Registered Voter Participation in Union County, NC

Max Steele

Purpose

- Create a dashboard for exploring trends and comparing elections
    - 2012, 2016, 2020 general elections

- Use machine learning to investigate relationships between demographics and participation

- Provide insights into increasing turnout for Democratic candidates

Obtain & Scrub

- NC State Board of Elections
  - Voter registration records
  - Voter history records

- Data preparation and cleaning
  - Drop duplicate records
  - Drop "Removed" and "Denied"
  - Merge records on unique NCID

- Separate datasets for 2012, 2016, and 2020
  - Filter voters based on:
    - Registration date
    - Age

Distribution of Voter Registration Status
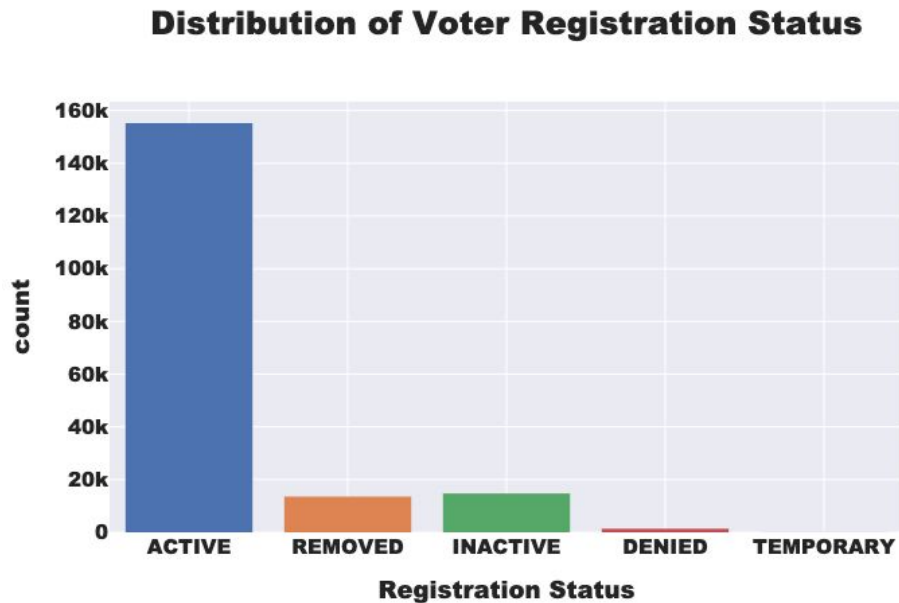
Explore: Interactive Dashboard
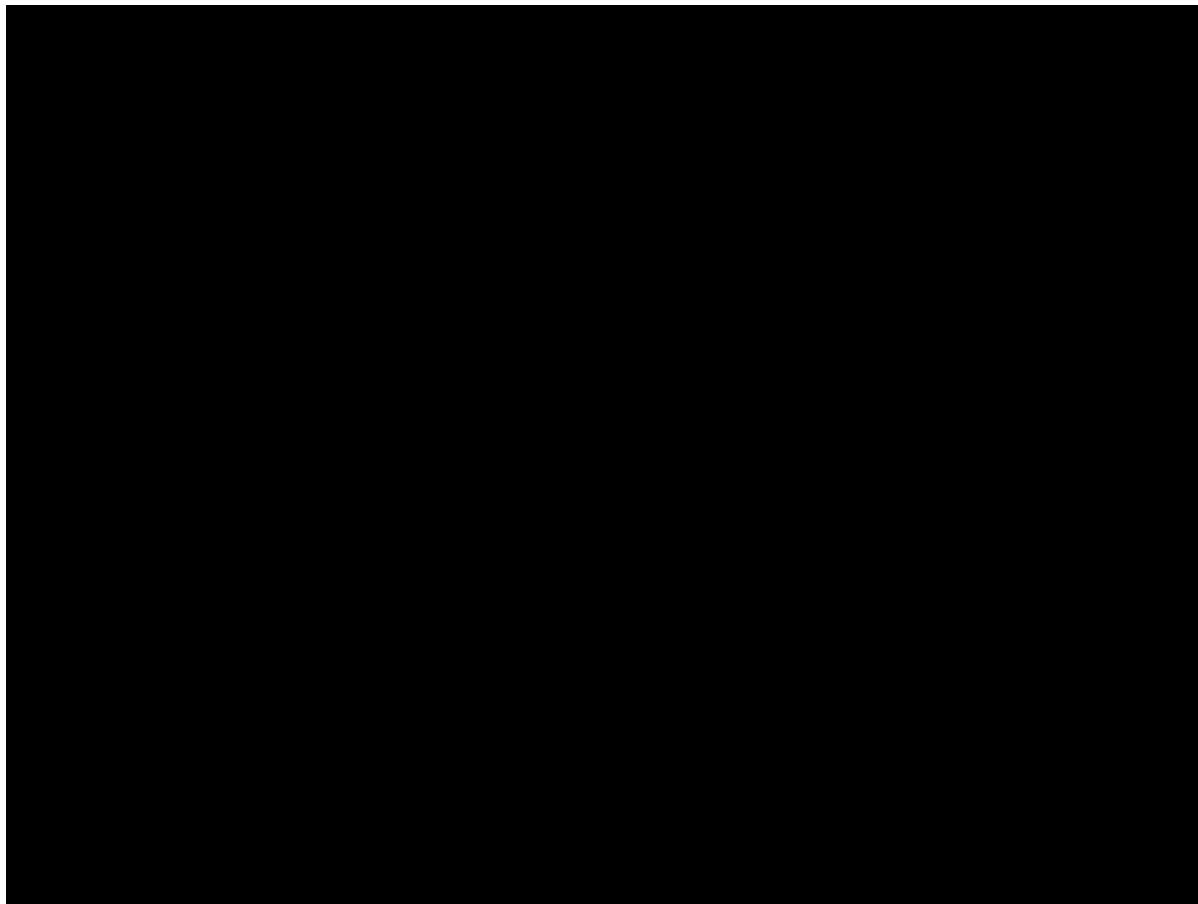
Dashboard Link

