Eastern Journal of European Studies
DOI: 10.47743/ejes-2024-0201 • December 2024 • VOLUME **15**, ISSUE **2**

Editorial: The promised land of digital technology - a spatial perspective

Peter Nijkamp, Ioana-Maria Costea, Aura-Elena Amironesei
Alexandru Ioan Cuza University of Iasi, Romania

Digital technology is nowadays everywhere. Its technological and computational power is almost beyond imagination. An interesting illustration can be found in the 'infinite monkey theorem' (Borel, 1913; Marsaglia & Zaman, 1993). If you give a monkey a laptop and if the monkey randomly hits the keys of the keyboard during an infinite time period, it will in the very long run with 100 percent certainty type any existing text that has a finite number of words. As an illustration, the present preface to this special issue of the Eastern Journal of European Studies (EJES), which was drafted by the guest editors of this special issue of EJES as an original and unique piece of work, can in the long run be reproduced by any monkey, provided we wait long enough. Clearly, if we would have a million mutually independent monkeys, this process would go much faster! The computational – and combinational – capacity of modern computers is indeed formidable. At the same time, this miraculous potential prompts many questions, of both an applied and ethical nature, in scientific research, but also in planning and policy-making. Such intriguing issues are addressed in this special issue, which is devoted to the theme of "*The Nexus of Digital Technology Applications, Spatial Data Analytics and Policy Regulations*". The successive articles in this issue zoom in on the high expectations and performance, but also on the severe limitations of the use of digital technology in spatial planning.

1. The broader context

An important spinoff of digital technology is artificial intelligence (AI), which may be seen as a rationally designed and logically programmed set of cognitive functions that mimic the human brains, including associative, combinational, learning, communicative, and problem-solving capabilities (McCorduck, 2004; Russell & Norvig, 2003). Such abilities comprise inter alia of deep learning, mathematics, statistics, data mining, computational learning, computer visioning, soft computing, neural networks, logic, natural language processing, optimization theory, or emergency management. AI is based on a complex interplay between digitalization and human brains in a modern high-tech society. For example, digital platforms are a sine qua non for social media interaction; public participation, digital inclusivity, and online consumer behavior have become salient features of this contemporary development.

From a multidisciplinary social science perspective, social media platforms, big data analytics, and artificial intelligence (including machine learning, neural network analysis, AR and VR advances, or large language models) will lead to a drastic re-orientation of research and policy in the social science domain. Fast learning, synthetic learning or imagineering will change the traditional scope and long-term perspective of many disciplines. This will not only prompt the need for novel curricula and training methods in secondary and higher education, but will also call for new initiatives to ensure that the contemporaneous revolution caused by digital technology will be beneficial for society at large. The 'digital divide' will likely become more pronounced, if 'digital humanism' is not broadly regarded as a major challenge to be coped with in realizing a sustainable and inclusive society. There are at least two challenges that have to be addressed effectively, viz. information reliability and human-machine interfaces.

Information is usually seen as one of the pillars of modern data, communication and innovation society. Information is traditionally regarded as a set of empirically and logically verifiable statements and may hence lead to truthful anchor points or inferences for research findings and applied policy. In modern digital information technology however, verifiability is becoming a problematic exercise. For instance, 'fake' information may sound as reliable as 'objective' information or fuzzy information. This observation questions whether information belief is solely based on measurable and logically sound empirical information treatment and test procedures, or whether also democratic arguments ('argumentum ad populum') may take over part of the verifiability of statements. And if so, which proper or new verifiability conditions have to be formulated? This question is, for instance, articulated in '*garbage in garbage out*' principles, but, more recently, in particular in '*bullshit in bullshit out*' principles.

