Exploring Uruguayan Elections

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Uruguay Elections Data Project Overview

Scope

- **Data Collection & Processing**: Electoral results (2004–2024)
- **Longitudinal Analysis**: Stable voter IDs enable tracking across multiple elections

Tools & Deployment

- **Python** for data analysis and visualization
- **Streamlit** for interactive web apps
- **Heroku** for easy online deployment

Key Outputs

- **User-Friendly Applications** to explore voting data by age, location, and precinct
- **Interactive Visualizations** highlighting trends and patterns

Real-World Impact

- Collaboration with a major Uruguayan newspaper (*Semanario Búsqueda*)

Context of Uruguay's Election System

- **Fixed Precinct Assignment**
  - Voters receive a *credencial* at 18
  - Stay in the same *circuito* for life unless they officially change IDs
  - Neighbors often remain in the same precinct for decades
  - Elections are mandatory

- This unique setup enables us to track the same voters over multiple election cycles, providing a rare opportunity for **longitudinal analysis** in both demographic (age-related) and geographic (location-based) dimensions.

Introduction: Importance of the Data

- **Stable Voter Tracking**: Because voter IDs don't change, we can follow how individuals' choices evolve—ideal for examining shifts in party preference over time.
- **Age & Location Patterns**: The fact that voters typically remain registered in the precinct where they lived at 18 allows for robust studies of how neighborhood contexts and generational factors influence voting behaviors.
- **Party Dynamics**: In a system with multiple significant political parties, seeing how support fluctuates among stable cohorts helps reveal deeper electoral trends.

Key Objectives

- **Voting Patterns Over Time**

Given the stability of voter IDs and precinct assignments in Uruguay, how have individual voting behaviors evolved since 2004?

- **Age & Generational Analysis**

Do younger voters (new voters) differ significantly in their political choices compared to older cohorts?

- **Candidate Distribution & Origins**

Which regions produce the most candidates for political parties?
Does the origin of candidates correlate with voting patterns in their home precincts or departments?

- **User-Focused Tools**

Interactive applications allow anyone to input a credencial and quickly see election results for that precinct from 2004 to 2024

Data Sources I

Publicly Available Data

- ❑ *Official Electoral Authority*: Core dataset detailing election results, candidate information, and additional metadata.

Custom-Requested Data

- ❑ *Voting Results per Precinct (2004–2024)*: Requested directly from the electoral authority, allowing a comprehensive view across multiple election cycles.
- ❑ *Planes Circuitales*: Documents detailing the distribution of voters into specific precincts (*circuitos*). This makes it possible to understand exactly who votes where over time.

Data Sources II

Candidates Data

❑Sourced from the *core electoral website*, providing information on every candidate's party affiliation, precinct of origin, and other relevant attributes.

Geographic Information

❑*Serie* Mapping: Obtained from visualizador.ide.uy, enabling the creation of precise maps to show how different *series* (codes for cities and neighborhoods) voted.

Necesidades Básicas Insatisfechas (NBI)

❑Obtained from: otu.opp.gub.uy

Tools & Platforms

Python Ecosystem

- Used *pandas* for data cleaning and processing, *matplotlib* or *plotly* for visualizations, and potentially other libraries (e.g., *geopandas* for mapping).
- *Jupyter Notebooks* for exploratory data analysis and reproducible research.

Streamlit for Web Apps

- Created interactive applications (*app_1*, *app_busqueda_after_election*, *map_busqueda*) using Streamlit.
- Each app allows users to explore data in a straightforward, user-friendly manner (e.g., entering a *credencial* to view voting results).

Deployment on Heroku

- Deployed the Streamlit apps to Heroku, making them publicly accessible.

Applications

- I created three apps so that people can see how others of a similar age and from the same city or neighborhood have been voting over the years.

App 1: Voter Precinct History

- Enter any *credencial* (voter ID number) to view how that *precinct* (*circuito*) voted from **2004** through **2022**.
- Provides an instant snapshot of election results for each relevant cycle.

Key Features

- **Visualization**: Displays the vote distribution in that precinct across multiple elections.
- **Historical Depth**: Helps users understand long-term voting trends in their own or someone else's precinct.