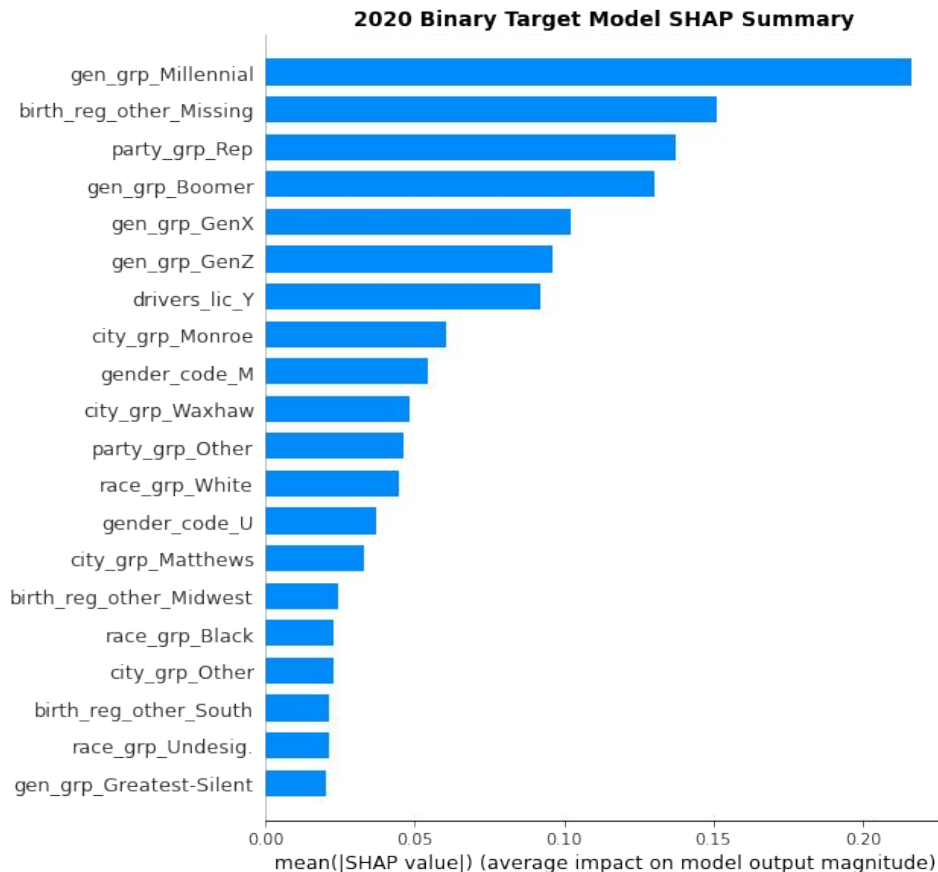# Modeling

- **Predicting Vote vs. No Vote:**
  - **Generation**
  - **Political Party**
  - Race
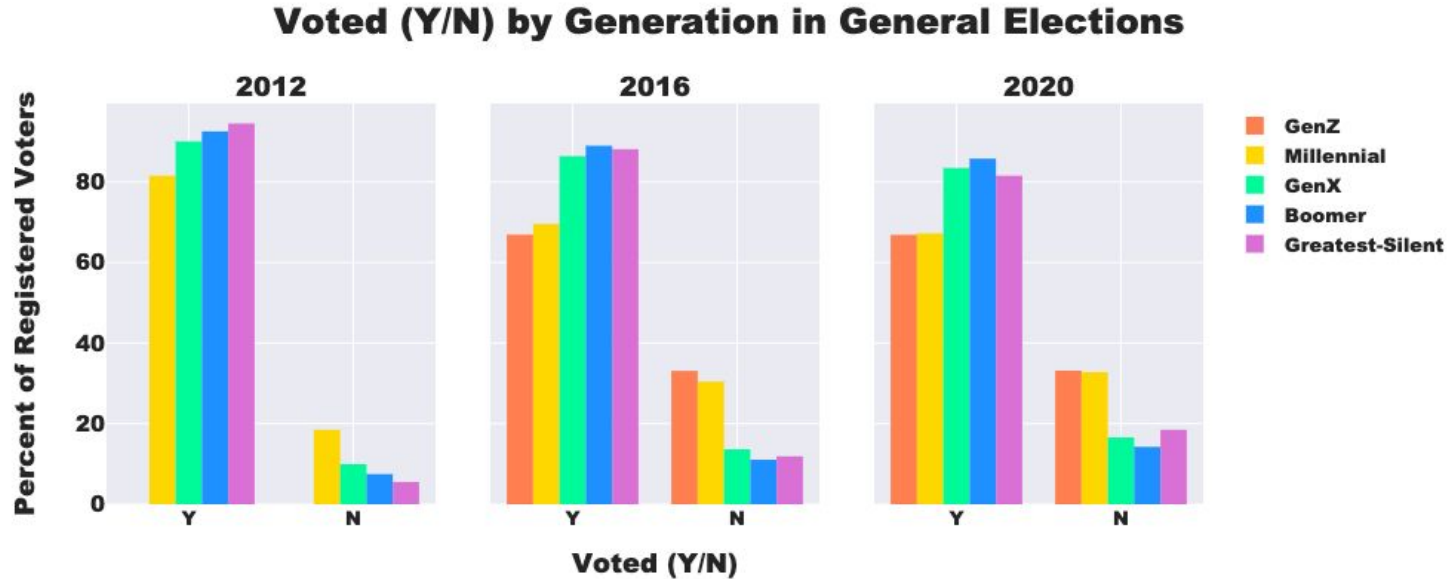 - Gender
  - **Birth Region**
  - **Drivers License**
  - City

- **Overall accuracy**
