Alexander C Murph

murph@lanl.gov ○ (412) · 996 · 1945 ○ website: sirmurphalot.github.io

Please see my website for further information about my research and a comprehensive selection of my teaching materials, including recordings of my lectures.

Education

August 2023	**University of NC at Chapel Hill**, Chapel Hill, NC Doctor of Philosophy in Statistics & Operations Research ○ Advisors: Jan Hannig (UNC), Jonathan P Williams (NC State), & Curtis B Storlie (Mayo Clinic)
May 2018	**Bucknell University**, Lewisburg, PA BS in Mathematics, BA in Computer Science, Minor in Women's & Gender Studies (GPA: 3.83/4) ○ Thesis Advisors: Assoc. Prof. Abby Flynt, Assoc. Prof. Brian King

Professional Positions

June 2023 - Present	Los Alamos National Lab, *Uncertainty Quantification Postdoc*
Sep 2023 - Present	Mayo Clinic Kern Center, *Research Consultant*
Aug 2021 - Sep 2023	Mayo Clinic Kern Center, *Visiting Graduate Student* ○ Responsible for PhD program funding Aug 2021 through graduation
May 2021 - Aug 2021	Mayo Clinic Kern Center, *Intern*
Aug 2019 - Aug 2023	University of NC at Chapel Hill, *Research Assistant*
Jun 2020 - Dec 2020	University of NC at Chapel Hill, *Course Instructor*
Aug 2016 - May 2018	Bucknell University, *Lead Residential Advisor*
Aug 2016 - May 2018	Geisinger Heath Center, *Research Apprentice*
May 2017 - Aug 2017	Nielsen, *Professional Services Analyst Intern*

Publications

Accepted Manuscripts:

- Murph, A.C., Strait, J.D., Moran, K.R., Hyman, J.D., & Stauffer, P.H. (2024) Visualisation and Outlier Detection for Probability Density Function Ensembles, *Stat*, 13(2), e662.
- Demuth, G., Storlie, C. B., Schaeferle, G., Wilson, P., Sunyang, F., Murph, A.C., Ruan, X., Pringnitz, J., & Hongfang, L. (2024). A Joint Longitudinal Model for Ongoing Prediction of Post Surgical Complication, Accepted to Journal of the American Statistical Association.
- Liu, Y., Hannig, J., & Murph, A.C. (2024) A Differential Geometric Perspective on Generalized Fiducial Inference, Accepted to Statistical Sciences.
- Murph, A.C., Hannig, J., & Williams, J.P. (2023) Introduction to Generalized Fiducial Inference. In J. Berger, X. Meng, N. Reid, & M. Xie (Eds.) *Handbook of Bayesian, Fiducial, and Frequentist Inference* (Ch. 13). Chapman & Hall.
- Faden, E., Mitchell, A., Murph, A.C., Myers, T., & Ryan, N. (2021). Mr. Hulot's Invisible Gorilla: Jacques Tati and Inattentional Blindness, *Projections*, 15(2), 1-29.
- Murph, A.C., Flynt, A., & King, B.R. (2021). Comparing finite sequences of discrete events with non-uniform time intervals, *Sequential Analysis*, 40(3), 291-313.

Manuscripts in review/preparation:

- Murph, A.C., Strait, J.D., Moran, K.R., Hyman, J.D., Viswanathan, H. S., & Stauffer, P.H. (202x) Sensitivity Analysis in the Presence of Intrinsic Stochasticity for Discrete Fracture Network Simulations, In Review.
- Murph, A.C., Hannig, J., & Williams, J.P. (202x). Generalized Fiducial Inference on Differentiable Manifolds, In Review.
- Murph, A.C., Storlie, C.B., Wilson, P.M., Williams, J.P., & Hannig, J. (202x) Bayes Watch: Bayesian Change-point Detection for Process Monitoring with Fault Detection, In Review.
- Murph, A.C., Gibson, G.C., VanDervort, L.B., Panda, N., Castro, L.A., Del Valle, S., & Osthus, D.A. (202x) Mapping Incidence and Prevalence Peak Data for SIR Forecasting Applications. In Review.
- Lawrence, E.C., Murph, A.C., Vander Wiel, S, Liu, C, & Zhang, J. (202x) A New Method for Multinomial Inference using Dempster-Shafer Theory. *Late Draft*.