Intended Users & Benefits

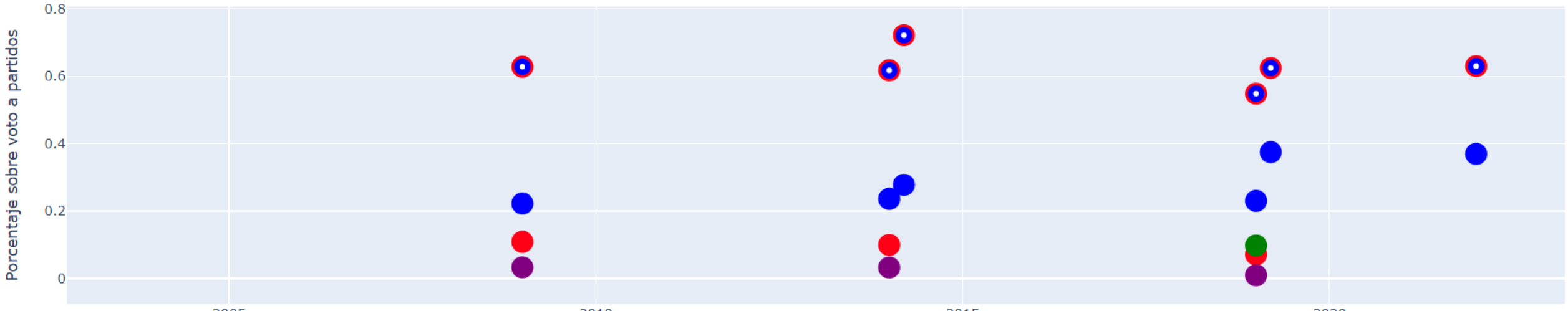
- **Voters**: Gain historical context for their precinct.
- **Researchers/Journalists**: Quickly compare how the same precinct evolved over multiple election cycles.
- **Campaign Teams**: Identify shifts in political preferences at the local level.

Consultá como votó tu circuito.

Escribí acá una credencial, y te dice como votó el circuito de esa persona desde 2004 hasta 2022 (excluyendo voto en blanco y anulados).

Serie:
Número:
Submit

Voto en el circuito de la serie [redacted]



App 2: Comparative Election Results: 2019 and 2024

- Created for ***Semanario Búsqueda*** to allow users to input any *credencial* (voter ID) and retrieve voting details for **2019** and **2024**.
- Displays both **first** and **second** round results, offering immediate comparisons across two election cycles.

- **Key Features**
  - **Dual-Time Comparison**: Quickly contrast how a precinct voted in 2019 versus 2024.
  - **Inclusive of Runoffs**: Shows second-round data, which can differ significantly from first-round outcomes.

- **Why It's Valuable**
  - **Media Integration**: Supports *Semanario Búsqueda* in presenting election data to readers in a user-friendly format.
  - **Deeper Analysis**: Researchers, journalists, or campaign teams can glean how second-round alliances or changes in voter turnout might have affected results.

Consulta de resultados electorales

Serie:

cda

Número:

102680

Consultar

En el circuito donde votaste, Yamandú Orsi pasó de obtener **58,7%** de los votos en octubre al **64,4%** en noviembre, mientras que los partidos de la Coalición Republicana (Álvaro Delgado) pasaron de obtener **37,7%** de los votos en octubre al **35,6%** en noviembre.

¿Qué pasó en 2019?

En el circuito donde votaste en 2019, el Frente Amplio (Daniel Martínez) pasó de obtener **54,9%** de los votos en octubre al **62,5%** en noviembre.

App3: Interactive Election Map

- Developed for *Semanario Búsqueda* to provide a **geographic** view of how Uruguay voted in **2019** and **2024** (first and second rounds).
- Displays each *Serie* (neighborhood or city code) on an **interactive map**, enabling quick visual comparisons across the country.

Key Features

- **Map-Based Navigation**: Users can hover or click on a *Serie* to see detailed voting data.
- **Year & Round Comparison**: Toggle between 2019 and 2024 results, including first and second rounds, for a full picture of electoral shifts.
- **Geospatial Insight**: Identifies regional patterns, helping to spot areas where voter preferences remained stable or changed significantly.

Why It's Valuable

- **Holistic Overview**: Covers the entire country at a glance.
- **Enhanced Storytelling**: Visualizing votes geographically can reveal patterns not immediately obvious in raw data.

Consulta para Resultados Electorales a Nivel de Serie Electoral

Seleccionar variables para los mapas:

Seleccionar la Elección para el Mapa 1

Noviembre 2019

Seleccionar la Elección para el Mapa 2

Noviembre 2024

Seleccionar quién recibe el voto en Mapa 1

Voto a Daniel Martínez

Seleccionar quién recibe el voto en Mapa 2

Voto a Yamandú Orsi

Buscar Serie Electoral:

Busca aquí tu serie electoral

cda

Voto a Daniel Martínez en Noviembre 2019 para la Serie CDA: 53.5%

Voto a Yamandú Orsi en Noviembre 2024 para la Serie CDA: 56.6%

Voto a Daniel Martínez en Noviembre 2019

Bajo Alto

Voto a Yamandú Orsi en Noviembre 2024

Bajo Alto

Analysis

Candidates Origins Analysis

- Examines where each party's candidates come from, using precinct-level data.
- Reveals geographic patterns in candidate origins across Uruguay.