  - **2020:** 66%
  - **2016:** 69%
  - **2012:** 66%


2020 Binary Target Model SHAP Summary

Recommendations

- Voter Age:
  - Focus on getting Gen Z and Millennials to the polls

Voted (Y/N) by Generation in General Elections
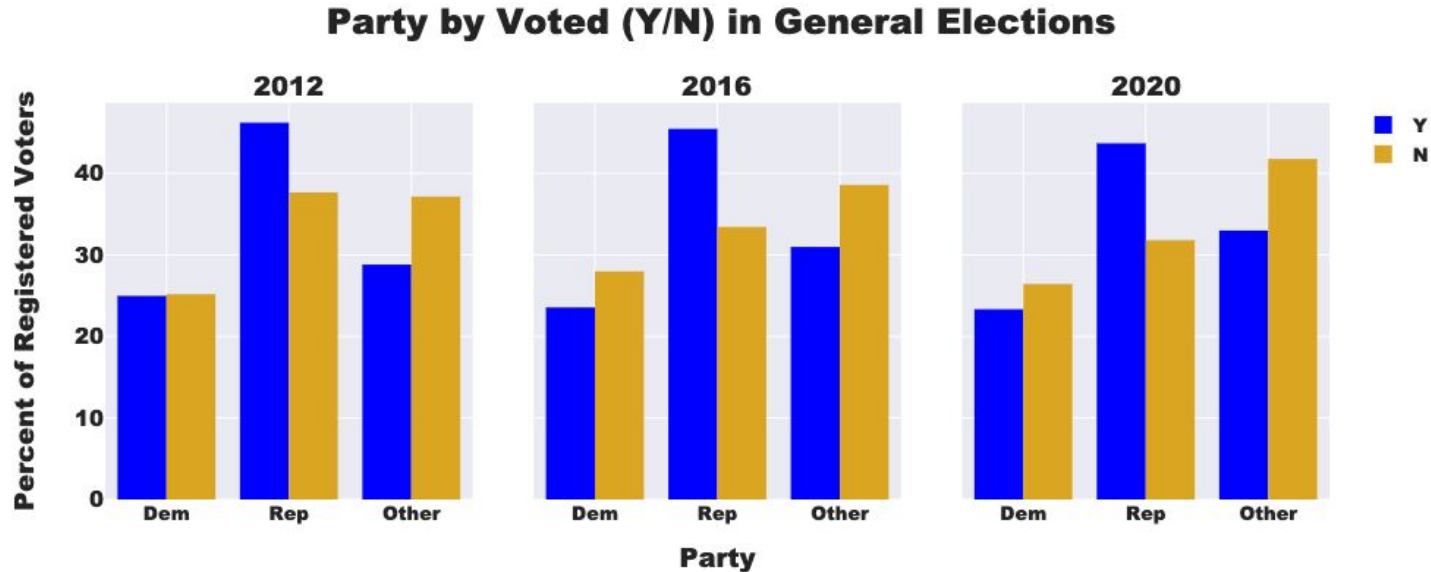

