

Adam M. Kurth

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Location: Providence, RI

RESEARCH INTERESTS

Developing rigorous theoretical and computational methods in biostatistics, epidemiology, and public health. Primary focus on Bayesian causal inference, survival analysis, and experimental design applied to chronic disease, transplantation outcomes, and oncology.

EDUCATION

Brown University

Doctor of Philosophy, Biostatistics

Providence, RI

Sep. 2025 — present

Arizona State University

Master of Science, Statistics, 3.8/4.0 – Accelerated, Academic Track

Thesis: "Investigating Determinants of Birth Weight Using Bayesian Tree-Based Nonparametric Modeling"

Advised by Dr. Richard P. Hahn

Bachelor of Science, Mathematics (Statistics) – Summa Cum Laude

Minor in Philosophy, 3.85/4.00

Tempe, AZ

Aug. 2024 – Jun. 2025

Aug. 2021 – Aug. 2024

PUBLICATIONS

- Reiser, M., & Kurth, A. (2). (in preparation). *A Monte Carlo comparison of the efficacy of Mplus, flexMIRT, PROC IRT, ltm, and mirt in IRT models estimation.*

RESEARCH EXPERIENCE

• School of Mathematical and Statistical Sciences

Tempe, AZ

Research Assistant, under Dr. Eleni Panagiotou

Jan. 2025 – May 2025

- Utilized knot-theory and topology to analyze protein structures for neurodegenerative disease research.
- Led computational modeling of intrinsically disordered proteins (IDPs) across variable temperature and molecular configurations, in collaboration with Dr. Wenwei Zheng.

• NASA Glenn Research Center (GRC)

Cleveland, OH

Research Intern, CHP-PRA Team, under Dr. Mona Matar

Jun. 2024 – Aug. 2024

- Developed natural language processing (NLP) pipeline (PyTorch) to classify predefined Mars surface tasks by associated human system demands (e.g., motor control, cognitive complexity), contributing to quantitative risk assessment for human spaceflight.
- Implemented supervised and unsupervised models to address imbalanced classification in multi-label biomedical mission risk data.
- Integrated task classifications into a Human Reliability Analysis (HRA) framework to inform mission risk models, supporting NASA's biomedical and physical sciences research priorities.

• Compact X-ray Free Electron Laser (CXFEL)

Tempe, AZ

Research Aide under Dr. Sabine Botha

Jun. 2023 – Aug. 2024

- Developed computational tools and analysis methods for femtosecond crystallography diffraction experiments, advancing protein structure determination using Python, MATLAB, and UNIX/Bash shell scripting.
- **cxls_hitfinder**: Designed and implemented a deep convolutional neural network (CNN) to detect Bragg peaks and estimate experimental parameters in femtosecond X-ray diffraction imaging data, significantly improving processing speed and accuracy.
- **waterbackground_subtraction**: Engineered a signal processing algorithm to subtract water background noise under variable flux conditions, enhancing peak detection robustness in diffraction data analysis.

SELECTED ORAL PRESENTATIONS

- **ASU Open Door, SoMSS Research Room** – Poster, Tempe, AZ Feb. 2025
Proteins as Knots: Implications for Neurodegenerative Diseases, Kurth, A. M.
Selected to present knot-theory concepts to general audience to promote research at ASU SoMSS.
- **NASA CHP-PRA Summer Student Research Discussion** – Presentation, Cleveland, OH Aug. 2024
Using Natural Language Processing AI Tools to Analyze Mars Tasks, Kurth, A. M., Rehm H., Matar M.
Presented findings on NLP classification frameworks to lead NASA GRC research mathematicians and human factors engineers.
- **AZBIO: Voice of the Patient** – Talk, Phoenix, AZ Sep. 2024
Delivered a talk to [AZBIO Voice of the Patient](#) discussing personal health experiences in transplantation, discussing the intersection of community engagement, patient advocacy, and public health considerations.

POSTER PRESENTATIONS & ABSTRACTS

- **Kurth A. M.** (1), Rehm, H., & Matar, M. (2025). *Developing Natural Language Processing and Supervised Machine Learning Techniques to Classify Mars Tasks*. [NASA Human Research Program Investigator's Workshop](#), Galveston, TX.
- Matar, M., Rehm, H., & **Kurth, A. M.** (3) (2025). *Large language models and generative AI tools to depict human systems' contribution to spaceflight tasks execution*. [NASA Human Research Program Investigator's Workshop](#), Galveston, TX.
- Botha, S., Everett, E., Ketwala, G., **Kurth, A. M.** (1), Verlarde, A., Grant, T. G., Kirian, R. (2024). *Data Analysis Tools for the Compact X-ray Light Source and Compact X-ray Free Electron Laser Facilities at ASU*. 18th International Conference for the Crystallization of Biological Macromolecules ([ICCBM](#)), Tempe, AZ.
- **Kurth, A. M.** (1), Botha, S. (2024). *Data Analysis Tools for the Compact X-ray Light Source and Compact X-ray Free Electron Laser Facilities at ASU*. 2024 BioXFEL Spring Symposium, Tempe, AZ.
- **Kurth, A. M.** (1), Botha, S. (2024). *Peak Intensity Analysis for Serial Femtosecond Crystallography Experiments at CXLS*. Biodesign Fusion Research Conference, Phoenix, AZ.