Longitudinal Voting Behavior

- Leverages Uruguay's stable voter IDs to track Frente Amplio (FA) vote share from 2004 to 2024 on each serie.
- Highlights longitudinal trends in the same precincts over multiple election cycles.

Age-Based Voting Analysis

- Focuses on how age groups—especially new voters—vote, comparing Yamandú Orsi's support among younger vs. older cohorts.
- Demonstrates consistent patterns of stronger youth support.

Analysis 1: Candidate Origins Analysis

- Investigates **where each party's candidates come from**, based on the precinct (*circuito*) in which they are registered to vote.
- Focuses on major parties and explores **regional patterns** in candidate distribution.

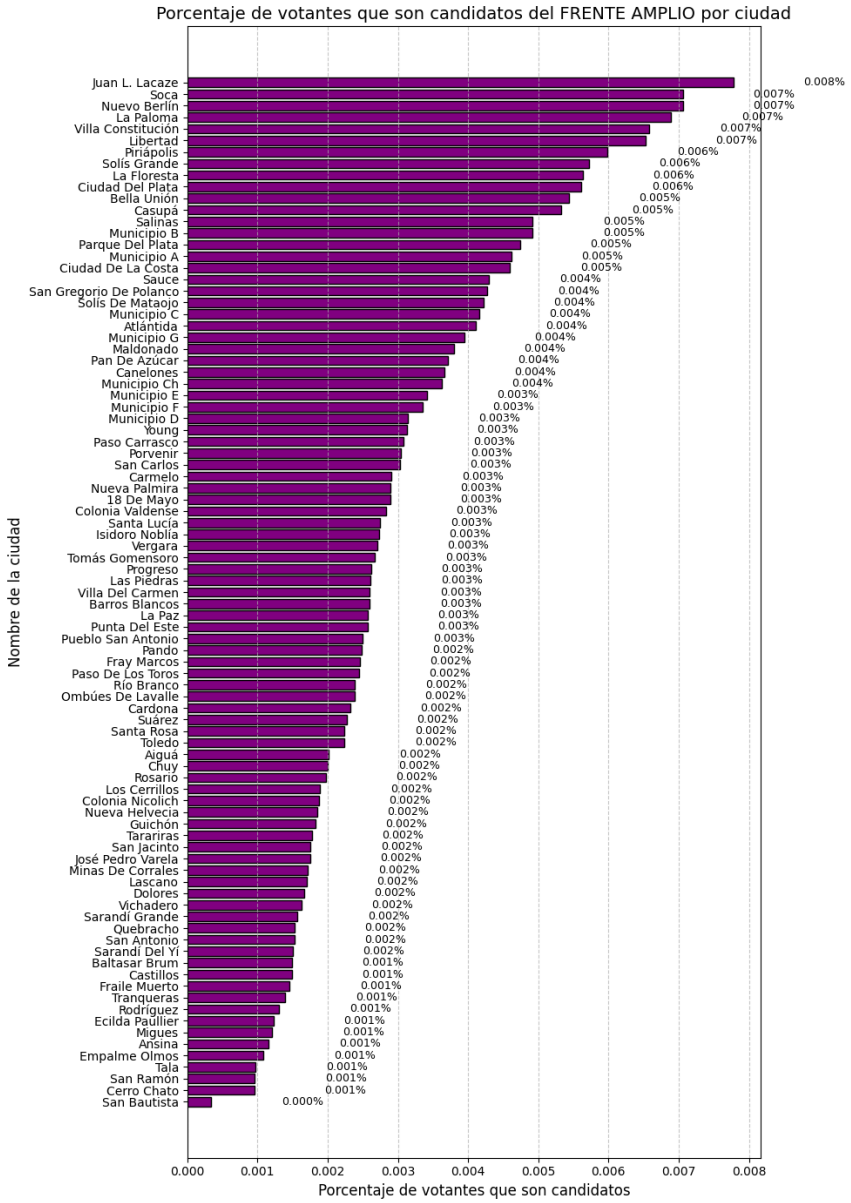
Key Features

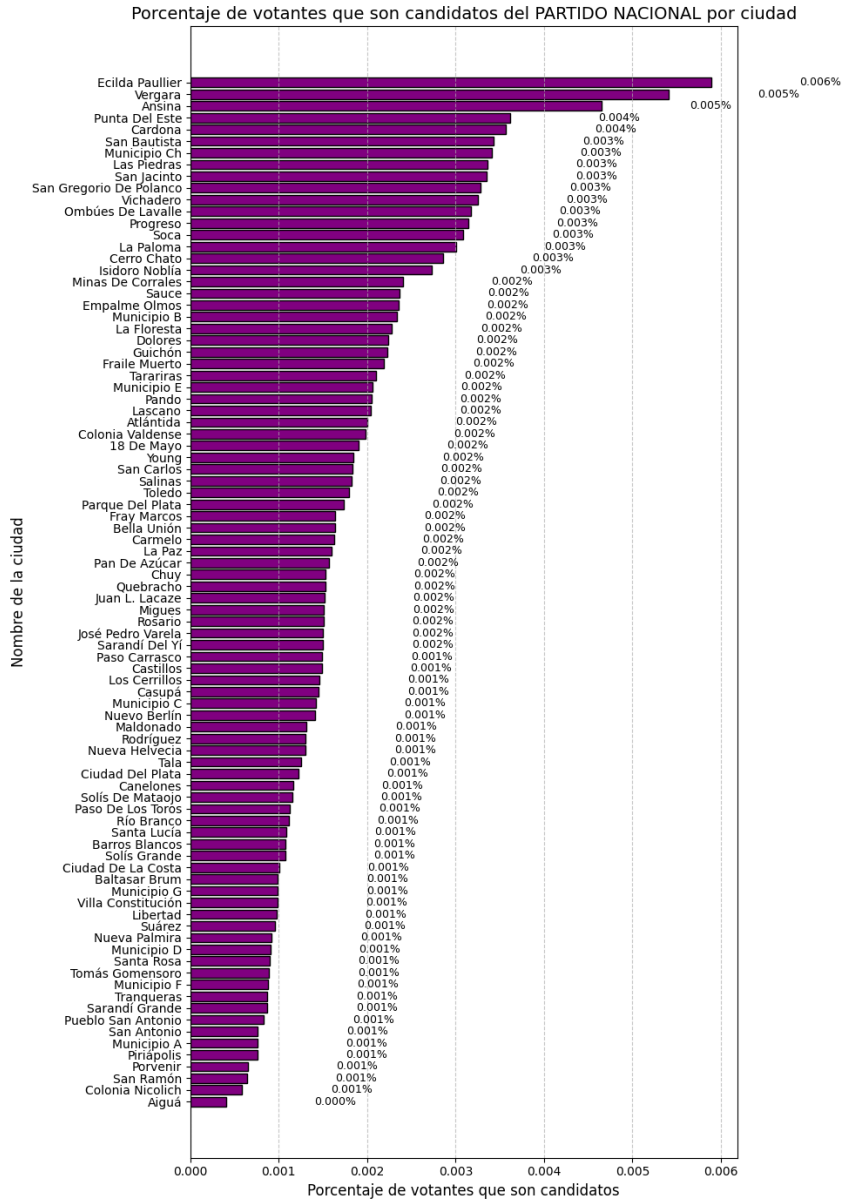
- **Geographic Breakdown**: Shows which departments or neighborhoods candidates are most concentrated in.
- **Party Comparison**: Examines whether certain parties tend to have candidates from specific regions.