Next, *human-machine interfaces* are another item of concern. The easy access to digital information sources (ranging from consumer responses to commercial or public services, and from low-threshold information access to chatbots) has meant in particular a radical change in consulting and advisory service provision. Sometimes consumers are better informed than sales personnel in a shop. The digital consumer tends to become entirely emancipated. But the question whether he/she is able to take ultimately better decisions is still open, as he/she does not know the level of credibility of digital information generated from a wide array of different sources. And if two different information sources (human – machine) are to be combined, is there a logical way to find a best compromise solution? The complex interactions between the human mind and computers deserves more attention in both scholarly and policy-making environments, including also the legal frameworks concerned.

2. AI and regional/urban policy

Every economy, every region, every city is impacted profoundly by digital technology. Due to its capacity to capture vast amounts of data and uncertain strategic information, digital technology has not only improved the speed and efficiency of our operations, from routine to advanced ones, but it has also broadened our understanding of complicated phenomena and enlarged our scientific vision. In a world that is increasingly faced with many uncertainties, the use of ICT-based knowledge and hitherto unknown information is a *sine qua non* for sustainability and resilience.

The immense potential of artificial intelligence (AI), encompassing research instruments such as computer visioning, deep learning, machine learning, natural language processing, and computational neural networks, has drawn significant interest in recent years, particularly in the realm of decision-making, innovation and research. Applications are found in nearly every field, from infrastructure planning to healthcare policy. AI has contributed significantly to an enhanced foundation of operational and strategic decisions in both the private and public sector and is often regarded as a critical instrument for improving the resilience capacity of complex systems, by designing online early warning systems, new risk assessment tools like interactive policy dashboards, and adaptive visionary decision-making tools (like meta-verses). Thus, leveraging AI for resilience and adaptive policy becomes a great challenge, including disaster management and emergency response.

Regional science is one area where artificial intelligence has plenty to offer. This discipline addresses the development of interdependent spatial systems (regions, cities, infrastructure, environment, communities) from a multi-faceted perspective. The data-driven approach of regional science requires sophisticated analytical tools; big data analytics and artificial intelligence are becoming more and more prominent in this regard, in addition to spatial statistics and spatial econometrics. It is, therefore, pertinent for vitality in regional science to address the innovative capacity of AI in the context of research on cities and regions. Admittedly, the wide-spread application potential of AI has also its drawbacks, like endangerment of privacy, or lack of control on data reliability, in particular when it comes to the output of AI.

In order to prevent negative externalities from overshadowing the benefits of AI applications, new regulatory mechanisms and rules on privacy protection, confidentiality requirements, and fake information are required. These must be implemented gradually. This may also hold for new advances and applications in regional science. Nonetheless, it is vital to keep in mind that there is an ongoing global race to develop, improve, and provide useful and acceptable artificial intelligence systems. Therefore, proposals for regulations on AI-related factors should not impede proper AI testing and development, as this is what keeps AI

developers ahead of the competition and supports them in designing the best AI systems, which benefits all the stakeholders.

Simultaneously, multiple nations across the globe as well as many organizations, including the European Union, began concentrating on the creation of an appropriate legal framework specific for AI, and the very first steps have been taken; at the same time, international agreements or memorandums started being signed between states to promote cooperation in the field of AI by exchanging information and developing it jointly. This demonstrates that states have recognized AI is not confined by national borders; simultaneously, AI development and advancements are strengthened and even secured through genuine information exchange. As in all matters, in respect of AI, the legal environment is called not only to arrange a set of (new) rules for the socially expanding phenomena, in order to facilitate, enhance, inhibit or protect specific interactions, as a *legiferenda* process, but also to include it as a tool in the implementation of the current legal framework. Hence, fields of public law – administrative law, financial law, tax law – and fields of private law implying the protection of general values – consumers law, data protection law, banking law - are drawn into the digital space and thus public policies in these areas start to involve and use the newly generated AI utensil.

The legal environment surrounding AI as it exists now is open to both praise and criticism, as already outlined by multiple scholars. Particular concerns revolve around legal provisions' ability to foster the AI advancement and, consequently, its widespread use, including in regional science. The societal and scientific potential of digital technology has to be balanced against the need for protective regulatory frameworks: it is, however, equally true that legislation often lags behind the swift progress of technological innovation.

