https://doi.org/10.37420/j.emr.2025.002

AI Governance: A systematic review using topic modelling techniques

Pengfei Zhang*
School of Economics and Management, North University of China, China
***Corresponding author, E-mail: zpengfei01@yeah.net**

Abstract:
This study provides a systematic review of artificial intelligence (AI) governance, utilizing topic modeling techniques to identify and analyze prevailing themes and research trends. The dataset comprises 1161 records from the Web of Science, spanning from 2006 to 2024, and was analyzed using BERTopic to uncover seven major clusters of topics. These clusters cover key areas, including smart cities and sustainable development, digital governance and legal challenges, and technology ethics and decision-making transparency. The findings reveal that AI governance is an interdisciplinary field, involving complex interactions between technical, legal, and ethical dimensions. The study highlights the increasing need for robust frameworks that address transparency, accountability, and the alignment of AI systems with human values. Furthermore, it underscores the importance of international cooperation in developing adaptive and inclusive regulatory measures to mitigate the risks associated with AI technologies. This review contributes to the ongoing discourse by offering a comprehensive overview of existing literature, identifying gaps, and proposing directions for future research, such as the empirical examination of governance models and the exploration of cross-cultural approaches to AI regulation.

Keywords:
Artificial Intelligence; Governance; BERTopic; Topic Mining; Evolution Analysis; Topic Modeling

1. Introduction

Artificial intelligence (AI) has become one of the most transformative technologies of the 21st century, reshaping industries, economies, and societies. AI holds significant potential to enhance productivity, improve decision-making, and address complex global challenges. However, the rapid development and widespread application of AI also bring substantial risks and uncertainties, including ethical issues related to bias and discrimination, as well as challenges concerning data privacy, accountability, and security (Jobin, Ienca, & Vayena, 2019; Floridi & Cowls, 2019; Binns, 2017). Therefore, establishing a robust framework for AI governance to guide the ethical development, deployment, and oversight of AI technologies is becoming increasingly urgent (Mittelstadt et al., 2016; Crawford, 2021).

AI governance refers to the policies, regulations, and ethical guidelines designed to ensure the responsible development and use of AI systems. It encompasses various aspects, including risk management, transparency, accountability, and alignment of AI systems with human values (Wirtz, Weyerer, & Geyer, 2019). Due to

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

the interdisciplinary nature of AI, governance requires collaboration among stakeholders from government, industry, academia, and civil society to create a balanced approach that promotes innovation while mitigating potential harms (Leslie, 2020; Taddeo & Floridi, 2018).

As AI increasingly permeates critical sectors such as healthcare, finance, transportation, and public services, the need for comprehensive governance becomes more pressing (Brynjolfsson & McAfee, 2014; Eubanks, 2018). A well-designed governance structure can not only prevent misuse but also enhance public trust and confidence in AI systems (Raji & Buolamwini, 2019; Brundage et al., 2020). Moreover, it addresses the ethical and legal challenges posed by AI's impact on human decision-making and social outcomes, ensuring that technological advancement aligns with societal welfare (Zou & Schiebinger, 2018).

This paper presents an extensive exploration of the dominant themes and topics addressed in previous research concerning AI Governance using topic modeling techniques. The investigation involves conducting a thorough examination of scholarly literature within the field, by analyzing a dataset consisting of 1161 records gathered from Web of Science (WoS), covering the period from 2006 to 2024. Literature encompasses a wide range of academic sources, including journal articles, review articles, early access, and editorial materials. To perform topic modeling on the corpus, the study employed the BERTopic algorithm.

2. Data and Methods

This study selected the Web of Science (WoS) Core Collection database as the primary data source. A search query was constructed using TS = ('AI Governance' and 'AI' + 'Governance') for precise matching of subject terms. The search was conducted on June 11, 2024, yielding a total of 1208 bibliographic records. After excluding records without abstracts, retracted publications, and articles evidently unrelated to the topic, a final dataset of 1161 bibliographic records was obtained (see Appendix A). The analysis spans literature from 2006 to 2024, including journal articles, review articles, early access, and editorial materials. Notably, more than 97% of the dataset comprises journal articles, review articles, and early access materials, with a significant surge in publications (>98%) post-2017. This paper thoroughly examines prevalent themes in AI governance research through topic modeling techniques, providing an in-depth analysis of academic literature.

Fig.1 illustrates the temporal distribution, emphasizing an exponential growth in research output from 2018 to 2023. Fig.2 elucidates the distribution by document type.The study meticulously evaluates each document, considering its relevance and kind, to create a refined dataset.

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

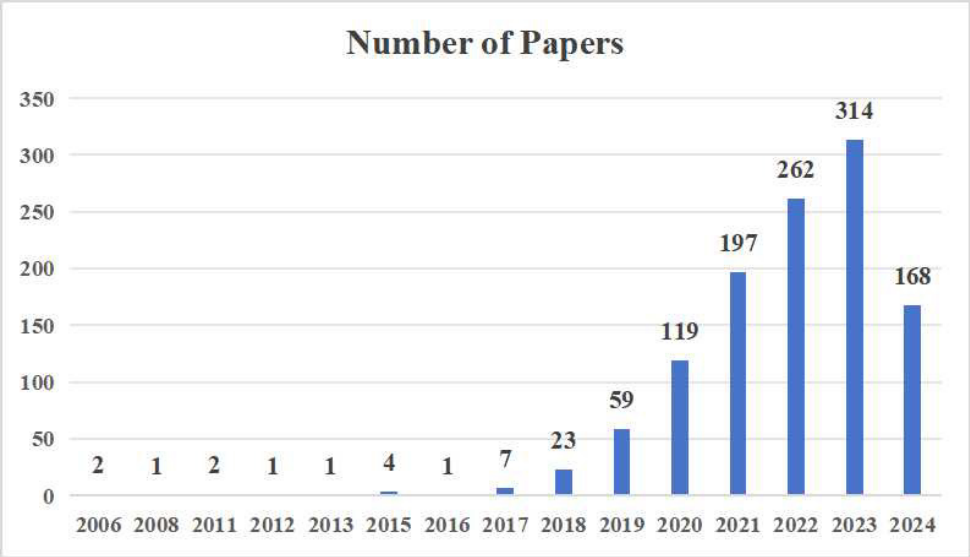


Fig. 1. Distribution of AI Governance research articles across years.

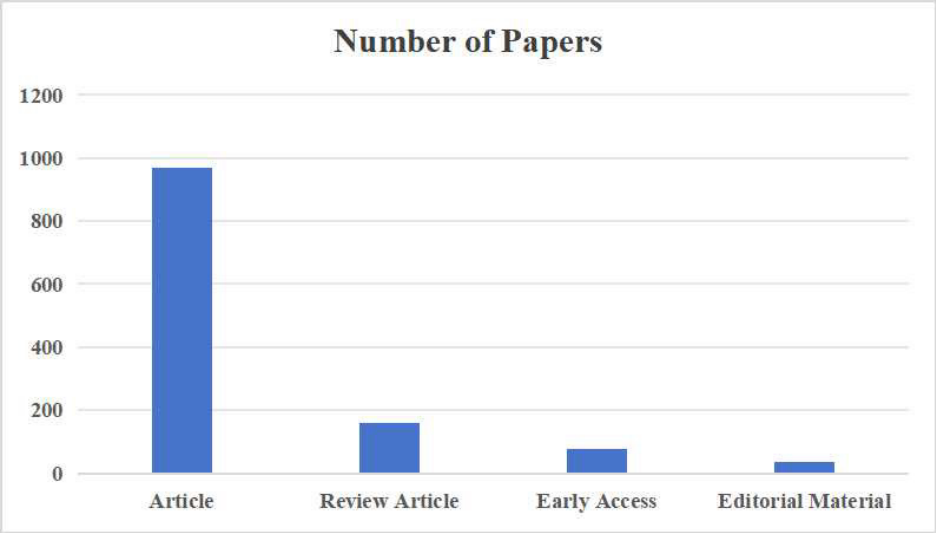


Fig. 2. Distribution of AI Governance research articles by 'type'.

Topic modelling is an unsupervised machine learning technique widely used for identifying latent themes within large collections of text data. It has evolved significantly since the introduction of Latent Dirichlet Allocation (LDA) by Blei, Ng, and Jordan (2003). LDA is an unsupervised probabilistic model that discovers topics in large text corpora by assuming that documents are mixtures of topics and topics are mixtures of words. LDA has been extensively used for various applications, including text classification, document summarization, and discovering latent structures in text-based data (Blei, 2012). However, despite its wide adoption, LDA has limitations, such as the need for careful tuning of hyperparameters and challenges in interpreting topics, especially when dealing with short or noisy texts like social media posts (Boyd-Graber, Hu, & Mimno, 2017).

