Emily J. Herron

1 Bethel Valley Rd, MS-6085, Oak Ridge, Tennessee 37831-6085, USA

emily.j.herron@gmail.com • +1 (865) 309-4052

EDUCATION

University of Tennessee, Knoxville, Tennessee, USA

- Ph.D. in Data Science & Engineering, Breseden Center   Aug 2018 – Dec 2023
  - Thesis: Generalized Differentiable Neural Architecture Search with Scaling and Stability Improvements
  - Advisor: Dr. Steven R. Young
  - Focus: Machine learning, deep learning, data analytics
  - Cumulative GPA: 3.95 / 4.00

Mercer University, Macon, GA, USA

- B.S. in Computational Science   Aug 2014 – May 2018
  - Graduated Summa Cum Laude
  - Cumulative GPA: 3.94 / 4.00

EXPERIENCE

Analytics and AI Methods at Scale Group, Oak Ridge National Laboratory

- Postdoctoral Research Associate   Jan 2024 – Present
  - Developed pipeline for accessing the trustworthiness of large language models for science from the perspectives of truthfulness, adversarial robustness, and ethics.
  - Incorporating evolutionary neural architecture search into mixture of experts (MoE) transformer architectures at scale
  - Researching and developing models for LLM-based hypothesis generation in fields of natural language processing and materials science

Learning Systems / Computational Data Analytics Group, Oak Ridge National Laboratory

- Graduate Research Assistant   Aug 2018 – Dec 2023
  - Developed stability and other improvements to CDARTS NAS algorithm
  - Researched and implemented selection algorithms for ORNL's MENNDL NAS software utilizing ORNL's Titan and Summit supercomputers
  - Collaborated on creation of NIEHS document mining pipeline: comparing and testing document embeddings and implementing NAS for in-PDF text detection
- Intern   Jun 2018 – Aug 2018
  - Carried out text mining project dealing with classification of NIEHS research publications
  - Trained Hierarchical Attention Networks and other models including Naive Bayes and Random Forests to classify publications based on satisfaction of various criteria
  - Leveraged frameworks including Hierarchical Attention Networks and Tf-Idf Based Weighting, and spatial distances between word groupings and criteria descriptions to quantify the relevance of words or word groups to criteria queries and category predictions

Big Data X REU, University of Chicago & Illinois Institute of Technology

- Undergraduate Researcher   May 2017 – Jul 2017
  - Contributed to development of automated pipeline for extracting metadata and predicting contextual relationships between files in large scientific repositories
  - Developed collection of modules for extracting metadata from images; functionality included feature-based clustering, text extraction using optical character recognition, and image classification through use of support vector machine models
  - Module tested on over 3,500 images; results published in poster, placed 3rd in ACM's undergraduate Student Poster Competition at Super Computing (SC) 2017 Conference

Mercer Engineering Research Center, Warner Robins, GA

- Intern   May 2016 – May 2018
  - Applied variety of machine learning methods to classification of aircraft flight regime data (Pandas, Scikit-Learn, Tensorflow, Keras, Weka)
  - Presented PowerPoint of classification results and findings to group of engineers on weekly basis
  - Researched and developed augmented reality-based remote collaboration and video streaming application for Microsoft Hololens using C, Unity, Windows 10 UWP, ASP.NET with team

PUBLICATIONS

Journal and Conference Papers

[1]   E. Herron, D. Rose, and S. Young, *Icdarts: Improving the stability and performance of cyclic darts*, September 2023. [Online]. Available: https://arxiv.org/abs/2309.00664.

[2]   J. Yin *et al.*, "Chathpc: Empowering hpc users with large language models," in *Journal of Supercomputing*, vol. 81, 2025. DOI: https://doi.org/10.1007/s11227-024-06637-1.

[3]   M. Chai, E. Herron, E. Cervantes, and T. Ghosal, "Exploring scientific hypothesis generation with mamba," in *Proceedings of the 1st Workshop on NLP for Science (NLP4Science)*, ACL, 2024, pp. 197–207.

[4]   E. Herron, J. Yin, and F. Wang, "Scitrust: : Evaluating the trustworthiness of large language models for science," in *AI4S: 5th Workshop on Artificial Intelligence and Machine Learning for Scientific Applications*, 2024.

