github
website
linkedin

Dominique Lockett

Ph.D Candidate/Computational Scientist

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A computational scientist with a diverse range of methodological expertise, including experimental design, automated ETL pipeline development, and the optimization, interpretation, and visualization of sophisticated models using cutting-edge R and Python tools. Equipped with the unique ability to break down and simplify complex techniques for diverse audiences, making technical concepts more accessible. An excellent candidate for organizations seeking a data-driven professional with a strong foundation in probability theory, statistics, and hands-on experience in contemporary machine learning and deep learning techniques.

Skills

Programming Languages	Python | R | MATLAB
Web Technologies & Databases	JavaScript | HTML | CSS | PostgreSQL | MySQL | SQLite | RSQLite
Frameworks & Libraries	Jupyter | BeautifulSoup | Numpy | Pandas | Scikit-learn | TensorFlow | PyTorch | Keras | XGBoost | LightGBM | sqlalchemy
Tools, Software & Formatting	ArcGIS | Stata | Git | LaTeX | MarkDown

Projects

News Discourse Analysis via Advanced NLP Techniques — June 2020-present

Big Data, Machine Learning, Data Engineering, Political Communication

- Constructed a large-scale dataset of Twitter data from 30 news outlets to examine communication patterns and styles, involving billions of tweets
- Designed and implemented a scalable ETL pipeline using Python packages such as `nltk` and `numpy` to develop efficient pre-processing in the management of big data
- Applied generalized linear mixed models and Bayesian statistics to analyze communication patterns, utilizing advanced NLP techniques such as sentiment analysis, topic modeling, and text classification using packages like `BERT`, `gensim`, and `scikit-learn`
- Demonstrated proficiency in handling API requests, pagination, and error management with `Tweepy`, ensuring a robust data collection process from Twitter
- Efficiently utilized `SQLAlchemy` ORM capabilities with `SQLite` for database storage and retrieval, employing features like declarative mapping, query composition, and connection pooling for optimal performance
- Presented complex quantitative analyses and findings to key stakeholders in a clear, concise, and actionable manner

Forecasting the 2020 Presidential Election — July 2019

Machine Learning, Ensemble Methods, Bayesian Inference, Time Series Analysis, Election Forecasting

- Developed a Bayesian model averaging approach to combine predictions from multiple forecasting models, leveraging expertise in experimental design and multivariate statistics
- Applied the ensemble method to the 2020 presidential election, resulting in a highly accurate and precise forecast with a 95% credible interval using 11 historical out-of-sample forecasts
- Designed and implemented an MCMC sampling scheme in `R` for rigorous statistical inference and uncertainty quantification, enabling a more comprehensive understanding of model performance and potential biases
- Conducted extensive data pre-processing, feature engineering, and model evaluation using cross-validation techniques to optimize model performance and ensure the validity of the forecasts

Political Advertisement Perception Study with Advanced Analytics **December 2021**

Data Engineering, Data Visualization, Conjoint Experiment, Political Advertising

- Conducted a conjoint experiment to understand user preferences and perceptions of political ads, leveraging expertise in non-parametric analysis with tools such as `cjoint`, `coefplot`, and `gmodels` packages for advanced statistical modeling and analysis
- Examined political and social issues survey data with `descr`, `labelled`, and `haven` packages to identify key trends and insights in public opinion
- Ensured accurate interpretation of results using statistical concepts such as weighted means, confidence intervals, and hypothesis testing
- Designed and developed informative visualizations with `ggplot2` and `plotly` packages, effectively communicating complex findings
- Utilized strong communication competencies to present actionable insights to extended teams and small groups of key stakeholders

Analyzing Misinformation Effects **July 2022**

Research Design, Data Analysis, Machine Learning, Data Visualization, Publication, Misinformation

- Developed a novel research framework integrating experimental and observational data to investigate misinformation effects on public opinion and behavior
- Employed machine learning techniques such as regression and generalized linear mixed models, classification, and clustering algorithms to evaluate causal factors and predict misinformation susceptibility
- Ensured validity and generalizability by using nationally representative samples and cross-validation techniques in the R
- Fostered transparency and reproducibility by submitting research data, code, and documentation to the Harvard Dataverse repository, enabling further collaboration and research in the field

