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Digital constellations in Telegram: political dynamics in the 2024 elections

ABSTRACT:

This study investigates the dynamics of network Compression and Rarefaction in electoral contexts, focusing on the reduction or strengthening of internal cohesion and connectivity among groups and discourses within Telegram groups during Brazil's 2024 municipal elections. We employ Social Network Analysis (SNA) and Topological Data Analysis (TDA) techniques on temporal series to identify interaction patterns and persistent homological structures. These approaches reveal both the strengthening of clusters and the weakening of connections, influenced by the impact of disinformative narratives. Additionally, Content Analysis supports the interpretation of the networks and topologies formed throughout the analyzed period. Preliminary results identify Nuclear Constellations, characterized by highly cohesive networks centered on political campaigns, and Bipolar Constellations, composed of isolated clusters reinforcing ideological bubbles. The methodology builds on previous studies applying TDA to political communication in temporal series (Rocha, 2024b; Rocha, Silva, Mielli, 2024), adapting and expanding its application to the Brazilian electoral scenario.

Keywords: Political mobilization; Affective polarization; Telegram; Topological data analysis; Persistent homology

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INTRODUCTION

This article is part of an ongoing research agenda dedicated to understanding how political discourse circulates, solidifies, or dissipates in decentralized digital environments - particularly those where control is diffused and moderation is less centralized, such as Telegram. In Brazil, Telegram has emerged as a key platform for political mobilization, ideological coordination, and the spread of disinformation, offering fertile ground for the study of political communication dynamics outside mainstream social networks. Amidst increasing political polarization, the platform has been widely used by groups across the ideological spectrum, though conservative and far-right actors have shown disproportionate dominance in terms of reach, replication, and mobilization.

The object of this study is the networked dissemination of political messages on Telegram during the 2024 Brazilian municipal elections. This electoral cycle offered a unique opportunity to observe how political narratives are constructed, contested, and reiterated over time, particularly in a fragmented digital ecosystem. The core research question guiding this investigation is: how do message-based Telegram networks evolve topologically throughout the electoral calendar, and what do these changes reveal about polarization, coordination, and the structure of political discourse in Brazil?

To approach this question, the study employs a methodological framework that combines Topological Data Analysis (TDA), especially Persistent Homology, with a temporal perspective grounded in Social Network Analysis (SNA). The dataset consists of over one million messages scraped from politically active Telegram groups, filtered and clustered using SimHash similarity. Each message is treated as a node, and those sharing high textual similarity are connected, forming graph structures for each month. These monthly graphs are then analyzed through k-Nearest Neighbor (kNN) filtrations to identify topological features - specifically, the emergence and persistence of structural patterns such as Nuclear, Bipolar, and Multipolar Constellations (Rocha, 2024b). This approach enables a meso-level understanding of political discourse formation, moving beyond user interaction metrics and focusing instead on the recurrence and circulation of content.

The theoretical framework builds on classic and contemporary understandings of Public Opinion, polarization, and digital media. Drawing from Walter Lippmann's concept of the pseudo-environment, Jürgen Habermas' theorization of the manipulated public sphere, and Pierre Bourdieu's critique of "public opinion," this study inter-

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rogates how mediated realities shape and constrain democratic engagement.

These foundations are extended through the work of theorists such as Zuboff (2019), who highlights the commodification of behavior in digital platforms, Citton (2013), who theorizes the attention economy as a logic of emotional amplification, and Kim (2023), who describes digital platforms as emotional sorters. Together, these perspectives ground the analysis of Telegram as an affective, algorithmically conditioned space where polarization is not only reflected but actively produced and reinforced.

Findings reveal that Telegram message-based networks exhibit shifting topologies throughout the electoral year. Early months display a mix of Multipolar and Bipolar Constellations, indicating thematic plurality and cross-pressured discourse. However, as the elections approach, particularly in October, the networks become markedly compressed, with an overwhelming presence of Nuclear Constellations. These dense, highly cohesive formations reflect intense message replication and ideological consolidation, suggesting narrative coordination aligned with campaign strategies. Importantly, the data highlights the role of conservative "gatekeepers" who not only anchor their own communities but often act as conduits of replicated content across the ideological spectrum—shaping debate even in progressive clusters.

By tracing these topological patterns over time, the study introduces the concepts of Compression (*recrudescimento*) and Rarefaction (*arrefecimento*) as analytical tools to understand how discourse tightens or loosens in response to political context (Rocha, 2024a). This framing helps illuminate how digital polarization manifests not just in sentiment or ideology, but in the very structure of discourse as it spreads through Telegram. The approach developed here offers a replicable and scalable method for capturing the evolution of political communication in high-volume, content-centric environments, highlighting both the utility of TDA in political science and the importance of studying narrative form as much as narrative content.

Ultimately, this article demonstrates that digital political communication is not merely a question of who speaks or what is said, but how messages replicate, align, and persist over time. The topology of these processes reveals the deeper logic of affective polarization in digital public spheres where repetition signals legitimacy, structure conveys power, and silence, too, is a form of influence.

Beyond this initial section, this article will count with further three. The second presents the theoretical framework, articulating classic and con-

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temporary notions of public opinion, polarization, and digital discourse, with a focus on how these concepts are reconfigured in platformed environments. The third details the methodological procedures employed, including data scraping, similarity detection, network construction, and the application of Topological Data Analysis (TDA) theory through Persistent Homology. The fourth section is dedicated to the analysis of Telegram networks throughout the electoral year, emphasizing the emergence and transformation of Nuclear, Bipolar, and Multipolar Constellations in the context of the 2024 Brazilian municipal elections.

The final section offers the main findings and conclusions, reflecting on how narrative compression and rarefaction processes shaped the communicational landscape during the electoral cycle. It also discusses the implications of structurally coordinated messaging, affective polarization, and the asymmetrical role of conservative gatekeepers. Lastly, it proposes directions for future research on the topology of political discourse in digital environments and the strategic occupation of ideological space on semi-private platforms like Telegram.

PUBLIC OPINION AND PSEUDO-ENVIRONMENT

The concept of Public Opinion has long sparked debate about its formation, legitimacy, and political weight. From Plato's aristocratic skepticism to Machiavelli's pragmatic concern with consent, thinkers have contested who shapes public sentiment and how. In modern democratic theory, this question gains renewed urgency: in digital environments like Telegram, where informal, high-volume, and algorithmically modulated conversations unfold, what becomes of Public Opinion? This article traces that question through classical and contemporary theory, linking it to the structural visualization of discursive polarizations via network Topologies.

In the 20th century, then, German philosopher Jürgen Habermas, part of the second generation of the Frankfurt School, defined Public Opinion and the public sphere by asserting that "*the public as a whole (*the public, le corps publique*) constitutes a tribunal more important than all the courts combined*" (Habermas, 2003). Although this idea was coined without considering Digital Social Media, it does serve as a basis for understanding the relevance of Telegram groups as an environment: Telegram communities, albeit deterritorialized, enable mass communication - especially in terms of cost and reach, since there are no geo-

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graphic or temporal boundaries. In lieu of his concept of manipulated public sphere, where "*a sphere of private individuals assembled into a public*" (Habermas, 2003), what unfolds is a communicative space marked by strategic framing, selective exposure, and emotional appeals, increasingly structured around disinformation.

This is precisely what happens in Telegram groups. Habermas also developed the notion of the manipulated public sphere, which helps in understanding studies on disinformative narratives circulating on digital platforms. This is because Habermas' concept of the Public Sphere was based on the bourgeoisie and referred to a participatory dynamic in which rational debate shaped collective will, a premise that collapses when discourse is steered by algorithmic amplification and affective mobilization rather than deliberation.

Therefore, rather than Public Opinion, what forms in the manipulated public sphere is an atmosphere ready for acclamation, a climate of opinion. What is manipulative is, above all, the socio-psychological calculation of messages addressed to unconscious tendencies that provoke predictable reactions, without, however, being able to compel those who, by doing so, guarantee plebiscitary agreement: relying on carefully crafted "psychological parameters" and experimentally validated appeals, the aim is to ensure that the more effectively these function as identification symbols, the more they lose correlation with principles. (Habermas, 2003).

Rather than presuming a shared deliberative rationality, the analysis presented here maps how digital publics form shapes of engagement - repeating cycles, dense clusters, and disconnected pockets - through disinformative amplification or emotional appeal based on values, such as religious, as seen in the electoral month of October. Telegram's affordances collapse boundaries of time, geography, and hierarchy, producing communicational flows better described in terms of Compression and Rarefaction (Rocha, 2024a) than consensus or contestation.

