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Poland in the Digital Age

A brief geopolitical assessment within the context of Artificial Intelligence and emerging technologies

Abstract: Within the three casual mechanisms known so far in relation to the emergence and spread of AI Nationalism, this short piece of research strives to combine recent IR literature involving cyberspace and AI with new insights from the institutional economic perspective and Neoclassical Realism, in order to make an introductory assessment focused on Poland's geopolitical challenges in the Digital Era. Since the analytical focus of this article concentrates on the case of Poland, the discussion can be perhaps also relevant for other countries pertaining to Central-Eastern Europe.

Keywords: AI Nationalism, Poland, digital sovereignty, AI Geopolitics, Russian AI

Polska w erze cyfrowej. Krótka ocena geopolityczna w kontekście sztucznej inteligencji i nowych technologii

Abstrakt: W ramach trzech okazjonalnych mechanizmów znanych do tej pory w związku z pojawieniem się i rozprzestrzenianiem nacjonalizmu AI, ten krótki fragment badań ma na celu połączenie najnowszej literatury IR obejmującej cyberprzestrzeń i AI z nowymi spostrzeżeniami z instytucjonalnej perspektywy gospodarczej i Neoklasycznego Realizmu. Zadaniem postawionym przed nimi jest dokonanie wstępnej oceny wyzwań geopolitycznych dla Polski w erze cyfrowej. Ponieważ analityczna część niniejszego artykułu koncentruje się na przypadku Polski, dyskusja może być istotna również dla innych krajów Europy Środkowo-Wschodniej.

Słowa kluczowe: nacjonalizm AI (Artificial Intelligence), Polska, suwerenność cyfrowa, geopolityka AI, rosyjska AI

Introduction

Taking into consideration the eternal destruction and displacement of entire civilizations, states, and populations throughout human history, Poland exempli-

fies a unique case in Europe, due to its turbulent past and the unextinguishable subsistence of a national identity embedded in a spiritual community united by culture and history. Stemming from the unaccomplished manifestation of *Corona Regni Poloniae* in the dawn of the 13th century, where the identification of the state and the Polish *volk* implied indivisibility under the concept of *gens polonica* (Balzer 1916), the Polish nation today finds itself once again deprived of core elements sustaining national sovereignty (Wittpahl 2017; Mueller 2020).

As the evolution of human ecosystems in cyberspace ushers in a new era of economic growth, a shift in power dynamics, moving away from humans entirely to algorithms, introduces a changing technical landscape transforming domestic political structures, national security, and state autonomy in the digital world (Dafoe 2018). Powered by the emergence of algorithmic processes, the digital era furthermore prescribes new challenges to the Polish economy, as a shift in the balance of power dictates a new geopolitical environment defined by a nation's technological trajectory.

Moreover, the inseparability of international trade and cybersecurity (Meltzer 2019) draws attention to the challenges that *cyber exceptionalism* (Katz 1997) and the governance of the Internet (Klein 2002; Chenou 2014) bring to Polish sovereignty at a time when machine learning, deep neural networks, big data, the internet of things, cloud computing and other digital technologies are used to collect, store, share, and analyze insurmountable amounts of data, while radically transforming social interactions and the nature of geopolitics (Zuboff 2019).

In essence, incomparable with previous centuries, the turbulent digitalization of Poland arrives at an increasingly unstable background, where the geopolitical nature of algorithmic agents cannot be isolated from domestic, regional, and international parameters (Craig 2018). Witnessing the advanced combination of nanotechnology, genetic enhancement, communication technology, and new technologies based in cognitive science (Roco 2002; Hersam 2011; Schwab 2020) in connection with the deep structural fault-lines in the neoliberal paradigm recently exposed throughout 2008–2020, this article strives to reveal the severity of these matters through brief insights in order to elevate the academic debate towards the national (and European) public sphere.

Methodology

The advancement and adoption of artificial intelligence in the 21st century, and its progression towards becoming a major geopolitical factor, predisposes the extraordinary acceleration of scientific and technological progress as a major force shaping global politics and the world economy (Brynjolfsson 2014; Butcher 2018). Sustaining that the continued progress in machine learning has driven new global transformational trends invoking the rise of *techno-nationalism* (Miailhe 2018; Möllers 2020), recent contributions from International Relations theory (Choucri

2012; Maurer 2019) and Institutional Economics (Parkes 2015; Wagner 2020) are used to having a converged and joint understanding about the impact of cyberspace and new technologies towards foreign policy and the nation-state. Thus, under the lens of neoclassical realism, process-tracing methods are utilized to assess the impact of algorithmic agents in international affairs by considering its effects at both the macro- and micro-levels in the areas pertaining to social, economic, political, and institutional phenomena.

Entering the Digital Era

The introduction of cross-border computer networks and technological infrastructures in the last decades of the 20th century (Chamoux 2019), in tandem with the growing expansion and operability of algorithmic agents in today's world, brings forward a new era characterized by a turbulent progression towards *machina economica* as the fundamental premises of methodological and normative individualism become neglected under the auspices of new digital technologies (Daneke 2020).

Following the resurgence of Poland in the 1990s, in the midst of the Internet's expansion and the establishment of a new *cyber domain* (Medeiros 2020), the transition and diffusion of power in the beginning of the 21st century takes shape during a time where digital data becomes a core component in the production of knowledge, wealth, and power (Beer 2019).

Apart from a rapid increase in computation capacity in the 2010-2020 period, the exponential increase of information available for big data analytics and the improvements in the automation of analytical model building reinforce the emergence of great power competition (Aznar 2019) concurrently as trade and cybersecurity are increasingly intertwined (Meltzer 2019).

Consequently, while this new reconfiguration of power in the digital age is guided by the vast economic and social disruptions accompanying the spread of AI (van Dijk 2017), the international environment in which Poland and Central-Eastern Europe re-emerged, initially dominated by geoeconomic principles during a time where unprecedented globalization took place and economic objectives became a priority for post-industrial societies (Kovač 2012), now finds itself shaken by deepening crises unparalleled to anything exhibited in the past (Avery 2017).

Thus, as the future power structure of the international system remains ambiguous, the rendition of human experience as behavioral data depicts a number of additional repercussions challenging Poland's sovereignty and national identity in the wake of the automation of unprecedented monitoring and control of human behavior within new economies of scale and scope (Grimm 2015; Werbach 2020).

