

Nathan Stromberg

Curriculum Vitae

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Education

2021–present **PhD Electrical Engineering**, *Arizona State University*

Advisor: Dr. Lalitha Sankar

2021–2024 **MS Electrical Engineering**, *Arizona State University*

Advisor: Dr. Lalitha Sankar

2017–2021 **BS Mathematics and Computer Science**, *University of Kentucky*

Research Experience

2021–present **Graduate Research Assistant**

- Lead collaborative research in robustness and fairness for machine learning models including determining research directions and writing conference papers
- Developed algorithms to make pretrained machine learning models fair to minority subpopulations
- Designed and implemented experiments for testing robust machine learning methods, including non-convex boosting and quasi-convex loss functions

2020–2021 **Undergraduate Research Assistant**

- Designed and implemented experiments to aid in analysis of robust machine vision models
- Enabled significant reduction in experimental compute overhead through massive parallelization

Teaching and Mentoring

2022–Present **Masters Student Mentor**

- Helped to determine research direction for Masters students
- Assisted in implementation and presentation of deliverables including advising on code and plots

2021–Present **Teaching Assistant**

- Aided in construction of homework problems for both graduate and undergraduate level probability and machine learning courses
- Worked directly with students to determine areas of difficulty, including holding “flipped classroom” discussions

Honors and Awards

2024 **International Symposium on Information Theory Travel Grant**

- Awarded to top students presenting work at ISIT 2024

2024 **ISIT 2024 Workshop on Information Theoretic Methods for Trustworthy Machine Learning Best Poster Award**

- Awarded for the presentation of Welfert et al. [2024a]

2021–2025 **Dean's Fellowship**

- Awarded to top undergraduates pursuing research in the Ira A. Fulton Schools of Engineering at ASU
- Funds recipients for 4 years

Publications

Monica Welfert, **Nathan Stromberg**, and Lalitha Sankar. Fairness-enhancing data augmentation methods for worst-group accuracy. In *ISIT IT-TML Workshop 2024*, 2024a.

Nathan Stromberg, Rohan Ayyagari, Sanmi Koyejo, Richard Nock, and Lalitha Sankar. Enhancing robustness of last layer two-stage fair model corrections. *Under Review*, September 2024a.

Nathan Stromberg, Rohan Ayyagari, Monica Welfert, Sanmi Koyejo, and Lalitha Sankar. Robustness to subpopulation shift with domain label noise via regularized annotation of domains. *Under Review*, September 2024b.

Monica Welfert, **Nathan Stromberg**, and Lalitha Sankar. Theoretical guarantees of data augmented last layer retraining methods. In *ISIT 2024*, July 2024b.

Tyler Sypherd, **Nathan Stromberg**, Richard Nock, and Lalitha Sankar. Smoothly giving up: Robustness for simple models. In *Proceedings of The 26th International Conference on Artificial Intelligence and Statistics*, volume 206, 2023.

Presentations

2024 **ISIT 2024**, *Athens, Greece*
Oral Presentation

2024 **ISIT 2024 IT-TML Workshop**, *Athens, Greece*
Poster Presentation

2023 **AISTATS 2023**, *Valencia, Spain*
Poster Presentation

2022 **ICML ML for Healthcare**, *Baltimore, MD*
Virtual Presentation

Professional Experience

2019 **AWS Applications Architect Intern**, *GE Appliances, a Haier Company*

- Worked individually to support and create call center applications hosted in AWS Connect and Lambda, and to streamline the IVR experience for over 8,000 consumers per day.
- Owned the creation of a new process to allow automated callbacks through a user-facing API and multiple backend Lambda functions, leading the process to eliminate wait time for consumers.

2018 **Summer IT Intern**, *Humana*

- Assisted with the creation of a computer model performance testing procedure and utilized Tableau and Excel to create a visualization of the results
- Informed deprecation decisions and streamlined the intake evaluation for new models
- Validated data in preparation for internal and external audits using SQL.