In response to these challenges, several advancements in topic modelling techniques have emerged, with BERTopic being one of the most recent and innovative models. BERTopic, introduced by Grootendorst (2022),

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

leverages transformer-based models, specifically BERT (Bidirectional Encoder Representations from Transformers), to improve upon the traditional LDA by generating more coherent and interpretable topics. BERT's ability to capture contextual relationships between words allows BERTopic to handle more complex linguistic patterns in text, resulting in higher-quality topics compared to LDA (Reimers & Gurevych, 2019).

BERTopic also incorporates clustering techniques, such as hierarchical density-based spatial clustering (HDBSCAN), to group similar documents before performing topic extraction. This approach helps to enhance topic granularity and accuracy, particularly in large and diverse datasets (Grootendorst, 2022). Moreover, BERTopic introduces a dynamic topic modelling capability, allowing researchers to track the evolution of topics over time, which has been particularly useful in analyzing social media trends and consumer sentiment.

2.1. Text preprocessing

Utilizing modules from the NLTK library, including tools for tokenization, part-of-speech tagging, stopword lists, and lemmatization, the NLTK data path is set. Then, a function is defined to convert NLTK part-of-speech tags to the WordNet format for use in the subsequent lemmatization step. The text data is read from a file and split into a list of documents, with each document corresponding to one line. If the document length exceeds 512 characters, only the first 512 characters are retained to ensure that the text length does not surpass the limit set during word vector generation. Next, each line of text is tokenized and part-of-speech tagged using NLTK, and only nouns, verbs, and adjectives are retained. Words are then lemmatized to their base form. Common stopwords and numbers are filtered out. The processed text is stored as tokenized form in a list. Finally, the processed text data is saved to a new file, with each line representing a cleaned document. This preprocessing step ensures that the input data for training the Bertopic model is clean and standardized, allowing the model to efficiently and accurately generate topics.

In the process of topic modeling, we chose to retain only nouns, adjectives, and verbs, based on the following considerations:Firstly, nouns, adjectives, and verbs carry the most important information in the text. Nouns usually represent concrete entities and concepts, forming the core elements of a topic. For instance, in the study of "Artificial Intelligence Governance" or "AI Governance," nouns like "intelligence," "governance," and "policy" directly reflect the main content of the topic. Adjectives provide additional descriptions and attributes to nouns, allowing for a more detailed understanding of the topic's characteristics, such as "artificial" and "ethical." Verbs describe actions and behaviors related to the topic, like "regulate" and "develop," revealing the dynamic aspects of the topic.Secondly, other parts of speech such as adverbs, prepositions, and conjunctions are primarily used to construct sentence structure and flow but do not carry major informational content. Including these parts of speech may introduce noise and redundancy, increasing the complexity of the model and hindering clear and effective topic identification and extraction. By retaining nouns, adjectives, and verbs, we can reduce the vocabulary size and computational complexity, thereby improving the clustering performance and topic coherence of the model. This approach helps us to capture and analyze topics more accurately, providing clearer and more meaningful results for the research. Additionally, we performed lemmatization on these words to ensure the quality of the textual data input to the model and the effectiveness of the analysis.

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

2.2. Document embeddings

In this stage, as shown in Fig. 3, embeddings are generated for each document (abstract) using BERT. These embeddings capture contextual information and semantics within the text. BERTopic uses Transformers for this step. We used the embedding model in BERTopic: bert-base-uncased ("Pretrained Models), which maps sentences & paragraphs to a 512-dimensional dense vector space and can be used for tasks like clustering or semantic search.

In Bertopic, these embeddings are utilized in the processes of clustering and topic modeling, aiding the model in identifying and extracting latent themes. By clustering text embeddings, Bertopic can group similar documents under the same topic, thereby revealing the underlying structure of the text data. Furthermore, embeddings generated by BERT effectively capture subtle nuances and complex relationships in language, enhancing the accuracy and interpretability of topic identification. This enables Bertopic to perform exceptionally well when handling large and complex text datasets, providing deeper insights.

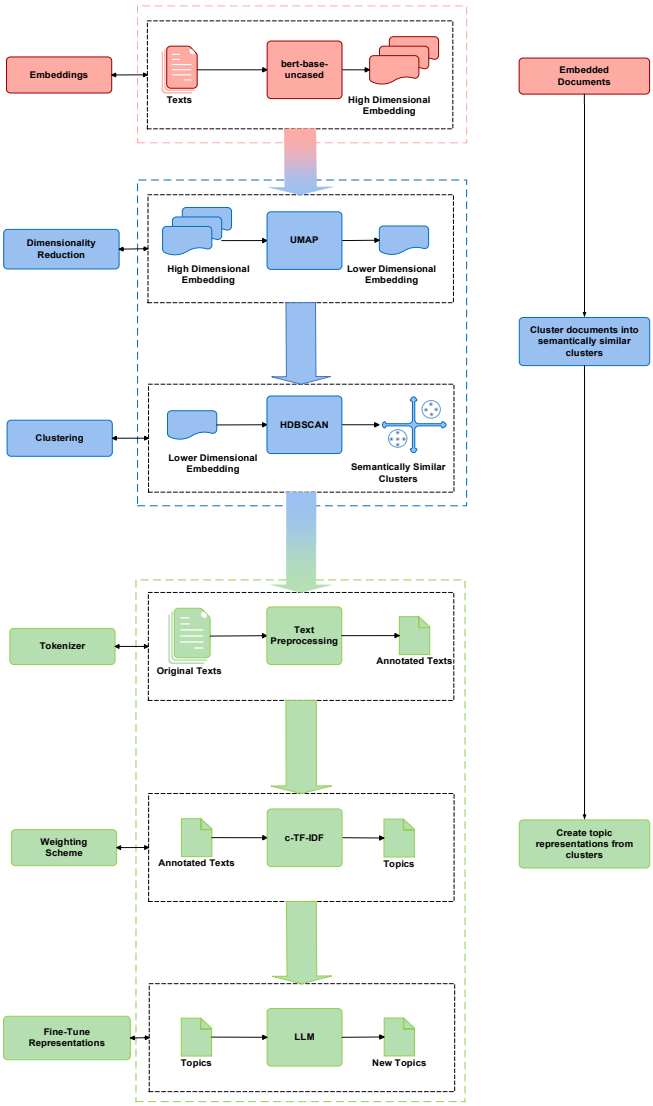


Fig. 3. Illustration of BERTopic.

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)



Fig. 4. The illustration of the topic words for the 21 topics derived by BERTopic.

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

2.3. Document clustering

After obtaining the high-dimensional embedded documents in Stage 2, we employed Uniform Manifold Approximation and Projection (UMAP) (McInnes et al., 2020) and Hierarchical Density-Based Spatial Clustering of Applications with Noise (HDBSCAN) (McInnes et al., 2017) as our primary dimensionality reduction and clustering tools to tackle the challenges of high-dimensional data analysis. This combination allowed us to delve into the data structure more comprehensively, extracting latent information that provides a solid foundation for subsequent analyses and decision-making. By applying these dimensionality reduction and clustering techniques, we improved the accuracy and reliability of our research in addressing the complexities inherent in high-dimensional data.

Common dimensionality reduction tools for high-dimensional data include Principal Component Analysis (PCA) (Jolliffe & Cadima, 2016) and t-Distributed Stochastic Neighbor Embedding (t-SNE) (Maaten & Hinton, 2008). PCA is a linear method that effectively captures the main variance within data, making it suitable for preliminary analysis; however, it exhibits notable limitations when addressing complex nonlinear relationships. In contrast, t-SNE excels at preserving local structures, particularly for visualization, but incurs significant computational overhead, particularly with large datasets. With the increasing demand for dimensionality reduction techniques, UMAP has emerged as a powerful alternative that not only addresses complex nonlinear relationships but also demonstrates efficiency and scalability, effectively capturing both the structure and nonlinear relationships within data while retaining critical information after reduction.

In clustering analysis, common tools include K-means (MacQueen, 1967) and DBSCAN (Ester et al., 1996). K-means is a partition-based method suited for spherical clusters but is sensitive to noise and outliers and requires pre-specification of the number of clusters. DBSCAN, a density-based clustering method, effectively identifies arbitrarily shaped clusters and handles noise; however, it may struggle with clusters of varying densities due to the significant impact of parameter selection on results. HDBSCAN combines the advantages of hierarchical and density-based clustering, allowing for the handling of varying cluster densities and automatically determining cluster structures without needing prior specification, making it a more flexible and efficient choice for complex datasets.

2.4. Topic representation

Class-based Term Frequency-Inverse Document Frequency (c-TF-IDF) is a variant of the traditional TF-IDF algorithm designed to assess the importance of words within documents, particularly in BERT-based topic modeling. In the Bertopic model, c-TF-IDF is utilized to capture keywords for each topic, enhancing traditional TF-IDF by incorporating contextual information. Specifically, c-TF-IDF combines two dimensions: term frequency, which reflects how often a specific word appears in a topic document, and inverse document frequency, indicating the word's general prevalence across the entire corpus. This approach effectively highlights highly relevant vocabulary within specific topics while suppressing common words that appear across multiple topics, thereby better revealing the unique characteristics of each topic. This method significantly enhances the interpretability and identifiability of topics when handling large text datasets.