Legend:
- GenZ
- Millennial
- GenX
- Boomer
- Greatest-Silent

Recommendations

- Drivers License:
  - Clear communication around voter ID laws
  - Transportation to and from polls

Drivers License by Voted (Y/N) in General Elections
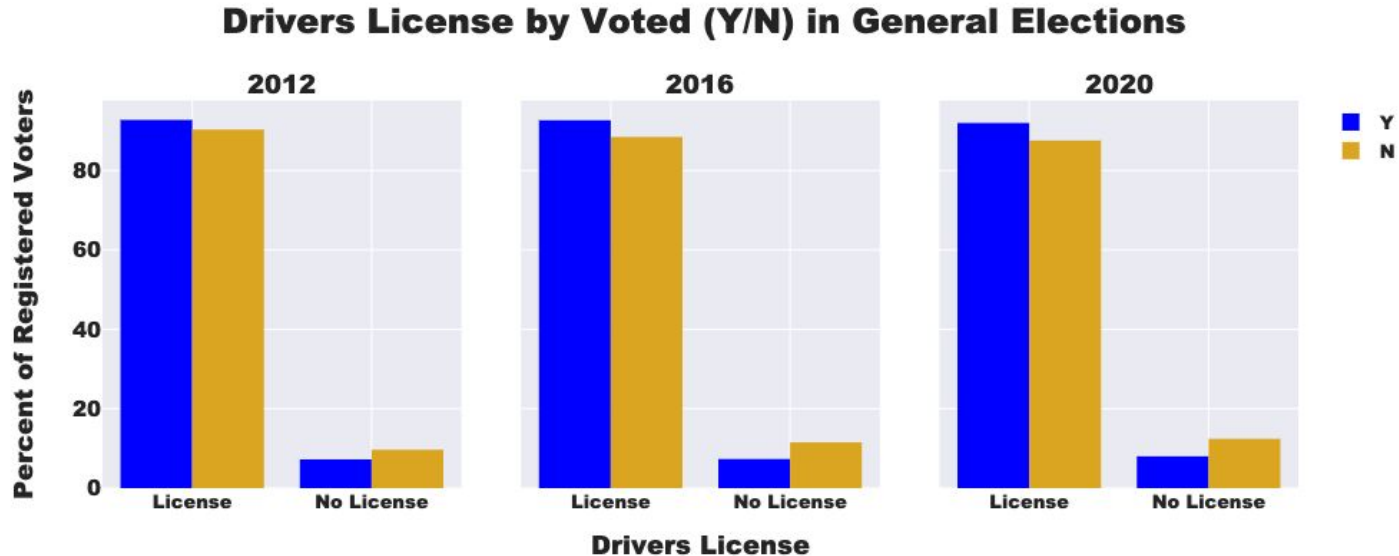
Recommendations

- Political Party:
  - Appeal to unaffiliated voters and members of minor political parties

Party by Voted (Y/N) in General Elections

Summary

- Union County Registered Voters dashboard as a tool for exploring:
  - Demographics
  - Participation in recent elections

- To increase voter turnout for Democratic candidates:
  - Gen Z and millennials
  - Clear communication around voter ID laws
  - Unaffiliated and minor party voters