In light of the fact that the defining element of state sovereignty shifts from territorial control to the management and manipulation of population data (Ricaurte 2019), the systemic parameters and the regional setting in which Poland is situ-

ated and embedded unequivocally confines it to the Digital Single Market as well as EU digital policy and legislation in the events when the Digital Markets Act and the Digital Services Act bring altogether both opportunities (Groendo 2016; Nyman-Metcalf 2018; Eurostat 2019) and threats (Davenport 2018) in the digital sphere.

As we enter a second global financial crisis (Roubini, 2020), the eminent shift in the world's economic and geopolitical centers of gravity from the Euro-Atlantic world toward Asia (Zeraoui 2014; Layne 2018), mainly as a result of China's rapid economic, military, and technological rise and the relative US decline, demarcates a new era of Polish foreign policy in view of the growing instability in Europe, the advent of regional hegemonies in Eurasia, and the rising tide of the fourth industrial revolution.

Uncertainty and global instability in the 2020s

The rules, norms, and conventions governing human interactions since 1944 have not only led to massive global inequality among societies and nations but also set the stage of the current *cyber revolution* (Betancourt 2015; Kello 2017) where converging technologies show the first signs of *post hominum* (Ferrando 2020; Kurki 2020) in par with ideals in *trans-humanism* within the background of digital space (Roco 2013; Berke 2016; Schwab 2020).

Just as the Internet became a critical part of the global communications infrastructure, the surge of inter-state conflicts in the Middle East, Eastern Europe, and Africa during the continuous depreciation of international law (Paulus 2004; Marxsen 2014; Williams 2020) challenges the notion of a rules-based international order after the surge of the unipolar moment of the United States. Drastically worsened and accelerated by recent events in 2020, the end of the Pax Americana arrives at a time when the world is already shaken by extreme poverty, inequality, hunger, and higher temperatures (Cox and Betts 2000; Khorsandi 2020; Hoffmann 2020). While damaging and unreparable internal divisions in the United States weaken its power projection abroad and China overtakes the US as the biggest trading partner of the European Union (Leali 2021), a power vacuum in several strategic regions under fierce competition further complicates matters for Poland (Kaye 2011; Sakwa 2015).

Notwithstanding the eminent existence of anomalies in the international financial system led by the United States (Ehret 2021), the revelations of banks' involvement in global corruption, massive tax avoidance by all major corporations, and a network of political malfeasance both at the national and international levels dismount previous empirical studies of institutional cooperation and collaboration (Snowden 2013; Tréguer 2018) while bringing forward a new era in power relations as technological advances transform international relations (Baums 2016; Girardi 2018).

Apart from a clear distribution of power gradually tilting towards the East, partially as a result of Xi Jinping's new governance model through the exploitation of geoeconomic tools (Brakman 2019) and the ascension of Asian economies, the struggle of Poland and the EU against US tech companies' mass surveillance capabilities and growing power (Hopkins 2021; Espinoza 2021) showcases the growing competition between states and global corporations. With several implications for the enduring role of national identity and nationalism in domestic political struggles and foreign policy (Kaldor 2004; Eriksen 2007; Sterling-Folker 2009; Skey 2017), the transformation of citizens into population data raises new questions as to what currently constitutes sovereignty as "advances in surveillance technologies and offensive cyber capabilities... [outpace] the legal, normative, and diplomatic mechanisms needed to protect digital data" (Hill 2014).

In turn, displacing the state-centric theoretical frameworks which make up the backbone of International Relations theory, the appearance of powerful entities embodying technological corporations larger than industrialized states becomes one of the biggest paradigms of the digital era (Nais 2017; Crecioli 2020). Reigning unbarred from regulations due to the lack of effective global institutional governance in the cyber domain (O'Hara 2018; Voelsen 2019), these powerful data processing actors, evolving alongside their host governments in a way which is difficult to capture (Levesque 2016; Karelov 2018), generate a new political phenomenon where national resources are redirected towards accomplishing long-term geopolitical goals (Capri 2020) at a time when the engine for technological innovation in dual-use technologies shifts from governments to commercial enterprises (Strange 1996; Kania 2018).

Thus, the lack of an imperative in balancing China (Fägersten 2019) and the American private sector (Herrero 2019) in the last decade allowed Poland and Europe to head off in different directions that make it more difficult for Europeans to coalesce around a single choice in the near future. The variation in state preferences in Europe, in part due to the influence that each of their distinct economic position has in their response to these systemic imperatives (Brawley 2012), most clearly seen in Sino-German economic relations (Rangel 2020; Sebena 2020), exposes Poland's fragile national security strategy, largely due to China's growing strategic partnership with Russia, and several domestic processes, such as Polish decision-makers' misperception of the new distribution of power (Polish National Security Strategy 2007; McCoy 2010; Lanoszka 2020), the misallocation of national resources based on false *realist* premises (Mearsheimer 2001; Lobell 2010), and inadequate strategies for confronting potential security dilemmas within Europe.

The miscalculated evaluation of the military primacy associated with the United States as a unipolar power in the domestic agenda of *Prawo i Sprawiedliwość* (Law and Justice Party) (Bieńczyk-Missala 2016; Polish Ministry of Foreign Affairs 2017) not only weakens Poland's future prospects in accordance with the outcomes of China's techno-strategic ambitions (Wübbecke 2016), but it also complicates foreign policy cooperation with Berlin and Paris (Zięba 2012; Simón 2015; Buras 2018).

In addition, the growing interconnectedness of people, organizations, and machines which results from the Internet brings forward a change in the underlying dynamics of the ecosphere as a platform-based ecosystem powered by data, cloud computing, and advanced manufacturing displaces previous economic principles (Dopfer 2005; Harper 2012; Wagner 2020). As we make the transition into the digital economy, the penetration of digital technologies into entire societies and the use of machine learning in big data analytics create new challenges for Polish leaders at a time when big tech firms are increasingly growing in scale and influence in the midst of the events pertaining to 2020.