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

$$\text{c-TF-IDF}(t,c) = \left(\frac{f_{t,c}}{|c|}\right) \bullet \log\left(\frac{N}{N_t}\right)$$

where.

t represent term.

c represent category.

$f_{t,c}$ represents the frequency of term t in category c (i.e., the total number of times term t appears in all documents within category c).

|c| represent the total number of words in category c (i.e., the sum of all words in all documents within category c).

N represent the total number of documents.

N_t represent the number of documents containing the term t.

2.5. Concise Topic Refinement Based on Large AI Models

By leveraging the Llama3 model, concise English topic labels are generated based on document summaries and topic-related keywords. To optimize the use of large language models (LLMs), specifying its role helps guide the model to produce outputs that meet the expected results.Firstly, two prompts are defined for the Ollama model: a system prompt and an example prompt. The system prompt informs the model that its role is that of a "Topic Label Summary Expert," while the example prompt provides a concrete example, demonstrating how to generate a concise topic label based on a given document and related keywords. These two prompts are combined into a base prompt, which will be used as the foundational instruction for generating each topic label. The base prompt will be expanded upon later with specific topic and document information. Secondly, a function called get_short_labels is defined to process the relevant documents and keywords for each topic. This function extracts document summaries for each topic from the document dataframe, sorts them by relevance based on topic probability, and selects the most representative summaries.Next, the keywords related to the topic are retrieved, and the selected summaries and keywords are concatenated into a prompt that is passed to the Llama model to generate a concise topic label. The function interacts with the model through ollama.generate(), and the generated topic labels are saved in the short_label column of the topics_info dataframe.Finally, the generated concise topic labels are saved in an Excel file, and the function returns the complete topic information with the generated labels.

3. Results

3.1. Determining the number of topics

Upon the implementation and training of the BERTopic model with the dataset, we successfully identified 21 distinct topics. As illustrated in Figure 4, the BERTopic model effectively extracts a set of lexemes that

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

accurately represent each identified topic. These lexemes, commonly referred to as "topic words," are essential for summarizing the core themes or concepts present within the corresponding corpus. The model evaluates these topic words by assigning scores that indicate their relative importance to each topic. These scores are derived using advanced algorithms that take into account the contextual usage and distribution of words throughout the corpus. Generally, words that frequently co-occur and significantly contribute to the overall meaning of a topic receive higher scores, while those of lesser relevance are assigned lower scores.

To enhance the model's performance and refine the number of topics, we constructed an intertopic distance map, as depicted in Figure 5. This visualization effectively illustrates the relationships among topics within a two-dimensional framework. Analyzing this map provides insights into the proximity and hierarchical organization of the topics, leading to a deeper understanding of the dataset's topic structure.

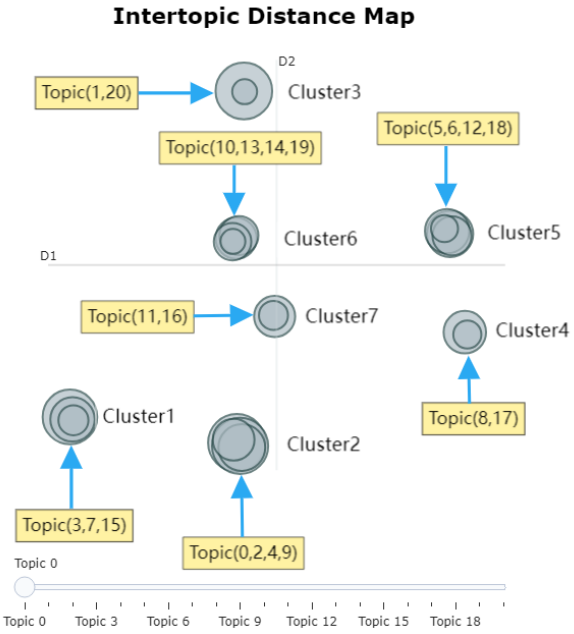


Fig. 5. Hierarchical Clustering for the 21 topics derived by BERTopic.

The intertopic distance map revealed compelling patterns and intricate relationships among the topics generated by the BERTopic model. Our findings can be categorized into three primary domains:

3.2. Topic proximity

An important finding is the close relationship between topics located near each other on the intertopic distance map. This proximity indicates significant similarity in their underlying content and themes. Topics that are closely linked often encompass interrelated concepts. To illustrate, a topic characterized by lexemes such as “urban, data, environmental, water, model, financial, environment, spatial, use, landscape” and another with lexemes like “smart, city, data, carbon, support, metaverse, technology, use, system, credit” were observed to be in close proximity, suggesting their interconnectedness within the domains of urban , environmental, and data domain.

3.3. Topic hierarchy

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

The intertopic distance map also offers valuable insights into the hierarchical organization of topics. It reveals clusters that form cohesive subgroups, each representing specific subdomains or research areas. This hierarchical framework facilitates the identification of overarching themes as well as subsidiary topics within the academic corpus. For example, a prominent cluster centers on “Smart cities, environmental, and data governance” while another focuses on “Applications and Challenges of Technology and Data in Sustainable Urban Development and Health Research.” This illustrates the diversity of research subdomains within the broader academic context.

Through a thorough evaluation of these dimensions, we identified seven distinct topic clusters, detailed in Table 1. These clusters reflect the outcomes of a comprehensive and systematic analysis conducted using the BERTopic model, providing valuable insights into the intellectual landscape of the academic corpus.

Table 1 Summary of the clusters of topics

Topic No	Count	Name	Representation	Cluster head	DLM Framework
3	**53**	**Urban Environment and Data Models**	**['urban', 'data', 'environmental', 'water', 'model', 'financial', 'environment', 'spatial', 'use', 'landscape']**	**1.Smart cities, environmental, and data governance**	**Smart Cities and Sustainable Development**
7	35	Smart City Technology and Carbon Credits	['smart', 'city', 'data', 'carbon', 'support', 'metaverse', 'technology', 'use', 'system', 'credit']		
15	16	Urban Data Auditing and Research	['city', 'urban', 'data', 'audit', 'big', 'study', 'pe', 'hei', 'sspe', 'paper']		
0	**59**	**Healthcare Data and Ethical Challenges**	**['health', 'healthcare', 'background', 'methods', 'clinical', 'research', 'objective', 'ethical', 'challenge', 'data']**	**2.Applications and Challenges of Technology and Data in Sustainable Urban Development and Health Research**	**Smart Cities and Sustainable Development**
2	56	Sustainable Campus Development and Technology Research	['city', 'smart', 'study', 'technology', 'development', 'transformation', 'sustainable', 'campus', 'research', 'energy']		

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

Topic No	Count	Name	Representation	Cluster head	DLM Framework
4	39	Impact of Blockchain Technology on Society	['study', 'factor', 'public', 'blockchain', 'medium', 'country', 'influence', 'social', 'technology', 'enabled']		
9	31	Data Research Methods and Design	['purpose', 'paper', 'approach', 'methodology', 'technology', 'review', 'research', 'design', 'author', 'data']		
1	**57**	**Digital Law and Social Technology Debate**	**['article', 'technology', 'human', 'digital', 'law', 'eu', 'right', 'technical', 'debate', 'social']**	**3.Technological, legal, and digital rights challenges in corporate and societal applications**	**Digital Governance and Legal Challenges**
20	11	Corporate Integration and Legal Issues in Healthcare Platforms	['corporate', 'integration', 'diverse', 'urban', 'emerge', 'healthcare', 'platform', 'uai', 'iptl', 'legal']		
8	**32**	**Technological Risks and Social Policy**	**['tech', 'technology', 'state', 'risk', 'social', 'existential', 'policy', 'resilience', 'year', 'power']**	**4.Trust and Policy Challenges in Digital Governance and Technological Risks**	**Digital Governance and Legal Challenges**
17	14	Legal Frameworks for Digital Trade and Trust	['trade', 'digital', 'authoritarian', 'agreement', 'rule', 'system', 'trust', 'data', 'medical', 'patient']		
5	**38**	**Digital Science and Community Research**	**['technology', 'digital', 'new', 'review', 'human', 'change', 'science', 'community', 'research', 'data']**	**5.Research and Practice of Digital Technology and Ethics in Data Applications and Governance**	**Digital Governance and Legal Challenges**
6	35	Ethics and Algorithmic Bias in Machine Learning	['technology', 'machine', 'learning', 'system', 'ethical', 'bias', 'board', 'knowledge', 'data', 'algorithmic']		
12	27	Data Application and Service Strategy	['use', 'road', 'application', 'strategy', 'data', 'service', 'critical', 'paper', 'manifesto', 'many']		