When it comes to the idea of a manipulated public sphere, such a notion resonates with the reflections made by Bourdieu (1981) on the real existence of Public Opinion. According to him, "*it is not opinion if we understand it to mean something that can be expressed in speech with some claim to coherence*" (Bourdieu, 1981). In other words, the information (or disinformation) disseminated in Telegram groups aims to connect with the people there, influencing how they think about certain topics.

These thoughts do not necessarily reflect their actual opinions, as they have been steered. Much like Habermas' public sphere, Telegram groups - despite the absence of direct state mediation - act as spaces for public formation and de-

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bate. They influence the expansion of information consumption and play a strategic role in political communication focused on the spread of disinformation to shape public opinion.

This analysis reinforces Lippmann's (1922) idea that public opinion is shaped by controlled informational flows, being less the result of rational reflection and more the product of media exposure. Given that his work dates back to the 1920s, Lippmann stated that "*it is universally admitted that the press is the main means of contact with the invisible environment*" (Lippmann, 2008). Still, the argument that traditional media influences the formation of "mass" public opinion also applies to digital media, which is gradually taking over the role of the traditional press in mediating public interaction with politics. This shift is particularly evident in algorithmic environments, where platforms act not only as intermediaries but as curators of political meaning, steering visibility and public attention through engineered information flows.

Understanding polarization in the digital age, then, requires revisiting foundational theories of communication and representation. Walter Lippmann's concept of the pseudo-environment, where individuals navigate mediated realities shaped by stereotypes and simplifications, finds amplified expression in today's platform-driven politics. Algorithmic curation fosters echo chambers that reinforce existing biases, deepening what Sunstein (2017) would call affective polarization. Lippmann's pseudo, environments, once shaped by editorial gatekeeping, are now governed by algorithmic selection. Persistent Homologies derived from Telegram message graphs allow us to detect how such environments coalesce, revealing cycles, voids, and clusters that map not just proximity but repetition, saturation, and separation (Rocha, 2024b).

Susan Herbst (2018) complements this reading by underscoring the role of media as active agents of hegemony, shaping public discourse in alignment with prevailing power structures. Her perspective adds a Marxian inflection to Lippmann's liberal diagnosis, making clear that digital environments do not merely mirror polarization - they structure and accelerate it. What emerges, then, is a structural ecology in which polarization is not a byproduct of ideological difference but a consequence of how information circulates and solidifies in platformed environments. The concept of Persistent Homology (Arfi, 2024) becomes analytically powerful precisely here: by revealing stable formations within these ecosystems, it allows us to perceive not just the presence of ideological camps but the structural consolidation of their communicative boundaries. Compression, in this sense, denotes not only density but ideological closure; Rarefaction, its counterpart, marks the dis-

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persal of narratives and the loosening of coherence within polarized fields. These structural patterns, visible through topological modeling, render Herbst's hegemonic media theory observable, mapping how power is not just exercised through content, but through the geometry of its repetition, reinforcement, and isolation.

In this light, Castells (2015) offers a powerful lens by framing digital networks as double-edged: they empower and fragment, they enable new forms of collective action while simultaneously eroding the cohesion of the public sphere. Networks of Outrage and Hope illustrates how these platforms can mobilize dissent and foster solidarity but also amplify division and emotional hostility. Herbst's idea of media systems as hegemonic agents converges here, as both recognize the entanglement between media infrastructure and sociopolitical fragmentation. When political representation becomes disembedded from party systems - as Mair (2013) theorizes in his Crisis of Representation—digital publics become the stage for ideological struggles once mediated by institutional filters.

Within this logic, the affective dimensions of polarization become not just a by-product but a functional feature of platform design. Citton's (2013) concept of the attention economy explains how emotionally charged content is not an anomaly but the commodity par excellence.

Algorithms, optimized for engagement, systematically favor outrage, spectacle, and symbolic conflict over deliberation, echoing Zuboff's (2019) thesis that surveillance capitalism transforms user behavior into marketable data, with outrage serving as a key behavioral surplus. This emotional engineering, as Kreiss and McGregor (2021) argue, deepens "technological intimacy," wherein platforms foster bonds between users and political content that simulate authenticity and trust, often bypassing critical scrutiny. Foucault's (2008) conception of discourse and power helps articulate how digital infrastructures exert control, not through overt censorship, but through amplification and marginalization, directing visibility toward dominant narratives while suppressing dissenting frames. Margetts et al. (2015) reinforce this interpretation by showing how social media dynamics favor viral over deliberative content, giving rise to "political turbulence" where coordination and mobilization occur rapidly and emotionally, with little room for reflection. In this context, Shiller's (2019) notion of narrative economics becomes crucial: dominant narratives do not simply represent collective sentimento they actively shape behavior, institutional responses, and, ultimately, political realities.

This intensification of affective polarization is further exposed by empirical studies such as Garimella et al. (2018), which show that echo

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chambers on social media are not incidental they are systematically structured. Users who engage across ideological lines are penalized both socially and algorithmically, while partisan "gatekeepers" gain traction by reinforcing in-group narratives and vilifying the opposition. Kim (2023) brings emotional nuance to this discussion, arguing that platforms are not merely ideological sorters but emotional amplifiers, engineering hostility and reducing opponents to existential threats.

When it comes to the objective of this article, the understanding of the Brazilian 2024 municipal elections through the topologies of networks, it is important to recall that Social Media Data is, by composition, high dimensional. At the core of digital polarization lies not the individual user, but the information structure itself. Depending on the data source, the primary unit of analysis often becomes the content rather than the user, especially when constructing networked representations. This shift from user-centric to content-centric analysis underscores the need for computational methods that account for clustering, amplification, and narrative alignment within digital ecologies.

Thus, digital polarization is not merely a reflection of ideological divide - it is structurally embedded in how information flows, how attention is distributed, and how narratives coalesce within digital architectures. The structural networks presented in this study visualize precisely that: constellations of discourse shaped not by deliberation, but by the strategic interplay of algorithmic incentives, media systems, and political affect.

METHOD - *DATA SCRAPING*

To analyze the dissemination of political information aimed at mobilizing specific political groups during the municipal elections, we began by identifying relevant Telegram groups and channels using election-related and partisan terminology. These keywords were selected for their connection to political mobilization strategies and narrative construction during the campaign period, ensuring that the collected data would be contextually significant. After identifying the target groups, we employed #TelegramScrap (Silva, 2024) to extract messages from these channels. Each message was captured along with its metadata, including author, content, group, and timestamp. This method enabled us to document the communication dynamics and narrative flows within politically engaged communities throughout the electoral process.

Given the structure of Telegram, which does not easily allow for the direct identification of shared content, we applied an algorithm to identify similar messages. This algorithm, with a similarity threshold of 90%, attributed the same ID to

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messages that were at least 90% identical. This method enabled us to track the dissemination of similar content across different groups and over time, enabling us to later create the networks.

Enabling Topological Data Analysis - Persistent Homologies in group-based networks and temporal of graphs

This article is part of an ongoing research agenda dedicated to applying Topological Data Analysis (TDA) to the study of political communication in digital environments, with a particular focus on platforms characterized by decentralized and semi-private structures such as Telegram. Building on earlier work that explored author-based networks in both Twitter and Telegram ecosystems (Rocha, 2023; Rocha, Silva, Mielli, 2024), this study advances the methodological framework by adapting TDA to group-level networks, allowing for the analysis of large-scale political discourse during the 2024 Brazilian municipal elections. By leveraging the unique capacities of TDA, specifically, the identification of Persistent Homologies through k-nearest neighbor (kNN) filtrations - this research seeks to uncover how political narratives coalesce, fragment, and circulate within digital communities. It aims to capture not only the content of political messaging, but also the structural and topological patterns that sustain or disrupt the flow of information across increasingly complex and polarized media ecosystems.

Topological Data Analysis (TDA) is a method for analyzing the shape of data using concepts from topology, particularly to understand the structure and features of high-dimensional datasets. It focuses on identifying clusters, holes, and voids within data, providing insight into underlying patterns and structures that may not be immediately apparent. Traditionally, this method has been applied in fields such as natural image processing, the study of infectious disease progression, sensor networks, and other domains within the so-called "hard sciences". While there have been some applications of TDA in Political Science (Carlsson; Vejdemo-Johansson, 2022), few works have proposed significant advances in exploring how political information circulates and mobilizes specific groups, especially during election periods such as Brazil's municipal campaigns.

