Merlin Heidemanns, PhD

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SUMMARY

Quantitative social science researcher with advanced methodological skillset, specialized in Bayesian statistics, forecasting, and survey methods, and eager to tackle complex problems with data-backed solutions.

EDUCATION

Columbia University, New York, NY 2017-2022
Doctor of Philosophy, Political Science
Concentration: Quantitative Methodology, Forecasting, and Survey Methods

Freie Universität, Berlin, Berlin, Germany 2014-2017
Bachelor of Arts (B.A.), Political Science, Magna cum Laude

EXPERIENCE

Research Scientist II, Amazon, Inc. 2022-2023

- Developed Bayesian methods to improve the accuracy and reliability of treatment effect estimates impacting over 100k experiments per year
    - Implemented Bayesian hierarchical models in Stan at scale
- Supported internal customer through documentation directed at employees without a statistical background

University Researcher, Columbia University 2017 – 2022

- Developed and executed a diverse set of research designs using spatial, time-series, and survey data and methods
    - Bayesian forecasting models for the US and French presidential elections to aggregate predictions from several models based on different data sources
    - Cross-national analysis of polling error patterns across the US, Canada, the UK, and Germany since 1994
- Developed original methodological approaches including
    - A multi-stage ecological inference model for race-level absentee ballot rejection rates using aggregate data
    - An aggregation model for surveys that differ in their response options
- Supervised three research assistants during data collection, assessing data quality and covering several thousand pages of archival reports
- Published articles in peer-reviewed scientific journals and newspapers

Instructor, Columbia University 2017 – 2022

- Taught undergraduate R coding sections for introductory statistics courses
- Led undergraduate and PhD level discussion sections in Applied Statistics over two years
    - Bayesian approaches to regression analysis, causal inference, hierarchical models, and survey methods (MRP)

Data Consulting, The Economist 2020

- Co-developed a forecasting model with Andrew Gelman and G. Elliott Morris for the 2020 US Presidential election aggregating predictions based on polls, unemployment, and presidential approval
- Contributed original research on the differential effect of absentee ballot rejections on election results using MRP, voter files, and census data to adjust election forecasts

Data Consulting, USAToday 2020

- Predictive modeling of the expected number of rejected absentee ballots for the 2020 election and discussed how best to communicate model limitations to the lay audience

Internship, United Nations Office of Internal Oversight Services 2018

- Used supervised text classification to extract and analyze event data from five years of daily reporting

- Communicated methodological benefits and limitations to stakeholders including potential event misclassifications

SKILLS

Programs: R, Stan, Python, QGIS, GitHub, Excel, SQL
Skills: Statistical modeling, Bayesian statistics, survey design and analysis, causal inference, machine learning

PUBLICATIONS AND MEDIA:

- **Heidemanns, M.** (2022). Prediction and Error: Forecast Aggregation and Adjustment. Dissertation
- **Heidemanns, M.,** Gelman, A., & Morris, G. E. (2020). An Updated Dynamic Bayesian Forecasting Model for the US Presidential Election. *Harvard Data Science Review*, *2*(4).
- Morris, G.E. & **Heidemanns, M.** (2020) In America, your absentee ballot is more likely to be counted if you're white. *The Economist*
- Morris, G.E. & **Heidemanns, M.** (2020) Mailing it in. *The Economist*
- Beall, P., Felke, C., Hajdenberg, J, Mulvey, E. Shukla, A., & **Heidemanns, M.** (2020) More than 1 million people could lose their vote on Nov. 3. *USATODAY*