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

Topic No	Count	Name	Representation	Cluster head	DLM Framework
18	13	Legal Frameworks and Practices in Radiology	['based', 'article', 'practice', 'government', 'radiology', 'framework', 'infosphere', 'appropriate', 'legal', 'record']		
10	**30**	**Ethical Risk Guidelines for the Public Sector**	**['public', 'risk', 'sector', 'adoption', 'guideline', 'ethic', 'use', 'ethical', 'question', 'expectation']**	**6.Algorithm Ethics and Transparency in Decision-Making Applications in the Public Sector and Corporations**	**Technology Ethics and Decision-Making Transparency**
13	27	Public-Private Boundaries in Algorithmic Decision-Making	['algorithm', 'decision', 'competitor', 'public', 'private', 'corporate', 'bias', 'making', 'court', 'data']		
14	25	Transparency and Sovereignty in Machine Algorithms	['article', 'transparency', 'machine', 'health', 'algorithm', 'algorithmic', 'eu', 'state', 'sovereignty', 'government']		
19	11	Surveillance and Applications of Blockchain Technology	['artifact', 'blockchain', 'technology', 'human', 'surveillance', 'domain', 'application', 'ppas', 'adms', 'frame']		
11	**30**	**Data Quality and Clinical Applications in Healthcare**	**['healthcare', 'care', 'clinical', 'application', 'patient', 'health', 'medicine', 'learning', 'data', 'quality']**	**7.Global Healthcare Data and Technology Innovations in Clinical Applications and Quality Improvement**	**Technology Ethics and Decision-Making Transparency**
16	15	Global Development of Big Data Technology	['data', 'big', 'model', 'use', 'global', 'public', 'show', 'technology', 'development', 'multi']		

Based on the DLM framework (Sharma et al., 2016, 2018), we categorized the clusters as follows: Clusters 1 and 2 were classified under "Smart Cities and Sustainable Development," Clusters 3 to 5 under "Digital Governance and Legal Challenges," and Clusters 6 and 7 under "Technology Ethics and Decision-Making Transparency."

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

Clusters 1 and 2 primarily explore the development of smart cities and the application and challenges of technology in sustainable development. Cluster 1 focuses on smart cities and environmental data governance. Keywords such as "city," "smart," "data," "governance," and "carbon" indicate that this cluster emphasizes how data and technology can optimize urban management, particularly in areas such as urban planning, environmental protection, and resource management. The use of data and technology in smart cities plays a crucial role in achieving carbon emission targets and establishing sustainable urban ecosystems. Cluster 2, on the other hand, emphasizes the application of technology and data in sustainable urban development and health research. Keywords such as "health," "sustainable," "development," "technology," "transformation," and "research" suggest that this cluster examines how technology drives urban transformation, especially in health research and social infrastructure development. Additionally, it addresses ethical challenges associated with technological applications, particularly in the use of health data and the societal impacts of technology.

Clusters 3, 4, and 5 encompass key challenges in digital governance, particularly concerning technology, legal, and ethical aspects. Cluster 3 focuses on technological, legal, and digital rights challenges in corporate and societal applications. Keywords like "technology," "law," "digital," "rights," and "society" reflect how legal frameworks aim to safeguard individual and corporate rights amid rapid technological advancements, with particular emphasis on compliance and privacy issues in digital transformation. Cluster 4 addresses trust and policy challenges in digital governance, with a focus on risk management in technology. Keywords such as "risk," "policy," "trust," and "technology" highlight how managing existential risks posed by widespread technological adoption and ensuring public trust through policy frameworks are core issues in digital governance. Cluster 5 concentrates on technological and ethical issues related to data applications. Keywords such as "algorithm," "bias," "ethics," "technology," and "governance" point to the ethical challenges of data-driven technologies, especially in machine learning and algorithmic decision-making, where addressing algorithmic bias and ensuring ethical compliance are the main points of discussion.

As depicted in Figure 5, Clusters 6 and 7 are observed to be closely related, as they both address the ethics and transparency of technology applications in public health. For instance, Cluster 6 includes discussions on algorithmic decision-making transparency, with keywords such as "ethics," "decision-making," and "transparency" reflecting the need to ensure fairness and transparency in algorithmic decisions within the public sector and enterprises. Cluster 7, on the other hand, explores the application of global health data, with keywords such as "healthcare," "data," and "quality" suggesting that it focuses on technological innovations aimed at improving healthcare quality and patient care. Furthermore, Cluster 7 includes exploration of global health data applications, where keywords such as "patient," "clinical," and "technology" indicate a focus on using technology to enhance medical quality and patient care.

4. Discussion

Drawing upon the DLM framework (Sharma et al., 2016, 2018), we classify the topics covering the utilization of AI Governance models across various domains as ”Smart Cities and Sustainable Development”, ”Digital Governance and Legal Challenges”, and ”Technology Ethics and Decision-Making Transparency”. Following the grouping of seven clusters of the 21 topics identified in Section 4, next, we will provide a more detailed discussion on each of the clusters.

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

4.1. Smart Cities and Sustainable Development

4.1.1. Smart cities, environmental, and data governance

The development of smart cities is closely linked to environmental governance. Chen and Wei (2024) explored the impact of regional spatial landscape patterns on PM2.5 and O3 concentrations, proposing corresponding spatial planning strategies. The study employed a random forest model to select key variables and utilized a geographically and temporally weighted regression (GTWR) model to analyze the spatiotemporal heterogeneity of the effects of landscape metrics on pollutant concentrations. These findings provide theoretical support and practical guidance for optimizing atmospheric management and spatial landscape patterns within urban agglomerations. In a related study, Bai and Zhang (2022) focused on information disclosure and management issues in the environmental and social governance (ESG) of the power sector, particularly in the context of the AI era. This research emphasized the role of artificial intelligence in enhancing corporate management efficiency and employee health indices, underscoring its relevance to the environmental governance of smart cities.

Data governance plays a critical role in the development of smart cities. Li et al. (2023) investigated the impact of corporate digital transformation on pollution reduction, revealing that digitalization significantly reduces pollutant emissions. This indicates that data governance not only enhances corporate management efficiency but also promotes environmental sustainability. Wei and Cheng (2022) developed an artificial intelligence-based approach for systematically assessing tree conditions and identifying management issues. By integrating large datasets of street trees, the study evaluated the complex relationships between tree attributes and ecosystem service (ES) values. This approach provides a scientific basis for urban forest management, contributing to the improvement of urban ecosystem service quality and sustainability.

Environmental monitoring and data analysis are essential components of environmental governance in smart cities. Liu et al. (2022) utilized multi-source data technologies and SPSS data analysis to investigate urban forest resources and various forest landscape pattern indices. The study found a significant spatially heterogeneous correlation between urban economic vitality and urban forest landscape pattern indices, offering new insights for urban planning and environmental governance.

Spatial analysis and urban planning are crucial tools for achieving effective environmental governance in smart cities. Ding et al. (2023) investigated the impact of urban natural surface evapotranspiration (ET) landscape patterns on land surface temperature (LST). The study highlighted the significance of ET spatial patterns in regulating urban thermal environments, providing new perspectives for urban planning and environmental management.

As the application of artificial intelligence (AI) in smart city environmental governance expands, technological risks and policy challenges have become increasingly prominent. Sharma (2024) discussed the benefits and drawbacks of AI in daily life and proposed a guiding framework for establishing responsible AI governance practices. The study emphasized the importance of multi-stakeholder engagement in AI governance to ensure that the future development of smart societies is safe, inclusive, and sustainable.

4.1.2. Applications and Challenges of Technology and Data in Sustainable Urban

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

Development and Health Research

The technological application of smart cities in health research highlights the growing role of AI in driving sustainable urban development. Alami et al. (2024) explored the integration of AI technology at a leading academic medical center in Canada, emphasizing the importance of organizational culture and leadership in fostering technological innovation. Additionally, Frost et al. (2024) conducted a scoping review to analyze public perceptions of healthcare AI (HCAI), underscoring the importance of public engagement in HCAI governance. These studies demonstrate the significant potential of AI to enhance the quality of urban health services, while also highlighting challenges related to public acceptance, data privacy, and ethical considerations.

Data Governance and Ethical Challenges. With the widespread application of big data in urban and healthcare research, issues related to data governance and ethics have become increasingly prominent. Bolt et al. (2024) emphasized how non-traditional data sources—such as mobility data, social media, and participatory monitoring platforms—can be leveraged to fill knowledge gaps during public health crises, highlighting the need for a robust data governance framework. Additionally, Kawasaki (2024) discussed the use of AI in diabetic retinopathy screening, stressing the importance of addressing both technical accuracy and governance issues in healthcare data management.

Technological Challenges and Innovative Governance. The rapid advancement of technology in sustainable urban development and health research has introduced a range of challenges. Birkstedt et al. (2023) conducted a systematic literature review to summarize key research themes and knowledge gaps in AI governance, proposing a future research agenda that highlights the need to consider various dimensions—such as technology, stakeholders, regulations, and processes—when implementing AI at the organizational level. This study provides valuable insights for understanding and addressing the application of AI technologies in urban and healthcare contexts.

Interdisciplinary Research and Collaboration. The application of AI technology in urban and healthcare sectors necessitates interdisciplinary collaboration and research. Ramezani et al. (2023) proposed a research agenda for using AI in health system governance through an explanatory scoping review and framework, highlighting the potential of AI to enhance health system governance. The study indicates that interdisciplinary collaboration is crucial for driving innovation and the application of AI technology in urban and healthcare sectors.