Why, then, use TDA? First, the nature of the scraped data must be considered: Telegram messages constitute a distinct communicational ecosystem, structured around channels and groups that function as networks. And where there are networks, there are topologies. Second, TDA offers a robust framework for identifying persistent features within noisy and unstructured data, making it particularly valuable for analyzing the chaotic and fragmented nature of digital political

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communications. By focusing on the stability of topological features across different scales, TDA reveals patterns that traditional methods may overlook, such as the amplification of targeted political narratives, the emergence of mobilization nodes, and the structuring of discourse among segmented publics.

Third, TDA enables novel insights by exploring higher-order structures within communication networks. Unlike traditional techniques that prioritize pairwise relations, TDA allows researchers to examine multi-dimensional simplicial complexes, uncovering more intricate configurations of connections and shared messaging. In the context of analyzing Telegram data during the 2024 municipal elections, this capacity is essential for mapping how political information - targeted toward specific ideological or partisan segments travels, clusters, and generates engagement across digital communities.

In this study, we opt for Topological Data Analysis (TDA) over traditional Social Network Analysis (SNA) due to both the sheer volume of data retrieved from Telegram during the 2024 municipal elections and the nature of our analytical interest. While SNA is well-suited for examining direct connections between individual users and uncovering metrics of centrality, cohesion, and information flow, our objective is not limited to tracing interactions or mapping relational proximity alone. In other words, while SNA has long captured dyadic proximity and centrality within networked political communication, it remains limited in identifying higher-order structures and enduring formations across scales. TDA, and particularly Persistent Homology, offers a way to detect structural compression and rarefaction, the overtime tightening or loosening of discursive cohesion, not at the level of nodes, but of overall geometric configurations. This is key to interpreting political messaging on Telegram, where clusters do not just form, but persist or dissolve across time.

And so, we are interested in the shape of the data - how patterns of political information cluster, persist, and evolve within and across groups over time. TDA provides a framework that allows us to abstract from individual nodes and instead analyze the broader structural properties and latent configurations present in the dataset.

This is done through the identification of Persistent Homologies through k-nearest neighbor (kNN) filtrations (Le; Taylor, 2022), as implemented in this work. By focusing on Persistent Homologies derived from kNN-based filtrations, we are able to observe the deeper geometric and structural traits of political communication that would otherwise be lost in node-centric approaches. Persistent Homology captures features of the data that persist across multiple scales, emphasizing the most robust and significant structural elements

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(Carlsson, 2020). Applying this method overtime upon Telegram activity allows us to trace how certain political narratives gain traction, how messaging converges within aligned groups, and how digital mobilization strategies evolve in the lead-up to electoral moments.

Using kNN within the TDA framework lets us model the Telegram ecosystem as a set of interconnected neighborhoods. Each message or user is linked to its nearest neighbors, forming localized structures that reflect actual communication flows. This setup allows for the identification of clusters, politically engaged groups or actors, and helps reveal how certain narratives are insulated within echo chambers, reinforcing specific worldviews and group identities. This is particularly relevant when examining how partisan messaging attempts to consolidate support or steer engagement in electoral contexts.

To extract Persistent Homologies, we structured the data in four steps: (1) building community-based networks from the collected messages; (2) removing disconnected simplexes from the main structure; (3) applying the kNN algorithm to define topological proximities; and (4) generating temporal charts based on the resulting graph structures.

In practical terms, we treated each Telegram message as a data point enriched with metadata: author, content, group affiliation, and timestamp. These messages were transformed into a network by assigning similarity-based IDs. If two messages - regardless of the group they were posted in - were at least 90% similar, they were assigned the same identifier. This enabled us to track how specific pieces of political content circulated across different communities. Groups were represented as nodes, while shared content became the edges connecting them. This model allowed us to observe how political messaging spreads, identify which groups are most central to its dissemination, and detect which narratives transcend individual groups to become part of broader digital political currents.

This method has been previously applied in Telegram (Rocha, Silva, Mielli, 2024, Rocha, 2024a) and Twitter (Rocha, 2023, Rocha, 2024b), though for author-based networks, instead of groups. In this study, the message is the atomic unit of analysis, not the user, because it is through the iterative circulation of identical or near-identical content that ideological clusters and communicational bubbles solidify. The following Telegram method, thus, has been replicated: First, we built author-based networks from the data. Second, we removed disconnected simplexes from the main network. Third, we applied the kNN algorithm into the network, and, finally, used the kNN graph alone into our temporal. We then used the similarity IDs to create vertexes between authors across groups. In

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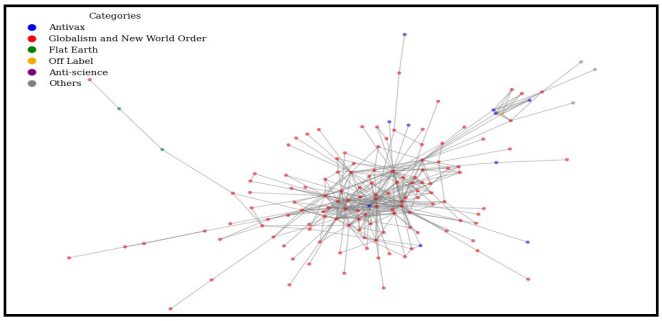
other words, if two messages, regardless of the group they belong to, are 90% equal, they are attributed the same ID, allowing us to identify the spread of content in this communicational universe.

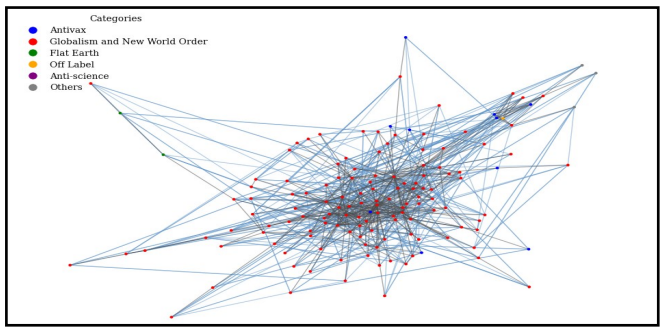
Figure 1 - May 2024 Conspiracy Theory main author based Telegram Network



Source: Rocha, Silva, Mielli (2024)

Now, we use kNN algorithm with k = 3 in order to identify the data neighborhood. This step allows for the identification of the local structure and connectivity within the data, providing a more detailed view of the relationships and patterns present in the communication network. The choice of k = 3 is significant because three vertices form a triangle, which is the simplest polygon that can represent a complete, closed shape. Triangulation is important because it captures the most basic unit of connectedness in the network, ensuring that we can identify and analyze the smallest closed loops, which are fundamental in understanding the local clustering and connectivity within the data. Furthermore, we observe that the topological structure remains consistent regardless of the increase or decrease in the k parameter. When the structure remains stable despite variations in the number of connections, this can be understood as an indication of Persistent Homology (Rocha, Silva, Mielli, 2024).

Figure 2 - May 2024 Conspiracy Theory author based Telegram Networks and *kNN* = 3 filtrations, in blue



Source: Rocha, Silva, Mielli (2024)

This article, however, builds networks from individual messages rather than from users or groups. Each message is treated as a node, and edges are formed between messages that share the same SimHashID, indicating high textual similarity. This approach was adopted due to the sheer volume of messages collected during the 2024 municipal elections and the need to accurately trace how specific content circulates across different Telegram communities. By structuring the network at the message level, we are able to directly capture patterns of replication, narrative amplification, and content-based clustering across the eco-

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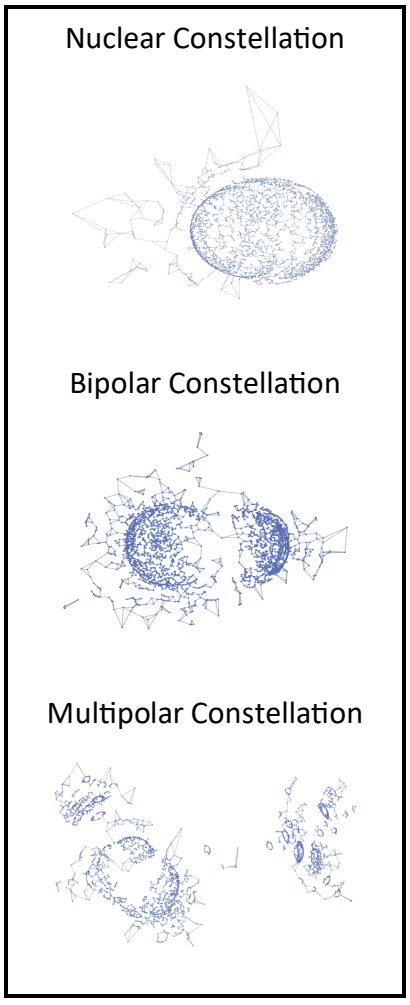
system. In other words, this message-centric graph construction enables the detection of narrative cohesion through similarity-based recurrence, offering insight into the structural persistence of ideas across temporal and thematic contexts.