Why It's Valuable

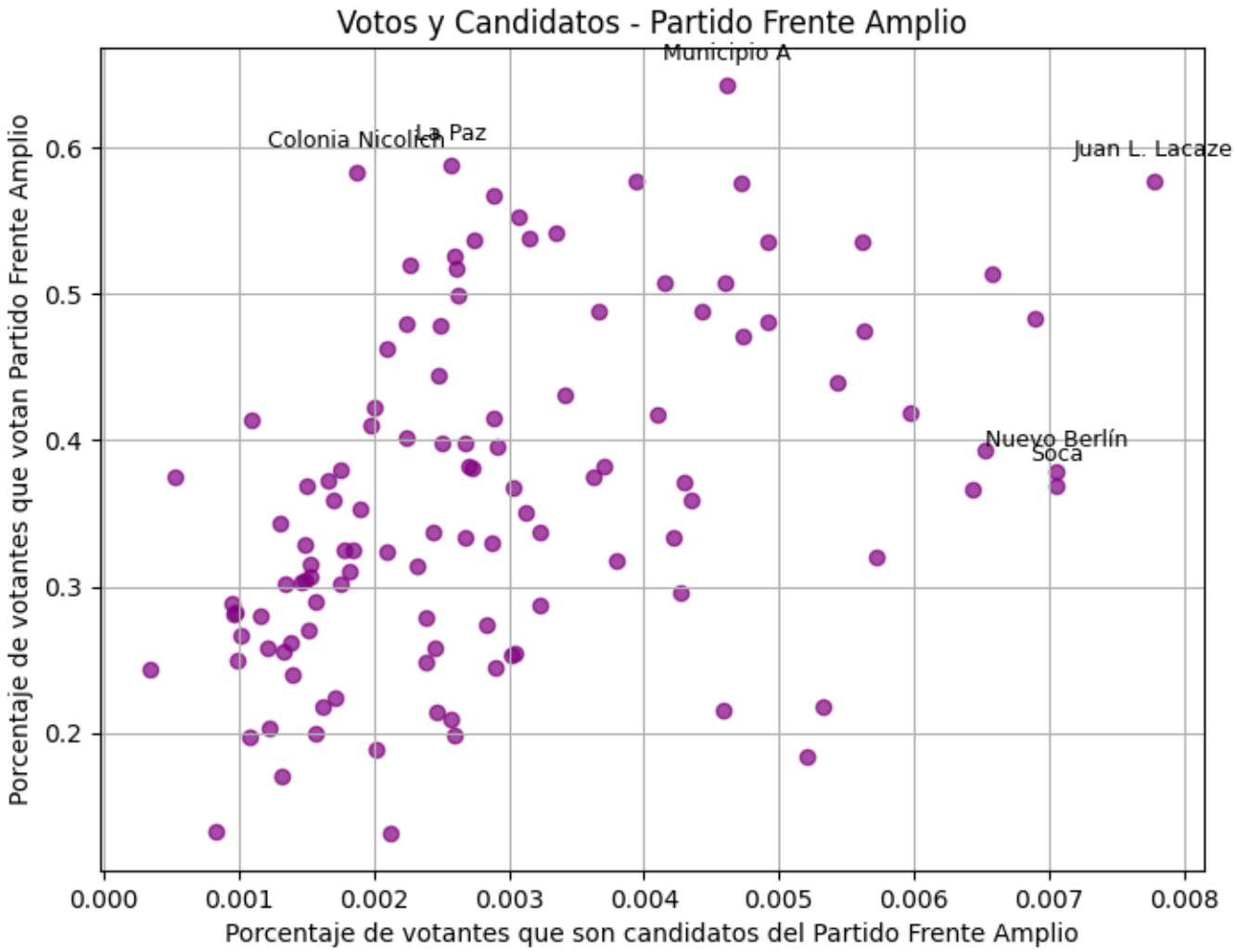
- **Electoral Strategy**: Political parties can spot geographic areas where they might want more candidate presence.
- **Sociopolitical Context**: Offers clues about whether certain regions produce more political leaders than others, possibly tied to socioeconomic factors.