Policy and Regulatory Frameworks. As AI technology advances, corresponding policy and regulatory frameworks must be continuously refined. Bartl (2024) explored the social and ethical impacts of digital crisis technologies and proposed three recommendations for the future development of such technologies: conducting AI impact assessments, considering environmental values, and establishing equitable partnerships. The study underscores the importance of establishing effective policy and regulatory frameworks in AI governance.

4.2. Digital Governance and Legal Challenges

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

4.2.1. Technological, legal, and digital rights challenges in corporate and societal applications

Technological Integration and Legal Frameworks for Digital Rights. In the context of smart cities and environmental data governance, technological integration is a key driver of sustainable development. Bareis (2024) discussed the issue of trust in AI as a quasi-other, and explored the social and rhetorical embedding of AI. This suggests that technological integration is not merely a technical issue but also involves social and ethical dimensions. Regarding the legal framework, Gamito (2024) analyzed the role of standardization in the EU AI regulations, emphasizing the importance of standardization in ensuring technological feasibility and compliance with EU laws and values.

Technological and Legal Challenges in Corporate Applications. At the corporate level, the integration of AI brings challenges on multiple fronts. Aronsson (2024) explored the ethical, governance, and caregiving practice issues surrounding robot-assisted services in Japanese nursing centers, raising questions about the practicalities of robotic care. This indicates that AI integration in corporate applications must consider both ethical and legal dimensions. Additionally, Demir (2023) discussed the protection of human biological data, noting that the legal status of data ownership remains ambiguous, and emphasized the need for specific validation of data ownership from both economic and social perspectives.

Digital Rights and Legal Issues in Societal Applications. At the societal level, the development of AI technology presents new challenges for digital rights and legal frameworks. Coeckelbergh & Saetra (2023) examined the role of AI in politics and democracy through the dilemma between technocracy and democracy, exploring how AI can address critical social and environmental issues. This suggests that the societal application of AI must be conducted on the basis of protecting digital rights and adhering to legal frameworks. Furthermore, Robles & Mallinson (2023) discussed the relationship between AI technology, public trust, and effective governance, emphasizing the importance of public trust in AI policy.

Complexity of Cross-Domain Integration and Legal Issues. The cross-domain integration of AI increases the complexity of legal challenges. Moon (2023) explored the contribution of inclusive AI to social good, proposing participatory governance as an appropriate mechanism for achieving inclusive AI. This indicates that cross-domain applications of AI require a more inclusive and transparent governance mechanism. Meanwhile, Collins (2023) discussed the impact of digitalization, datafication, automation, and AI on migration studies, highlighting how these technologies are reshaping the concept and governance of migration.

AI Governance from a Global Perspective. On a global scale, the challenges of AI governance are even more complex. Heeks et al. (2024) conducted a systematic literature review exploring China's digital expansion in the Global South, including its influence on digital governance. This suggests that AI governance must not only address domestic legal and ethical issues but also consider the challenges of governance from a global perspective.

4.2.2. Trust and Policy Challenges in Digital Governance and Technological Risks

Technological Risks and Governance. Feldstein (2023) discussed the potential impacts of generative AI on democracy, governance, and warfare, highlighting threats to democracy, enhanced surveillance and propagan-

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

da capabilities, as well as new cyberattack and disruption potentials. Additionally, Sepasspour (2023) outlined four major challenges facing global AI governance, including the speed, scale, and uncertainty of AI advancements, and the initial state of multilateral efforts and national-level policies. These studies suggest that technological risks are a critical issue in AI governance, necessitating global cooperation and policy innovation to address them.

Data Governance and Privacy Protection. Moodley (2024) examined how big data and AI are transforming healthcare, while emphasizing the ethical, legal, and societal challenges, as well as the need for global guidelines. Furthermore, Stef et al. (2023) used interpretable AI models to provide evidence on how institutional quality affects CO2 emissions, stressing that policies for environmentally sustainable economic growth need to be combined with improvements in institutional characteristics. These studies indicate that data governance concerns not only the effective use of technology but also the preservation of social values and ethical standards.

Policy Development and Compliance. Price et al. (2023) discussed collaborative governance in medical AI, underscoring the roles of central and local regulatory bodies in ensuring safety and effectiveness. Jones (2023) analyzed how trade policymakers in the digital economy are addressing AI, pointing out the shortcomings of existing trade rules in promoting AI innovation and governance. These studies emphasize the importance of developing effective policies to foster the responsible use and innovation of AI.

Social Impact and Ethical Considerations. Chung & Jaffray (2021) highlighted the need for a robust metadata supply chain to provide reliable data with known provenance before realizing the potential of AI technology in clinical practice. Sutcliffe & Brown (2021) discussed the issue of trust in technology governance, noting how governance failures can erode trust, thereby affecting the development and reform of technology. These studies indicate that social impact and ethical considerations are essential issues that must be addressed in AI governance.

Global Cooperation and Governance Models. Zeng (2020) analyzed how China is strengthening its authoritarian governance through digital means, emphasizing China's competitive advantage and risks in AI development. Morin et al. (2019) discussed how the G7 is tackling emerging and cross-border issues, including AI, through informal and like-minded approaches. These studies suggest that global cooperation is crucial for shaping effective AI governance models.

4.2.3. Research and Practice of Digital Technology and Ethics in Data Applications and Governance

Integration of Technology and Ethics. With the advancement of technologies such as machine learning and deep learning, their applications in fields like healthcare, finance, and transportation are becoming increasingly widespread. However, this rapid technological development has also brought about ethical concerns, such as data privacy and algorithmic bias. Helbing & Ienca (2024) proposed a comprehensive governance framework, emphasizing the necessity of precautionary safeguards to address the potential risks and inequalities posed by emerging technologies. Additionally, Kshetri (2024) discussed the current state and challenges of AI governance bodies, stressing the importance of establishing effective AI governance mechanisms.

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

Challenges of Data Governance. With the surge in data volume, ensuring data security, compliance, and effective utilization has become a key issue. Baeza-Yates (2023) emphasized the importance of responsible AI, distinguishing between AI ethics and responsible AI, and discussed key aspects such as principles, governance, and regulation.

Accountability and Transparency in Intelligent Systems. The accountability and transparency of intelligent systems are another critical area of AI governance. As AI systems play an increasingly prominent role in decision-making processes, ensuring that these systems' decisions are interpretable and accountable has become an important issue. Peckham (2024) proposed an AI harm and governance framework to enhance the credibility of AI systems. Moreover, Cao (2023) provided a comprehensive review of the challenges, technologies, and opportunities related to AI in the financial sector, emphasizing the importance of data-driven analysis and learning.

Application Practices of AI in Specific Fields. In the healthcare field, AI is transforming clinical decision-making and patient care. Davis et al. (2023) discussed how to address health equity when deploying AI algorithms in radiology, proposing a practical framework to help radiologists tackle health equity issues when introducing new tools. In the environmental sector, Sit et al. (2020) conducted a systematic review of the use of deep learning methods in water resource management, discussing the ethical issues these technologies pose in decision-making.

4.3. Technology Ethics and Decision-Making Transparency

4.3.1. Algorithm Ethics and Transparency in Decision-Making Applications in the Public Sector and Corporations

Ethical Challenges of Algorithms and Public Sector Applications. In the public sector, ethical issues surrounding algorithms are particularly prominent as they directly affect citizens' rights and well-being. Conti & Seele (2023) explored the role of AI ethics committees in smart societies and proposed a model of randomly selecting committee members to enhance public legitimacy and participation. Additionally, Veale et al. (2023) examined global models of AI governance, including ethics committees and industry governance, emphasizing the importance of considering "who benefits" when creating AI regulations.

Algorithm Transparency and Decision-Making. Transparency is a key component of algorithmic ethics, particularly in decision-making processes. Ferrari et al. (2023) proposed three conditions for regulating generative AI systems: industrial observability, public inspectability, and technical modifiability. These conditions provide a structured perspective for understanding and regulating AI. At the same time, Gaozhao et al. (2024) conducted experimental studies showing that individuals tend to prefer decisions made by civil servants rather than by AI, indicating significant room for improvement in algorithmic transparency and trust.

Data Governance and Privacy Protection. Data is the cornerstone of AI algorithms, and its governance and privacy protection are critical issues in AI governance. Wang (2024) discussed the differing approaches of the EU and China regarding the extraterritorial application of AI laws and regulations, emphasizing the importance of data governance in global AI governance. Furthermore, Sætra (2023) introduced the AI ESG

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

Protocol, a tool for assessing and disclosing the environmental, social, and governance impacts of AI and data capabilities, underscoring the role of data governance in AI ethics.