Group affiliation is retained as a node attribute, allowing for group-level interpretations without losing the granularity of message-level diffusion. This model offers analytical precision for identifying how political content flows, which messages serve as central pivots of engagement, and how echo chambers are structured around recurring textual artifacts. It also enables the application of Topological Data Analysis (TDA), which benefits from high-resolution, content-level data to detect Persistent Homologies topological features that persist across multiple thresholds of connectivity.

These persistent structures help reveal the underlying shape of discourse, providing insights into how narratives stabilize or fragment over time. In her 2024 study, Rocha identifies three such structures - Nuclear, Bipolar, and Multipolar Constellations - emerging from k-Nearest-Neighbor (kNN) Persistent Homology analyses of social media. Nuclear Constellations show tight, centralized clusters often reflecting political personalism; Bipolar Constellations reveal polarized, ideologically divided spaces; and Multipolar Constellations expose fragmented discourse with multiple competing centers. Modeled mathematically using Gaussian functions, these patterns offer a robust framework for understanding how political information circulates, clusters, and polarizes within digital networks.

Figure 3 - Examples of Nuclear, Bipolar and Multipolar Constellations



Source: Rocha (2024b)

In the Conspiracy Theory networks, the discovered structures have been majorly nucleated, indicating cohesion. This suggests that political discourse in such environments tends to revolve

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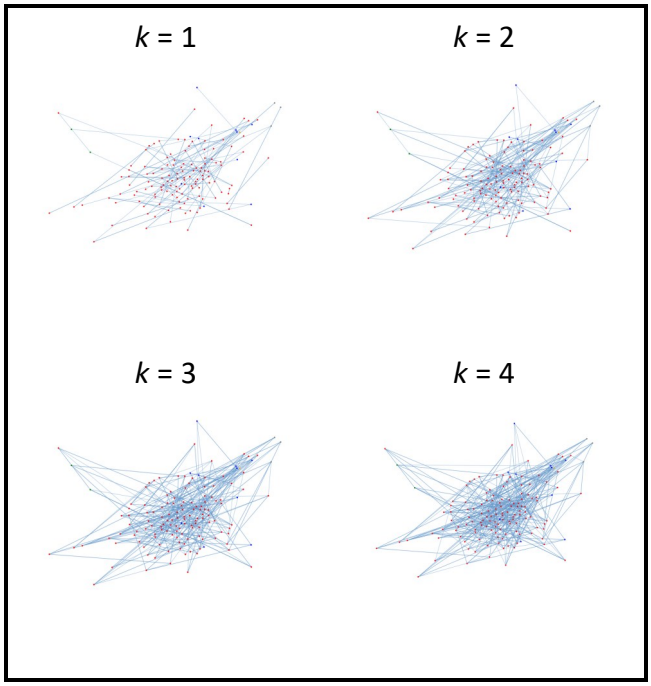
around a central cluster of repeated or highly similar messages, reinforcing a dominant narrative often anchored in personalism or ideological closure. The persistent homological feature is discovered by assessing the endurance of these topological formations across varying thresholds in the k-Nearest-Neighbor (kNN) filtrations. In the previous study, most of these nuclear constellations revealed tightly clustered communities where information flows were dense and concentrated, reflecting an echo-chamber effect. The images below illustrates one such structure, where message similarity and temporal proximity coalesced into a stable and centralized pattern of discourse.

Figure 4 - Persistent Homology discovered in Conspiracy Telegram Networks



Source: Rocha, Silva, Mielli (2024)

In sum, this study applies TDA to understand how political information circulates across Telegram during the 2024 Brazilian municipal elections, leveraging message-based networks constructed from scraped message data. Unlike Social Network Analysis (SNA), which centers on direct user-to-user connections, TDA enables us to explore the shape and persistence of structures across scales, capturing the geometric backbone of political communication. Through k-Nearest Neighbor (kNN) filtrations, we identify Persistent Homologies that reveal the most stable and significant topological features in the network - clusters, cycles, and voids that endure across resolutions. These features are critical in detecting how political narratives take form, persist, and interact in highly dynamic digital ecosystems. Building on previous work where Telegram networks were modeled at the author level (Rocha, Silva, Mielli, 2024), this article adapts the approach to message-level aggregation, allowing for a tractable analysis of large-scale data and a shift from micro-level interaction to meso-level community behavior. By doing so, we not only preserve key structural insights but also expose broader narrative patterns and inter-group relationships.

In contrast, when analyzing Political Communities on Telegram, a different structural pattern emerges. Across several months of 2024, we observe the consistent presence of Multipolar

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Constellations - topologies marked by the coexistence of multiple narrative hubs and intersecting discourse clusters. Within each Multipolar Constellation, finer structures of Bipolar and Nuclear formations are also detected, often reflecting moments of thematic alignment or sudden centralization of debate. However, unlike in Conspiracy Theory environments, these clusters within Political Communities display significantly less cohesion. Instead of centralized echo chambers, we find loosely connected conversational regions, cross-pressured clusters, and more fragmented discursive fields. This indicates a more dispersed and competitive communicational landscape, where multiple narratives vie for attention and where ideological centrality is less consolidated.

In short, while Conspiracy Theory networks tend toward structural convergence and message saturation, Political Communities are topologically volatile, more plural, less coordinated, and marked by intermittent convergence rather than sustained cohesion.

A final consideration to be made is: For the purposes of this research, we do not apply k-Nearest Neighbor (kNN) filtrations directly to the visualized graphs, given the volume of data and the analytical scope of the study. Instead, the graphs are examined and categorized based on their structural features, which remain conceptually consistent with those uncovered through kNN-based Persistent Homology. In this sense, while the filtrations are not computed on each cluster, the theoretical framework of TDA - and the classification of Nuclear, Bipolar, and Multipolar Constellations - still guides our interpretation. The notion of persistence across scales, central to Persistent Homology, underpins how we read and distinguish the visible structures, even when not explicitly measured through kNN thresholds.

When it comes to the temporality, organizing the graphs sequentially across the months allows us to observe the rhythm and shifts in the communicational structure - revealing not just static topologies, but dynamic movement within the discourse, and how the shapes might compress, in example, with constellations going from Multipolar, to Bipolar, to Nuclear, or rarefact, with constellations going from Nuclear, to Bipolar, to Multipolar (Rocha, 2024a). Through this lens, it becomes possible to identify moments of compression (*recrudescimento*), where the networks become denser, more centralized, and more coordinated - as seen in October, when the elections begin - as well as phases of rarefaction (*arrefecimento*), in which the discourse disperses, clusters become looser or more peripheral, and narrative cohesion diminishes. At last, while the structural properties of message similarity are captured through graph-based TDA, qualitative content analysis ensures semantic validation of clus-

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ters. This mixed-methods integration allows us to connect narrative structure with political meaning. Finally, for content analysis, whenever a YouTube link was provided, the #YouTubeScrap (Silva, Rocha, 2024) was employed to extract metadata and transcript, when available.

Data and Q*uantitative Analysis*

Unlike previous work, this article handles a colossal amount of data scraped from hundreds of Telegram groups over multiple months, encompassing millions of messages exchanged during the 2024 municipal elections. The scale and heterogeneity of this dataset demand a pre-quantitative analytical stage - an intermediate layer of processing that precedes the extraction of topological features.

Preliminary quantitative analysis reveals the magnitude and complexity of the communicational landscape: across twelve months, over 1.1 million messages were scraped, with monthly volumes ranging from approximately 87000 to 112000 messages. After removing unique, SimHash Ids those appearing only once, the dataset retained between 24000 and 50000 messages per month, indicating significant narrative recurrence and message replication. These filtered datasets were then transformed into graph structures, where each message was treated as a node and each shared message as an edge.

