ANALYSIS ON ELECTIONS CONTRIBUTIONS DATA

AGENDA

Overview

Dashboard

Feature Importance

Closing Thoughts

OVERVIEW

QUICK HISTORY ON ELECTIONS CONTRIBUTIONS/DONATIONS

- Since 2003, all corporate and union donations have been banned and caps on donations were introduced.

- Additional regulations and changes have been added in to further enforce and reduce the caps to limit the impact of large donors on elections.

- Elections Canada keeps an open database on all contributions over $200 as part of their attempt to keep all donations transparent since the 38th general election (2004).
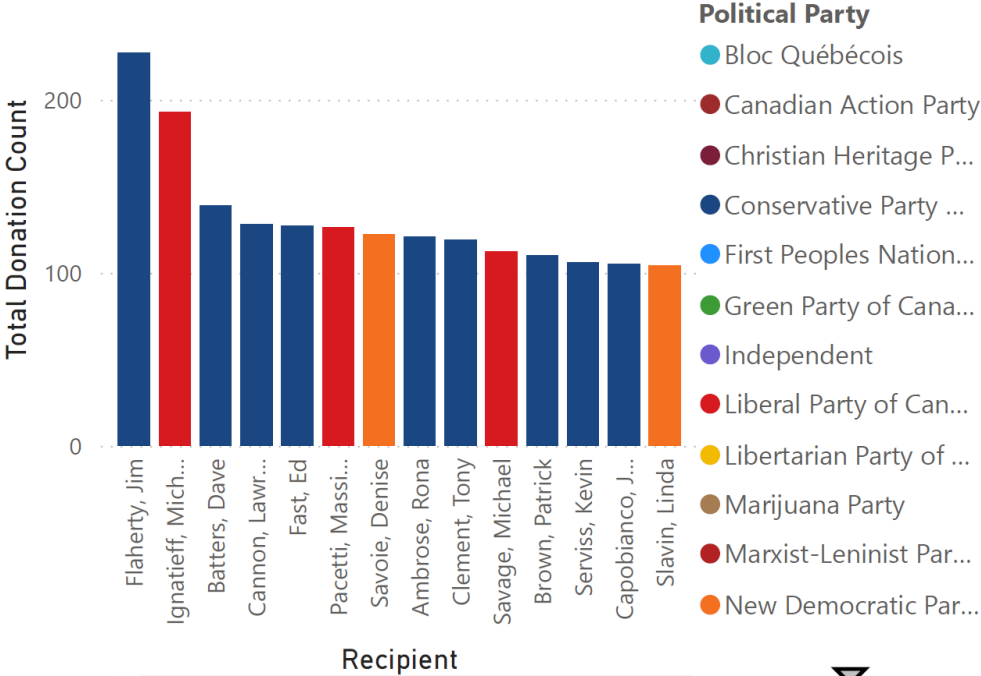
GOALS

- Utilize available data to analyze potential impact of donations/contributions for elections.

- Create a visualization dashboard to illustrate additional key insights on the data.

DASHBOARD

Overview - Political Contributions/Donations

Total Number of Donations for Each Recipient

Political Party
- Bloc Québécois
- Canadian Action Party
- Christian Heritage P...
- Conservative Party ...
- First Peoples Nation...
- Green Party of Cana...
- Independent
- Liberal Party of Can...
- Libertarian Party of ...
- Marijuana Party
- Marxist-Leninist Par...
- New Democratic Par...

