

Zach Markovich

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Summary

Computational social scientist with 8 years of applied data science experience. Key strengths include predictive modeling and processing large datasets as well as communicating key results to non-technical audiences and stakeholders.

Education

PhD Massachusetts Institute of Technology, Political Science and Statistics	Expected 2023
BA Dartmouth College, Government, Mathematics, and Social Science	2015

Experience

Data Science Intern, Liberty Mutual Insurance	Summer 2022
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- Developed a model to identify auto accidents with potential for recovery of funds paid via the legal process based on structured data and free text associated with every claim
- Improved model accuracy projected to yield over \$3 million of savings annually

Graduate Researcher, MIT Political Science	2017— Present
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Predictive Modeling

- Constructed random forest algorithm to identify inattentive responders in survey research
- Trained ensemble learner to predict county level public opinion from a small national survey
- Implemented naïve Bayes classifier to identify federal employees based on short textual descriptions
- Built meta-learner to predict 2018 elections based on experts' published predictions

Causal Modeling and Econometrics

- Developed novel machine learning algorithm for measuring the importance of different spend buckets to an organization's success
- Used algorithm to measure the impact of political campaigns' spending on election outcomes
- Conducted difference-in-differences analysis of New York City's municipal records to model the effect of minimum wage increases on the political engagement of low-income workers
- Used regression discontinuity design and federal payroll data (70 million records) to quantify the change in political ideology after joining the public workforce

Surveys and Experimental Design

- Utilized deep autoencoders for the extraction of political ideology from survey responses
- Programmed 5 surveys using PHP and the Qualtrics survey platform
- Fielded and analyzed survey experiment measuring the effect of partisan media on public opinion towards big tech companies
- Implemented experimental design measuring reduction of social desirability bias in factorial experiments

Data Processing and Manipulation

- Compiled item level campaign expenditures database (83 million records)
- Used fuzzy merge to combine municipal payrolls (1.3 million records) with voter rolls (6.8 million records)

Teaching Assistant, MIT Political Science	2020— Present
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- Lectured on topics in machine learning and statistics
- Wrote problem sets focusing on machine learning and statistical models including regression techniques, hypothesis testing, random forests, k-nearest-neighbors, and deep learning

Research Associate, Harvard Business School	2015— 2017
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- Created survival models to predict the duration accounting rules based on board member characteristics
- Coded web scrapers to gather data on 217 accounting rules

Research Associate, Dartmouth Policy Research Shop	2013— 2015
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- Provided data analysis to the New Hampshire and Vermont state legislatures on topics like end-of-life care or the effect of an energy efficiency charge on income inequality

Skills

- **Programming:** R (tidyverse, ggplot2, data table), Python (numpy, scikit, pandas, keras, tensorflow), SQL (Postgres), PHP, Stan, AWS,
- **Statistical Models:** Bayesian Modeling, Hierarchical Models, Generalized Linear Models, Survival Analysis, Latent Variables Models, Mixed Effects Models, Causal Inference, Panel Models
- **Machine Learning Techniques:** Non-Parametric Regression, Deep learning, Natural Language Processing, Tree Based Models, Deep Learning, Cluster analysis