Using Scrollytelling to Explain Voting Power in Ecuador

Gonzalo Gabriel Méndez
Escuela Superior Politécnica del Litoral
Guayaquil, Ecuador
gmendez@espol.edu.ec

Patricio Mendoza
Escuela Superior Politécnica del Litoral
Guayaquil, Ecuador
pdmendoz@espol.edu.ec

ABSTRACT

We present a scrollytelling visualization that explains the concept of "voting power", which refers to the influence that a group of voters have, relative to the geographical area they live in, on an election's outcome. We explain this in the context of Ecuador, a country with electoral districts of varied sizes and populations (and, thus, varied voting power). Our visualization is designed to explain that a bigger territory does not necessarily imply more votes. Understanding this concept is particularly important in Ecuador, a country that officially depicts elections results through maps that use color hue to indicate the winning candidate of a given geographical area.

CCS CONCEPTS

• **Human-centered computing** → **Visualization systems and tools**.

KEYWORDS

Electoral data, voting power, scrollytelling, Ecuador.

1 INTRODUCTION

Visualization is a powerful tool to communicate election data, as it has the potential to make election results more understandable, accessible, engaging, and appealing to the general public [2]. To depict the results of an election, it is common to resort to choropleth maps whose regions are colored according to the majority vote. This technique works quite well to show ideological maps (e.g., liberal vs. conservative). However, to be effective, it requires very specific settings: the number of people who vote in each region must correlate with their geographical area, or the regions must have similar sizes and populations. Additionally, the winning candidate must have a significant advantage over their contenders. These conditions are hardly met in most electoral systems. Thus, choropleth maps may introduce distortions suggesting, e.g., that entire regions of a map voted for a given candidate—even if the difference with others contenders was tight.
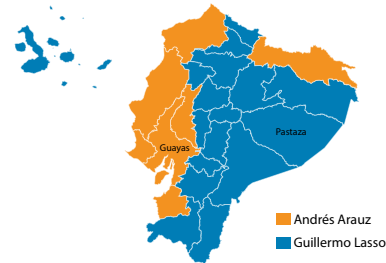
Figure 1: Results of the 2021 Ecuadorian presidential election. Adapted from https://www.eluniverso.com/resultados-elecciones-ecuador-presidente-2021

These problems are often observed in Ecuador. Figure 1 illustrates how *El Universo*, the largest daily newspaper of Ecuador, presented the results of the final round of the last presidential election. As it can be seen, most of the country's provinces appear in blue, even when the difference between the two final candidates was of only about 4 percentage points. This choropleth technique is widely used not only by different types of media but also by the *National Electoral Council*, the body responsible for organizing elections in Ecuador and communicating their results.

To redress this problem, we present a visualization that explains the concept of "voting power" in the context of the Ecuadorian electoral system. Voting power refers to the fact that "*the number of registered voters in a particular district determines the potential of such district to influence the overall election results*" [1, p. 593].

This concept is relevant in Ecuador as Ecuadorian voters are irregularly distributed among provinces due to the geographic characteristics of the country's four natural regions. Consider, e.g., the Galapagos Islands vs. the provinces from the Amazonian rain forest, or the populations from the Coast vs. those from the Highlands. These differences imply, for example, that only three provinces concentrate as much as 50% of the electoral registry (6.6 million voters). Our visualization aims at explaining these disparities between population and territory. We argue that understanding the concept of voting power can ameliorate the distortions introduced by poorly designed visual representations that depict election results.

