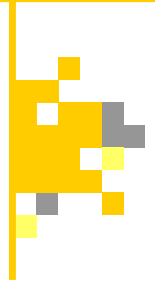


## PRESENTATION



### Collective Monograph “Computational Social Sciences in a changing global landscape: expanding tool-sets

#### for a Multipolar World

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In 2021, the physicist and computer scientist Stephen Wolfram, the mind behind Mathematica and Wolfram Alpha, employed the expression **Ruliad** to represent the ultimate space of all possible computational rules. Through the Ruliad, every concept, every theory, every model could be computationally tested through code. The Ruliad is the space where every possible rule of thought, language or structure is already encoded, waiting to be traced, and there, any system of ideas, from ethical frameworks to economic models, can be imagined as a path through an infinite web of rules.

Though the Ruliad was initially conceptualized as an ever-encompassing space to test mathematical and physics models, the concept of Ruliad

indeed harbors all possibilities, and indeed provides a way to think about human creativity, and knowledge itself as a computational exploration. The dream is, that whenever we formulate a new theory, create a metaphor, or even design an institution, we are effectively selecting a thread within the infinite web of the Ruliad, giving it meaning through test and perspective - through computational methods.

In this Collective Monograph - a published dossier at Revista InterAção - we invited authors to submit papers addressing the challenges, innovations and anticipations associated with a digitally connected Multipolar World. This was, of course, in the context of the brief Brazilian 2025 presidency of BRICS, as we hoped to inspire the develop-

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ment of new tool-sets for a better understanding of the shifting global landscape, as well as to better understand the impact of new technologies in the broader political scenario.

And indeed, this Collective Monograph presents both types of outputs:

To start with the dream and how it is contested, **Téllez-Zepeda's** study situates the very notion of Digital Sovereignty within competing imaginaries of integration, showing how the promises of openness, neutrality and connectivity are constantly rearticulated through the everlasting historical struggle for the monopoly of legitimate authority. In this sense, Global Digital Governance is yet another thread in the infinite Ruliad, a space where rival projects, principles and symbolic universes contend for meaning, and where each institutional design is less a finished structure than a chosen path within the boundless web of possible rules that shape our common future.

And what is the future we've been promised? For many years, the Global South has struggled to thrive beneath the shadow of the Collective West, and **my paper with Dashichev** explores the western cynicism and how cognitive warfare has been treaded in the digital sphere through what we understand as Diplomacy 2.0. The webs of the Ruliad that have been reserved for the Global South have long been western in origin, channeling its development through borrowed frame-

works, dependent infrastructures, and narratives designed elsewhere.

This is also reflected in the report coordinated by **Silva, a ten-hands effort consisting of him, myself, Vaz, Veneziani and Modanez**. The digital infrastructure of Brazil, much like other countries, reveals the structural weight of these inherited webs: in mapping public spending at the Federal, State and Municipal levels for IT solutions, we found that the country, in its drive to modernize, overwhelmingly opted to acquire foreign and Western technologies - largely from U.S. Big Tech - instead of investing in the development of its own sovereign digital infrastructure. The loss of 23 billion reais in foreign technology seems little if compared to the geopolitical implications of such dependence: each contract signed with external providers further entrenches Brazil into frameworks it does not control, diminishing its capacity to define rules, set standards, and protect its own data.

What appears as modernization, in fact, perpetuates asymmetry, as the infrastructures that sustain public administration, health, education, and security remain subordinated to logics external to the country. In this sense, the debate on digital sovereignty is not a question of efficiency or cost alone, but of political autonomy and historical agency.

In Téllez-Zepeda's terms, this inherited submission binds Brazil to an integrationist imaginary

that reaffirms dependency rather than contest it. At the same time, as argued in my paper with Dashichev, such reliance exposes the Global South to intensified forms of cognitive warfare, where narratives of efficiency and inevitability conceal deeper asymmetries of power. Together, these studies show that the struggle for digital sovereignty is itself a struggle over which threads of the Ruliad we choose to follow: whether continuing along Western-designed paths, or asserting new ones that reflect the aspirations of a truly multipolar order.

And our colleagues from the East, indeed, show the way. **Kotova's** study demonstrates how Russia has positioned itself not only as a consumer of global technologies but as a producer of scientific and educational infrastructures that can be shared across the BRICS+ space. By highlighting traditions of fundamental science, strong institutions for the training of human capital, and a growing ecosystem of domestic digital industries, her study highlights the role of Russia in reducing technological dependency and creating alternatives to Western-dominated platforms.

