Alexander Murph

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

Education

May 2023 | **University of NC at Chapel Hill**, Chapel Hill, NC
Doctor of Philosophy in Statistics & Operations Research
- Dissertation Advisor: Jan Hannig
- Qualifying exams in Theoretical & Applied Statistics and Probability

May 2018 | **Bucknell University**, Lewisburg, PA
Bachelor of Science in Mathematics
Bachelor of Arts in Computer Science
Minor in Women's & Gender Studies
- Thesis: "Comparing Sequences of Finite States with Non-Uniform Time Intervals"
- Advisors: Asst. Prof. Abby Flynt, Assoc. Prof. Brian King

Research

Aug 2019 – Present | EAS with Gaussian Graphical Models (GGMs)
The overarching aim of my research is to bring what has come to be known as the EAS methodology for model selection to GGMs, which will introduce a creative new means for covariance selection for GGMs. A major piece of this project is the development of theory to perform constrained differentiation on the manifold of positive-definite precision matrices with fixed zeros.

Jun 2016 – May 2018 | Bucknell-Geisinger Research Initiative (BGRI)
Research Assistant
Developed predictive models to determine whether a patient will go into Septic Shock from Sepsis. Was responsible for researching and coding the models, and developing a database for specific data queries. Trained in dealing with sensitive patient data and various issues of privacy. See https://github.com/sirmurphalot/sepsis-review-code for personal contributions to this project.

Publications

- Faden, E., Mitchell, A., Murph, A., Myers, T., & Ryan, N. (2021). Mr. Hulot's Invisible Gorilla: Jacques Tati and Inattentional Blindness, *Projections*, Accepted Oct 5, 2020.
- Murph, A., Hannig, J., & Williams, J. Examples in Fiducial Inference, Submitted to Chapman & Hall Handbook on BFF inference.
- Murph, A., Flynt, A., & King, B. Comparing Finite Sequences of Discrete Events with Non-Uniform Time Intervals, Under Review at Sequential Analysis .

Teaching & Course Development Experience

Fall 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.

Summer 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.

Spring 2020 | Machine Learning
Teaching Assistant
Helped teach 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 – Present | AYA Cancer Advising Board
Coordinator
I created a board of young adult cancer survivors to oversee the development of 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.

June 2020 – Present | DataOPS Outreach Team
Team Member
I am an active member of my department's recent diversity initiative to provide fun, accessible data education to underrepresented high-school students.

Talks and Presentations

Mar 2017 | AMIA 2017 Joint Summits on Translational Science, San Francisco
Poster Presenter
Poster entitled Machine Learning and Statistical Techniques to Predict Sepsis: Unifying Previous Work. Summarized the BGRI's findings to professionals in the field of Medical Informatics. Conference provided valuable exposure to numerous presentations by leaders in the field.

Nov 2016 | EPaDel Mathematics Conference, Villanova University
Student Speaker
Talk entitled Sepsis Safari: Predictive Data Analysis on Wild Data. Covered topics on training and testing predictive models, and gave a brief overview of my research under the BGRI.

Scholarships

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. Under this program, I have organized three mathematics related social events a semester to facilitate social time between faculty and students.

Aug. 2014 | **Cancer for College** ($ 5,000)
Non-profit organization that grants scholarships to cancer survivors wanting to obtain an undergraduate degree

Computer Skills

Basic: HTML, Linux, Photoshop
Intermediate: SAS, Java, C, Julia
Advanced: R, Python, Matlab, Mathematica, Excel, PowerPoint, Git, LaTeX

Honors

Eagle Scout
Honors Societies: Phi Beta Kappa, Pi Mu Epsilon, Omnicron Delta Kappa, Mortar Board
Bucknell Awards: Residential Colleges 'Golden Pair', Bucknell Class Award of Excellence '18, Bucknell Mathematics Award