The resulting monthly graphs contained between 22000 and 32000 nodes and upwards of 60000 to over 113000 edges, showcasing the density and interconnectedness of political discourse during this period. Notably, the number of clusters with more than three nodes fluctuated between 899 and 1342 per month, revealing a persistent pattern of medium-scale groupings that neither converged into a single dominant cluster nor dissolved into purely fragmented structures suggesting a communicational environment marked by thematic convergence and local cohesion rather than systemic centralization.

These metrics collectively justify the adoption of TDA as the methodological framework best suited to capture the shape and stability of such complex, evolving political structures. Let us, then, examine the following chart.

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Chart 1 - Quantitative data leading to TDA

Month	Number of messages	SimHash ID with more than 1 message	Total messages after removal of unique SimHash IDs	Number of nodes in the graph	Number of edges in the graph	Total clusters detected after removing unique SimHash IDs	Clusters with more than 3 nodes
January	95807	13240	46486	28709	82785	9917	1100
February	94880	12760	45918	28839	75028	9346	899
March	98646	12716	42775	28450	109372	10668	1017
April	97503	13077	42744	28176	60524	9755	1248
May	103199	15009	50705	32241	77296	10297	1342
June	87902	9656	31963	22361	68308	7801	1069
July	97304	9870	36258	24198	78160	7999	1283
August	98129	9324	34521	22477	71063	7485	1179
September	100334	10660	37943	25300	93715	8416	1284
October	112745	9837	24359	24359	106838	7969	1195
November	105633	9100	34497	23147	113400	7576	1169
December	91675	9523	34164	23271	107753	7112	1205

Source: Authors (2025)

To construct the monthly networks, we first filtered the dataset by removing messages associated with SimHash IDs that appeared only once - these are typically noise or non-replicated content not relevant to the structural diffusion of political narratives. The remaining messages were those that shared a SimHash ID with at least one other message, indicating high textual similarity. Each of these messages was then treated as a node in the graph, with its metadata - including category and group affiliation - preserved as node attributes. Edges were created between every pair of messages that shared the same SimHash ID, forming fully connected subgraphs (cliques) for each cluster of repeated content. This approach highlights the relational structure of content replication across Telegram during each month of the election cycle. The resulting graphs, ranging from ~22,000 to ~32,000 nodes and up to over 113,000 edges, were then analyzed to extract topological features.

These included the total number of connected components (clusters), and how many of those clusters contained more than three messages, indicating a recurring narrative circulating through multiple contexts. This message-based network construction methodology, grounded in content similarity rather than user interaction, allows for a fine-grained understanding of how political messaging clusters, amplifies, and potentially

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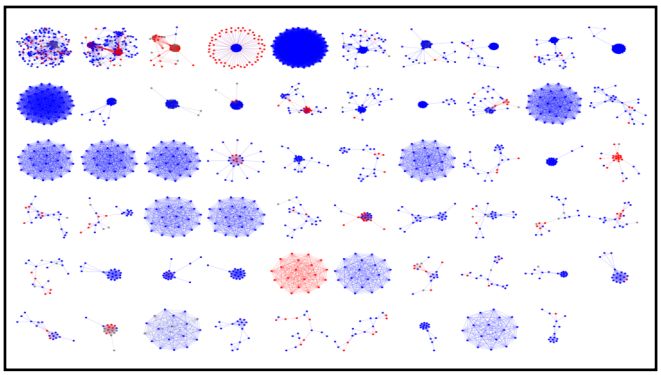
fragments across Telegram's complex communicational terrain.

Given that each monthly graph contains approximately 1,000 clusters with more than three nodes, this article focuses on a strategic subset of these networks specifically, those with topological structures most relevant to the electoral calendar, such as during the months of March and May, providing some context, and then September, October and November the pre and post electoral months.

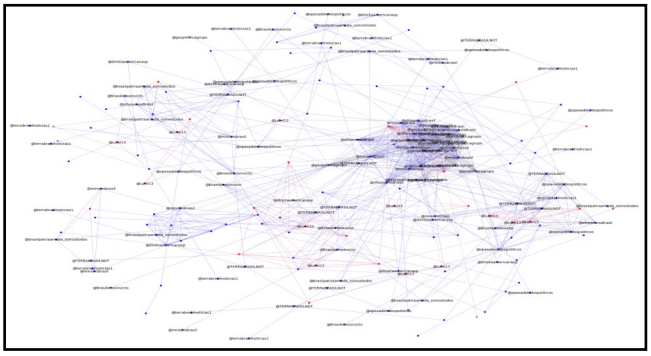
Figure 5 - 60 largest clusters in March 2025



Source: Authors (2025)

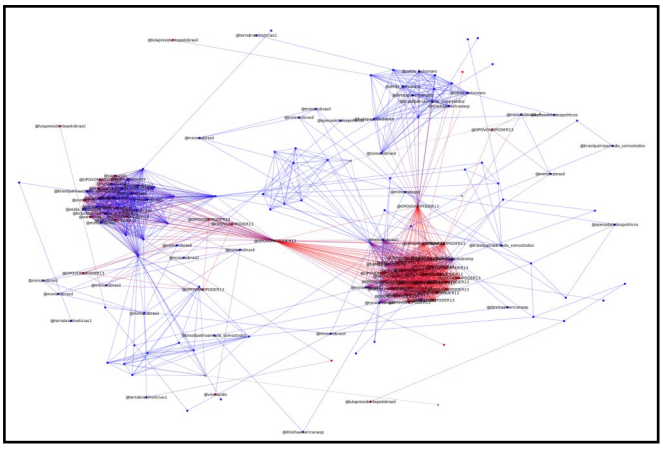
The above visualization displays the 60 largest message-based clusters from March 2025, each representing a distinct constellation formed through high-similarity political content on Telegram. A clear structural variation is observable: several clusters exhibit tightly packed, highly interconnected nodes characteristic of Nuclear Constellations, indicating strong cohesion around a central message or narrative. In contrast, other clusters display Bipolar Constellations, where two visually distinct cores - red for the progressive groups, blue for the conservatives - are connected by fewer intermediary nodes, suggesting polarized but interacting discursive fields. The clusters are ordered from largest to smallest. Let us, then, consider the two largest clusters.

Figure 6 - Largest cluster from March 2025



Source: Authors (2025)

Figure 7 - Second largest cluster from March 2025



Source: Authors (2025)

The first cluster is majorly nuclear, while the second has a more outright bipolar structure, if not nearly multipolar as the progressive cluster

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(red) branches towards two blue ones. Interestingly, the most repeated messages across the dataset reflect this difference in structure: the top entry - an invitation link to the channel *freedomnewsforyou* - appears in over 200 messages and acts as a hub-like anchor within a tightly packed core of aligned content, characteristic of a highly cohesive nuclear constellation. In contrast, other top-ranked messages, such as YouTube live links and stylized ideological slogans, circulate across clusters that are ideologically mixed or thematically divergent, contributing to more diffuse structural configurations. These messages not only appear in different groups but also connect communities with distinct political orientations, suggesting either active contestation or cross-posting practices. The coexistence of both cohesive and cross-pressured content within the top layer of replicated messages helps explain the visible fragmentation in some constellations and the centralization in others—each reflecting how political narratives were either consolidated or stretched across competing Telegram communities during the electoral period.

When it comes to the most shared videos, the most recurrent YouTube videos shared across political Telegram communities in March predominantly stem from conservative content creators, particularly the channel *Direita no Brasil [OFICIAL]* – Mario Robert, which appears multiple times with titles marked by urgency and sensational framing—such as "*URGENTE! POLÍCIA FEDERAL FAZ OPERAÇÃO CONTRA BOLSONARO" and "BOMBA! ZÉ TROVÃO, O NOVO TRAÍRA?*" These videos generally accuse left-wing actors or institutions (notably the STF and Minister Alexandre de Moraes) of authoritarianism, censorship, or corruption. Other conservative influencers like Flávio Bolsonaro and Dr. Marcelo Suave also appear, reinforcing narratives of persecution, judicial excess, and moral outrage. Among the most shared items are also videos from Luciano Cesa, a spiritual-political influencer blending esotericism and anti-establishment rhetoric, whose content appears multiple times in this dataset. In contrast, progressive content is virtually absent among the top-shared videos this month, showcasing a pattern of right-wing dominance in message replication and virality within the observed ecosystem. Overall, the selection reflects a discourse ecosystem built around grievance, urgency, and emotional mobilization, often invoking themes of betrayal, revelation, and resistance.