Algorithmic Bias and Fairness. Algorithmic bias is another key issue in AI governance, especially in public sector and corporate applications. Madan & Ashok (2023) conducted a systematic literature review to identify the technical and organizational factors affecting AI adoption in public administration, including issues of bias and fairness. Similarly, Buhmann & Fieseler (2023) proposed a framework to promote responsible innovation in AI, highlighting the importance of fostering public participation and informed debate in the face of AI's opacity challenges.

4.3.2. Global Healthcare Data and Technology Innovations in Clinical Applications and Quality Improvement

The Application and Development of Artificial Intelligence in Healthcare. The use of artificial intelligence (AI) in healthcare is rapidly evolving. Reddy et al. (2024) explored the potential applications of generative AI in healthcare, including the development of automated systems, enhanced clinical decision-making, and democratized access to specialized diagnostic tools. Overgaard et al. (2023) highlighted the importance of integrating quality management system principles throughout the lifecycle of developing, deploying, and utilizing machine learning and AI technologies in healthcare environments.

Data Governance and Patient Care. Data governance plays a crucial role in ensuring the safe and compliant application of AI in healthcare. Stogiannos et al. (2023) proposed a comprehensive AI governance framework, emphasizing the necessity of rigorous AI validation and evaluation procedures. Additionally, Chithaluru et al. (2023) introduced an optimized privacy information exchange model to enhance the security and performance of explainable AI within WiMAX-based IoT networks, demonstrating the importance of data governance in maintaining patient care standards.

Clinical Decision Support and Quality Improvement. The application of AI technologies in the development of clinical decision support systems (CDSS) can significantly improve the quality and efficiency of healthcare services. Khoury et al. (2022) discussed the potential use of AI in allergy and immunology practice and research, underscoring the importance of data science and bioinformatics in training future allergists and immunologists. Hashiguchi et al. (2022) identified five key policy areas for developing, evaluating, and adopting AI technologies in the healthcare sector, including health data governance and the operationalization of AI principles.

Ethics, Transparency, and Explainability. As AI becomes more deeply integrated into healthcare, issues of ethics, transparency, and explainability have emerged as critical components of AI governance. Hallows et al. (2022) emphasized the importance of safe and ethical AI in radiation therapy, drawing lessons from safety practices in the aviation industry. Meanwhile, Visram et al. (2023) explored attitudes of children and young people toward the potential role of AI in medicine and healthcare, highlighting the need to include their perspectives in AI governance to ensure ethical and inclusive development.

AI Governance from a Global Perspective. Globally, AI governance extends beyond technological advancements, encompassing international cooperation and policy coordination. Wang et al. (2023) demonstrated that

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

AI has a significant mitigating effect on the global ecological footprint, underscoring its crucial role in environmental governance. This research highlights the importance of cross-border collaboration to address the multifaceted impacts of AI on both healthcare and the environment.

5. Research opportunities

The field of AI Governance is constantly evolving, and there are many exciting research areas that hold promise for future advancements. Based on the topics that have been identified from this literature review, we hope to propose some key areas of focus for future research in AI Governance.

5.1. Smart cities, environmental, and data governance

The construction and development of smart cities offer new research opportunities for environmental sustainability. As urbanization accelerates, optimizing energy consumption, reducing waste generation, and improving resource efficiency through artificial intelligence (AI) have become key areas of interest. For instance, the development of AI-based methods, such as deep learning models for air quality monitoring, could help predict pollution trends and inform urban environmental policy-making. Furthermore, research on reducing carbon emissions through intelligent transportation systems and leveraging AI to enhance urban greening and biodiversity also presents promising directions for future studies.

Data governance plays a pivotal role in the development of smart cities. With the widespread application of big data, cloud computing, and the Internet of Things (IoT), ensuring data security, privacy, and compliance while promoting data openness, sharing, and efficient use remains an urgent challenge. Researchers could explore the establishment of more robust data governance frameworks, addressing issues such as data quality control, privacy protection, and data ethics. Moreover, studying how technologies like blockchain can ensure data transparency and immutability is another area worthy of attention.

Financial governance and innovative business models are crucial for the sustainability and scalability of smart city projects. Researchers may explore how financial technology (FinTech) and AI can optimize financing models for smart city projects, as well as design effective incentive mechanisms to encourage private sector involvement in smart city development. Additionally, investigating how AI can improve the efficiency and effectiveness of urban management—particularly in areas such as urban planning, disaster response, and public safety—represents valuable research opportunities.

As AI is increasingly integrated into urban planning and governance, ensuring fairness and inclusivity in technology deployment, and avoiding the exacerbation of social inequalities and divisions, has become a critical research concern. Researchers could examine how AI technologies can enhance the transparency of policy-making, foster public participation, and promote social welfare, ultimately contributing to improved quality of life for urban residents.

5.2. Applications and Challenges of Technology and Data in Sustainable Urban Development and Health Research

Sustainable Development of Smart Cities. With the accelerating pace of urbanization, the concept of smart

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

cities has emerged to address the challenges of modern urban environments. Researchers can explore how artificial intelligence (AI) technologies can be leveraged to optimize resource allocation, enhance energy efficiency, reduce environmental pollution, and improve the quality of life for urban residents. This involves multiple domains, including intelligent transportation systems, smart grids, and urban data analytics, aiming to achieve sustainable urban development through technological solutions.

Technological Innovation in Healthcare. In the healthcare sector, the application of AI is becoming increasingly widespread, ranging from diagnostic support and personalized treatment to telemedicine services. Researchers can investigate how AI can be utilized to enhance the efficiency and quality of healthcare services, while also addressing concerns related to data privacy and ethics, ensuring the security and confidentiality of patient information.

Data Governance and Privacy Protection. In urban development and health research, vast amounts of personal and sensitive data are collected and analyzed. Researchers can explore how to establish effective data governance frameworks that ensure data security, privacy, and compliance. This includes studying data encryption technologies, anonymization methods, and the development of relevant data usage policies and regulations.

Interdisciplinary Collaboration and Knowledge Integration. The application of AI technologies requires interdisciplinary collaboration, bringing together experts from urban planning, environmental science, healthcare, computer science, and other fields. Researchers can investigate how to facilitate such collaborations to integrate knowledge and techniques from diverse domains, addressing complex problems in urban development and health research.

Technical Challenges and Solutions. The pursuit of sustainable urban development and health research involves various technical challenges, such as data integration, model training, and algorithm optimization. Researchers can explore innovative technical solutions to improve the performance and reliability of AI systems, while also considering scalability and adaptability.

Ethical and Legal Issues. As AI technologies advance, ethical and legal issues have become increasingly prominent. Researchers can study how to establish appropriate ethical guidelines and legal frameworks to ensure that the application of AI does not infringe on individual rights and does not have adverse societal impacts.

Public Engagement and Social Acceptance. For the effective application of AI technologies, it is crucial to enhance public awareness and acceptance. Researchers can explore how educational and outreach activities can improve public understanding of AI, as well as how to gather public feedback to ensure that technological development aligns with societal needs and expectations.

5.3. Technological, legal, and digital rights challenges in corporate and societal applications

Technology Integration and Compliance. With the rapid advancement of artificial intelligence (AI) technologies, how companies integrate these technologies while maintaining compliance has become a crucial area

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

of research. This involves examining the technical challenges companies face when adopting AI, such as issues related to data privacy, algorithmic transparency, and security. Additionally, it is essential to analyze how existing legal frameworks adapt to these emerging technologies and what new regulations may be needed to ensure the responsible use of AI.

Digital Rights and Ethical Issues. In the realm of digital rights, research can focus on how AI affects individual privacy, intellectual property, and freedom of expression. This includes studying how AI systems handle and analyze personal data, and how these practices align with existing human rights frameworks. Furthermore, there is a need to explore ways to protect the rights of marginalized groups in AI decision-making processes and to ensure fairness and non-discrimination in AI systems.

Corporate Governance and Accountability. Corporate governance is another critical aspect of AI governance, where research can investigate how companies establish effective governance structures to oversee the use of AI. This includes studying how companies can ensure the transparency and explainability of AI systems, as well as how to develop accountability mechanisms to address the consequences of AI-driven decisions. Additionally, it is important to explore how companies balance innovation with ethical responsibilities, and how they can collaborate with regulatory bodies to develop industry standards.

Legal Frameworks and Policy Development. The development of legal frameworks and policies is another significant direction in AI governance research. This area involves analyzing how current legal systems are adapting to the challenges posed by AI, particularly in areas like data protection, liability, and cross-border data flows. Furthermore, it is crucial to examine how new policies can be formulated to promote the healthy development of AI while safeguarding societal interests and values.

Social Impact and Public Engagement. Research on AI's social impact can focus on its applications across various sectors and its effects on public life. This includes studying how AI transforms workplaces, education, and healthcare, as well as how these changes impact social structures and individual lives. Additionally, there is a need to explore how public engagement and collaboration among multiple stakeholders can ensure that AI development aligns with societal needs and expectations.