Thus, several factors, which cannot be fully integrated due to the extent of this article, evidently explain the current international environment. In the first instance, humanity's transition towards advanced AI systems signals asymmetric geographical gains and losses, not only undermining governance, management, and growth models (Dafoe 2018), but also fundamentally altering economic processes and even social organizations (Growiec 2018; Sokmen 2019). Consequently, the weaponization of AI brings forward strategic implications where the requirement for and the simultaneous challenge of greater military-civilian fusion becomes inevitable (Levesque 2016; Burton and Soare 2019), especially when Polish policymakers fail to fully grasp the implications of 4th generation warfare in contrast to Vladimir Putin's assertive response (Kucharczyk 2017; Deeks 2019; Wright 2019).

Moreover, the acquisition of DNA specialist companies and the emerging interest in genetic modifications by tech corporations (Farr 2016; Microsoft 2018; Prainsack 2020) in a landscape where their overexpansion in various markets and juxtaposition with a declining US economy at record rates outpace previous predictions (Igan 2020; Kobielus 2020), advances the notion of Europe's diminishing digital sovereignty in an era of *digital colonization* (Ortega 2020; Chisnall 2020). While China's tech industry sustains an advanced surveillance state and Russia's internal digital surveillance network experiments with AI-driven monitoring of social networks inside and outside its boundaries (Waltzman 2017; Soldatov 2019), leaked documents detailing plans by Google, Amazon, Apple, and Microsoft to undermine new digital legislation in Brussels provide empirical evidence of a major power struggle in European soil (Stevis-Gridneff 2020).

Under the supposition that Amazon sets the rules for digital commerce, Google's digital empire with information of 4.5 billion users outpaces any competitor while holding the biggest database in the world (Sanoja 2020), and Facebook's monopolistic power in social networks grants it direct control of personal data from 2.45 billion users (Iqbal 2021), Poland's *digital sovereignty* comes to the fore (Mueller 2017; Caveltly 2019).

In addressing future security policies and the sovereignty of Poland and other Central-Eastern European states with the new evolution of digital space and its political consequences, the convergence of institutional economics and neoclassical realism provides an opportunity to integrate the multiple impact of algorithms

in politics and economics in order to understand digital power and its components, which primarily rest on the strength of the digital economy and major cyber capabilities at the national level (Soesanto 2017; Newman 2019; Yang and Gu 2021).

The impact of Artificial Intelligence

The recent evolution of the new digital economy and the expansion of digital commerce, in hand with the primacy of data and the Internet for economic growth and international trade, involve new fundamental features challenging our traditional understanding of economic phenomena, human interactions, privacy, national security, political influence, and so forth. Within the context of current economic international relations, the power of algorithms and data under the increasing resort to geoeconomics by major economic powers (Aaronson 2018; Jaeger 2020) thereafter accompanies multiple developments.

New imperatives of the Digital Economy

The introduction of AI agents into society and their role as the new economic actors uncovers new economic patterns which transcend economic theory as human-agent collectives dictate new properties to digital entities where individuals are no longer the ultimate point of reference of moral obligations (Kirschgässner 2013; Puaschunder 2018). Subsequently, in a digital environment where humans are the minority on the Internet since 2010, adjustments in the division of labor between humans and machines become pronounced, since “in a world with AI a transition takes place from the economic pattern of division of human labor and specialization... to micro-division of labor and even further specialization” (Wagner 2020).

In tandem with the micro-division of labor, the information asymmetries under the advent of human-agent collectives and the unprecedented superabundance of data, enunciate the consequences of data and machine labor as new factors of production (Varian 2019). While this leads to network effects where the most powerful corporations constitute a barrier to entry in markets for AI-based services and substantial economics of scale from data are predominantly controlled by few AI providers (Rubinfeld 2017; Reinsel 2018; Goldfarb 2018), the “increasing trafficking of personal data to supply algorithm-based analytics and AI... enabling a new form of digital enslavement that has the potential to curtail liberty and cause harm” (Chisnall 2020) fosters the relevance of data, not only as a strategic asset in the global economy, but also a core element for foreign and security policy (Voon 2019).

Given the above economic patterns’ destabilization of human institutions, the co-evolution of humans and AI unveils countless new adaptations needed to

contain unwanted external effects. The interdependency of institutional issues in a world with AI, where agent-principal misalignments arise from existing information asymmetry and the properties of the digital environment pave the way for market and political dominance, brings to light the importance of both domestic-level lawmaking and regional security measures with the view that technological progress in AI and the institutions affecting its development become a strong determinant of state power (Parkes 2015; Deeks 2019).

Lastly, the digital economy and the exponential growth of data, estimated to grow from 33 zettabytes in 2018 to 175 Zettabytes by 2025 (Reinsel 2018), denotes new implications for global data flows, critical infrastructure, national cyber defense, online information, and cyber-espionage.

New vulnerabilities to private and sensitive information imply the critical foundation of security in international trade, while cybersecurity concerns bring increasing number of trade restrictions under the justification of national security (Schaffer 2018; Sacks 2019).

Likewise, the amassing of health data by tech corporations (Copeland 2019) and their presence in healthcare ventures, acquisitions, product developments, partnerships, and beyond, (McGoey 2015; Drees 2020) in connection with their implementation of AI technologies and other advanced technologies (Faggella 2018), consequently obscures a future where collective and individual autonomy resurfaces (O'Neil 2016; Epstein 2018; Bryson 2018).

Interestingly, while we present the strategic value of cyberspace with its impact on international affairs (Maurer 2019) and the erosion of our economic and institutional order rooted in normative individualism in the midst of AI agents and human-agent collectives (Wagner 2020), digital data as an increasing element in the production of knowledge and China's institutional statecraft illustrates several complications deriving from the Information Age (Solove 2004; Ikenberry 2017), thereby demanding suitable institutional arrangements founded on agent-based computational economics within the context of broader changes which affect the international order (Nye 2011; Agrawal 2019; Daneke 2020).

In essence, the displacement of humans in the new AI economy in combination with *nanospace* and the power of *genetic space* (Labhasetwar 2005; Rainie 2017) exposes the structures, institutions and processes in global affairs that were partially successful in the 20th century and prior (Choucri 2012; Müller 2016; Mulainathan 2017).

A few further insights can be supplied.