Parties differ on candidates origins

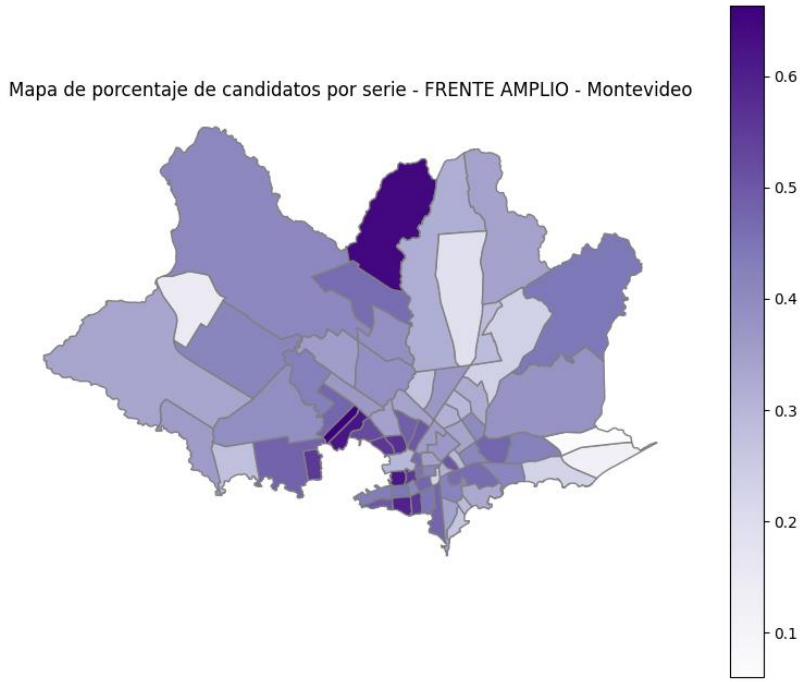


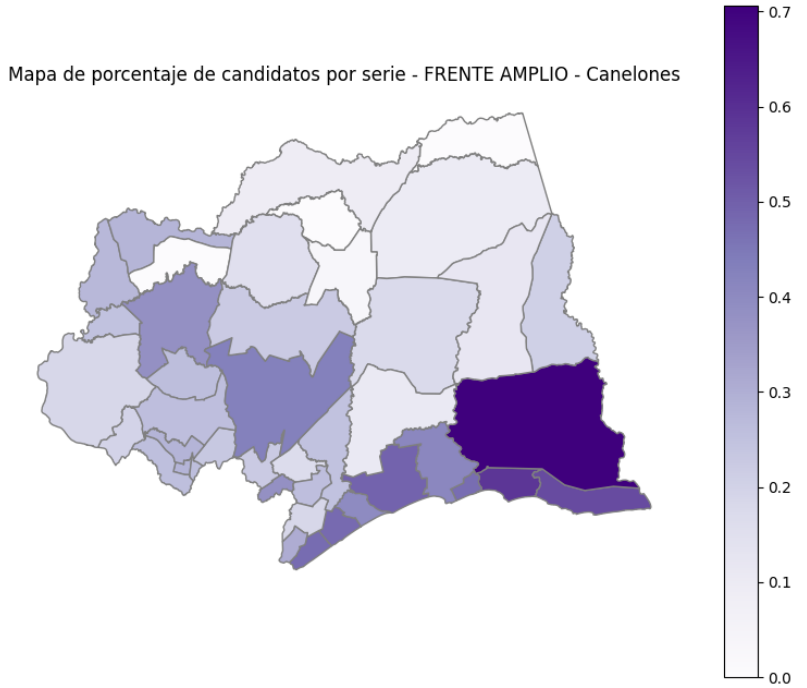


Share of Votes and Number of candidates are positively correlated