Future Work

- Investigate interaction effects among demographic features

- Scale up to statewide models

- Add to dashboard
  - Trends in voter registration status
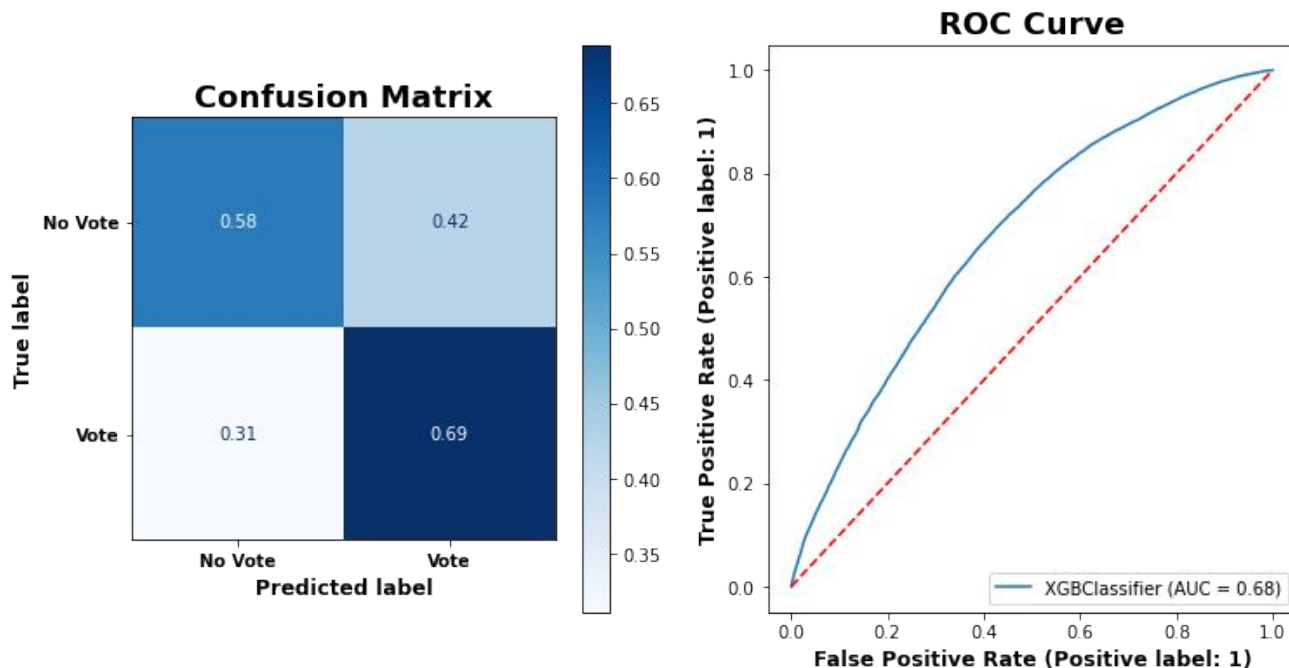 - Compare current registered voter population to U.S. Census data
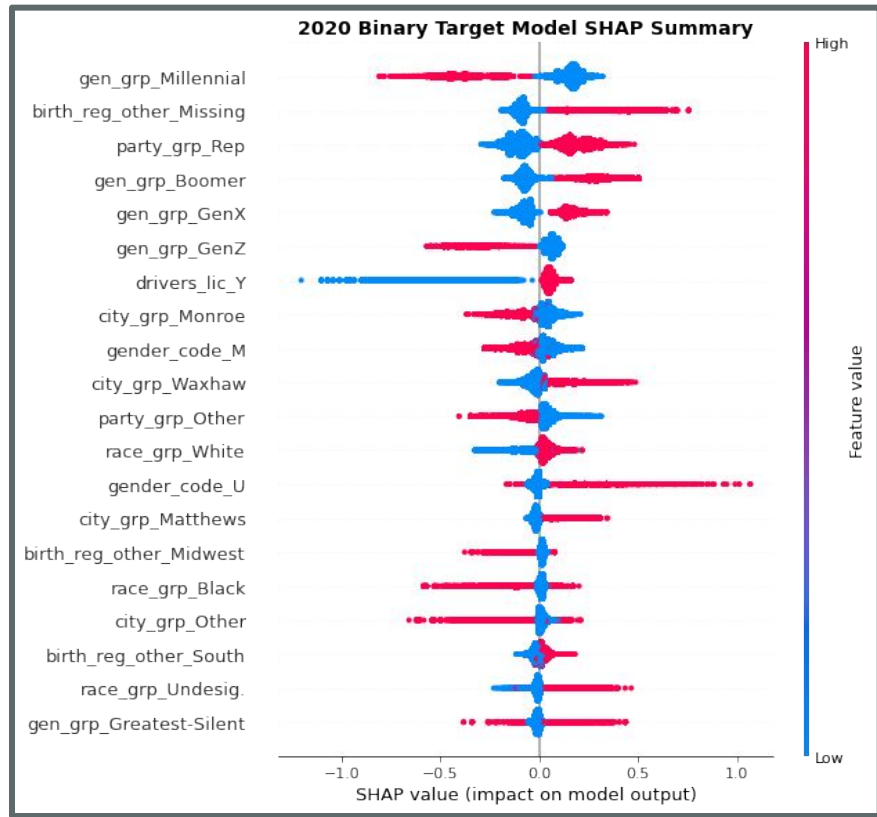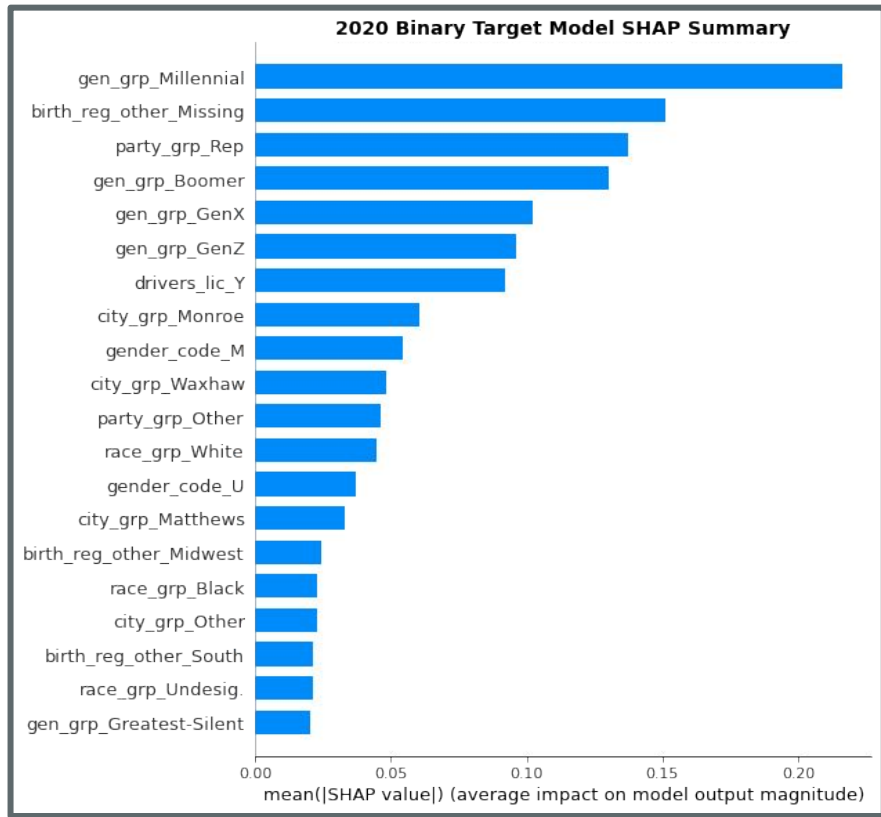
Thank you!

