

INTRODUCTION

This report presents a geospatial analysis of election data to identify outliers among polling units. The aim of this report is to detect significant deviations in voting patterns for different parties, identify the most anomalous polling units, and provide explanations for these anomalies.

METHODOLOGY

The methodology for this analysis consists of the following steps:

GEOSPATIAL ANALYSIS:

Geospatial analysis deals with the use of data to determine locations. The data to be used is not restricted to a particular type, all kinds of data can be worked on. This analysis can locate trends, patterns and relationship in spatial data with the use of sources like satellites, maps, GIS, google sheet etc.

- **Data Collection with Geocoding:** The data includes latitude and longitude coordinates for each polling unit, along with the votes received by different parties. and google sheet was used in acquiring it.
- **Neighbor Identification:** For each polling unit, neighboring units within a 1 km radius were identified using the geodesic distance method and should be grouped in a cluster either with excel, python, SQL etc.

OUTLIER DETECTION:

- **Outlier Score Calculation:** For each party, the outlier score was calculated as the absolute deviation of a polling unit's votes from the mean votes of its neighboring units.
- **Sorting:** Polling units were sorted by their outlier scores for each party to identify the most significant outliers.

SUMMARY OF FINDINGS

Detailed Examples

APC: Top 3 Outliers and their closest polling unit

Polling Unit: UMUJU VILL. HALL, Imo ['Outlier Score']: 498.11538461538464

closest unit:

Ikpaokwaraebo market sqr, Umuobom town hall, Umuju vill. Hall, Amagu vill, Cent. Sch. Ii Umuobom 4, Umuobom 3.

Polling Unit: UMUOJINMA VILLAGE SQUARE, Imo ['Outlier Score']: 401.6

closest unit:

Umuokwe hall, Ama Ezike Nwawuihe sq, Umuezukwe hall, Umuogu village square, Umuojinma village square

Polling Unit: C.P.S. OHAKPU I, Imo ['Outlier Score']: 375.625

closest unit:

Institute of management, C.P.S. Ohakpu i, CP.S. Ohakpu ii, sec. school Ohakpu, Aro-Ndiekwara square, Masquerade square, Umuoma t. junction 2.

LP: Top 3 Outliers their closest polling unit

Polling Unit: STARTRIGHT PRIMARY SCHOOL I, Imo ['Outlier Score']: 414.6304347826087

closest unit:

Aladinma Umudire hall, Startright primary school i, Mann st. primary school i, Mann st. primary school ii, Mann st. primary school iv, township primary school.

Polling Unit: UMUBARA HALL, Imo ['Outlier Score']: 398.73333333333335

closest unit:

Comm. sch. Umuokparafor, Obasamanwu i square, Obasamanwu ii square, Ejimadu hall, Umudurudom hall.

Polling Unit: UMUOMEIHE VILLAGE HALL, Imo ['Outlier Score']: 380.5238095238095

closest unit:

Umuchele Owerre hall, Central school Dioka, Umuosu civic hall, Central school Umuoma, Central school Umuoma, Central school Ikpem

PDP: Top 3 Outliers their closest polling unit

Polling Unit: UMUOMEIHE VILLAGE HALL, Imo ['Outlier Score']: 451.85714285714283

closest unit:

Umuchele Owerre hall, central school Dioka, Umuosu civic hall, Central school Umuoma, central school Umuoma, central school Ikpem.

Polling Unit: TOWN SCHOOL, MBUTU, Imo ['Outlier Score']: 124.375

closest unit:

Isiala hall, community school, Ekenguru, Awaka hall, Amawo town hall, town school, Mbutu, Ihitte Oha village hall, Ubahi village square ii, Umudim village square.

Polling Unit: IHITTA-OGADA-VILLAGE SQUARE, Imo ['Outlier Score']: 103.0

closest unit:

Community primary school Ihitta-Ogada, Community primary school Ihitta-Ogada ii, Ihitta-Ogada-village square, Ukwuobu square Owalla Umuosugwu ii.

NNPP: Top 3 Outliers their closest polling unit

Polling Unit: UMUOKEHI/UMUDIONU HALL, Imo ['Outlier Score']: 25.142857142857142

closest units:

Umunumo hall i, Umunumo hall ii, Umuesi hall, Umuchieze civic hall i, Umuchieze civic hall ii, Umuokehi/Umudionu hall, Umuobi hall.

Polling Unit: NNORIE SEC. TECH., Imo ['Outlier Score']: 17.333333333333332

closest units:

central school Nnorie, primary school Nnorie, Ekeukwu Nnorie market sq. i, Ekeukwu Nnorie market sq ii, Umuedi Nnorie hall, Nnorie sec. tech.

Polling Unit: DEV. PRI. SCH. EZIAMA, Imo ['Outlier Score']: 6.625

closest units:

Central sch. Eziam, dev. pri. sch. Eziam, Umuogba vill.1 sq.1 Eziam, Umualum vill. sq. Eziam, comm. pri. sch. Umuokoro Amato Eziam, Umuchukwu hall Eziam, Umuchie hall Eziam, umulu vill. sq. Eziam

CONCLUSION

Based on the vote trends of the polling units for various parties, this research was able to identify notable outliers. Potential explanations for the deviations of the top outliers were revealed through their visualization and highlight. Important realizations consist of:

- Polling Unit-1 had significantly higher votes for each party compared to its neighboring units.

- Targeted campaigning and local events can significantly impact voting patterns.
- Demographic factors and local issues play a crucial role in shaping voter behavior.
- Further investigation into these outliers can provide deeper insights into electoral dynamics and inform future campaign strategies.
- The highest outlier score suggests an unusual surge in votes, possibly due to targeted campaigning or local issues that resonated with voters.

NOTE:

The detailed code and data used in this analysis can be found in the GitHub repository. The repository contains the following:

- The complete dataset used for the analysis.
- Python scripts for data processing, geospatial analysis, and outlier detection.
- Google Collab with detailed code and explanations.