This variation can also be mapped: Visualization for Montevideo (capital)





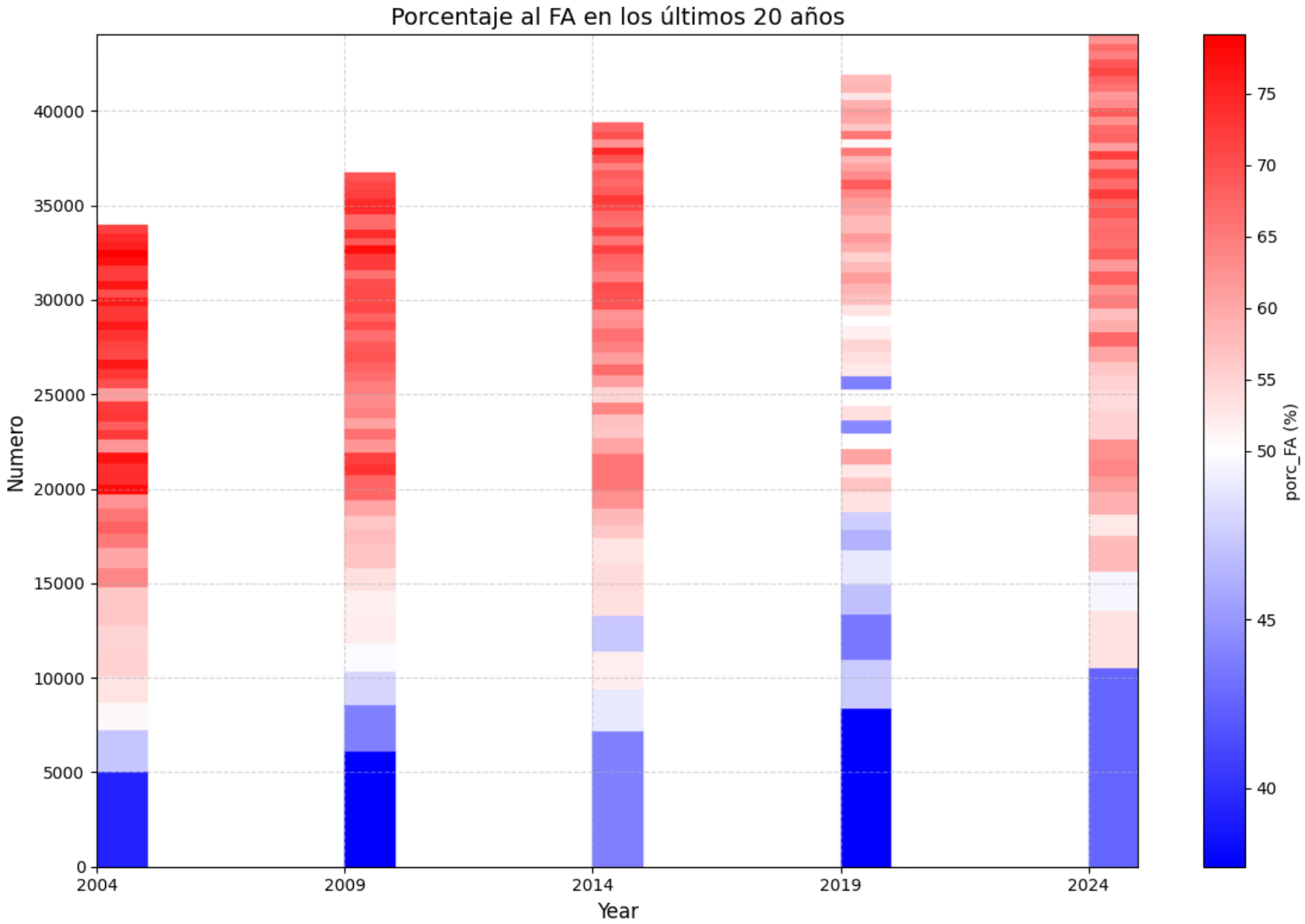
Analysis 2: Longitudinal Voting Behavior