First, in regards to the geoeconomics of data, growing state intervention in cyberspace and the abusive practices by large tech corporations, both prevailing in the logic of the United States' promotion of a free flow of data and China's wide-ranging restrictions on cross-border data flows ultimately pushes Poland to pursue a strategy under the umbrella of a technocratic supra-national system suffering from a contemporary legitimacy crisis (Rensmann 2019) as growing complications persist (Gaub 2020).

Secondly, data, software, and computation not only structure our behavior and modify the principles of economics but also demand major institutional changes (Koppl and Kauffmann 2015; Wagner 2020). While new factors of production, such as data and AI-based machine labor, now entail new set of rules and theoretical concepts (Parkes and Wellman 2015), the ability to predict and shape human behavior through customized databases and machine learning tools (Stachl 2020) uncovers new paradigms in capitalisms' value creation model, as well as governmental and public administrative use of algorithmic and advanced technologies (Landau 2020).

In return, digital capitalism and the profound changes in the international system at the systematic level caused by the influence, virtual repression, and immense power of technological entities both in the United States and China (Zuboff 2019; Max 2020) pose additional obstacles to the national interests of European nation-states in the face of a multifaceted crisis within the European Union. As the digital sphere becomes a contested domain for economic superiority (Roberts 2018; Moraes 2019; Cory 2020), the technological division between the world's largest economies and the EU's inconsistent strategies — one example being its unsuitable regulatory approach towards data and intellectual property protection (Marelli, Lievrouw and Hoyweghen 2020), places — place Poland in a conflicting geopolitical environment where both regional adversaries and allies progressively accentuate its existential purpose.

Consequently, in times of totalitarian measures in the West (Gardini 2020) and large tech monopolies, the momentum of the Fourth Industrial Revolution, “characterized by a fusion of technologies — such as artificial intelligence, gene editing and advanced robotics — that is blurring the lines between the physical, digital and biological worlds” (Government of the United Kingdom 2019), demands large sacrifices for Poland at the societal and political level, which, nevertheless, are constrained to a limited (and temporary) extent, due to power considerations, societal preferences, historical memory, domestic pressure and normative/ideational factors.

Emerging from a combination of technologies including, but not limited to, cloud computing, biotechnology, new sources of data from mobile devices, quantum physics, robotics and factory automation, artificial intelligence, nanotechnology, and more, the new digital economy evolves under new modes of expansion and control of data resulting in new global transformational trends that are met with varying nationalist responses (Chander 2014; European Commission 2020).

The rise of AI Nationalism

In conjunction with the latest governmental strategies prioritizing AI policy in favor of strengthening national industries to boost competitiveness, increase productivity, and solve societal challenges (Wübbecke 2016; European Commission 2017; US Department of Defense 2019), and the tendencies leading to the monumental changes in human society in 2020 (Copeland, 2019; Schwab 2020), the exponential

use of machine learning now augmented through the next vast digital migration of entire populations at the start of this decade inevitably reinforces the emergence of great power competition (Horowitz 2018; Gros 2019).

The advancement of China's leadership in the development of artificial intelligence through the justification of national security measures, such as data localization (Moraes 2019), wide-ranging restrictions in the flow of data, and its relentless quest for technological expertise and knowledge from the West (Lan 2018), not only introduces a new geoeconomic element to economic relations but also lays bare the vulnerabilities of those following a market orientation in today's digital era (Hunter 2018; Roberts 2021).

The mass state backing of key industrial sectors affecting China's technological rise and the acceleration of Chinese acquisitions of international high-tech corporations directly supported by the Chinese government exhibits a new kind of geopolitics in which progress in AI transmutes national priorities to the digital sphere in parity with economic and military superiority (Hogarth 2018; Deeks 2019). The industrial modernization of China, largely drawing from Germany's and the United States' national strategic initiatives (Kuo, Shyu and Ding 2018; Yang and Gu 2021), in connection with Xi Jinping's techno-nationalist approach, creates a new path of economic development where national AI strategies displace previous geopolitical and military doctrines centered on globalization (Spence 2019).

On the other side of the hemisphere, in the course of banning free speech under a fully censored infrastructure through the deletion of accounts, online content and the shutdown of several platforms (Nadler 2020; Ramaswamy 2021), Western technological companies and their agglomeration of power through deep learning, cloud computing, and the storage and manipulation of data from around the globe corner European states to seek guidance and unity in the European Union (Steiger 2017; Tréguer 2018; Kwet 2019).

While neoclassical realist scholars predict that the compatibility of the resurgent nationalisms in both hemispheres poses no inherent conflict of interests, as China currently wants more global influence while the United States seeks less (Schweller 2018), the undermining of democracy due to a new era of great power competition undoubtedly leaves Poland with restricted maneuverability. Thus, Polish influence within the EU and its Eastern flank reveals the extent to which Polish foreign policy is directed without any conceivable possibilities of expanding to other parts of the globe.

Within the context of divisions between Western European nations that fight against the dissemination of nationalistic, nativist, and ethnic religion-based rhetoric online, and those of Eastern Europe, such as Hungary, where Christian and conservative values are protected against ideological censorship on social platforms, Polish policymakers' aggrandizing against adherence to Brussels' secular and 'progressive' views subsequently clarify Poland's initial endeavor to combat digital sovereignty on its own (Hopkins 2021).

Therefore, in light of the notion that the “rapid spread and adoption of AI shifts the defining element of state sovereignty from territorial control to the management and manipulation of population data” (Goode 2020), being a relatively small player in the digital sphere in Europe, Poland’s behavior in the geopolitical environment of data through small state foreign policy reasoning has meant a more aggressive strategy in the cyber domain, as seen with states such as Estonia (Crandall 2020). Interestingly, Poland’s ambition of becoming an important player in Central-Eastern Europe through leadership at the China-CEEC Summit (Duda 2021), the Three Seas Initiative (Polski Instytut Ekonomiczny 2020; World Bank 2020), the Lublin Triangle (Bornio 2020, 2) and the Visegrad alliance (Verseck 2021) points towards a greater emphasis on digital challenges.

Within this background, the rapid progress of machine learning in the developed world and China’s ambitious plan to become the most technologically-advanced nation by 2030 sets forth a course for *AI Nationalism*, as ultra-high expectations of new technologies and technological entanglement display increasing protectionist measures and restrictions in international trade (Karelov 2018; Goldfarb 2019). With the potential to create new military capabilities, enhance state power, improve resource allocation, and a myriad of endless possibilities, the dual nature of artificial intelligence prearranges how states shape national policies in view of entirely new models of governance, converging the interests of the state and the capabilities of the private sector in the digital environment (Ding 2018; Kuo 2019).