2 THE VISUALIZATION

Our visualization is designed as a scrollytelling tool. Combinations of texts and visual representations unfold as the user scroll a web page. We decided in favor of this style to promote engagement. Figure 2 shows the main visual elements of our narrative. As the user explores the content, these elements are animated to achieve smooth transitions. To provide context and additional information, our tool shows short paragraphs at the left of each visual. Due to space limitations, this text is not shown in the referred figure.
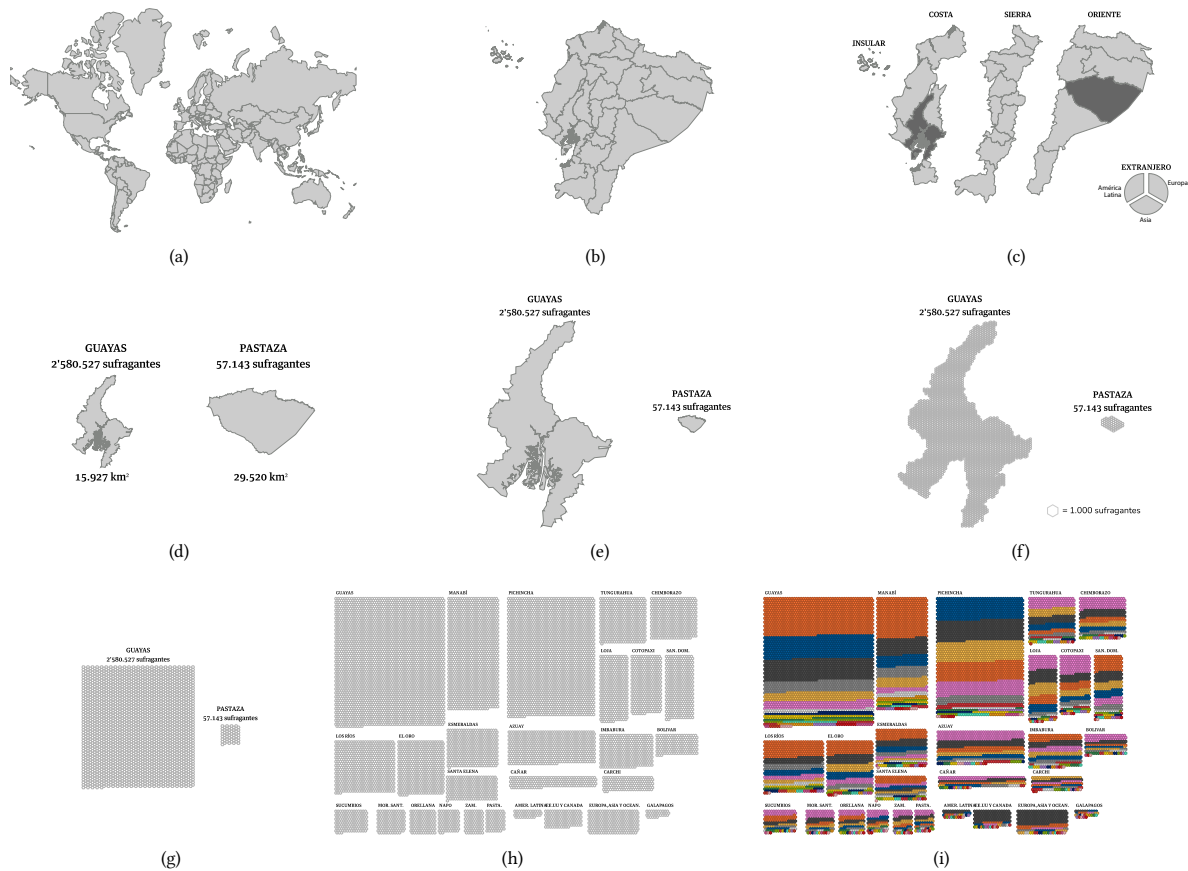
Figure 2: Visual elements of our tool that explains voting power in the Ecuadorian electoral system. The textual explanation that accompanies each visual is not shown. The visualization is available online at http://vis.cti.espol.edu.ec/explicaciones.

Our visualization starts situating Ecuador within the world context (2(a)). We mention this explicitly as Ecuadorians who reside abroad can vote at electoral precincts located in Ecuador's embassies or consulates. We then zoom in Ecuador's four natural regions (2(b)), which appear next to a representation of the electoral regions from abroad (2(c)). We then proceed to visually explain the concept of voting power. To this end, we isolate two provinces from the map (2(d)): *Guayas* and *Pastaza*. These provinces belong, respectively, to the coast of Ecuador and to its rain forest. The visualization shows the population and territory (in kms^2) of each province. As it can be noted, the area of Pastaza is almost twice as big as that of Guayas. However, the number of voters registered in the latter, is 45 times larger. In (2(e)), we scale the provinces to show how small Pastaza's influence in the election outcome is—despite its large territory. We then show an hexagonal tiled version of the two provinces (2(f)). This arrangement allows us to divide each province into a discrete number of small regions, each of which represents a thousand voters. To make the relative influence of each province to the election outcome more evident, we rearrange the hexagons that compose each province into rectangular structures (2(g)). This representation allows for easier comparison of the provinces' number of voters. Once the tiling is explained for Guayas y Pastaza,

we show all the provinces of the country grouped by region (2(h)). Finally, we depict the results of the last presidential election by coloring each province's tiles according to the number of votes obtained by each political party (2(i)). This last view points to a separate, interactive visualization tool that enables exploration and comparative analyses of the election results.

3 CONCLUSION

We presented a scrollytelling visualization tool that supports the understanding of voting power, a concept that refers to the relative contribution of a given territory to the outcome of an election. The tool explains this concept within the context of the Ecuadorian political reality.

REFERENCES
[1] Peter Ondrejka. 2016. Mapping election results in proportional electoral systems. *Journal of Maps* 12, sup1 (2016), 591–596.
[2] Nina Valkanova, Robert Walter, Andrew Vande Moere, and Jórg Múller. 2014. MyPosition: Sparking Civic Discourse by a Public Interactive Poll Visualization. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing* (Baltimore, Maryland, USA) *(CSCW '14)*. Association for Computing Machinery, New York, NY, USA, 1323–1332. https://doi.org/10.1145/2531602.2531639