Total Amount Received in Donations for Each Recipient

Political Party
- Bloc Québécois
- Canadian Action P...
- Christian Heritage ...
- Conservative Party...
- First Peoples Natio...
- Green Party of Can...
- Independent
- Liberal Party of Ca...
- Libertarian Party of...
- Marijuana Party
- Marxist-Leninist Pa...
- New Democratic P...
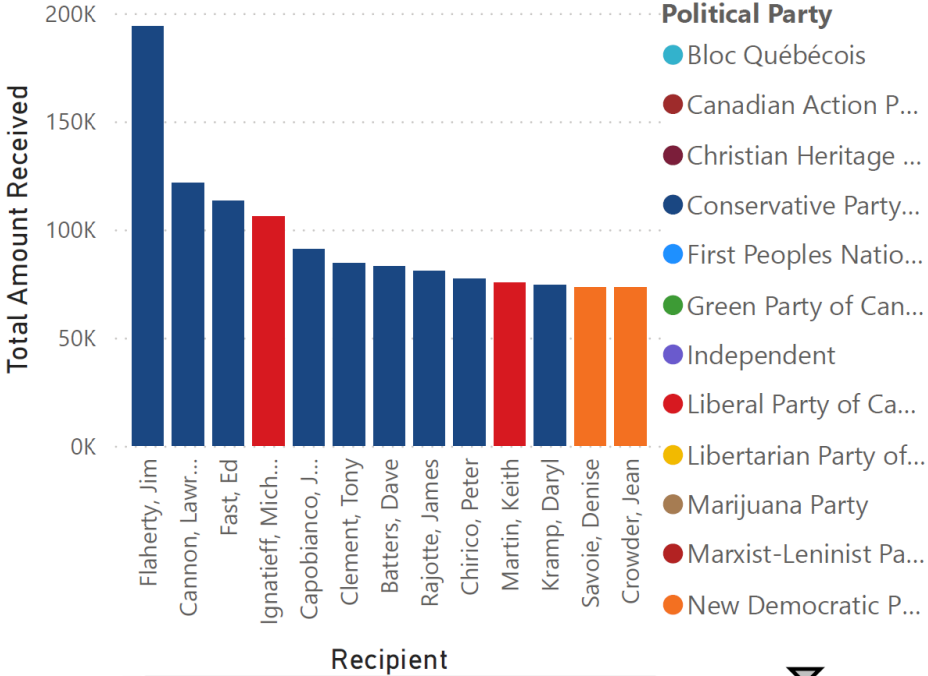
Electoral event

39th general election

Electoral District

All

Contribution Caps

Election	Contribution Cap
38	5000
39	5000
40	1000
41	1000
42	1500
43	1500
44	1500

Total Donations Received by Political Party

0.29M (1.97%)
2.43M (16.66%)
6.18M (42.37%)
4.98M (34.1%)

Political Party
- Conservative Party o...
- Liberal Party of Cana...
- New Democratic Party
- Green Party of Canada
- Independent
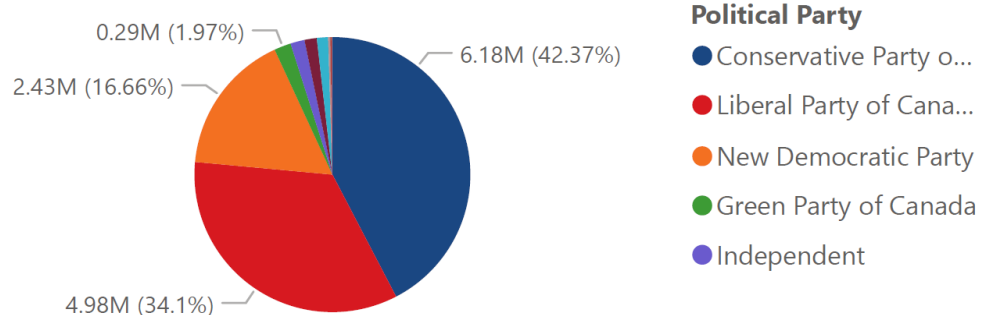
699.07
Average Donation Amount