Measuring Effectiveness of Misinformation Corrections: Design and Implementation **September 2022**

Research Design, Data Analysis, Data Visualization, Grant Writing, Misinformation

- Devised a novel survey experiment to assess the efficacy of misinformation corrections using advanced statistical techniques, including non-linear mixed models and Bayesian statistics
- Implemented a pilot survey and deployed the final survey to a diverse, nationally-representative sample, ensuring generalizability of the results
- Analyzed survey data using R programming, employing packages such as `dplyr`, `tidyverse`, and `ggplot2` for data manipulation, visualization, and application of multivariate statistics
- Developed data-driven insights on the effectiveness of various misinformation correction techniques and presented findings through clear and informative visualizations
- Contributed to grant writing efforts, securing funding for future research on misinformation and its impact on public opinion and behavior
- Effectively communicated complex quantitative analyses to extended teams and key stakeholders, utilizing strong communication competencies to present findings in a clear, concise, and actionable manner

Experience

Python Instructor — **June 2020 — Present**
Washington University in Saint Louis — Saint Louis, MO

- Developed a curriculum teaching Python programming, data analysis techniques, Git, and JupyterLab for public health master's students
- Taught Python fundamentals, data manipulation, and visualization using `pandas`, `numpy`, and `matplotlib` libraries
- Supervised hands-on projects, highlighting the use of GitHub for version control and JupyterLab for interactive analysis
- Adapted teaching methods for diverse learners, preparing students to address public health problems with data-driven approaches

Research Assistant — **June 2018 — Present**
Washington University in Saint Louis — Saint Louis, MO

- Implemented advanced ensemble machine learning techniques, such as Bayesian model averaging and random forests, to develop an R package (`EBMAforecast`) for predicting heterogeneous treatment effects in political research
- Conducted extensive data pre-processing, exploratory analysis, handling of missing values, outlier detection, and feature engineering to ensure high-quality data input for model development
- Optimized model performance through rigorous hyper-parameter tuning, cross-validation, and appropriate feature set selection, leading to improved predictive accuracy and robustness across contexts
- Collaborated with interdisciplinary teams of political scientists, statisticians, and computer scientists to apply methodologies and communicate complex findings effectively

Vice Chair of Special Business District — **March 2021 — December 2022**
Tower Grove South — Saint Louis, MO

- Collaborated with stakeholders to allocate property taxes for safety and cleanliness in the Tower Grove South neighborhood, St. Louis
- Redesigned and maintained the district's website, enhancing user experience and public information access
- Represented the district at meetings, addressing inquiries about neighborhood projects and services
- Fostered teamwork among stakeholders, promoting collaborative problem-solving and the implementation of community-driven solutions

Education

Ph.D. in Political science	Washington University in Saint Louis	August 2017 — Present
M.A. in Political Science	Saint Louis University	August 2016 — May 2017
B.A. Political Science (Cum Laude)	Saint Louis University	August 2013 — May 2016
A.A. Communication	Ivy Tech Community College	August 2009 — May 2012

Publications

Guess, Andrew, Dominique Lockett , Benjamin Lyons, Brendan Nyhan, Jacob M. Montgomery, and Jason Reifler. 2020. "'Fake news' may have limited effects beyond increasing beliefs in false claims." The Misinformation Review.

Edelson, Laura, Dominique Lockett , Jacob Montgomery, Damon Mccoy, Tobias Lauinger, Celia Guillard"US Public Opinion Towards Platform Regulation of Political Advertisements: Discontent and Consensus for Reform" (Forthcoming)

Lockett, Dominique. Using Objectivity to Improve Argument Evaluations. (Forthcoming)

Awards and certificates

Research seed grant	Washington University in Saint Louis	November 2020
Diversity fellowship	Saint Louis University	June 2016
Fundamentals of G.I.S.	University of California, Davis	September 2020