This, of course, resonates with the notion of disinformation - not necessarily because the factual content of each video can be systematically debunked, but because the communicational logic underpinning their circulation relies on affective intensity, narrative simplification, and algorithmic virality. As observed by Kreiss and McGregor

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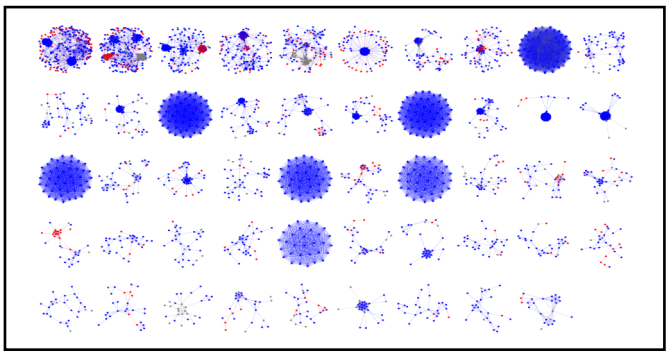
(2021), the personalization of political communication in digital environments enables "technological intimacy," which makes emotionally charged content feel more authentic and trustworthy, even when it lacks evidentiary grounding. In this context, disinformation operates less as a lie and more as a mode of engagement - what Zuboff (2019) would frame as the monetization of behavioral surplus, where outrage becomes the commodity of choice. The prevalence of moral panic, symbolic conflict, and existential framing - especially in videos shared at scale - suggests that political Telegram ecosystems function as emotional amplifiers, privileging content that reinforces tribal belonging and antagonism over content that fosters deliberation. This aligns with what Margetts et al. (2015) describe as "political turbulence," where networked dynamics favor action without reflection, and virality replaces reason as the central logic of public persuasion. Let us, the, head towards the month of May.

Figure 8 - 50 largest clusters in May 2025



Source: Authors (2025)

The month of May showcases more diverse networks, even if they still showcase irregular topological features, unlike what we will later see in October. Noticeably, the first eight structures (Figure 9) portray two bipolar networks, which could potentially explain processes of political polarization. Nevertheless, the existence of Multipolar Constellations within the largest communicational networks display that there is some degree of fragmentation and thematic plurality across Telegram communities. This suggests that, while ideological polarization remains a prominent structural feature - especially in the networks that revolve around mirrored clusters of opposing narratives - there are also concurrent currents of discourse circulating among less aligned groups.

These Multipolar Constellations indicate the coexistence of multiple narrative centers, with some messages bridging between distinct ideological clusters, reflecting a more competitive and less centralized informational landscape during this period. Nevertheless, a significant number of disconnected networks persist throughout the month, signaling that many clusters of communication remain isolated - suggesting the existence of communicational bubbles and echo chambers. Such fragmentation points to the persistence of ideologically insulated environments, where information is reinforced rather than contested, limiting exposure to alternative viewpoints and con-

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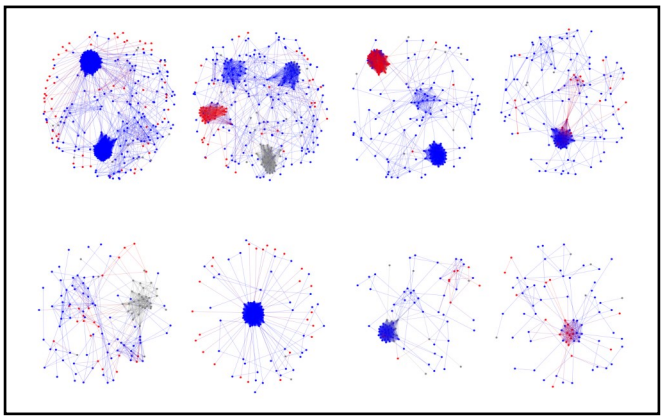
tributing to the overall polarization of the digital space - as seen in Figure 10.

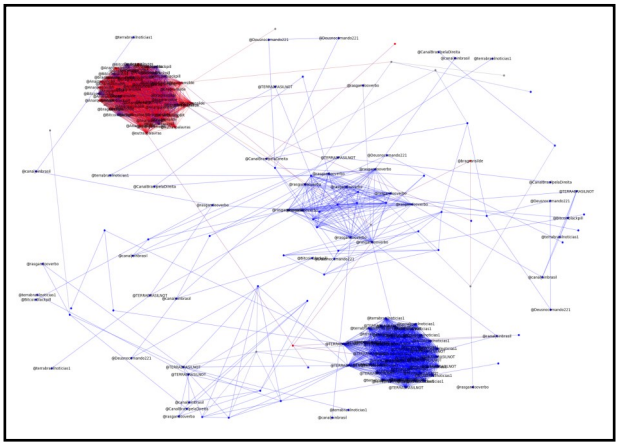
The coexistence of Multipolar and disconnected topologies signals a hybrid communicational moment: one marked by both narrative dispersion and the seeding of polarized, insular communities that would later consolidate into tighter, more nucleated constellations.

Figure 9 - Largest eighth clusters from May 2025



Source: Authors (2025)

Figure 10 - Third largest communicational cluster in Telegram - a Bipolar Constellation



Source: Authors (2025)

This third largest group is the most interesting, when it comes to Topological features because it contains an entire community of gatekeepers composed of conservative groups that deliver content to both progressive and conservative groups. This may signal a tendency of conservative groups of dominating the public sphere - which is confirmed by the shared content:

In the overall May dataset, a recurring pattern of conservative political content, centered on narratives of institutional distrust, anti-Supreme Court rhetoric, and support for figures such as Bolsonaro is observed. Much of the messaging is aimed at mobilization, with videos and links promoting live discussions, denunciations of perceived injustices, and appeals to patriotism or religious identity. The narratives commonly invoke terms like "*urgente*," "*liberdade,*" and "*verdade,*" and many are structured around highly emotional language, moral dualisms, or calls to action. These pieces of content often function as anchoring points for echo chambers, encouraging recirculation across multiple Telegram groups, especially among conservative audiences. In that sense, this is already visible in Figure 8, where few clusters are explicitly progressive or centrist, suggesting a content environment that leans heavily toward one side of the ideological spectrum.

Sadly, when it comes to the YouTube videos, most of them had already been deleted by the

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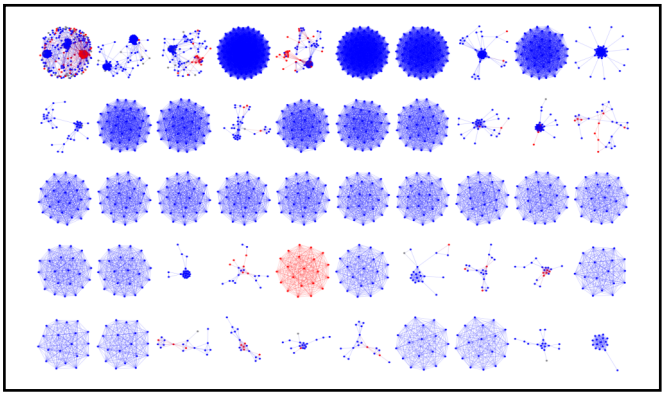
time of data scraping. This is likely the result of coordinated content moderation and takedown efforts, particularly in compliance with decisions from Brazil's Superior Electoral Court (TSE), which intensified scrutiny over electoral disinformation and violations of platform guidelines. While these deletions limited our ability to conduct qualitative analysis of the audiovisual material, the persistence of their SimHash clusters across Telegram does confirm a crucial dynamic already described by Lippmann (1922) and later theorized through Foucault (2008) and Zuboff (2019): even when direct access to content is restricted, the underlying discursive structure remains intact. The flow of narratives, once embedded in the attention economy and algorithmic memory of digital infrastructures, continues to circulate through screenshots, textual reiterations, and user commentary - often detached from the original source.

This phenomenon speaks directly to the power asymmetry embedded in platform architectures: as Citton (2013) argues, emotionally charged content becomes the commodity of choice in attention economies, while Zuboff reminds us that surveillance platforms profit from sorting, amplifying, and reproducing precisely the type of content that is most susceptible to takedown. In this sense, what is removed on one layer often persists on another—just as topological features endure across kNN filtrations. Here, the deleted videos' enduring imprints across Telegram reflect the structural homologies of affective polarization: narratives don't vanish; they recompose, stabilize, and reappear elsewhere in the communicational mesh. As such, deletion does not equate to disappearance, but rather, as Herbst (2018) and Garimella et al. (2018) suggest, becomes part of a new cycle of antagonism - fueling grievance, reinforcing ideological bubbles, and legitimizing claims of censorship.