Questions?

Max Steele

https://github.com/zero731

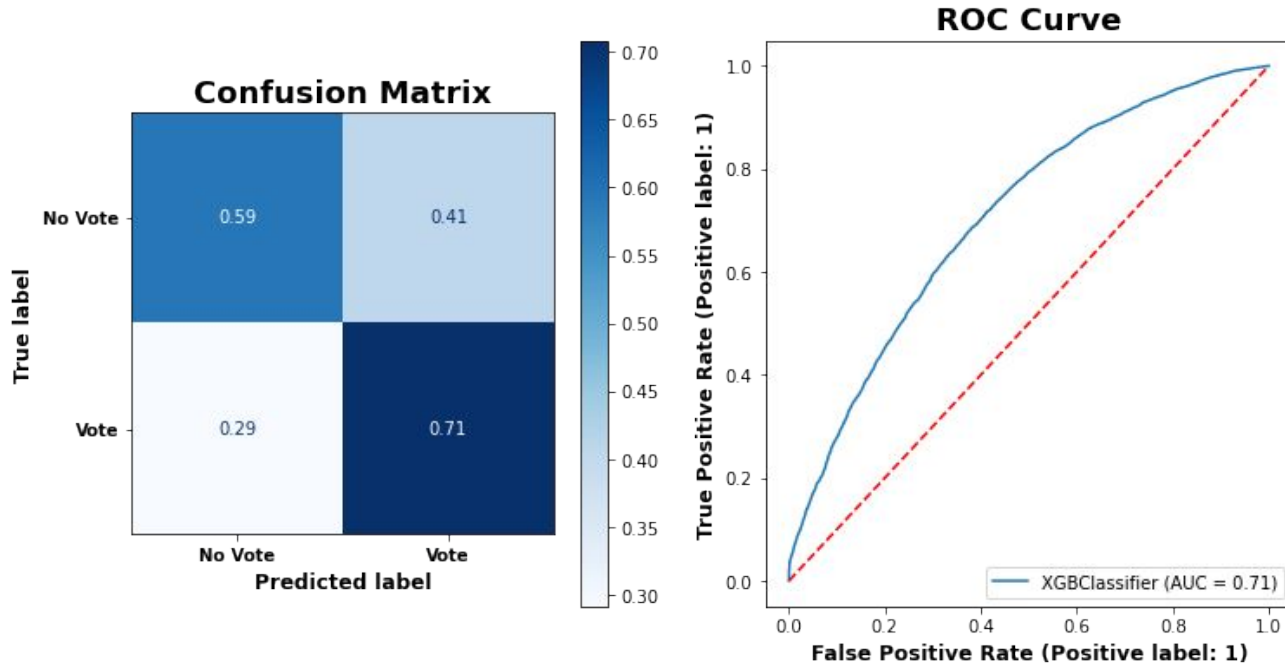# Appendix I – Best 2020 Model

- 66% accuracy

Appendix II – Best 2020 Model

Appendix III – Best 2016 Model

- 69% accuracy

Confusion Matrix

ROC Curve