Key Insights
- In general, the Conservatives tend be the most successful at fundraising, often being the dominant party in terms of donation share
- While contribution caps have generally decreased over time, the average amount in terms of donations have remained similar.
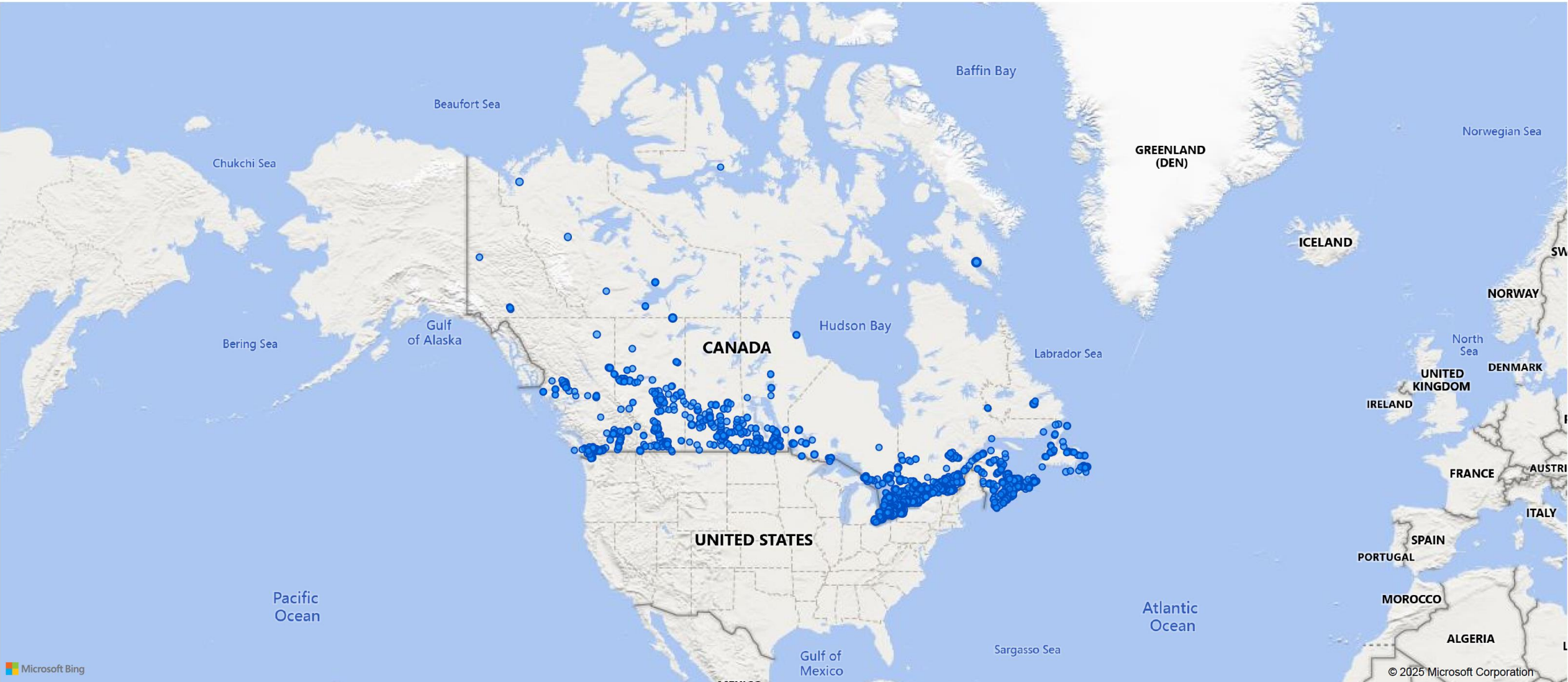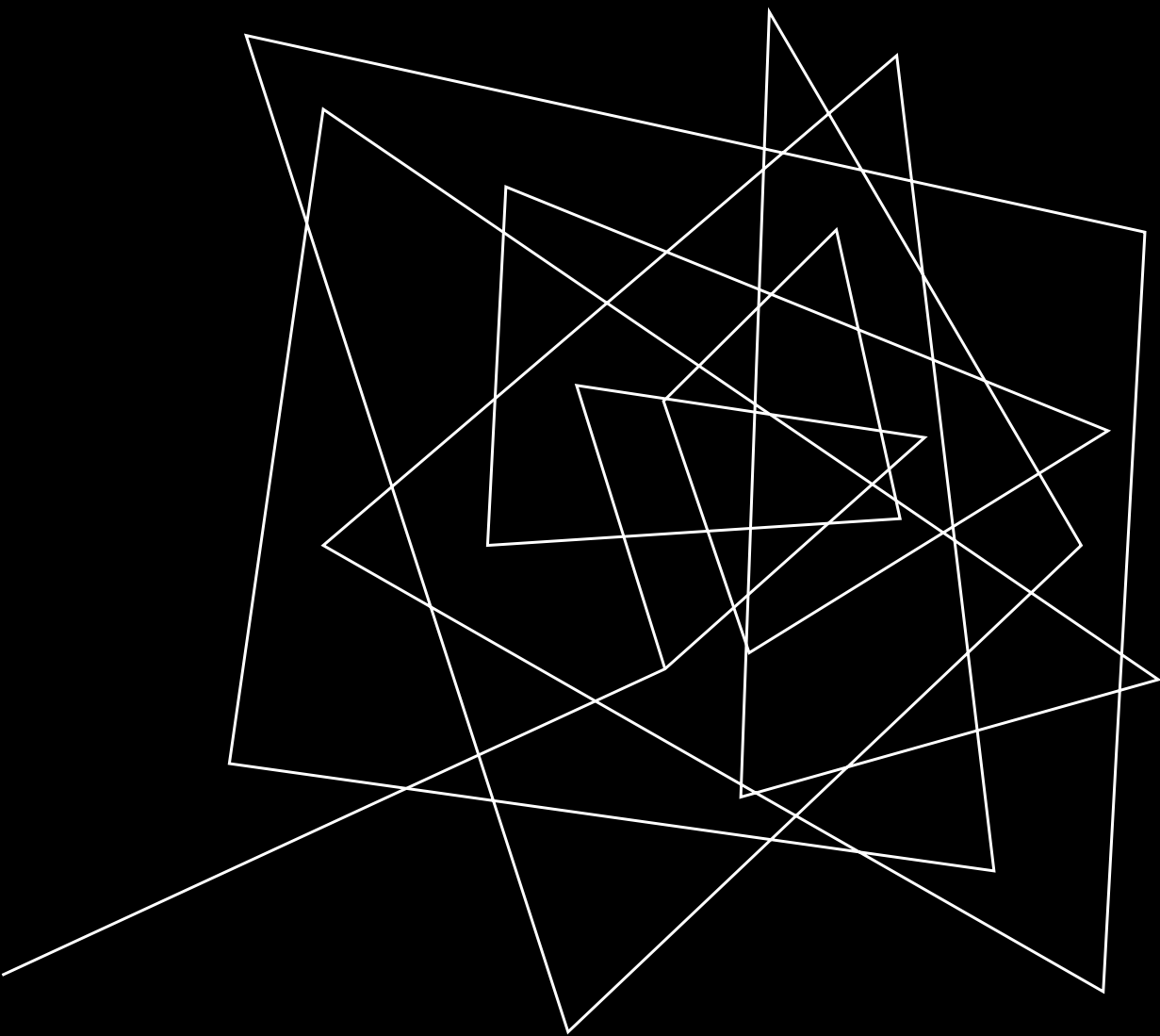
Map of Donor Locations