Heading towards the pre-electoral period, we have the following structures for the Month of September:

Figure 11 - 50 largest clusters in September 2025



Source: Authors (2025)

Interestingly, as we head towards September, the first three structures display varying levels of polarity, the second and third being clear Bipolar Constellations, and the first, once again, a Multipolar Constellation with an entire conservative cluster acting as gatekeeper. When it comes to the initial clusters, it is also quite interesting to see

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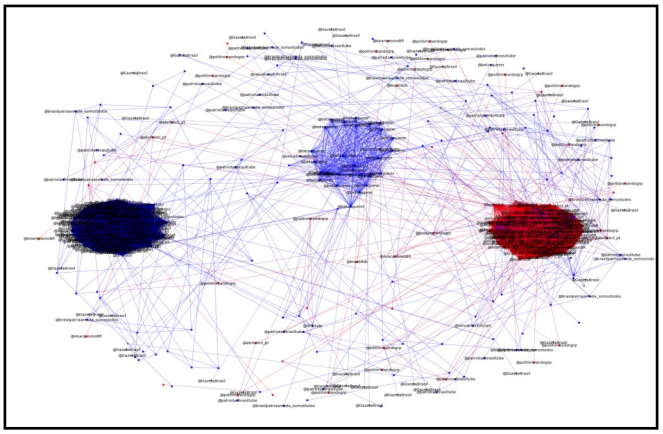
more nuclear or nucleated constellations than we did in previous month - suggesting recrudescence. This suggests that certain ideological communities not only concentrate discourse internally but also serve as intermediaries between otherwise disconnected clusters. The conservative gatekeeper group, in particular, appears to mediate the flow of replicated content across segments of the network, shaping cross-cluster communication without fully integrating divergent discursive poles. This reinforces the notion that, while some networks exhibit fragmentation, others operate as central conduits in the broader informational architecture.

With this being the month prior to the elections, With this being the month prior to the elections, the structural complexity and strategic positioning of certain clusters take on even greater significance. The presence of Bipolar and Multipolar Constellations indicates heightened ideological activity and competition, with key groups actively reinforcing internal cohesion while attempting to influence or intercept discourse from opposing spheres. The conservative gatekeeper role observed in the largest network suggests an effort to frame narratives and manage discursive boundaries at a crucial moment in the electoral cycle.

Figure 12 - Largest communicational cluster in Telegram - a Bipolar Constellation - in September



Source: Authors (2025)

When it comes to September's most circulated content, a noticeable portion of the most frequently shared messages consists of Telegram invite links, promotional material for fringe political channels, and low-information circulation such as stickers or short slogans. The top shared messages revolve around amplification of alternate Telegram channels (e.g., @selvabrasiloficiall, @freedomnewsforyou, @RandomAnarchy), religious messaging ("*Em Cristo Somos Mais Que Vencedores*"), and group invitations - many of which are phrased in ways that evoke ideological unity or mobilization. This suggests a phase of intensified mobilization and group consolidation ahead of the municipal elections, where network-building and reaffirmation of group identity seem to take precedence over overt narrative conflict or ideological persuasion. The messaging reflects

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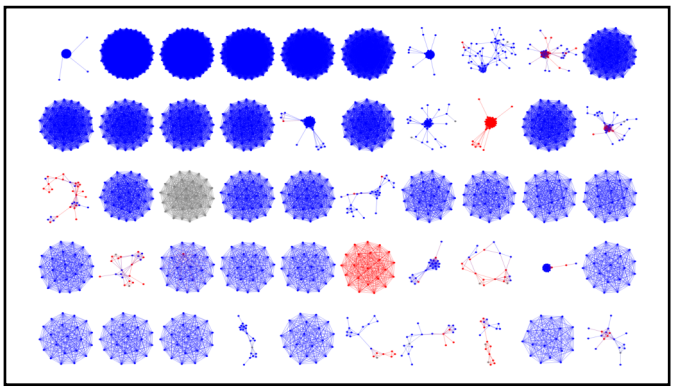
attempts to widen reach and deepen engagement within **pre-existing** ideological bubbles.

The prominence of invite links and ideological reinforcement suggests that users are not simply consuming information, but being actively funneled into insulated communicational spaces. This reinforces Herbst's (2018) argument that media systems, now operationalized through platform infrastructures, serve as agents of hegemony, structuring not only discourse but the social architecture of engagement. The rise of gatekeeping clusters further reflects what Citton (2013) identifies as the affective economy of digital attention, wherein emotionally resonant symbols outperform informational content in capturing and consolidating public focus. Here, affect, repetition, and symbolic reinforcement become the very topology of discourse—shaping the form, flow, and endurance of political narratives across the network.

Heading towards the electoral month per se, we are presented with the following structures.

Figure 13 - 50 largest clusters in October 2025



Source: Authors (2025)

A very important discovery here is that the first six Constellations are Nuclear, and also extremely dense and nucleated - and not just that, most graphs are Nuclear Constellations. This structural convergence in the networks during October, the electoral month, is highly relevant as it indicates a sharp intensification in narrative cohesion and message replication. Such dense and centralized formations suggest the presence of coordinated communication strategies, likely aimed at consolidating voter bases and dominating informational spaces. In contrast to the earlier months' more fragmented or Bipolar patterns, October's predominance of Nuclear Constellations reveals a communicational landscape increasingly saturated with repeated content and ideologically aligned messaging, a hallmark of high-stakes political mobilization. This reflects not only narrative consolidation but also potential efforts to minimize dissent or competition in the digital discourse leading directly into the elections.

As for the content, the most shared messages in October predominantly revolve around fringe ideological mobilization, religious messaging, and links to external channels, often encouraging users to migrate to Telegram or follow affiliated content. Several top entries are links to conservative or libertarian content hubs (like @freedomnewsforyou or @selvabrasiloficiall), while others promote religious broadcasts and

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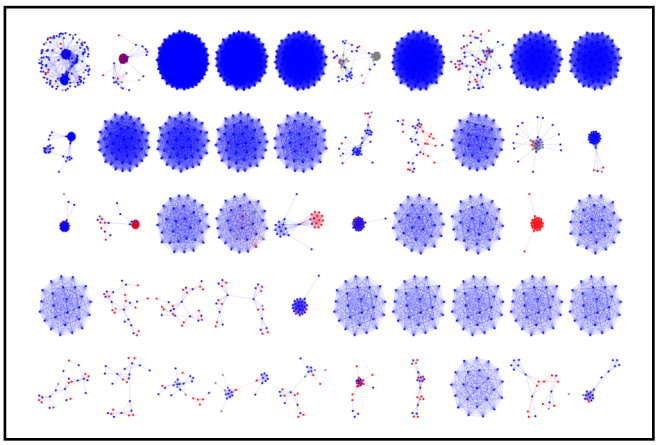
spiritual movements. Notably, many messages blend ideological calls with appeals to faith, sovereignty, or resistance. This hybrid nature - political-religious and often conspiratorial - suggests an effort to galvanize segmented digital publics through emotional and cultural alignment, a strategic communication hallmark of the final electoral stretch. The repetition of identical or near-identical content across diverse groups illustrates narrative coordination and targeted replication, reinforcing echo chambers and boosting message visibility in Telegram's algorithmic flows.

When it comes to articulating the canon with the results, the consolidation of affectively charged, identity-oriented messaging is not coincidental but structurally incentivized, aligning with Citton's (2013) formulation of the attention economy, wherein emotionally resonant symbols are weaponized for both visibility and mobilization. The religious overtones and moral binaries identified in the October content also reinforce Kim's (2023) notion of platforms as emotional sorters, where symbolic coherence matters more than ideological coherence. Meanwhile, the visible disappearance of counter-hegemonic or dissenting content resonates with Foucault's (2008) analysis of power through discourse, suggesting that amplification and erasure are intertwined tactics of control. As polarization crystallizes through structural compression, what we witness is not merely electoral campaigning but a computationally amplified struggle over meaning and memory in the digital agora.

After the electoral month, the following structures are seen.