3. Aims and scope

This special issue of the *Eastern Journal of European Studies* seeks to explore the promising contribution of AI and other digital technologies – including their data-analytical potential – to regional science development, while also recognizing their limitations and weaknesses, with a special focus on AI systems. Concurrently, the legal landscape concerning AI systems is similarly closely related to topics from regional science, related data reliability and AI usage in this field; it even serves as a basis for addressing some of the challenges associated with AI systems that have hindered them from being used. Considering this, if deemed fit, that legal perspectives on AI use in regional planning should be included in scholarly studies. Well-founded proposals for *de lege ferenda* provisions that address potential problems with AI and emerging technologies applied to regional science are useful. The various contributions in this special issue are conceptual, empirical or planning-oriented in nature. They are sometimes based on original fieldwork, case-law or on existing studies showcasing, for example, that AI and digital technologies can act as

a catalyst for improved understanding of complex spatial planning phenomena. Clearly, to avoid negative implications for regional and urban sustainability, as a result of such radically new innovations like AI, a critical perspective is necessary. The diverse contributions in this special issue of EJES articulate both the promises and the boundaries of AI and other digital tools.

4. The puzzle pieces that make up *the Nexus of Digital Technology Applications, Spatial Data Analytics, and Policy Regulations*

The first paper *AI & Regional Science: past, present, and future* bridges the burgeoning field of AI with Regional Science, providing an insightful exploration of its promises and pitfalls. By tracing the evolution of AI applications within Regional Science—from historical use cases to current advancements and future prospects—it positions AI as both a tool for innovation and a subject of critical scrutiny. The article is particularly significant for its practical and academic contributions. Practically, it highlights how AI tools can revolutionize spatial data analysis, regional policy-making, and educational methodologies. Academically, it extends the discourse on AI's role in Regional Science, offering a foundational overview for scholars and policymakers to navigate the integration of digital technologies. This work enriches the broader conversation on the nexus of digital technology applications, spatial data analytics, and policy regulations.

The paper *Is artificial intelligence a trustworthy route navigation system for smart urban planning?* delves into the transformative role of AI in urban planning, focusing on the concept of "city intelligence" and its impact on quality of life in smart cities. By examining the connection between AI-generated content and decision-making processes, the research highlights the opportunities and challenges AI presents for enhancing urban environments. It also emphasizes the critical need for validation mechanisms, introducing principles like "Garbage-in Garbage-out" (GiGo) and "Bullshit-in Bullshit-out" (BiBo) to ensure reliable AI-generated information. This work is essential for advancing the discourse on how AI can catalyze positive urban developments and support the creation of intelligent cities.

In the paper *A 3D approach on European data cooperative as an intermediation service*, the authors focused on the role data flows and clusters play in the nowadays society by presenting the mechanism of a data cooperative in the European Union. Light is particularly shed on the provisions of EU's Digital Governance Act (DGA), which regulates the "life-cycle" of a data cooperative. The legal, psychological and economic dimensions of such a cooperative are as well explored throughout the paper, which becomes thus a valuable interdisciplinary work. Given that data is often regarded as the new gold, scholarly contributions in this field are of great importance, as they help pave the way for a better understanding and more effective use of data, as well as fostering proper and compliant collaboration in this domain.

The paper *Digital twin dialogues on regional development – an interpretative text conversation between humans and chatbots* explores the evolving role of digital tools, in particular AI, in text interpretation within regional development literature, aligning with the theme of the special issue on digital technology applications and spatial data analytics. Through a controlled experiment comparing human-made and machine-made summaries of academic texts, the study uncovers key differences in content depth, stylistic approaches, and interpretative perspectives influenced by methodological and normative frameworks. The findings highlight the complementary strengths of human and machine-generated summaries, emphasizing the potential for integrating these approaches in academic discourse.

