Astrophysics.
- Arizona State University.
 - Simulating cosmic lensing shear with realistic B- and E-mode shifts.
 - Summer 2024.
- Lance Fletcher**, PhD student in Computer Science.
- Texas A & M University.
 - Massively parallel random walk sampling and embeddings.
 - Primary Advisor: Roger Pearce.
 - Autumn 2023-present.
- Juliette Mukangango**, PhD student in Statistics.
- Colorado School of Mines.

- Novel loss and objective functions for outlier robustness in training sparse MuiGPs models.
- Primary Advisor: Douglas Nychka.
- Summer 2023.

Akil Andrews, PhD student in Computer Science.

- University of New Mexico.
- Adaptive Bayesian optimization under changing data representations.
- Primary Advisor: Melanie E Moses.
- Summer 2023.

Ian McGovern, PhD student in Statistics.

- University of California, Los Angeles.
- Uncertainty analysis of hybrid deep neural network and Gaussian process predictions.
- Primary Advisor: Frederic Schoenberg.
- Summer 2023.

Abiodun Sumonu, PhD student in Mathematics.

- University of Alabama.
- Survey of Biclustering Algorithms.
- Summer 2023.

Marina Dunn, Masters student in Data Science,

- University of California, Riverside.
- Visualizing sparse Gaussian process optimization.
- Summer 2022.

Killian Wood, PhD Student in Applied Mathematics.

- University of Colorado, Boulder.
- Multiscale Bayesian optimization of MuiGPs.
- Primary Advisor: Emiliano Dall’Anese.
- Summer 2022.

Michał Lisicki, PhD student in Computer Science.

- University of Guelph.
- Distributional reinforcement learning on gridworld environments.
- Primary Advisor: Graham Taylor.
- Summer 2022.

Sudharshan Srinivasan, PhD student in Computer Science.

- University of Oregon.
- Communication optimization for highly non-uniform distributed graph algorithms.
- Primary Advisor: Boyana Norris.
- Summer 2021.

Alec Dunton, PhD student in Applied Mathematics.

- University of Colorado, Boulder.
- Parameter sensitivity of stochastic block models under subspace embeddings.
- Primary Advisor: Alireza Doostan.
- Summer 2020.

Teams and Challenges

Davy Walker, Ukamaka Nnyaba, and Hewan Shemtaga,

- PhD Students in Computer Science, Auburn University.
- Auburn Data Science Capstone Project.
- ECG Time Series Classification Using Computationally Efficient Gaussian Processes.
- Autumn 2023.

Rafael Bidese, Chinedu Eleh, and Yunli Zhang,

- PhD Students in Computer Science, Auburn University.
- Auburn Data Science Capstone Project.
- Stellar Blend Image Classification Using Computationally Efficient Gaussian Processes.
- Autumn 2022.

Jocelyn Ornelas, Alan Triano, Cristian Espinosa, Denylson Fuentes, and Rahul Ravi,

- A PhD Students (Jocelyn) and 4 undergraduates in Data Science programs.
- University of California, Merced.
- LLNL Data Science Challenge.
- Asteroid detection and orbit extraction from astronomy corpora.
- Sprint 2021.

**PROFESSIONAL
SERVICE**

Conference Service

- Program Committee: SIAM International Conference on Data Mining (SDM24). Houston, Texas, USA. April 18-20, 2024.
- Program Committee: 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD23). Long Beach, California, USA. August 6-10, 2024.
- Program Committee: 28th International AAAI Florida Artificial Intelligence Research Symposium Conference, FLAIRS-28. Hollywood, Florida, USA. May 18-20, 2015.

Journal Service

- Reviewer: American Astronomical Society: The Astrophysical Journal. 2022.

Committee Service

- : Committee Member. LLNL/Computing Inclusion, Diversity, Equity, and Accountability Committee. Subcommittees: “Improving Student Pipelines” and “Thrive Conversations”. 2023-present.
- Leader/Organizer. LLNL/Computing Summer SLAM! presentation session for summer students. Summer, 2024.
- Leader/Organizer. LLNL/Computing Summer SLAM! presentation session for summer students. Summer, 2023.
- Committee Member. LLNL/Computing Strategic Initiative for DEI in Recruiting, Outreach, and Hiring. 2021.

Mentorship Service

- : Instructor: “DevOps for Data Scientists”. LLNL Data Science Summer Institute. Summer, 2024.
- : Team Mentor. Auburn University Data Science Capstone project. “Enhancing Electrocardiography Data Classification Confidence: A Robust Gaussian Process Approach” Autumn, 2023.
- : Instructor: “DevOps for Data Scientists”. LLNL Data Science Summer Institute. Summer, 2023.
- : Team Mentor. Auburn University Data Science Capstone project. “Stellar Blend Image Classification Using Computationally Efficient Gaussian Processes”, Autumn, 2022.
- : Instructor: “The Streaming Data Model and Selected Algorithms”. LLNL Data Science Summer Institute. Summer, 2022.
- : Team Coach. LLNL/UC Merced Data Science Challenge. Summer, 2022.

**TEACHING
EXPERIENCE**

Thayer School of Engineering at Dartmouth College, Hanover, VT, USA

Teaching Assistant

Instructor for ENGS/QBS 108: Applied Machine Learning

Autumn 2017

- Collaborated with instructors to develop course curriculum aimed at graduate engineering and computer science students and taught $\sim 25\%$ of course lecture content.
- Led team of 4 teaching assistants
- Provided group and one-on-one assistance to students covering lecture topics
- Planned, wrote, and graded all student assignments

Instructor for ENGS 177: Decision Making Under Risk and Uncertainty **Winter 2017**

- Planned and taught a weekly recitation covering practical machine learning topics
- Provided ground and one-on-one assistance to students covering lecture topics
- Wrote student assignments with the assistance of the instructor and provided grading

The Ohio State University, Columbus, OH, USA

Teaching Assistant

Instructor for CSE 625: Automata and Formal Languages **Summer & Autumn 2010**

- Planned and taught a weekly recitation covering details and proofs of lecture topics
- Graded student assignments

Grader for CSE 560: System Software Design and Development **Summer 2010**

- Graded student assignments and held office hours

AWARDS

LLNL SPOT Awards

2024: Excellence in instructing and mentoring students as part of the Data Science Summer Institute (DSSI).

2023: Outstanding leadership of the Summer 2023 Summer SLAM! student presentation seminar.

2022: Contributions to COMP Strategic Initiative for DEI in recruiting, outreach, and hiring.

2021: Excellence in mentorship as a part of the LLNL/UC Merced Data Science Challenge.

LLNL Deputy Director Science & Technology Excellence in Publication Award

2023: Gaussian process classification for galaxy blend identification in LSST

2023: Light curve completion and forecasting using fast and scalable Gaussian processes (MuyGPs)

2021: Scaling Graph Clustering with Distributed Sketches

Advanced Maui Optical and Space Surveillance Technologies (AMOS) Conference

2022: Best Machine Learning Paper

High Performance Extreme Computing (HPEC) Graph Challenge

2020: Graph Challenge Champion

2019: Graph Challenge Champion

International Conference on Security and Cryptography (SECRYPT)

2018: Best Paper Award

MIT Lincoln Laboratory

2015: Lincoln Scholar Fellowship

The Ohio State University

2010: Phi Beta Kappa Inductee

2010: Bingham Award in Philosophy

2008: Kenneth Cummings Scholarship

2007-2011: Distinguished Merit Scholarship

2007-2011: Ohio Academic Scholarship

SECURITY
CLEARANCE
CITIZENSHIP

DOE Q-clearance (Spring 2024).

USA