TECHNICAL SKILLS & INTERESTS

- **Statistical Methodology:** Distribution and inference theory, Bayesian inference, causal inference, linear models, regression analysis, analysis of variance (ANOVA), mathematical statistics, deep/machine learning, natural language processing (NLP).
- **Mathematics:** Real analysis, advanced calculus, numerical analysis, computational imaging, computational linear algebra, geometry, topology (knot theory), symbolic logic.
- **Programming Languages:** Python, R/RStudio, Bash, UNIX/Linux command line, MATLAB, Java, \LaTeX .
- **Tools:** PyTorch, scikit-learn, Git/GitHub/GitLab, Sphinx/GitPages, web development.
- **Data Visualization:** ggplot2, Matplotlib, Seaborn, Plotly, Tableau.
- **Soft Skills:** Experienced public speaker and presenter in technical and non-technical settings.
- **Interests:** Classical literature, philosophical analysis, fitness, meditation.

SELECTED HONORS & AWARDS

- **Academic:** ASU Graduate College University Grant (GCUG) (2025); Rising Star Nomination NASA GRC (2024); Accelerated Master's Award (2024); BioXFEL Scholar (2024); ASU Alumni Legacy Scholarship (2021);
- **Resilience:** Ruth Cheatham Foundation (2023-2024); Pediatric Cancer Research Foundation Survivor Scholarship (2023); Coats & Todd Overcoming Disability Scholarship (2023); HPFY Beyond Disability Scholarship (2023); John W. Luttrell Children's Network Scholarship (2022-2023); Burress Family Foundation Underdog Scholarship (2022);

VOLUNTEERING & COMMUNITY ENGAGEMENT

- **Student Health and Wellness Advisory Committee (SHWAC)** Oct. 2025 – present
Selected to serve as a liaison between the student body and Brown's Health and Wellness leadership, working to align university services with student needs.
- **Starlab ExpertLink 2024** – Talk, Virtual from AZ Oct. 2024
Served as a STEM expert panelist for K–12 students, focusing on sustainability, astronaut health, and NASA research initiatives. Cultivated science communication skills, contributing to early STEM education.
- **AZBIO: Voice of the Patient** – Talk, Phoenix, AZ Sep. 2024
Delivered a talk to [AZBIO Voice of the Patient](#) discussing personal health experiences in transplantation, discussing the intersection of community engagement, patient advocacy, and public health considerations.
- **ASU News: Math and stats grad beats the odds...** – Article, Tempe, AZ May 2024
Featured in ASU News discussing resilience, academic achievement in mathematics and statistics, and overcoming health challenges.
- **APHON AZ: Patient Panel** – Talk, Phoenix, AZ Apr. 2024
Spoke at the Association of Pediatric Hematology/Oncology Nurses annual conference, sharing patient perspectives and insights into healthcare outcomes research.
- **Donate Life Arizona:** Tempe, AZ Sep. 2022 – present
Actively engaged in organ donation advocacy, contributing to community awareness events, educational programs, and outreach campaigns.
 - **Campus Challenge: ASU Diablo's Club Zero:** Aug. 2024
Supported on-campus organ donation advocacy and information dissemination.
 - **Speaker's Workshop:** Mar. 2024
Participated in sessions to refine public speaking and community education strategies.
 - **Annual Fiesta Bowl Parade**
 - **Donate Life AZ 2022 Calendar Feature & Interview**
Interview and featuring in Donate Life AZ annual calendar. Discussing personal story in interview format for community outreach for organ donation.
 - **Monthly Volunteer Meetings**
- **Children's Organ Transplant Association:** Remote/Scottsdale, AZ Apr. 2020 – present
Organized fundraising events, including a golf tournament, to support lifelong immunosuppressant medication costs.
 - **2022 COTA Calendar** – Nov. 2022
Promotion and featuring in annual calendar by discussing personal story for community engagement for transplantation awareness.
 - **The Mulligan Golf Tournament** – May 2022
Main contributor in planning golf tournament operations, catering and overall planning and organization. This fundraising event was to raise money for my life-long reliance on immunosuppressant medication due to transplantation. All proceeds went to [COTA for Adam K.](#)

REFERENCES

Sally Morton, Mentor
Executive VP Knowledge Enterprise ASU
Phone: 480-965-4087
Email: scmorton@asu.edu

Mona Matar, Supervisor & Mentor
Research Mathematician, NASA GRC
Phone: 704-706-5350
Email: mona.matar@nasa.gov

Richard Hahn, M.S. Advisor
Professor, ASU
Email: prhahn@asu.edu

Sabine Botha, Supervisor & P.I.
Assistant Research Professor, ASU
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Email: sbotha@asu.edu