The potential role of the AI in managing European funds, with a specific focus on its application within the EU Cohesion Policy in Romania is examined in the paper *The use of AI tools in managing European funds allocated for regional development in Romania*. The study is grounded in robust qualitative research, involving multiple relevant Romanian authorities. This approach enabled the author to accurately capture the perspectives of these representatives, particularly regarding their openness to AI, their perceptions of its benefits, its potential limitations, and boundaries, as well as exploring new possible applications of AI in the management of EU funds.

The paper *How to employ artificial intelligence in public administration? Analysis and discussion of the Ibero American charter on artificial intelligence in civil service* addresses the responsibilities of public administrations regarding the use of AI, with a particular focus on one of the earliest regulations in the field: the Ibero-American Charter on Artificial Intelligence in Civil Service. The authors do not shy away from highlighting the downsides of AI, which adds credibility to the paper and reinforces the author's impartial perspective on the use of AI in public administration. Throughout the paper, the authors explored the potential areas for AI implementation, especially in Latin American countries, while thoroughly considering the legal frameworks governing AI. The analysis includes a comparison between the Ibero-American Charter and the EU's AI Act. Given that AI adoption has predominantly occurred within private companies and services, examining its integration into public administration is crucial, as it lays the foundation for future modernization and technological progress. This, in turn, can lead to more efficient, improved public services and decision-making processes. Therefore, the paper contributes to the growing body of work that advocates for the responsible adoption of AI in public administration.

The matters of data, digital markets and privacy, focusing on the latter and its economic dimension is explored in the paper *Data, digital markets, and the economic value of privacy*. The author employs empirical findings to support and substantiate the ideas presented, in particular that privacy is of high economic value. The paper aims as well to underline the role of digital markets within the privacy rights, while

also thoroughly exploring the legal framework applicable to privacy within the European Union, with a critic eye.

The paper *Digital transformation and competition policy: analysing EU's regulatory response to emerging technologies* deals precisely with the nexus between legal frameworks governing competition, digitalization, and the emerging technologies within these domains. It offers a fresh perspective on competition in the digital era, considering the growing and continuous impact of new technologies. Particularly noteworthy is the paper's focus on the twin transition—digital and environmental—alongside its emphasis on sustainability.

The author of the paper *Taxpayer's privacy. Issue seen as one of tax challenges* addresses a relatively underexplored topic: the limited privacy granted to taxpayers. While the lack of privacy is often justified by legal provisions, the author critically examines both the effectiveness of these legal justifications and the actual level of privacy granted to taxpayers. The paper provides a thorough critique of the right to privacy's effectiveness and highlights the link between mechanisms designed to prevent tax evasion and the resulting erosion of taxpayer privacy. The author also considers the implications of algorithmic analysis of taxpayer behaviour, concluding that such practices may be harmful due to the inherent fallibility of algorithms, which can arise for various reasons. Furthermore, the article emphasizes that the introduction of new technologies in tax administration is likely to further erode taxpayer privacy. As a solution, the author proposes the implementation of legal design, a human-centered approach that could better safeguard the taxpayer's right to privacy. This approach has the potential to establish a more protective tax system and provide a practical foundation for the development of future tax regulations and procedures.

The paper *Are collaborative economy platforms an engine for tourism resilience? Evidence from the European Union* explores the relationship between the resilience of collaborative economy platforms and the resilience of the tourism sector, focusing on the extent to which the former influences the latter. The analysis considers the dimensions of the collaborative economy, highlighting its benefits, and the tourism industry. It discusses the role of the collaborative economy in strengthening the tourism sector, particularly during challenging times that require resilience for recovery and survival. Furthermore, the paper presents insightful and innovative ideas to enhance the capacity of the collaborative economy to support and strengthen tourism within the European Union.