- Hyman, J.D., Boampong, L., Murph, A.C., Navarre-Sitchler, A., Srinivasan, G., Carey, J.W., & Viswanathan, H.S. (202x) Determining the dominant factors for carbon mineralization in three-dimensional fracture networks. *Late Draft*.
- Strait, J.D., Moran, K.R., Murph, A.C., Hyman, J.D., & Stauffer, P. (202x) Covariate-Informed Multi-Fidelity Bias Correction of Distributions, *Late Draft*.

Professional Services

- Referee for Journal of Data Science ..... *1 manuscript*
- Referee for Chapman & Hall Handbook on BFF inference ..... *1 manuscript*

Talks and Presentations

Apr 2024	Los Alamos National Lab Statistical and Data Sciences Seminar, *Los Alamos, NM* *Invited Speaker*
Feb 2024	SIAM Conference on Uncertainty Quantification, *Trieste, Italy* *Speaker*
June 2022	IEEE International Conference on Healthcare Informatics 10, *Rochester, MN* *Poster Presentation*
May 2022	NISS Graduate Student Research Conference, *Virtual* *Speaker*
May 2022	Bayesian, Fiducial, & Frequentist 7, Toronto *Poster Presentation*
Nov 2021	The Classification Society Annual Meeting, Bucknell University, PA *Poster Presentation*
Mar 2017	AMIA 2017 Joint Summits on Translational Science, San Francisco *Poster Presentation*
Nov 2016	EPaDel Mathematics Conference, Villanova University, PA *Student Speaker*

Scholarships & Funding

Apr 2022	Raj Chandra Bose Student Travel Award ($ 750)
Aug 2021	SAMSI RA Fellowship NSF funding to allow me to focus entirely on research for Fall 2021.
Aug 2014	Bucknell Mathematics Scholarship ($ 40,000) The Bucknell Mathematics Scholars Program recognizes a very limited number applicants with strong potential to excel as students of mathematics.
Aug 2014	Cancer for College ($ 5,000) Non-profit organization that grants scholarships to cancer survivors wanting to obtain an undergraduate degree

Software & Computer Skills

CRAN packages written:	sawnuti, bayesWatch, DeBoinR
Software developed:	autoGFD
Basic proficiency:	html, Photoshop
Intermediate proficiency:	Java, Julia, Perl, TensorFlow, Mathematica
Advanced proficiency:	R, C/C++, LAPACK, STAN, Python, Matlab, Git, LaTeX, HPC Environments, Linux

Teaching & Course Development Experience

Aug 2020	Data Science for COVID-19 *Course Instructor* Created a course covering how a data scientist might approach the problems that arise in a global catastrophe like the COVID-19 pandemic. We had speakers from South Korea, England, and South Africa, as well as local scholars from the US. This international roster of speakers mirrored what was a fully international classroom; we had over 100 students hailing from 12 countries taking the class in 12 different timezones.
Jun 2020	Introduction to Data Analysis *Course Instructor* Designed and taught an introductory statistics course. Focused on making the difficult and sudden transition to remote learning as painless as possible for my students, while still demanding diligence and genuine mastery of the material.
Jan 2020	Machine Learning *Teaching Assistant* Assisted a graduate-level Machine Learning class with Dr. Andrew Nobel. I wrote all computing assignments for this class using the R programming language.

Community Involvment

Nov 2019 – Jun 2023 | AYA Cancer Advising Board
Founding Member, Coordinator
I created a board of fellow young adult cancer survivors to oversee the development of a transfusion space specifically for Adolescent and Young Adults (AYAs) at the UNC Cancer Center. We continue to advise the UNC Cancer Center on multiple projects and grant proposals.

Aug 2021 – Feb 2024 | Triangle Swing Dance Society
Secretary
I am on the executive board for a non-profit business that plans monthly Swing Dancing events in the Triangle area. These events feature both local and national live musicians, and are supported by a strong, enthusiastic community of dancers. In addition to being an active voting member on our executive team, my duties involve managing communications with customers, organizing and documenting meetings, and helping produce the dances themselves.

Honors

Eagle Scout
Honors Societies: Phi Beta Kappa, Pi Mu Epsilon
Bucknell Awards: Bucknell Class Award of Excellence '18, Bucknell Mathematics Award