[5]   E. J. Herron, S. R. Young, and D. Rose, "Icdarts: Improving the stability of cyclic darts," in *2022 21st IEEE International Conference on Machine Learning and Applications (ICMLA)*, 2022.

[6]   J. Duncan *et al.*, *The sensitivity of word embeddings-based author detection models to semantic-preserving adversarial perturbations*, 2021. DOI: 10.48550/ARXIV.2102.11917. [Online]. Available: https://arxiv.org/abs/2102.11917.

[7]   E. J. Herron, S. R. Young, and T. E. Potok, "Ensembles of networks produced from neural architecture search," in *International Conference on High Performance Computing*, Springer, 2020, pp. 223–234.

[8]   E. Herron, T. J. Skluzacek, I. Foster, and K. Chard, "Applying image feature extraction to cluttered scientific repositories," 2017.

INVITED PRESENTATIONS	▪ Herron, E., Yin, J., Wang, F. SciTrust: Evaluating the Trustworthiness of Large Language Models for Science. 2024 Monterey Data Conference, Monterey, California, Poster.
	▪ Herron, E., Young, S.R., Rose, D. Generalized Differentiable Neural Architecture Search with Performance and Stability Improvements for Scientific Applications, SOS26 2024, Cocoa Beach, FL, Poster.
	▪ Herron, E., Young, S.R., Rose, D. ICDARTS: Improving the Stability of Cyclic DARTS. 2022 21st IEEE International Conference on Machine Learning and Applications, Nassau, The Bahamas.
	▪ Herron, E., Young, S.R., Potok, T.E. Ensembles of Neural Networks Produced from Neural Architecture Search, Women in High Performance Computing Workshop, SuperComputing 2020, Virtual.
	▪ Herron, E., Young, S.R., Potok, T.E. Ensembles of Neural Networks Produced from Neural Architecture Search, The International Conference on High Performance Computing 2020, Virtual.
	▪ Herron, E., Skluzacek, T., Foster I., Chard, K. Applying Image Feature Extraction to Cluttered Scientific Repositories. Student Research Competition Poster Session, SuperComputing 2017, Denver, CO.

AWARDS & SCHOLARSHIPS

Oak Ridge Leadership Computing Facility

▪ Facility Director's Discretion Project. 20,000 Summit Hours.	2022 – 2023

University of Tennessee, Knoxville

▪ Bredesen Center Data Science & Engineering Fellowship	Mar 2018

Super Computing Conference

▪ ACM Student Poster Competition Undergraduate Semifinalist	Nov 2017

Mercer University

▪ Outstanding Student in Computational Science	Apr 2016 – Apr 2018
▪ President's and Dean's Lists	Dec 2014 – May 2018
▪ Summa Cum Laude	May 2018
▪ Academic Scholarship	Apr 2014

PROFESSIONAL AFFILIATIONS & ACTIVITIES

Institute of Electrical and Electronics Engineers (IEEE)

▪ Member	2022 – Present

Association for Computing Machinery (ACM)

▪ Member	2017 – Present

PROFESSIONAL SERVICE

ORNL Traveling Science Fair, Oak Ridge, TN, USA

▪ Volunteer	2024

ORNL Undergraduate Summer Internship Program, Oak Ridge, TN, USA

▪ Mentor	2024

ORNL AI Summer Institute Tutorial: "Generative Natural Language Processing Primer: Riding the Journey to Large Language Models"), Oak Ridge, TN, USA

▪ Assistant Instructor	2024

2022 International Conference on Machine Learning (ICML 2022), Baltimore, Maryland, USA

▪ Reviewer - Top 10%	2022

Bredesen Center Peer Mentoring Program, Knoxville, TN, USA

▪ Peer Mentor	2022 – 2023

Introduce Your Daughter to AI, Oak Ridge National Laboratory

▪ Volunteer	2018 – 2019

Majors in Minutes, Mercer University

- Computational Science Major Representative 2016 – 2018

3D Modeling Inventors Workshop, Museum of Aviation
- Volunteer 2017