The author of the paper *The impact of digital transformation on financial performance in public banks, development banks, and private banks in Türkiye* examines the impact of digitalization on one of the earliest sectors to adopt it: banking. The author conducted empirical research, focusing on the most significant banks in Turkey to test and demonstrate the proposed hypothesis. The investigation explored the relationship between digital transformation and key financial indicators, including asset profitability, equity profitability, and capital adequacy ratios, using an

exploratory research design with mixed methods. The conclusions highlight how critical bank KPIs are influenced by digitalization and provide insights into the future trajectory of the banking sector in this context.

The paper *Creations generated by artificial intelligence in literary and artistic property: the new death of the author?* introduces discussions on art and intellectual property to the broader context of the special issue of the Eastern Journal of European Studies. Authorship and copyright, topics that have ignited tremendous debate since the emergence of AI-generated artworks, lie at the heart of the paper. The legal framework applicable is identified and analysed, in particular its applicability to AI-generated creations within a system originally designed for natural persons. A distinctive feature of the paper consists of a legal comparative approach, incorporating perspectives from French, Romanian, and EU law. The paper concludes with author's own input on the necessity of new regulations to address the unique challenges posed by AI-generated artworks. The special characteristic of the article is also granted by the fact it combines considerations of French, Romanian and EU law, altogether. The paper ends with a still up to date debate on whether new regulations for AI-generated artworks should be passed.

In the paper *Re-shaping legal concepts to support the use of artificial intelligence and a taxation perspective on digital services* the author examines the legal challenges emerging from the rapid evolution of the digital economy, with a particular focus on the EU's AI Act. By promoting rules to ensure the trustworthiness of AI technologies, the EU aims to address both safety concerns and the protection of legal subjects in the digital economy. The study highlights the multidimensional impact of these regulations, including their implications for digital service tax—a contentious topic where unilateral initiatives often outpace multilateral agreements. The article is of significant importance, both practically and academically, as it provides a critical analysis of how the EU's regulatory framework offers substantial benefits to citizens and organizations. It also delves into the controversial aspects of AI regulations, exploring potential disadvantages and their implications for the social environment.

From paper to pixels: navigating the entangled net of VAT deductions study highlights one of the most recent and significant changes brought about by digitalization in the tax sector: the introduction of (mandatory) e-invoicing. The authors analyse how parts of the current EU regulations governing the right to deduct, primarily designed for paper-based invoices, may become obsolete with the mandatory adoption of e-invoices. Through a thorough examination of case law and doctrine, the authors identify which prerequisites for the right to deduct are tied to traditional paper invoices and which of these requirements will no longer apply in the context of e-invoicing. The article serves as a relevant starting point for potential future amendments to regulations concerning the right to deduct based on invoices.

The paper *Judicial syllogism - integrating non-monotonic logic in a deductive logical form* explores the evolution of judicial reasoning by addressing the

limitations of the traditional judicial syllogism, a deductive logical framework widely used in legal contexts. While classical logic provides a foundational structure for applying law, its static nature fails to account for the dynamic elements of judicial processes, where changing premises (*quaestio juris* and *quaestio facti*) can influence conclusions. The study proposes integrating non-monotonic logic into the judicial syllogism to reflect these dynamic aspects while maintaining its structural integrity. The article contributes to the discourse on adapting classical logical systems to contemporary legal and technological challenges, aligning with the journal's theme of intersecting digital technology, data analytics, and policy frameworks.

References

Borel, E. (1913). La Mécanique Statique et l'Irréversibilité. *Journal de Physique Théoretique et Appliquée*, *3*(1), 189-196.

McCorduck, P. (2004). *Machines Who Think. A Personal Inquiry into the History and Prospects of Artificial Intelligence.* A K Peters/CRC Press, New York. https://doi.org/10.1201/9780429258985

Marsaglia, G., & Zaman, A. (1993). Monkey Tests for Random Number Generators. *Computers & Mathematics with Applications*, *26*(9), 1-10.

Russel, S. J., & Norvig, P. (2003). *Artificial Intelligence*. Prentice Hall, New Jersey.