Beyond Russia, **Malashenko's** work directs attention to the economic dimension of digital sovereignty, framing it as a precondition for sustainable development in strategic sectors. His analysis of the oil and gas industry shows how the creation of a BRICS-wide open-source digital ecosystem

offers not only autonomy from Western suppliers but also tangible economic gains: cost efficiency, resilience against sanctions, and value retention within the union itself. By involving companies such as Petrobras, Saudi Aramco, and PDVSA, the project points to the possibility of constructing an integrated value chain where critical infrastructures, data flows, and financial returns remain under the control of BRICS+ actors. In this way, digital sovereignty is not merely about technology, but about capturing development multipliers, safeguarding energy security, and generating new circuits of accumulation that strengthen the Global South's position in the world economy.

These are the studies analyzing the challenges we now face. When it comes to the development of new toolkits, three articles bring forth new computational tools - by all means exploring the new paths presented by the Ruliad:

**Garin and Kostyrkin's** paper presents the IOS RAS initiative hosted on the Russian Yandex Cloud, showing how locally adapted solutions can be designed not to replicate Western infrastructures, but to empower cross-border cooperation and science-to-business integration on terms defined by the South itself. Technological sovereignty does not need to ride on heavy industries or state-led infrastructures alone, but also in the subtle architectures of information exchange, negotiation, and partnership-building. Within the infinite space

of the Ruliad, their contribution highlights that the choice of which computational paths to follow can shape not just theoretical knowledge but concrete practices of solidarity, innovation, and collective development.

And speaking of practices of solidarity and information exchange, the article **I coordinated, once again with my colleague Silva, as well as Gurgel and Marques** furthers a research agenda in *Topological Data Analysis for Political Communication*, explores how electoral discourse in Brazil can be understood not just as a flow of messages but as structured constellations of connectivity and rupture. By applying TDA, we trace the persistent homologies that reveal when groups converge into nuclear formations or disperse into fragmented bipolarities, mapping the very moments of recrudescence and rarefaction of political networks.

Here, the notion of the Ruliad offers a conceptual bridge: it suggests that computation is not only a tool for analysis, but the very condition that enables us to develop new methodologies for exploring political life. By conceiving every possible path of meaning and interaction as part of the Ruliad, we recognize that techniques such as TDA are not just instruments of measurement, but ways of accessing and systematizing fragments of this infinite structure. Each network mapped, each constellation detected, represents a methodological advance that allows us to grasp how discourse

materializes, how narratives crystallize, and how collective identities form. In this sense, the Ruliad is less a metaphor than a generative framework: it opens space for designing novel approaches that make visible what would otherwise remain hidden in the complexity of digital communication.

**Ivanova, Skripka and Tunik's** paper follows a similar path by showcasing how computational approaches can be mobilized to forecast international dynamics in the context of multipolarity and digitalization. Their study demonstrates that by integrating artificial intelligence with geospatial analysis, it becomes possible to operationalize complex theoretical concepts such as multidimensional presence and spatial determination of decisions. In doing so, they expand the analytical reach of International Relations beyond descriptive frameworks, providing tools capable of processing vast datasets, uncovering hidden relations, and modeling future scenarios of interaction between the Global South and other regions.

Much like our use of TDA for mapping political discourse, their contribution illustrates how the Ruliad can inspire methodological innovation: by acknowledging that every potential configuration of power and influence is already latent in the computational fabric of reality, researchers are able to design instruments that make these possibilities visible, traceable, and politically meaningful.

At last, **my final paper with Silva** is more of a tool than anything else. In concordance with his previously developed tool *TelegramScrap* (2023), *YouTubeScrap* emerges as an open-source solution designed to assist researchers in the toilsome task of data scraping. By automating the collection of video metadata, transcripts, and multilingual content without the need for API keys, it lowers barriers of access and makes large-scale analysis feasible for scholars and practitioners alike. More than a technical instrument, however, *YouTubeScrap* represents the opening of a whole new branch of the Ruliad into Political Communication and beyond: by transforming the practical difficulties of gathering data into streamlined processes, it allows new questions to be asked, new methodologies to be built, and new insights to be generated across disciplines. In this sense, the tool contributes not only to the democratization of digital research, but also to the expansion of the very horizons of computation as a way of knowing the world.

This Collective Monograph, then, is both an invitation and a statement. It shows that the struggle for digital sovereignty, the design of economic alternatives, and the refinement of computational methods are not separate agendas but interwoven paths within the infinite web of the Ruliad. From debates on governance and sovereignty to the creation of open-source infrastructures and the in-

vention of new analytical tools, the contributions gathered here affirm that the Global South has the capacity not only to contest inherited frameworks but to generate its own. In doing so, they demonstrate that multipolarity is not simply a geopolitical arrangement, but also a methodological, technological, and epistemological choice: one that embraces computation as a shared language to build futures beyond dependency.

I can only hope that this corpus serves as proof that the South is not condemned to reproduce borrowed scripts, but capable of writing its own. That in choosing our own threads within the Ruliad, we affirm sovereignty not only in the digital sphere, but in thought, in imagination, and in the very architectures of the future.