The exploitation of AI for political power thus brings into question the governance of information technology and cyberweapons in relation to the reconfiguration of state sovereignty and the emerging interrelationship between AI and nationalism (Chander 2014; Dutton 2018), showcased through government AI initiatives in countries such as the United Kingdom, France, India, China, Japan, and others (Karelov 2018; Manning 2019).

Apart from the vast social, political, and economic disruptions caused by algorithms and the global trends forcing most of the developed and developing world to pursue their strategies in accordance with those of the US or China, traces of digital authoritarianism, mass surveillance, tracking systems, and more in the West and Asia underlines growing concerns about the impact of dual-use technologies in the 21st century (Weiser 1991; Harris 2016).

Without touching on the similarities and differences found between the authoritarian digital features of the United States and China (Zuboff 2019; Yayboke 2020; Khalil 2020; Durand 2020), the regional challenges facing Poland in the algorithmic revolution come to be divided mainly in socio-economic and military/geopolitical grounds mostly due to Europe’s vulnerability to current developments in the global economy, demographic variations, increasing temperatures, and energy resources (ÖIR 2011; Guasti 2020), in tandem with the expansive powers of the EU and Russia’s antagonism towards Ukraine (Wigell 2015; Dudek 2016; Kaczyński 2021).

Within these challenges, the existence of new behavioral futures markets where “the accumulation of behavioral surplus is the master motion of surveillance capitalism from which key economic imperatives can be induced” (Zuboff 2019) draws attention to the competition between states and global corporations. While foreign management of a population’s data and the rise of instrumentation power pervade all human experience through surveillance capital, now violating the inner sanctum “as machines and their algorithms decide the meaning of your sighs, blinks, and utterances; the pattern of your breathing and the movements of your eyes” (Zuboff 2019), the rendition of human experience as behavioral data brings to light digital dispossession and algorithms as a powerful force to reinforce or debilitate the boundaries of national identities (Butcher 2018; Werbach 2020).

Separately from structural disruptions in society and the economy, the weaponization of AI and the aggravation of the security dilemma caused by the indistinguishability between offensive and defensive capabilities in cyberspace open up new geopolitical frontiers at a time when an ostensible fragmentation of the cyber norm ecosystem continues (O’Hara 2018; Battaleme 2020).

The manifold challenges to self-determination in the digital sphere become attached not only to cybersecurity, but also to the domains of physical and political security (Brundage 2018). In conjunction with the expansion of algorithmic population management and the unprecedented asymmetries of knowledge and power promulgated by global corporations such as Amazon, Tencent, Google, Alibaba, and Facebook (Chui 2015; Girardi 2018; Beer 2019), the cyber-capabilities of Russia at the turn of the new century and the intrusion of Moscow in cyber domains and critical infrastructures as seen in Estonia in 2007 (Estonian Foreign Ministry 2007), Georgia in 2008 and Ukraine in 2014, place Poland’s digital sovereignty at a critical moment, as reliance on AI systems becomes more pronounced than ever before (Wright 2019; Lambach 2019).

Transcending in the Digital Age

The multiple systemic pressures exasperating Poland and Central-Eastern Europe bring to the forefront Poland’s regional environment, as German geo-economic dominance fails to solve the crises shaking the foundations of the ‘European project’ in the presence of Russia’s growing influence and power (Budnitsky 2020). Even when shifts in power at the international level dominate, threats also originate from the subsystemic or regional and domestic environments (Lobell 2009).

Additionally, the interaction of AI developments with other technologies, one example being the destabilization of nuclear strategic balances through the use of AI in military-decision making (Geist 2018), draws on the multidimensional challenges of ensuring the security of digital infrastructures at the same instance when the rise of networked communications pose threats to the existing political systems (Pohle 2020).

In pursuit of defending its national interests, Poland's behavior is better understood not solely by analyzing the fundamental changes in the international system but also by taking into account the rational assessments of the political elites (Ripsman et al. 2016), its leadership, and additional factors emanating from the domestic and individual level.

Consequently, cognitive factors, such as perceptions of internal and external threats (stemming both from the West and Russia) and its moral obligation to preserve its Christian heritage, traditional values, and national identity help further explain Poland's foreign policy in the digital era.

The antagonistic role of Russia

The concept of power is central to geopolitics and international relations. Power in all its forms — ideological, military, economic, and political — is still the most relevant component in today's international system. Following the end of communism after 1989, major changes to the international distribution of power and its diffusion through the shift of relative power from states to non-state actors has outlined the relevance of neoclassical realism in the advent of several new manifestations in international politics and the increasing persistence of the state.

Consequently, the displacement of the predominant function of force throughout human history up until the ideological front between the Soviet Union and the United States has ultimately led economic power to become the dominant factor in the power structure of the post Cold War international system (Kovač 2018).

Thus, while power has shifted towards the markets, and the pace of globalization has substantially increased international trade, world production, and economic interdependence like never before in recorded history up until the year 2020 (Kim 2000; Nayar 2005), unsurmountable theoretical failures have persisted in defining its main source(s) in the Digital Age. Beyond the inefficacy of replacing the unit of the state with economic relations (market theory) or through pure notions of historical and social constructions (constructivist theory), the inability of structural realism to analyze the state within itself and classical realism's methodological weakness and limited capacity to incorporate cultural and structural powers has demanded a more solid approach (Rose 1998).

While realist theories do remain a relevant framework for identifying important security-related issues in the cyber domain (Craig 2018), the unique dynamics of conflict within the algorithmic revolution and cyberspace automatically displace previous realist theories that were originally developed to explain kinetic forms of warfare (Eriksson 2006; Langø 2016). As the European Union and Russia head towards digitalizing their societies, as well as maximizing their ability to obtain desired outcomes through the use of electronically interconnected information resources in the cyber domain (Nye 2011), the necessity of digital-age security is inescapable.

Enduring the antagonistic stance of Russia throughout history, most recently through the enforcement of Communism and the expansion of the Soviet Union, Poland and other European states' assessment of threats emanating from Moscow do not go unanswered in terms of national and economic security on par with cybersecurity issues (Kozłowski 2020).

