Adam Kurth

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Objective

As a master's graduate student at Arizona State University, I am passionate about pushing the boundaries of biostatistics and statistical theory. My enthusiasm for both theoretical exploration and practical application drives my ambition to advance research in public health and innovate within the realm of statistical methodology.

Education

Arizona State University — Tempe, AZ
Master of Science, Statistics — *Aug. 2023 – present*
Bachelor of Science, Mathematics (Statistics) – Summa Cum Laude — *Aug. 2021 – Aug. 2024*
Minor in Philosophy — *3.84/4.00*

Scottsdale Community College — Scottsdale, AZ
General Studies — *Aug. 2020– Dec. 2021*
3.84/4.00

East Valley Institute of Technology — Mesa, AZ
Graphic Design — *2019-2020*

Experience

- **Decision Theater Network** — Tempe, AZ
  Research Aide — *Aug. 2024 – present*
  - Enhanced research initiatives by crafting insightful briefs, conducting intricate research, managing extensive databases, executing sophisticated models, delivering presentations, and meticulously preparing materials for publication.

- **NASA Glenn Research Center** — Cleveland, OH
  Internship with CHP-PRA Team — *Jun. 2024 – Aug. 2024*
  - Pioneered the research and implementation of supervised and unsupervised NLP classification models using scikit-learn and PyTorch to assess the impact of Mars missions on various human system categories.
  - Tackled the challenge of imbalanced multilabel classification by processing Mars task text descriptions and predicting human system task categories, ensuring comprehensive analysis and accurate results.

- **Compact X-ray Free Electron Laser (CXFEL)** — Tempe, AZ
  Research Aide/Data Analyst — *Jun. 2024 – Aug. 2024*
  - Engineered Python packages for high-throughput experimental crystallography imaging, bolstering biophysics research at the unique Compact X-ray Light Source (CXLS).
  - **cxls_hitfinder**: Developed a convolutional neural network (CNN) model, advancing Bragg peak detection in experimental images and optimizing parameter combinations for realistic scattering patterns from extensive datasets.
  - **waterbackground_subtraction**: Innovated data acquisition methods to refine signal photon count estimates for high- and low-flux diffraction images, facilitating precise post hoc analysis of experimental datasets.

Publications

- **Item Response Theory (IRT) Monte Carlo software comparison study** — pending
  Co-Author
  - **Title**: "A Monte Carlo Comparison of the Efficacy of Mplus, flexMIRT, PROC IRT, ltm, and mirt in IRT Models Estimation."
  - Engaged in a collaborative research project with Yi Zheng and M. Reiser, focusing on managing preprocessing, conducting simulations, developing software, and documenting performance evaluations of R's mirt package under the 2PL IRT model.

- Created comprehensive visualizations of RMSE and bias metrics for all simulated subjects, enhancing the interpretability and impact of our findings.

Scholarships

- ***2024***: Rising Star Nomination NASA GRC, John W. Luttrell Children's Network Scholarship.
- ***2023***: Pediatric Cancer Research Foundation Survivor Scholarship, Coats & Todd Overcoming Disability Scholarship, Ruth Cheatham Foundation, HPFY Beyond Disability Scholarship.
- ***2022***: Burress Family Foundation Underdog Scholarship, John W. Luttrell Children's Network Scholarship.
- ***2021***: ASU Alumni Legacy Scholarship

Technical Skills & Interests

- **Mathematics & Statistics**: Real Analysis, probability, Linear Models, regression analysis, deep learning, Natural Language Processing, linear algebra, geometry, calculus.
- **Programming Languages**: Python, R, Bash, Linux/Command Line (CL), MATALAB, Java, LaTeX.
- **Technical Skills**: PyTorch, Scikit-Learn, Plotly, Git/GitHub/GitLab, Sphinx/GitPages, and web development, scientific writing.
- **Research Interests**: Biostatistics, measure theory, medical imaging, prediction, survival analysis, forecasting, informed decision making, deep/machine learning.
- **Soft Skills**: Public speaker, and presenter in technical and non-technical settings.

Conferences & Presentations

- **NASA Human Research Program Investigator's Workshop (IWS)** - Poster — Feb. 2025
  Using Natural Language Processing AI Tools to Analyze Mars Tasks, Kurth A., Rehm H., Matar M.
- **NASA CHP-PRA Summer Student Research Discussion** - Presentation — Aug. 2024
  Using Natural Language Processing AI Tools to Analyze Mars Tasks, Kurth A., Rehm H., Matar M.
- **Biodesign Fusion Research Conference** - Poster — April 2024
  Peak Intensity Analysis for Serial Femtosecond Crystallography Experiments at CXLS, Kurth A., Botha, S.
- **BioXFEL Annual Symposium** - Poster — Feb. 2024
  Peak Intensity Analysis for Serial Femtosecond Crystallography Experiments at CXLS, Kurth A., Botha, S.

Personal Statement

As a current accelerated master's student in statistics and a recent graduate with a bachelor's degree in mathematics (statistics), I am ambitious about pursuing a career in academic statistical research. I have engaged in rigorous research roles with mathematicians at NASA, policy leaders at Decision Theater, and technical experts in chemistry and physics at CXFEL. My collaborations extend to extracurricular research with Yi Zheng and the creation of various Python and R programming repositories on GitHub. These projects span topics from reinforcement learning and algorithmic intuition to fundamental machine learning and statistical reasoning.

The rigor of working with mathematicians at NASA and engaging in graduate-level coursework has honed my capabilities at the doctoral level. At Decision Theater, I have developed strong technical presentation skills, effectively communicating complex concepts to diverse audiences. As a driven and enthusiastic scholar, I seek further education to enrich the fields of biostatistics and statistics while exploring both theoretical and applied components. I am eager to contribute to the field through innovative research and impactful projects, particularly in the applications of machine learning in medical imaging and diagnostics. I look forward to collaborating with like-minded individuals and organizations to drive positive change in the field.

References

Sally Morton, Mentor
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Research Mathematician, NASA GRC
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