5.4. Trust and Policy Challenges in Digital Governance and Technological Risks

With the rapid development and widespread application of artificial intelligence (AI) technologies, ensuring their acceptability and transparency within society has emerged as a critical research area. Researchers can explore how inclusive policies and regulations can be formulated to enhance public trust in AI, while ensuring fairness and accountability. This involves evaluating existing governance frameworks and developing new models to address the ethical and social challenges posed by AI.

As the risks associated with AI technologies continue to grow, effective policy interventions to mitigate these risks have become increasingly important. Research can focus on areas such as data privacy protection, algorithmic transparency, the explainability of automated decision-making, and the unintentional biases that AI systems may introduce. These studies can inform the creation of effective policies to prevent the misuse of technology and ensure that its development aligns with societal values and norms.

The accelerating pace of global digitalization has made cross-border AI governance a pressing issue. Re-

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

searchers can investigate how different countries and regions can coordinate policies to facilitate global cooperation and governance of AI technologies. This not only includes the establishment of technical standards but also addresses how to balance diverse interests across various legal and cultural contexts.

The application of AI in specific sectors, like healthcare, presents unique governance challenges. Research can focus on how policies and regulations can ensure that AI enhances service quality while safeguarding patient privacy and data security. This requires an in-depth analysis of existing healthcare data governance systems and the proposal of practical measures for improvement.

As AI increasingly influences decision-making processes, ensuring the fairness and rationality of these processes has become a significant topic of interest. This involves exploring aspects such as algorithmic ethics, decision-making transparency, and public participation. Researchers can examine how policy design can promote the openness and auditability of AI-driven decision processes, thereby enhancing public trust in the technology.

5.5. Research and Practice of Digital Technology and Ethics in Data Applications and Governance

Data Ethics and Privacy Protection. With the advancement of big data and artificial intelligence (AI) technologies, the collection, storage, and analysis of data have become commonplace. However, this has also raised concerns over privacy breaches and data misuse. Researchers can explore how to effectively utilize data resources while safeguarding individual privacy. This includes the development of new data anonymization techniques, the enhancement of legal frameworks for data privacy protection, and the design of ethically sound data governance strategies. Future research may focus on how to balance data utilization with privacy protection, and on establishing technical standards and policy guidelines to address this balance.

Algorithmic Transparency and Explainability. The decision-making processes of AI systems are often perceived as a "black box," which has raised widespread concerns, especially in high-stakes domains such as healthcare and finance. Researchers can work on improving the transparency and explainability of algorithms, making decision processes more open and understandable. This effort involves not only improvements in algorithm design but also the development of new tools and methods to help stakeholders without technical backgrounds understand how AI systems operate and the potential impacts of their decisions.

Cross-Domain Data Governance Framework. Different industries and sectors have unique requirements and challenges regarding data usage. Research can explore how to construct a cross-domain data governance framework that accommodates diverse data application scenarios. This effort requires consideration of sector-specific ethical issues, legal and regulatory requirements, and the feasibility of technical implementation. Additionally, there is a need to study how to promote and implement these frameworks globally to address governance challenges arising from cross-border data flows.

Ethical Standards and Compliance in AI. As AI technologies become more prevalent, the establishment of universally accepted ethical standards is increasingly important. Researchers can investigate how to develop and implement these standards to ensure that the design and application of AI systems align with ethical principles and social values. This involves studying how to assess the ethical impacts of AI systems, how to

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

establish effective compliance monitoring mechanisms, and how to adapt these standards across different cultural and societal contexts.

Synergistic Development of Technology and Policy. Technological advancement often outpaces policy development. Research can explore how to better synchronize technological progress with policy formulation to ensure the responsible development of AI technologies. This includes studying how to anticipate the potential impacts of emerging technologies, how to design flexible policies that can adapt to rapidly changing technological environments, and how to use policy frameworks to guide technological innovation toward societal well-being.

5.6. Algorithm Ethics and Transparency in Decision-Making Applications in the Public Sector and Corporations

Development of an Ethical Framework for Algorithmic Decision-Making. Currently, there is a lack of a unified ethical framework guiding the use of algorithmic decision-making in both the public and private sectors. Researchers can explore how to develop a comprehensive ethical framework that informs the design, deployment, and evaluation of algorithms. This includes identifying key ethical principles such as fairness, transparency, privacy protection, and accountability, which are essential for guiding algorithmic decisions.

Measuring and Enhancing Algorithmic Transparency. Transparency is a core component of algorithmic ethics. Research can focus on how to quantify algorithmic transparency and develop tools and methods to enhance the interpretability and transparency of algorithms. This involves efforts such as algorithm visualization, improving the interpretability of outcomes, and implementing audit mechanisms within the decision-making process to ensure clear and comprehensible algorithmic operations.

Comparative Study of Cross-Domain Algorithmic Governance. Different countries and regions have adopted varying approaches to algorithmic governance. A comparative study of governance models across jurisdictions can help identify best practices and suggest governance strategies that are adaptable to diverse cultural and legal contexts. Such research can provide valuable insights into creating a more harmonized approach to algorithmic governance on a global scale.

Impact of Algorithmic Decision-Making on Public Trust. The effect of algorithmic decision-making on public trust in both government and corporate sectors is a crucial area of study. Researchers can examine how aspects like transparency, interpretability, and adherence to ethical standards can enhance public trust, as well as how effective algorithmic governance can strengthen this trust. Understanding these dynamics can lead to better policy design and improved public confidence in AI systems.

Identifying and Mitigating Algorithmic Bias and Discrimination. Algorithmic decisions can unintentionally lead to bias and discrimination. Research can focus on developing new techniques to identify and mitigate biases within algorithms, as well as studying the impact of these biases on specific demographic groups. By understanding the sources and effects of bias, researchers can propose targeted policy recommendations to address and prevent discrimination in algorithmic systems.

International Cooperation in Algorithmic Governance. With the global deployment of AI technologies,

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

cross-border algorithmic governance is becoming increasingly important. Researchers can explore how international cooperation can facilitate the development of global standards and guidelines for algorithmic governance, as well as how to coordinate governance strategies among different nations. Such efforts are essential for establishing a cohesive and effective regulatory environment for AI on a global scale.

Legal and Policy Analysis of Algorithmic Governance. Legal frameworks and policies play a critical role in the governance of algorithmic decision-making. Research can analyze how existing legal structures address the challenges of algorithmic decisions and propose new policy recommendations to ensure that ethical standards and transparency are effectively regulated. This may include studying data protection laws, anti-discrimination regulations, and accountability mechanisms to adapt them to the evolving landscape of AI technologies.

5.7. Global Healthcare Data and Technology Innovations in Clinical Applications and Quality Improvement

As artificial intelligence (AI) technology continues to evolve in the healthcare sector, researchers have the opportunity to explore new algorithms and models that can enhance the accuracy and efficiency of clinical decision-making. This includes the development of advanced machine learning techniques capable of processing and analyzing large, complex datasets, as well as the creation of more precise predictive models to forecast disease progression and treatment outcomes. Such innovations can provide clinicians with powerful tools to improve patient care, treatment effectiveness, and overall quality of life.

The collection, integration, and analysis of healthcare data on a global scale offer researchers unique opportunities to identify medical patterns and trends across regions and cultures. Through cross-border collaboration, researchers can leverage large datasets to study the epidemiology of diseases, evaluate the effectiveness of different treatments, and inform global public health policies. This requires not only robust data analysis skills but also a deep understanding of data governance regulations and ethical standards across various countries and regions.

The application of AI to improve the quality of healthcare services is a critical area of research. Researchers can explore how AI technologies can optimize resource allocation, increase the accessibility and equity of healthcare services, and reduce medical errors while enhancing patient safety. This involves the development of intelligent monitoring systems to track medical processes and patient conditions in real-time, as well as the creation of personalized care plans that cater to the specific needs of different patient populations.

In the realm of technology ethics and governance, researchers have the opportunity to explore how to maximize the use of medical data for research and innovation while safeguarding patient privacy. This includes the development of new data encryption and anonymization techniques, along with the establishment of ethical guidelines for data sharing and utilization. Additionally, researchers can study ways to ensure the transparency and explainability of AI systems in healthcare, which is essential for building trust among patients and healthcare professionals.

As AI becomes more prevalent in healthcare, training healthcare professionals to develop the necessary skills and knowledge to work with these technologies has become a vital area of research. Researchers can

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

explore the most effective education and training methods to ensure that medical professionals can effectively utilize new technologies while understanding their potential limitations and risks. This includes designing curricula that address both the technical aspects of AI tools and the ethical considerations related to their use.

6. Conclusion

6.1. Contributions

The systematic review presented in this study provides a comprehensive overview of artificial intelligence (AI) governance, highlighting its diverse applications across various sectors, including healthcare, smart cities, environmental management, and data governance. The integration of AI in these areas emphasizes the need for robust frameworks to address ethical, legal, and technical challenges. By synthesizing existing research, this review contributes to a clearer understanding of the current state of AI governance, identifying key themes such as transparency, accountability, and international cooperation. Furthermore, the findings suggest actionable recommendations for policymakers to create inclusive and adaptive regulatory frameworks that can support the responsible development of AI technologies globally.