While partial balancing mechanisms against Moscow in the beginning of the 21st century were caused by power asymmetry and opposing interests, Poland's synchronized engagement policy with Russia in the first decade of the new century can be better explained through leader images and strategic culture at a time when Polish authorities pursued diplomatic relations based on partnership and increasingly manifested intentions to improve relations with Russia (Antonovič 2021).

Considering Warsaw's interest in developing dialogue and co-operation with Moscow in the fields of history, culture, and the economy and, during its pursuit, in strengthening the ties of Russian and Polish local municipalities during the first years of the Law and Justice Party (Fijołek 2017; Antonovič 2021), Lech Kaczyński's death in 2010 (Jørgensen 2014) showcases previous failed attempts to eliminate the persistent historical animosity (Sumner 1944; Valeriano 2013).

Regrettably, exposing Russia's aversion *ad nauseam nauseam* to Central-Eastern Europeans and Vladimir Putin's abhorrence of Poles, Ukrainians, and other ethnic Europeans through regional hegemony (Кузьо, 2017; Arakelyan 2018; Górzyński 2019; Луценко 2020), the events in Smolensk further point to internal domestic divisions in association with Donald Tusk (Jørgensen 2015) and his connections with Brussels, thus magnifying internal competition to a wider regional dispute at the EU-level. Even though uncertainty still pervades a broad set of cyber issues (Mavrelli 2021), the unique case of Russia in the international arena brings many challenges to its neighbors in the European continent (Valeriano 2018; Cheravitch 2020).

Apart from the challenges that China and the European Union face in regard to the US digital hegemony, Russia's great power imaginary and its promotion of the Internet multilateralism against Washington's interests in the digital sphere contrasts with all other players, due to its militaristic approach towards AI, based on new modes of 4th generation warfare (Jensen 2019; Qureshi 2019).

Exemplified in Ukraine through the evolution of hybrid warfare in the military doctrine of the Russian Federation (Zarembo 2021) and the weaponization of information in order to polarize societies and destabilize the functioning of the state (Banasik 2015), a revised version of the Gerasimov Doctrine (Герасимов 2019) contends Polish leadership in a less permissive regional environment. Confined to EU institutions, NATO (Gilli 2019), and German-Russian relations (Cohen 2006; Wigell 2015; Sziklai 2020), Poland's ability to control information flows becomes a necessary function to boost national security and preserve its independence (Lonsdale 1999).

While empirical records of the last 30 years of digital conflict proclaim a remarkable degree of self-restraint by states and the avoidance of completely destructive

behavior in cyberspace (Singer 2014; Maness 2018), the relative technological infancy of cyber operations implies the unpredictable nature of *lex ferenda* in terms of international law governing cyber warfare (Schmitt 2019; Newman 2019). In return, concerning the strategic implications of the weaponization of AI technologies in combination with Russia's traditional asymmetric responses to geopolitical confrontations (Burton 2019), Poland's military emulation of a declining superpower facing several defeats on multiple fronts bring into question the state building for future wars (Taliaferro 2009) and state mobilization (Schweller 2009).

Under evidence that elite cohesion and consensus provided a willingness to balance, while social cohesion and government vulnerability provided Polish policy makers with the ability to counter external threats and maximize its state power (Bieńczyk-Missala 2016), Poland's greater access to economic resources after its ascension to the European Union, the strength of its institutions, and Andrzej Duda's ability to maintain support for national security strategies helped Poland's aim to increase its relative power against Russia (Bogdan 2015; Szopa 2019).

Nevertheless, while the Polish state previously enjoyed higher mobilization and extraction capacity in face of high external vulnerabilities due to the war in Ukraine, therefore emulating the military, governing, and technological practices of the United States, the rise of Russia through a spectrum of alliances and military interventions abroad, and Germany's increased dependence to its energy infrastructure point out to the revival of a long and deep estrangement between Poland and Russia as the territories of Ukraine and Belarus once again become a contested region for influence and power (Wyciszkievicz 2017; Brudnicka 2016; Bartosiak 2020).

Therefore, in face of several regional and systemic pressures, the lack of entirely new institutions, technologies, or governing practices in Poland's adaptive strategies to offset the relative power advantage of Russia (as well as China) can be attributed to organizational culture, worldviews and expectations, and the quality of its political leadership (Dudek 2016; Antonovič 2018).

Against a background of widening contention over Russia's foreign policy, divergences on financial and immigration policies, and the manifestation of intra-EU alliances (Buras 2018; Schulz and Henökl 2020; Jirušek 2020), the dynamics of interest articulation and accumulation in Europe, in conjunction with the locus in the centralization of power in Brussels, assert a rising multipolarity environment in the midst of emerging regional powers and European disintegration.

Division within the EU

While a fractured Europe deals with a power rivalry between the West and China in the 2020s as Germany bears increasing responsibility for the technological competitiveness of the European Union and its overall stability (Brattberg 2020), Europe's largest economy suddenly becomes entrenched in an EU-institutional

embedded foreign policy which no longer aligns with the geopolitical interests of its neighbors.

Seen most recently through the Russian infrastructure projects in the Baltic Sea and closer Sino-German relations, Poland and other EU member states are consequently propelled to further misalignment of their national interests to those of the elite in the European Union (Hunter 2017; Sziklai 2019).

With the largest AI ecosystem in Europe (Westerheide 2018) and the leading hub of European AI companies located in its capital, the departure of the United Kingdom from the European community indirectly places the German economy at the heart of the European digital market (Delponte 2018) and with Boris Johnson in power, the kingdom's traditional foreign policy is reactivated. Fighting against the resurgence of any competing state in continental Europe, the subsequent anticipation of the United Kingdom in benefiting from a clash between the European Union and the Russian Federation comes to display the growing importance of French and German foreign policy in relation to Poland's national interests (Dueck 2009).