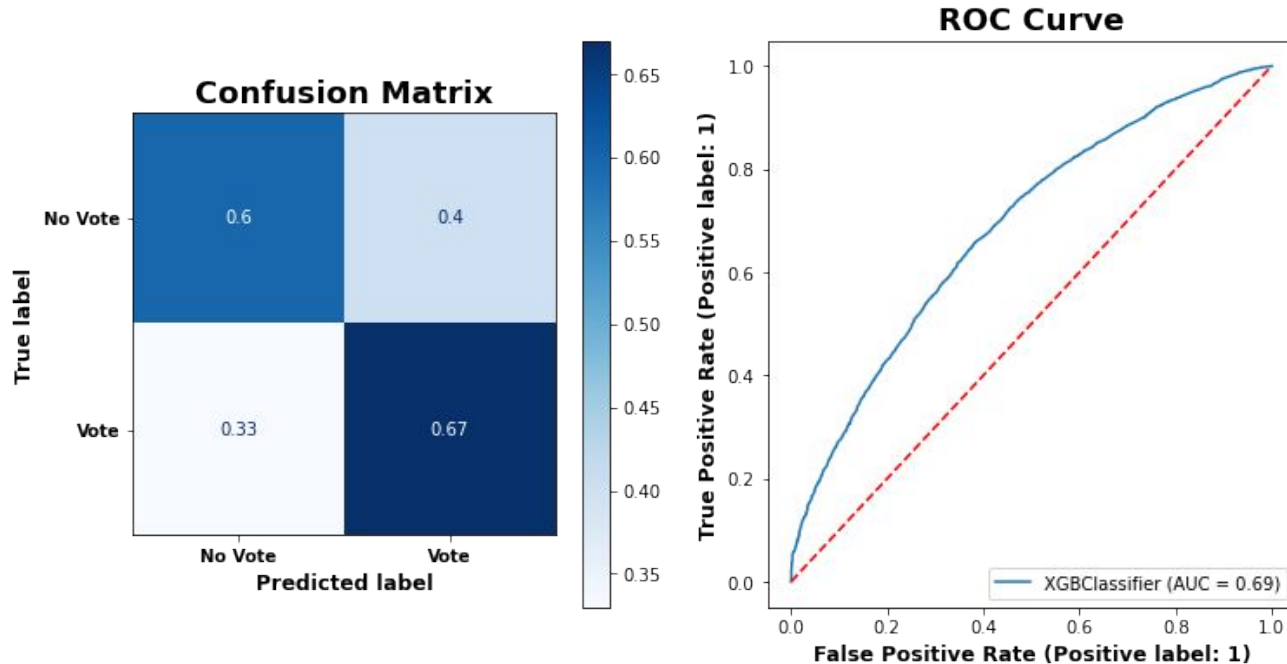# Appendix IV – Best 2016 Model
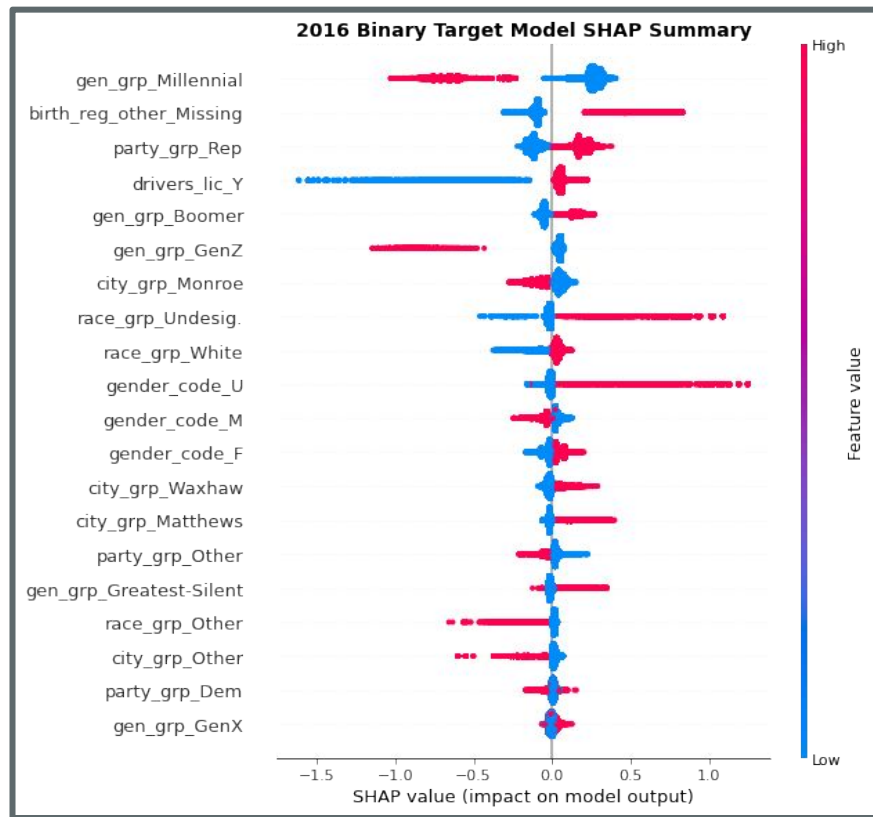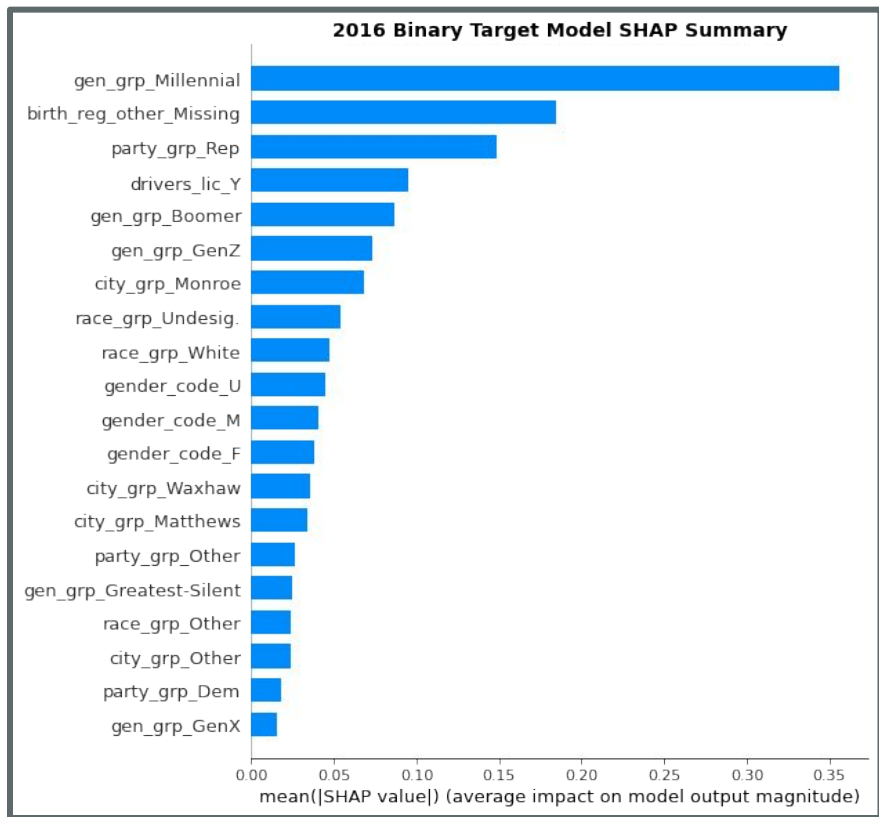
Appendix V – Best 2012 Model

- 66% accuracy

Appendix VI – Best 2012 Model

2012 Binary Target Model SHAP Summary