49.76K

Total Unique Donors

FEATURE
IMPORTANCE

MODEL CHOICE AND EXPLANATION

Gradient-Boosted Random Forest

Machine learning model that combines many "decision trees" to make more accurate predictions:

- Handles both numerical and categorical data well

- Run both classification and regression models

SHAP Values (SHapley Additive exPlanations)
Method for explaining ML model decisions

- Shows which inputs have the most influence on the prediction output

- Game theory-based calculations to divide up the "credit" on the input's influence on the result
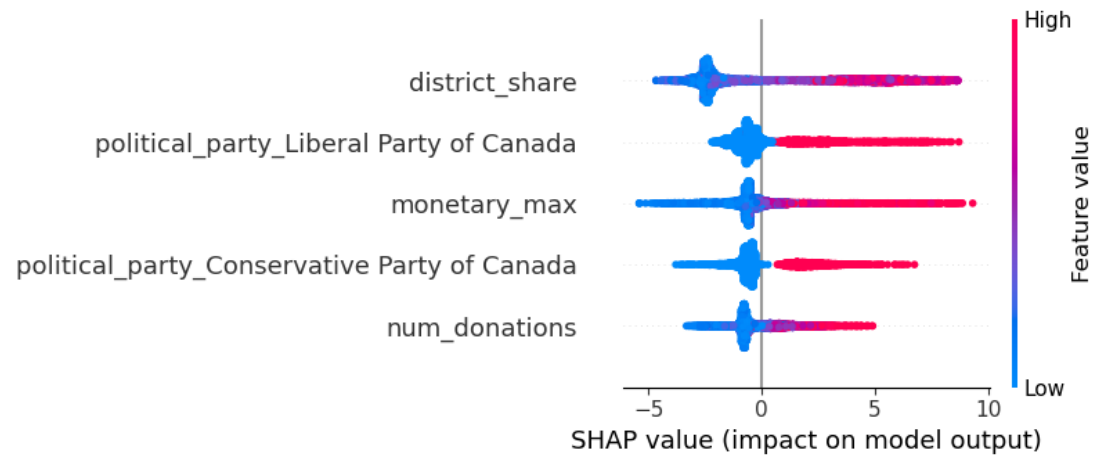
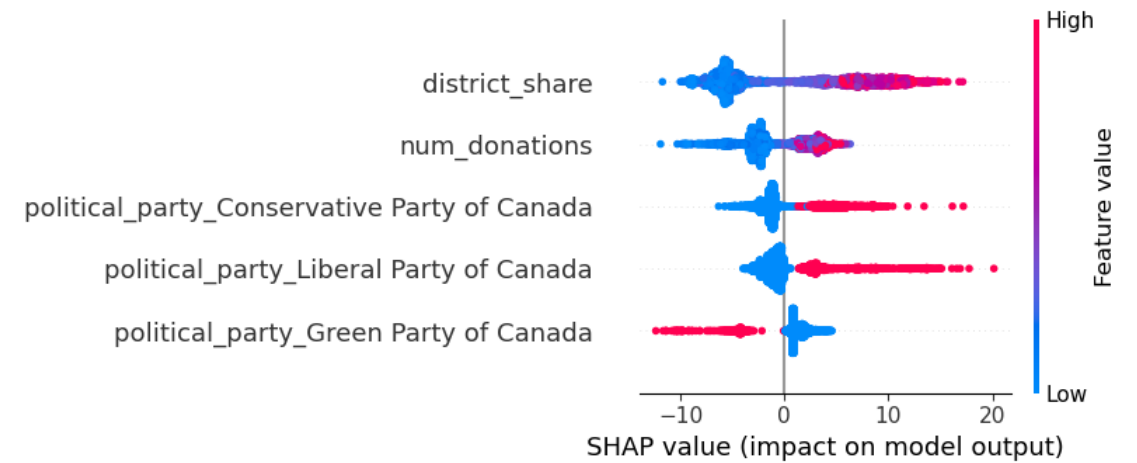# EXAMPLE TREE
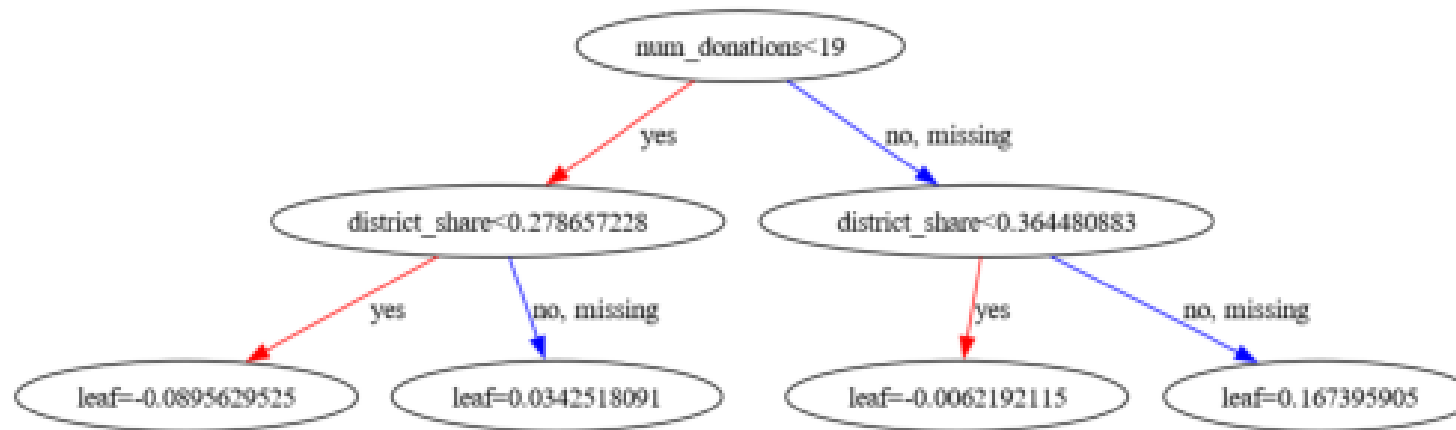
FEATURES ANALYZED

- District share (i.e. what % of donations recorded was captured by the candidate)

- Highest donation amount received

- Total donation amount received

- Number of donations

- Which election this happened in

- Which district the candidate was based in

- Which political party the candidate was in

SHAP GRAPHS

Classification

Regression

KEY INSIGHTS

- The model results aren't stellar – about 50% accuracy in terms of prediction, and ~10% error in vote share.

- However, this level of performance is expected: the goal wasn't to predict accurately, but to test whether donation patterns relate to outcomes.

- Based on the results, it shows that fundraising/donation support does have some potential influence on election results.