As a result of countering Chinese imperialism in Asia, the American withdrawal from Syria in the midst of a strategic transformation of the United States where vital interests in securing the fate of Europe become secondary opens up an immense vacuum with several consequences as Germany and France compete for continental control in the EU (Rynning 2017), while regional imperialist ambitions from Turkey and Russia arise in the Mediterranean. In face of Marcon's failure to compensate for France's economic weakness with military influence by aiming to accelerate the dismantlement of NATO (Stratfor 2018; Nguyen 2020), the interest of the German bourgeoisie in preserving an American military protectorate in order to maintain the nations of the Eurozone captive to its mercantilism through the over-exploitation of German workers exposes the opposing interests of both parties.

While the dissolution of NATO would inevitably lead to growing American hostility against Germany and to the territorial expansionism of authoritarian Russia — which worries the German liberal bourgeoisie — and to Chinese economic predation in its precarious Central European region, Polish and German overreliance on a weakening military structure implies a genuine European security policy, as the United States supports Turkey and Poland to prevent any form of stabilization, thereby granting the USA control through major divisions (Rühle 2018; Buras 2018).

Consequently, behind the regional security mechanisms left behind by the United States' gradual withdrawal from Europe, as seen through the *Międzymorze* under Polish leadership in the East, and the *Nordisk Forsvarssamarbeid* in Scandinavia, the future prospects of France's military projects portray less momentum in the long run, as ethnic and religious unrest in its territory prevent a cohesive and stable internal policy (Schweller 2004; Sealy 2019; Gabon 2021). Additionally,

opposing France's ambition to create Europe's defense under its command following their diplomatic confrontation with Brexit and major confrontations, British interests in preserving NATO to undermine France's ascendancy over Germany eventually weakens France's capacity to project its power and influence within the next decade.

At a time when destabilization in West Africa due to the defeat of French forces brings great concerns of a second great migration crisis, the situation in the Mediterranean, a new point of geopolitical tension between Europe and the East, outlines Germany's central role as a provider of regional stability over the growing dangerous competition between Russia, Turkey, and France.

As these regional threats amplify with the prevalence of globalization, demographic and climate change, energy issues, and social polarization (Aversano-Dearborn, Beiglböck, et al, 2011), while Germany's decisive role as a *Gestaltungsmacht* (Banchoff 1999; Hellmann 2016) and mediator between the West and Russia is clear (Banchoff 1997), the predominance of its geographical position or *Zentralmacht* once again comes to the forefront (Reichwein 2019).

In addition, whereas widening discord over anti-Russian sanctions between EU member states display major divisions as Russia becomes a regional power in the Middle East, Africa, and Eastern Europe, Moscow's Islamic outreach efforts become a new geostrategic tool in the near future and a direct threat to Polish identity and society (Asadikia 2016; Cerantonio 2015; Hosein 2017; Dudzińska 2019).

Moreover, the Eurozone crisis (2009-2015), coupled with the Schengen crisis in the mid-2010s, a reversal of the *widening* dimension of European political integration through Brexit (Schramm 2019), and the rule-of-law crisis now encompassing not only Poland and Hungary, but now Germany (Sinn 2020), come to be regarded as the clearest signs of European disintegration.

The outcome of a monetary union among institutionally-diverse members with distinct economies and cultures consequently provide evidence that though "institutional differences within the euro area are large, and did not converge with its creation" (Perotti 2020), other areas pertaining to the EU institutional frameworks' aim at strengthening social cohesion and sustaining the new digital economy would eventually need consideration in order to adapt to the new realities of policy-making (Brundage 2016; Craglia 2018).

Furthermore, in a world where networks constitute the new social morphology of our societies (Castells 2000), the anti-traditional ethos and rationalization of collective identities (Habermas 1998) promulgated and upheld by an assertive and unequivocal *sui generis* German foreign policy rooted in EU institutions bring forward the pivotal role of cyberspace, where data privacy, technological venues for cyber access, machine learning, and other factors lay bare the overarching vulnerabilities in the social fabric of European societies (Sussman 2018).

Witnessing how algorithms "regulate increasing number of parts of social life, economics, politics" while penetrating "deeper and deeper into social relations,

and personal life of each individual” (Iwasiński 2020), the erosion of strong social ties within the state and among Europeans (Vriens 2018; Bursztyń 2019) eventually all come to the detriment of national identities. Ultimately, driven and shaped by historical memory and a European identity (Van Weringh 2010; Tekiner 2020), Germany’s promotion of European values under an unspecified multicultural society disciplined as a ‘*Civilian Power*’ (Harnisch 2001) subsequently uncovers its incompatibility with the shared ethnic, historical, and cultural bonds shared by Poland and other European nations (Malešević 2019).

Overall, the disintegration of the Eurozone, renationalization of asylum and internal security policies in the EU, the partial loss of authority by the European Commission and Court of Justice, and growing disparity between the core and the periphery (Schimmelfennig 2018), display the ongoing differentiated integration strategy adopted by EU policymakers to regain control of the political process. Afflicted by the emergence of new threats and conflicts within its borders, internal misalignments within the European Union pave the way for additional burdens for the Polish government in the presence of increased interdependence and growing vulnerabilities (Więclawski 2016).

Encompassing the aforementioned developments, the threatened existence of the European Union under a mounting volatile environment materializes as the previous rules-based trading system and its institutions become marred in a geoeconomic chain reaction triggered by the national security objectives of the United States and the irreconcilability of China’s state-centric model with the key pillars of trade, investment and financial rules put in force for the past decades (Moraes 2019).

Naturally, the negative implications in international economic law caused by the new dynamic changes to the underlying logic of global economic relations under a world with artificial intelligence, further questions the capacity of EU and Polish institutions to tackle the challenges posed by the rising need of cybersecurity measures as the imminent collapse of the free market economy exhibits a wide array of dilemmas within the context of emerging technologies (Schaffer 2018; Cory 2020; EU Chamber of Commerce 2021).

Since neoclassical realism predicts that under the current circumstances Poland is posed to worsen its competitive advantage in the event of a future war, the other two determinants of state power come to the fore: nationalism and ideology.

Polish identity and the resurgence of nationalism

Polish identity persists through the preservation of Polish culture, language, and faith.

The escalation of tensions in Europe have not only resurfaced historical antecedents undermining Polish independence at a time when cyberwarfare unleash-

es a new cyberpolitical reality on a multidimensional level (Schmitt 2013; Banasik 2015), but also directly threatens key aspects of its collective identity (Williams 1998).