- Uses **Uruguay's stable voter ID system** to track changes in voting preferences from **2004 to 2024**.
- Examines the evolution of the **Frente Amplio (FA)** vote share at each precinct (*circuito*) over multiple elections for a specific *serie*.

- **Key Features**
  - **Same Voters Over Time**: Voter IDs rarely change, allowing for **true longitudinal analysis** of how a group of individuals, with a similar age and from the same location, behavior shifts.
  - **Cross-Election Comparison**: Pinpoints any sudden swings or gradual trends in support on each *serie*.

- **Why It's Valuable**
  - **Behavioral Trends**: Identifies long-term loyalty vs. shifts in party allegiance.
  - **Policy & Campaign Relevance**: Could inform whether policy changes or campaigns drive changes in FA support.

In 2019, FA decreased their vote share for all ages



Analysis 3: Age-Based Voting Analysis

- Compares **Yamandú Orsi's vote share** among different **age groups** in Uruguay.
- Highlights how *new voters* (those who did not vote in the previous election) differ from older cohorts.

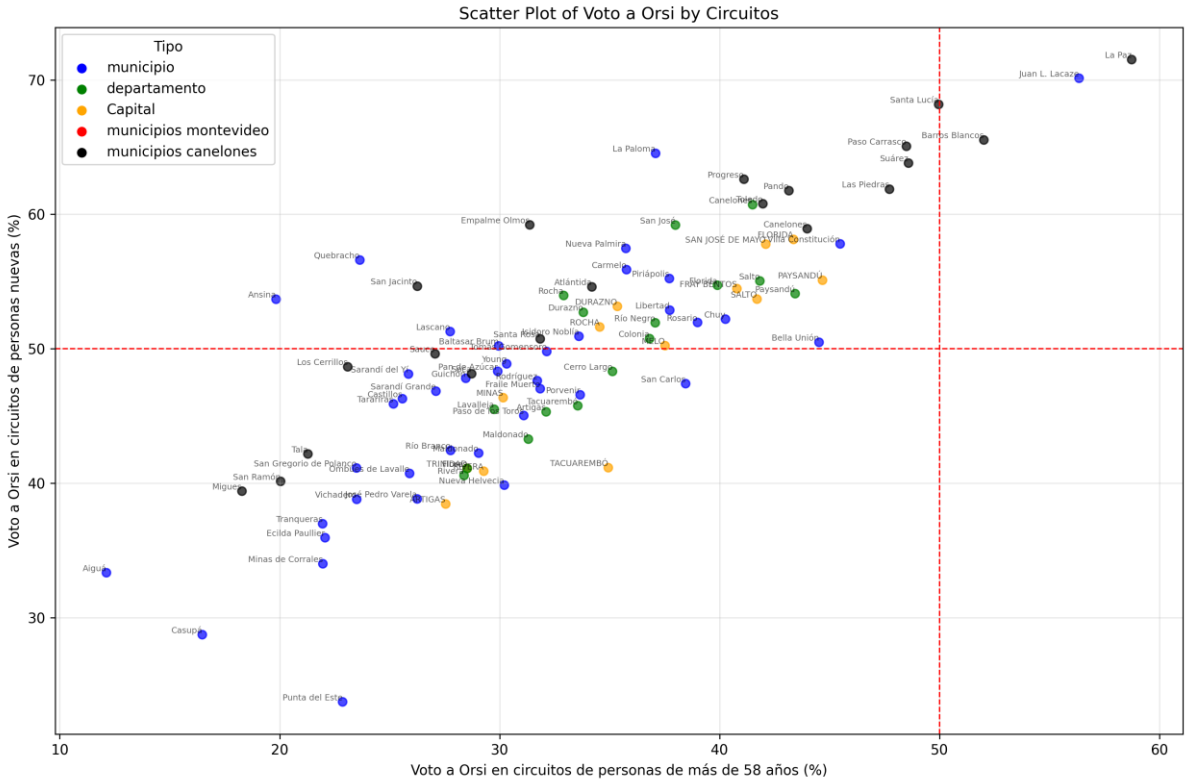
Key Features

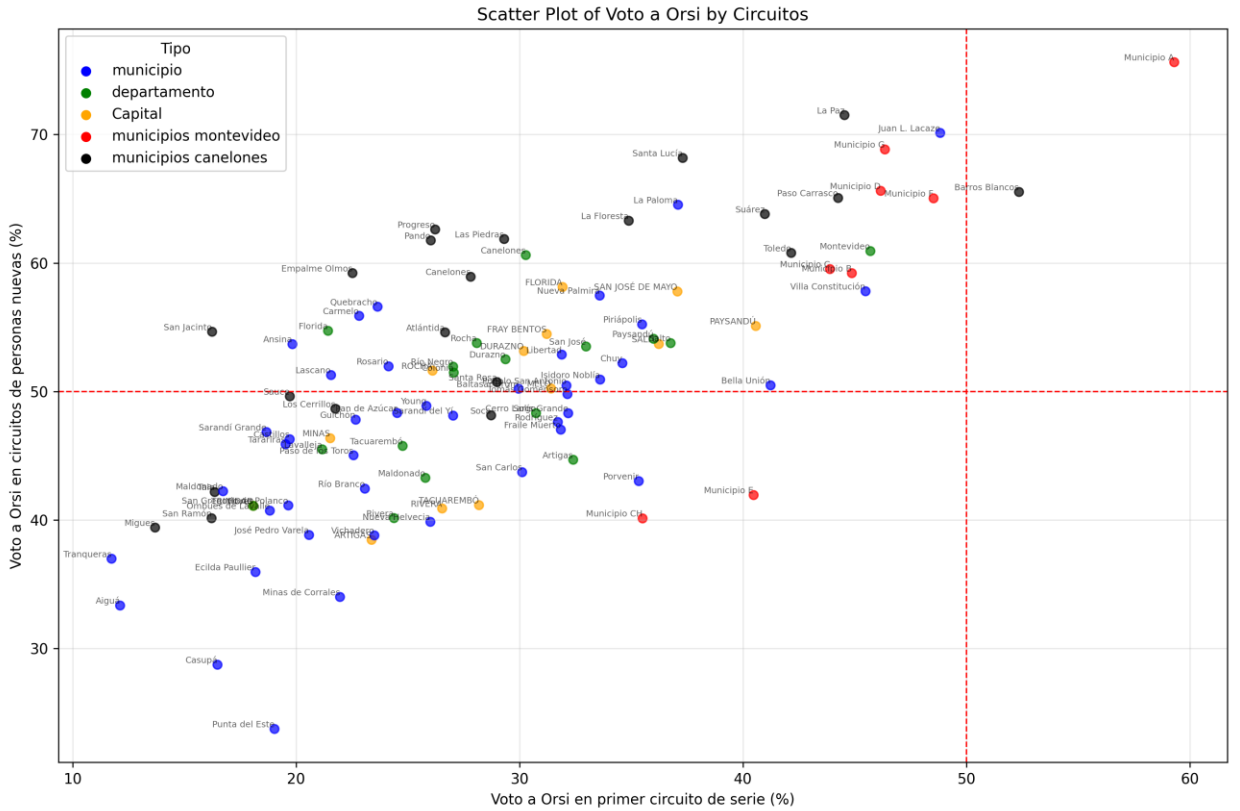
- **Age Segmentation**: Breaks voters into demographic categories (e.g., under 43 vs. over 43, under 58 vs. over 58, or the oldest in each *serie*).
- **Longitudinal Tracking**: Uses Uruguay's stable voter ID system to see if young people's preferences remain consistent over time or diverge from older groups.
- **Actionable Insight**: Helps understand **generational shifts** in voter behavior, indicating how younger voters might shape future political landscapes.

Why It's Valuable

- **Generational Trends**: Reveals whether Orsi's base skews younger or older and by how much.

Here goes a title





Conclusion & Contact

- This project merges **longitudinal data** with **interactive apps** to offer unique insights into Uruguay's electoral landscape.
- The analyses highlight **age-based preferences**, **regional candidate distributions**, and **potential socioeconomic influences** on voting.

Contact & Questions

- **Email**: gul30@pitt.edu
- **GitHub**: github.com/guillelezama/elecciones_UY