DAMON M. BAYER

Statistics PhD Student

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EXPERIENCE

Student Trainee – Biostatistics Research Branch

National Institute of Allergy and Infectious Diseases

June 2021–September 2021 | Remote

- Developed novel statistical method for improved confidence intervals to estimate prevalence of rare diseases in complex surveys.
- Designed and executed simulation study to evaluate properties of a proposed Bayesian group sequential clinical trial.

Data Science Intern

Tidepool

March 2019–November 2020 | Remote

- Conducted statistical analyses to support premarket submission for Loop, an open-source, automated insulin delivery controller.
- Collaborated with product and medical advisory teams to make data-informed decisions about product features.

Math & Statistics Tutor / Teaching Assistant

South Dakota State University & University of California, Irvine

2015–2020 | Brookings, SD & Irvine, CA

- Communicated complex mathematical and statistical concepts to a non-technical audience.
- Created discussion lessons to facilitate learning statistics through R programming.

SELECTED PROJECTS

Estimating and Forecasting SARS-CoV-2 Transmission

- Developed Bayesian SEIR model to nowcast and forecast COVID-19 cases in Orange County, CA.
- Developed pipeline to update and present modelling results on public website.
- Contributed new features and fixes to stemr R package.

Variable Selection for Clustering on the Unit Hypersphere

- Methodological development for automatic variable selection using model-based clustering on spherical data.
- Implemented in FvMLM R Package.

Topic Modeling the Daschle Collection

- Summarized 100's of gigabytes of constituent emails and archival documents using topic modeling.
- Presented findings to former Senate Majority Leader Tom Daschle.

EDUCATION

PhD Statistics (4.0/4.0)

University of California, Irvine

2018 – 2023 | Irvine, CA

- Dissertation Focus: Bayesian methods for the analysis of infectious disease data

MS Math & Statistics (4.0/4.0)

South Dakota State University

2016 – 2018 | Brookings, SD

- Arnold K. Skeie Analytics Graduate Fellow
- Senator Thomas A. Daschle Student Fellow

BS Math & Statistics (3.9/4.0)

South Dakota State University

2013 – 2016 | Brookings, SD

- Honors College Distinction

SKILLS & SPECIALTIES

Computing:

R | R Package Development | Python | Stan | LaTeX | R Markdown | SQL | git/GitHub | SLURM/HPC

Statistics & Applications:

Text | Clustering | Diabetes | Infectious Diseases | MCMC | Clinical Trials | Bayesian Statistics

Coursework:

Machine Learning | Statistical Computing | Consulting | Advanced Bayesian Statistics | Correlated Data | Linear Regression | Stochastic Processes

PUBLICATIONS

Journal Articles

- Bayer, Damon, Jonathan Fintzi, et al. (Sept. 2020). “Using multiple data streams to estimate and forecast SARS-CoV-2 transmission dynamics, with application to the virus spread in Orange County, California”. In: *arXiv:2009.02654 [q-bio, stat]*.
- Bayer, Damon and Semhar Michael (Apr. 2019). “Exploring the Daschle Collection using Text Mining”. In: *arXiv:1904.12623 [cs, stat]*.
- Bayer, Damon (2018). “Variable Selection Techniques for Clustering on the Unit Hypersphere”. In: *South Dakota State University*.
- Bayer, Damon, Cedric Neumann, and Anjali Ranadive (2016). “Communication of Statistically Based Conclusions to Jurors-A Pilot Study”. In: *Journal of Forensic Identification* 66.5, pp. 405–427.

Poster & Oral Presentations

- Bayer, Damon (June 2021a). “Accounting for Time-Varying Testing Patterns when Estimating and Forecasting SARS-CoV-2 Transmission Dynamics”. In: *World Meeting of the International Society for Bayesian Analysis*. Virtual.
- – (May 2021b). “Accounting for Time-Varying Testing Patterns when Estimating and Forecasting SARS-CoV-2 Transmission Dynamics”. In: *MIDAS Network Annual Meeting*. Virtual.
- Michael, Semhar and Damon Bayer (July 2019). “Variable Selection Techniques for Model-Based Clustering of Directional Data”. In: *Joint Statistical Meetings*. Denver, CO.
- Bayer, Damon and Semhar Michael (Feb. 2018). “Variable Selection Methods for Clustering with Mixtures of von Mises–Fisher Distributions”. In: *SDSU Data Science Symposium*. Brookings, SD. Awarded third place overall.
- – (Oct. 2017). “Topic Modeling the Daschle Collection”. In: *Daschle Scholars Meeting*. Brookings, SD. Private meeting with former Senate Majority Leader Thomas Daschle.
- Bayer, Damon (Apr. 2016). “The 2016 Presidential Primary Debates: a Natural Language Processing Analysis”. In: *SDSU Undergraduate Research, Scholarship, and Creative Activity Day*. Brookings, SD. Awarded second place in Math, Engineering, and Physics.
- – (Apr. 2015). “Improving the Communication of Forensic Evidence to Jurors: a Pilot Study”. In: *SDSU Undergraduate Research, Scholarship, and Creative Activity Day*. Brookings, SD.
- Bayer, Damon and Jessie Hendricks (July 2015). “Statistical Interpretation of Forensic Evidence”. In: *South Dakota Experimental Program to Stimulate Competitive Research*. Pierre, SD.

SERVICE

Reviewer for

- Journals
  - PLOS One