- It could represent meaningful proxy for voter support and potentially used in combination with other data to elevate models.
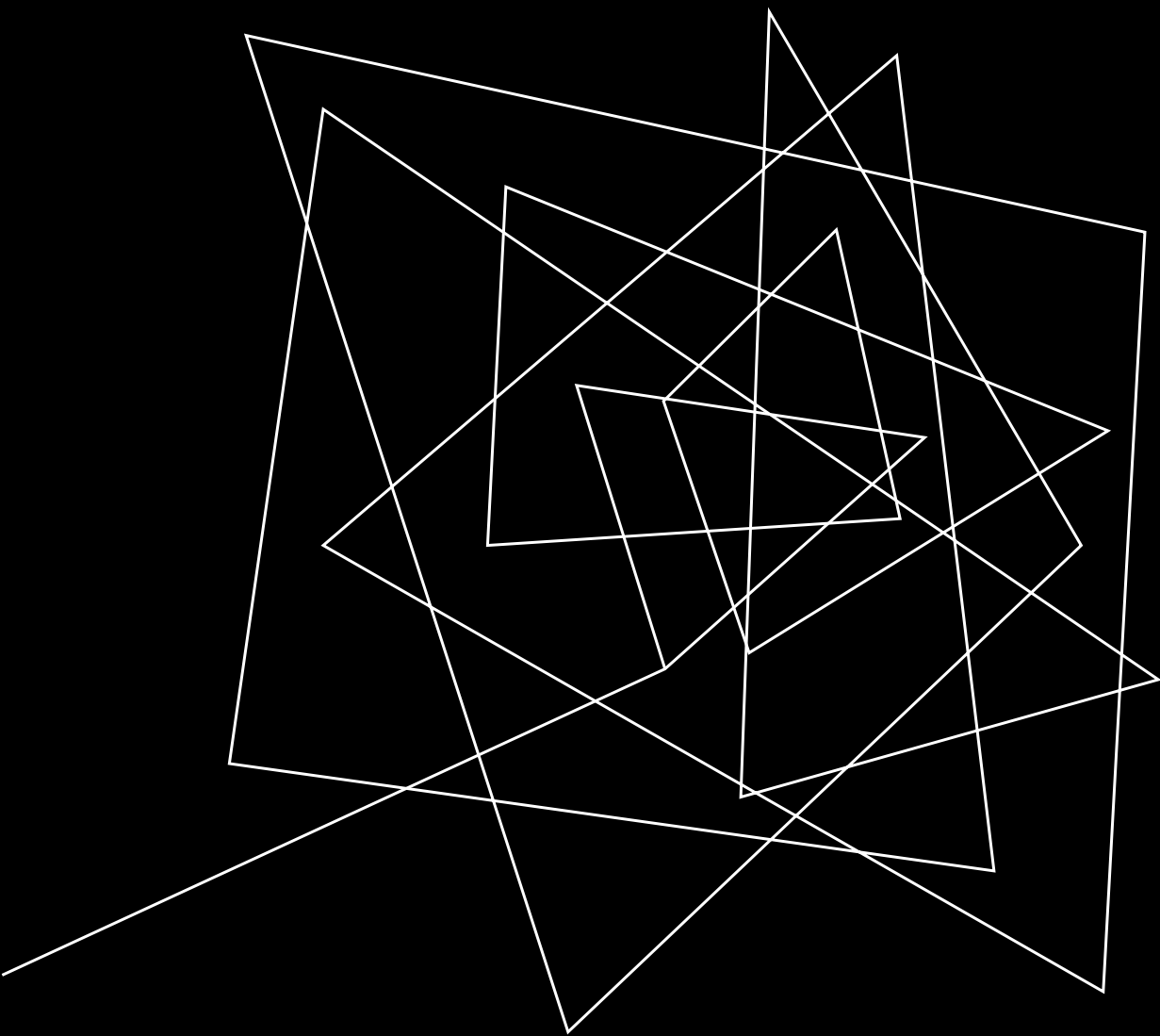
CLOSING
THOUGHTS

FINAL TAKEAWAYS

- While it may seem obvious as a conclusion, this suggests that tracking donations can be a signal for campaign momentum.

- This signals that strong grassroots campaigns that really work to interact and engage within the members of a district to be financially engaged could lead to better election results

- While the pool of generous donors is small, this group alone shows the potential influence of fundraising on results.

- The reduced contribution caps in general does not seem to have detrimentally affected average donation size.

- Canada has established a transparent system of tracking contributions but needs to better translate this to the public in a more accessible way.

THANK YOU!

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