Nacjonalizm polski and national identity, especially in the age of social media and mass politics, continue to play an enduring, foundational role in domestic political struggles and foreign policy in light of the growing interdependence within the EU (Sterling-Folker 2009).

Within the major works in the study of nationalism that are often cited in the majority of historical and sociological studies (Anderson 1983; Hobsbawm 1983; Gellner 1997), the authors put forward the focus on nationalism as an ideology that facilitates the aspiration for independence and the attainment of sovereignty (Kundra 2019). Diverging from Kohn's dichotomy of civic and ethnic forms of nationalism (Kohn 1944), widely denoted by thinkers like Jürgen Habermas, Herbert Marcuse, and Theodor W. Adorno within the concept of *Verfassungspatriotismus* to suppress *le esprit de nation* within Europe in the 21st century (Primoratz 2009; Furedi 2018), the concept of *patriós* comes to embody one of the emblematic characters of Polish identity and those within Central-Eastern Europe in the Digital Age (Kania-Lundholm 2012).

Nevertheless, while a new politics of nationalism appears in the digital world (Eriksen 2007; Dahlgren 2009), departing from the state-centered understanding of sovereignty within the Polish context in the mythologized representation of motherhood with nationhood in *Matka Polka* (Mickiewicz 1831), her role during the previous occupation and statelessness of Poland "related to guarding language, culture and faith, but also to reproduction" (Kania-Lundholm 2012) once again gains ground, as individual self-determination is irrevocably fixed in the autonomy of users of digital technologies and services, while global competition in the AI industry threatens to dilute the distinctiveness of national cultures (Pohle 2020).

On par with excerpts of future enactments of EU Legislation (Dinstein 2020) and the new market exchange of behavioral data (Žižek 2018; Zuboff 2018; Chisnall 2020) superseding the *punctum saliens* of Poland's and other European states' constitution (Kahler 1943; Dawson 1945; Kohn 1949), the framing of entire nations through the aggregation of population data draws upon the implications of Artificial Intelligence towards national identities and nationalism within the European context (Bundesministerium für Bildung und Forschung 2019; Goode 2020).

Within the growing literature on nationalism and its relationship with AI, several developments become accelerated, as the result of the birth of *AI Nationalism* in China in 2016 (Lee 2019) magnify the vast economic and social disruptions that accompany its spread and adaptation.

In essence, insights from recent literature unveils a few points when taking into account Polish interests from *Strategia cyberbezpieczeństwa Rzeczypospolitej Polskiej na lata 2016–2020* (Świtakowska 2017).

Following China's lead, Russia's national AI strategy is in an advantageous position to reinforce the state's territorial control through the creation of proprietary national databases and platforms (Putin 2019; Marat 2020), hand-in-hand with

using AI as a powerful source to amplify its informational, psychological and diplomatic actions through *маскировка* (*maskirovka*) and the control of gravitational centers of societies in Ukraine (Jaitner 2015), France (Shekhovtsov 2017), Germany (Miazhevich 2018; Mankoff 2020), Poland (Bornio 2020; Zaryn 2020), Belorussia (Barros 2020), the United States (Ajir 2018; Wright 2019), and others under national branding and non-linear warfare (Kasapoglu 2015; Waltzman 2017), outpaces Poland's outreach in the EU, Ukraine, and Belarus.

As the conversion of cultures into data in Europe imperils the bonds between states and its societies when Polish population data comes to be structured by Berlin, the EU and corporations (Kraemer 2020; Dinstein 2020), in contrast to the state-led deployment of AI in Russia, where a reinforcement of its existing territorial, administrative, and cultural boundaries is evident, a few opportunities become imminent: securitizing selective social practices that make Poland's national identity distinctive; reinforcing and protecting the boundaries of national identities of Poland and native Europeans; and exporting Polish values and practices in favor of the collective interests of Estonians, Latvians, Lithuanians, Belarusians, Ukrainians, Czechs, Slovaks, Germans, Hungarians, and others, via new cyber geo-strategic ambitions (Bria 2015; Maurer 2019; Bendiek 2020) tied to the new demands of the last decade (Yang 2021).

Within these developments, Poland indirectly becomes destined to protect vital continental core interests outside of its national borders.

Notwithstanding these circumstances, the rapid evolution of AI in Poland in the last decade (Deep Knowledge Analytics 2018) and the ascent of Warsaw as a strategic location for data centers in Europe (ICT 2020) opens up new opportunities in the instance when digitization becomes the next growth engine for Central and Eastern Europe (Novak 2018).

Launching the first commercial satellite in the world in 2019 (Kołodziej 2019), Poland has shown its capacity to transcend through innovation. Occupying a National Cyber Security Index above main players such as the UK, Germany, France, Russia, the United States, and China, but hovering around 29th place in the global arena (NSCI 2020), Poland's potential could well be harnessed in the near future, as Central Europe renders new challenges to its neighbors.

Conclusion

The rise of Artificial Intelligence has indirectly resulted in the accelerated collapse of the theories sustaining neoliberalism and all the values, ideologies, and social orders that the free-market economy supports (Brown 2015).

Consequently, the manipulation of the European Union as a geopolitical tool for the international system contradicting its *raison d'état* as a project of peace and stability thus prolonged since the *Charter of Paris for a New Europe* in 1990

brought the potential increase of internal ethnic and religious conflicts, due to the variety of scenarios that emanate from a wide scope of diverging interests towards Europe. As Poland and the European continent confront the global geopolitical ramifications of 2020, many things remain uncertain.

Demonstrating through this brief assessment that the observed behavioral pattern of Poland and other nation-states resulted from casual forces of distinctive levels simultaneously pushing in different directions, it could be concluded that domestic processes acted as the final arbiter for the survival of the state in an increasingly anarchical environment. However, there are many unknowns, especially when it comes to the internal development of Poland's strongest allies, such as the United States and Germany.

Additionally, the lack of strategy for addressing China's growing role in Europe has been compounded with different political aims, instances of internal divisive foreign affairs, and the failure of the EU to balance against common threats. In essence, conceptualizing the EU as a 'system of differentiated integration' advances new challenges in adapting the conflagration of robotics, network technologies, blockchain, gene editing, and artificial intelligence.

Since new technologies are offering nations new geopolitical power, can Poland grow its geopolitical influence through technology? If so, how can Poland do it?

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