Empowering Voters: Matching Donors with Struggling Candidates

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April 30th, 2023

Abstract

This project aims to address challenges related to political participation and decision-making in a democratic society by providing a platform that helps users make informed decisions. It does so by highlighting struggling candidates who would benefit the most from donations based on their beliefs and state. The project uses a predictive model created from data on the 2022 House of Representatives elections to identify key candidates. The platform encourages greater participation within democracy by encouraging involvement through donations. The model sorts candidates based on their campaign funds, beliefs, and chance of winning. Users can filter by state and easily access the candidate's campaign page. Its purpose is to make it easier for voters to become informed and engaged in the political process.

Background

In a democratic society, citizen participation in the political process is essential. However, it can be challenging for voters to navigate the complex landscape of politics and understand which candidates are most likely to win an election and which issues are most important to them. Additionally, campaigns can be expensive, and struggling candidates may be less likely to win, limiting the diversity of perspectives that can be represented in government.
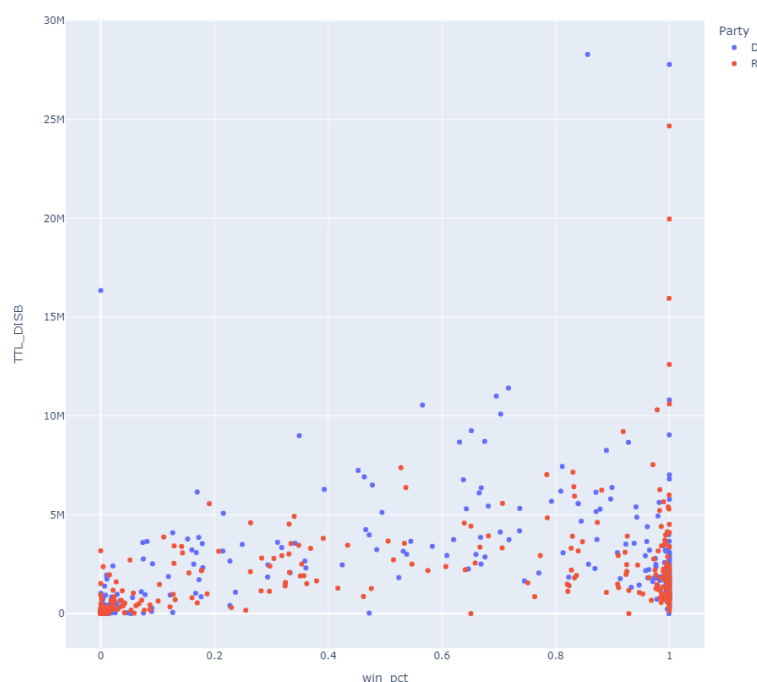
This project's purpose is to address these challenges by providing a platform that helps users make informed decisions when voting for candidates. Specifically, the project aims to highlight candidates who are struggling to fund their campaigns and would benefit the most from donations, leveling the playing field and ensuring that candidates with strong beliefs and policies have a better chance of winning, regardless of their financial resources.

Methodology

The study utilized data from the Federal Election Commission (FEC), FiveThirtyEight, and OpenSecrets to construct a comprehensive understanding of the numerous factors that contribute to election outcomes. The analysis focused on the 2022 House of Representatives elections, given the high availability and significant correlation between campaign finance and electoral success. Key variables, such as total funds raised, total expenditures, incumbency, and predicted win percentages, were integrated into a predictive model to rank candidates based on their potential impact. Ideological alignment data collected from FiveThirtyEight was also incorporated to facilitate user selection of candidates. The findings were visualized using standard Python data science libraries, providing users with an intuitive and user-friendly interface.

Results

The analysis revealed a strong correlation between campaign financing and electoral outcomes, with 93% of candidates who raised more money emerging victorious in contested races. This underscores the need for greater transparency and accountability in campaign finance, which can be seen looking into the total distribution of money versus win percentage.

The analysis also encompassed the Senate elections, but the House dataset was chosen for further analysis due to its stronger correlation. A logistic regression was conducted, utilizing key variables to classify the election winner with impressive accuracy (~92%). This model was leveraged to identify the candidates most susceptible to the impact of a donation, adjusting the relevant variables and quantifying the resultant difference in predicted probabilities. The findings were visualized using Streamlit, enabling users to easily engage with the data and adjust it according to their respective ideologies.

Challenges

The project encountered several challenges that are common in data science projects. Technical issues such as data preprocessing, selecting appropriate statistical models, interpreting results, and visualizing data were particularly challenging. Effective communication, collaboration, and leadership skills were also essential in managing team dynamics and ensuring that all members contributed effectively to the project's objectives. Ethical considerations regarding potential biases in political data were another significant challenge that required careful navigation. Moreover, given the project's size and scope, time management, and project

organization were critical to the project's success, and the team had to adapt quickly to meet strict deadlines and milestones.

Concluding Discussion and Future Work

In conclusion, this project successfully created a platform to address the challenges related to political participation and decision-making by highlighting struggling candidates who would benefit the most from donations based on their beliefs and state. The project's methodology utilized a predictive model created from data on the 2022 House of Representatives elections to identify key candidates and was visualized using standard Python data science libraries. The analysis revealed a strong correlation between campaign financing and electoral outcomes and underscored the need for greater transparency and accountability in campaign finance. However, the project encountered several challenges such as technical issues, effective communication, collaboration, leadership skills, ethical considerations, time management, and project organization. Future work could involve expanding the scope of the platform to include other elections like local elections or developing additional features to facilitate greater user engagement and understanding of the political process.

Acknowledgements

We would like to extend our sincere gratitude and appreciation to our mentor, Dr. Randy Olson, for his invaluable guidance and support throughout the course of this project. Dr. Olson's expertise in data science and his dedication to our team's success have been instrumental in shaping our approach and achieving our goals.

His feedback and advice have been critical in helping us navigate the challenges of the project and ensuring that we stay on track. We are grateful for the time and effort he has invested in our project and his unwavering commitment to our success.

In addition, we would like to thank Dr. Dirk Colbry for assembling our team and providing us with the opportunity to work on such an important and impactful project. His guidance and leadership have been instrumental in ensuring the success of our team and the project as a whole.

References

- Federal Election Commission (FEC) website: https://www.fec.gov/
- FiveThirtyEight website: https://fivethirtyeight.com/
- OpenSecrets website: https://www.opensecrets.org/
- Streamlit website: https://streamlit.io/
- Our repository: https://github.com/pavlicag/campaign_finance_donation_optimization.git
- Our streamlit: https://pavlicag-campaign-finance-donation-optimiz-streamlitmain-iuzsxf.streamlit.app/