Figure 14 - 50 largest clusters in November 2025



Source: Authors (2025)

As we head away from the electoral month, we see a process of rarefaction of networks, with a Bipolar Constellation gracing the 1st position in November. This indicates loosening of communicational cohesion and a shift toward more ideologically polarized but less coordinated engagement. The decline in dense, Nuclear structures suggests a dispersal of central narratives, as campaign efforts recede and attention fragments. Political discourse becomes more reactive and less structured, with clusters no longer orbiting around dominant messaging cores, but rather forming around thematic opposition - marking the end of the peak cycle of electoral narrative consolidation. This post-

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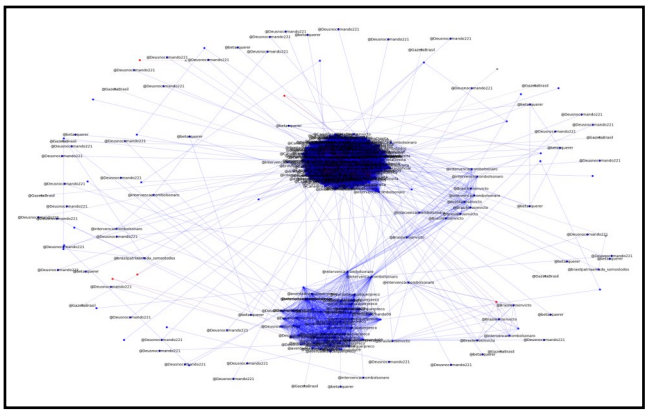
electoral rarefaction exemplifies what Castells (2015) describes as the dual nature of digital networks: they are capable of intense mobilization, but equally prone to dispersal once the political moment dissipates.

As campaign imperatives wane, so too does the coherence of narrative convergence, giving way to loosely coordinated clusters that reflect a shift from strategic framing to symbolic reaffirmation.

Figure 14 - Largest communicational cluster in Telegram - a Bipolar Constellation - in November



Source: Authors (2025)

Though both clusters are conservative, one of them is distinctively Christian, indicating a continuation of the previous month's campaigning, particularly among evangelical and religious right-wing networks that remained mobilized even after the elections. This suggests that while the general intensity of political messaging may have diminished, certain ideological groups - especially those aligned with moral and religious agendas - sustained their narrative output and cohesion. Their messaging appears less electoral in tone and more doctrinal, preserving momentum around issues like persecution, prophecy, and national identity, thus reinforcing long-term communicational structures beyond the electoral event itself.

As for the most shared content, several high-frequency messages include invitation links, religious or nationalist rhetoric, and re-shared content from conservative-aligned platforms or influencers. Notably, some entries involve anti-vaccine sentiments, moralist appeals, and coordinated channel promotion (e.g., listings of partner groups and Telegram handles), suggesting ongoing mobilization and an effort to maintain engagement despite the post-election period. Thematic persistence across these messages reveals a continuity of network activity rooted in group cohesion and ideological alignment rather than purely electoral mobilization.

The persistence of religious discourse, even as other narratives fragment, underscores Foucault's (2008) claim that discourse is a vehicle of power not simply through content, but through its ability to endure and reproduce social orders. Similarly, the continued presence of affectively charged messaging reflects the platform logic described by Citton (2013) and Kim (2023): attention is sustained not by relevance, but by emotional

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resonance. In this case, moralist and conspiratorial frames remain operative as affective anchors, sustaining ideological communities even in the absence of electoral urgency. The endurance of these narratives beyond the campaign cycle reveals the structural imprint of affective polarization and reinforces the long-term normalization of digitally mediated ideological sorting.

CONCLUSIONS AND FINAL CONSIDERATIONS

This study combined Topological Data Analysis (TDA), particularly Persistent Homology, with temporal Social Network Analysis (SNA) to examine Telegram message-based networks throughout Brazil's 2024 municipal elections. By treating each message as a node and connecting those with high textual similarity (via SimHash IDs), the analysis captured structural features of political discourse beyond user interaction, focusing instead on narrative recurrence, clustering, and diffusion. Networks were observed monthly, allowing for the identification of topological patterns - namely Nuclear, Bipolar, and Multipolar Constellations as designed by Rocha (2024b) - and their evolution over time. The temporality approach enabled the detection of moments of Compression (*recrudescimento*) and Rarefaction (*arrefecimento*) (Rocha, 2024a), reflecting the shifting intensity and organization of political messaging throughout the electoral cycle. This method provided a rigorous, scalable framework to trace how political content consolidates, polarizes, or disperses across ideologically segmented digital publics.

The topological structures identified in the Telegram data from Brazil's 2024 municipal election cycle - when executive and legislative representatives were elected at the local level - reveals a digital ecosystem marked by the presence of information bubbles and potential echo chambers. These structures, often manifesting as multipolar constellations, underscore the role of affective and ideological alignment in shaping political discourse and influencing public opinion. The fragmentation observed is not isolated but rather a continuation of a broader trajectory of political polarization in Brazil. Since the 2018 election of Jair Messias Bolsonaro, digital platforms have become increasingly segmented, serving as battlegrounds for ideological dispute. These tensions escalated further in 2022, when Luiz Inácio Lula da Silva defeated Bolsonaro and returned to the presidency after a period of imprisonment related to the Lava Jato investigations. In this context, Telegram emerges as a critical environment for political mobilization and discursive consolidation, where polarized narratives are not only exchanged but structurally embedded in the very topology of communication.

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In the electoral month of October, Telegram networks reached their highest point of structural compression, characterized by an overwhelming dominance of Nuclear Constellations - dense, centralized, and ideologically cohesive clusters. This marked a turning point in the electoral cycle, as narrative saturation and repetition peaked, reflecting intense coordination and the strategic consolidation of messaging aimed at voter mobilization. The prevalence of religious, conspiratorial, and emotionally charged contente, amplified through repetitive dissemination across conservative and libertarian channels, demonstrates a platform logic where affect trumps deliberation. These findings confirm the theoretical framework: as Citton (2013), Zuboff (2019), and Kim (2023) suggest, the emotional economy of digital environments privileges symbolic coherence and algorithmic virality over pluralism. In October, the structure of discourse itself becomes the message - an echo chamber architecture forged not only by ideological alignment but by the very design of attention economies, manifesting a compressed, saturated communicational landscape driven by urgency, repetition, and moral polarization.

This electoral phase fostered the emergence of strategic clusters that gain clear prominence in September and October, when political communication reaches its highest volume and density. As the election dates approached - October 6th for the first round and October 27th for the second, the network structures display a marked process of Compression (*recrudescimento*), as theorized by Rocha (2024a), with Nuclear Constellations overwhelmingly dominating the communicational terrain. These formations, which are highly dense and ideologically cohesive, suggest the presence of coordinated efforts to replicate specific narratives at scale. In this moment, ideological messaging becomes less exploratory and more declarative, less about persuasion and more about reaffirmation. This is not merely a consequence of political urgency, but a by-product of Telegram's structural affordances and the emotional logic of algorithmic amplification.

The solidification of these constellations reflects a communicational logic geared toward internal cohesion, informational homophily, and symbolic reinforcement. Rather than seeking to broaden debates or engage in cross-ideological deliberation, messages during this phase focus on strengthening preexisting communities. Calls to action, channel promotion, and shared ideological motifs dominate the discourse, reinforcing what Lippmann (1922) would describe as pseudo-environments constructed realities where opinion is not shaped by reflection but by repetitive cues and symbolic anchoring. The emphasis on main-

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taining group unity, encouraging followers to join additional Telegram spaces, and promoting ideological alignment reveals a strategic deployment of discourse intended to saturate digital attention and crowd out competing narratives.

While the study offers robust insights into the structure and evolution of political discourse in a high-stakes electoral context, it also opens avenues for further inquiry. A particularly relevant finding concerns the role of conservative "gatekeepers", clusters that serve as bridges between ideologically distinct communities: these groups were shown to consistently deliver content not only to conservative networks but also to more moderate or progressive spaces, suggesting a positional advantage in shaping the broader informational environment. Future research should examine the mechanisms, strategies, and content typologies employed by these actors, as well as the extent to which their communicational asymmetry contributes to a long-term imbalance in digital political influence. Such investigations would deepen our understanding of discursive power and its structural manifestations in platform-driven public spheres.

In the final stretch of Brazil's 2024 municipal elections, Telegram networks collapsed into dense, centralized constellations of repeated, emotionally charged content - revealing not just political mobilization, but structural saturation. Narrative diversity gave way to ideological reaffirmation, as coordinated messaging crowded out deliberation and amplified affective polarization. These compressed formations were not accidental; they reflect how digital platforms reward symbolic coherence and virality, not plurality. In this architecture of attention, discourse becomes infrastructure, and the shape of the network is itself a form of power.

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