6.2. Limitations and future research

While this review offers valuable insights into AI governance, there are some limitations that need to be addressed in future research. Firstly, the rapid evolution of AI technologies implies that new governance challenges and opportunities may emerge, necessitating continuous updates to this review. Secondly, the scope of this study is limited to the analysis of existing literature, which may not fully capture practical, on-the-ground issues faced by stakeholders. Future research should focus on empirical case studies that examine the real-world implementation of AI governance frameworks. Additionally, exploring cross-cultural differences in AI governance approaches can provide a more nuanced understanding of how local contexts influence the effectiveness of regulatory measures.

References

[1]Jobin, A., Ienca, M., & Vayena, E. (2019). The global landscape of AI ethics guidelines. Nature Machine Intelligence, 1(9), 389-399. https://doi.org/10.1038/s42256-019-0088-2

[2]Floridi, L., & Cowls, J. (2019). A unified framework of five principles for AI in society. Harvard Data Science Review, 1(1). https://doi.org/10.1162/99608f92.8cd550d1

[3]Binns, R. (2017). Fairness in machine learning: Lessons from political philosophy. Proceedings of the 2018 Conference on Fairness, Accountability, and Transparency, 149–159. https://doi.org/10.48550/arXiv.1712.03586

[4]Mittelstadt, B., Allo, P., Taddeo, M., Wachter, S., & Floridi, L. (2016). The ethics of algorithms: Mapping the debate. Big Data & Society, 3(2). https://doi.org/10.1177/2053951716679679

[5]Crawford, K. (2021). Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence. Informatik Spektrum, 44, 299–301. https://doi.org/10.1007/s00287-021-01385-5

[6]Wirtz, B. W., Weyerer, J. C., & Geyer, C. (2019). Artificial intelligence and the public sector—Applica-

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

tions and challenges. International Journal of Public Administration, 42(7), 596-615. https://doi.org/10.1080/01900692.2018.1498103

[7]Leslie, D. (2020). Understanding artificial intelligence ethics and safety: A guide for the responsible design and implementation of AI systems in the public sector. The Alan Turing Institute. https://doi.org/10.5281/zenodo.3240529

[8]Taddeo, M., & Floridi, L. (2018). How AI can be a force for good. Science, 361(6404), 751-752. https://doi.org/10.1126/science.aat5991

[9]Brynjolfsson, E., & McAfee, A. (2014). The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. W. W. Norton & Company. ISBN: 9780393239355

[10]Eubanks, V. (2018). Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor. St. Martin's Press. ISBN: 9781250074317

[11]Raji, I. D., & Buolamwini, J. (2019). Actionable auditing: Investigating the impact of publicly naming biased performance results of commercial AI products. Proceedings of the 2019 AAAI/ACM Conference on AI, Ethics, and Society, 429-435. https://doi.org/10.1145/3306618.3314244

[12]Brundage, M., Avin, S., Clark, J., Toner, H., Eckersley, P., Garfinkel, B., & Anderson, H. (2020). Toward trustworthy AI development: Mechanisms for supporting verifiable claims. arXiv preprint arXiv:2004.07213. https://arxiv.org/abs/2004.07213

[13]Zou, J., & Schiebinger, L. (2018). AI can be sexist and racist—it's time to make it fair. Nature, 559(7714), 324-326. https://doi.org/10.1038/d41586-018-05707-8

[14]Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent Dirichlet Allocation. Journal of Machine Learning Research, 3, 993-1022. https://dl.acm.org/doi/10.5555/944919.944937

[15]Blei, D. M. (2012). Probabilistic topic models. Communications of the ACM, 55(4), 77-84. https://doi.org/10.1145/2133806.2133826

[16]Boyd-Graber, J., Hu, Y., & Mimno, D. (2017). Applications of topic models. Foundations and Trends® in Information Retrieval, 11(2-3), 143-296. https://doi.org/10.1561/1500000030

[17]Grootendorst, M. (2022). BERTopic: Neural topic modeling with a class-based TF-IDF procedure. https://doi.org/10.48550/arXiv.2203.05794, 2022/03/11/.

[18]Reimers, N., & Gurevych, I. (2019). Sentence-BERT: Sentence embeddings using Siamese BERT-networks. Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing, 3982-3992. https://doi.org/10.18653/v1/D19-1410

[19]Grootendorst, M. (2022). BERTopic 0.9.4 Documentation. Retrieved from https://maartengr.github.io/BERTopic/index.html

[20]McInnes, L., Healy, J., & Melville, J. (2020). UMAP: Uniform Manifold approximation and projection for dimension reduction. https://doi.org/10.48550/arXiv.1802.03426

[21]McInnes, L., Healy, J., & Astels, S. (2017). hdbscan: Hierarchical density based clustering. Journal of Open Source Software, 2(11), 205.

[22]Jolliffe, I. T., & Cadima, J. (2016). Principal component analysis: A review and recent developments, 2065 Philosophical Transactions of the Royal Society A: Mathematical, Physical & Engineering Sciences, 374, Article 20150202.

[23]Maaten, L.v. d., & Hinton, G. (2008). Visualizing Data using t-SNE. Journal of Machine Learning Research, 9(86), 2579–2605, 2008. [Online]. Available: http://jmlr.org/p apers/v9/vandermaaten08 a.html.

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

[24]MacQueen, J. (1967). Some methods for classification and analysis of multivariate observations. In Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability (Vol. 1, pp. 281-297). University of California Press.
[25]Ester, M., Kriegel, H.-P., Sander, J., & Xu, X. (1996). A density-based algorithm for discovering clusters in large spatial databases with noise (Vol. 96, pp. 226–231). and others.
[26]Sharma, R., Fantin, A.-R., Prabhu, N., Guan, C., & Dattakumar, A. (2016). Digital literacy and knowledge societies: A grounded theory investigation of sustainable development. Telecommunications Policy, 40(7), 628–643.
[27]Sharma, R. S., Malone, L. G., Guan, C., & Dattakumar, A. (2018). A maturity model for digital literacies and sustainable development. In Encyclopedia of information science and technology (4th ed., pp. 2280–2291). IGI Global.
[28] Chen, X; Wei, F. Impact of territorial spatial landscape pattern on PM2.5 and O3 concentrations in the Yangtze River delta urban agglomeration: Exploration and planning strategies[J]. Journal of Cleaner Production, 2024, 452(1). http://dx.doi.org/10.1016/j.jclepro.2024.142172
[29] Bai, SX; Zhang, JX. Management and information disclosure of electric power environmental and social governance issues in the age of artificial intelligence[J]. Computers & Electrical Engineering, 2022, 104(4). http://dx.doi.org/10.1016/j.compeleceng.2022.108390
[30] Li, GQ; Jin, YP; Gao, X. Digital transformation and pollution emission of enterprises: Evidence from China's micro-enterprises[J]. Energy Reports, 2023, 9(4). http://dx.doi.org/10.1016/j.egyr.2022.11.169
[31] Wei, S; Cheng, ST. An artificial intelligence approach for identifying efficient urban forest indicators on ecosystem service assessment[J]. Frontiers in Environmental Science, 2022, 10(21). http://dx.doi.org/10.3389/fenvs.2022.994389
[32] Liu, XJ; Pan, Y; Zhou, HY. Indexing coordination of ecosystem and urban economic vitality in coastal cities: An observation in yangtze river delta[J]. Frontiers in Environmental Science, 2022, 10(6). http://dx.doi.org/10.3389/fenvs.2022.1004648
[33] Ding, N; Zhang, Y; Wang, YC; Chen, LQ; Qin, K; Yang, XY. Effect of landscape pattern of urban surface evapotranspiration on land surface temperature[J]. Urban Climate, 2023, 49(1). http://dx.doi.org/10.1016/j.uclim.2023.101540
[34] Sharma, S. Benefits or concerns of AI: A multistakeholder responsibility[J]. Futures, 2024, 157(8). http://dx.doi.org/10.1016/j.futures.2024.103328
[35] Alami, H., Lehoux, P., Papoutsi, C., Shaw, S. E., Fleet, R., & Fortin, J. P. (2024). Understanding the integration of artificial intelligence in healthcare organisations and systems through the NASSS framework: a qualitative study in a leading Canadian academic centre. BMC HEALTH SERVICES RESEARCH, 24(1). http://dx.doi.org/10.1186/s12913-024-11112-x
[36] Frost, E. K., Bosward, R., Aquino, Y. S., Braunack-Mayer, A., & Carter, S. M. (2024). Facilitating public involvement in research about healthcare AI: A scoping review of empirical methods. INTERNATIONAL JOURNAL OF MEDICAL INFORMATICS, 186(1), 1–10. http://dx.doi.org/10.1016/j.ijmedinf.2024.105417
[37] Bolt, K., Gil-González, D., & Oliver, N. (2024). Unconventional data, unprecedented insights: leveraging non-traditional data during a pandemic. FRONTIERS IN PUBLIC HEALTH, 12(4), 307–316. http://dx.doi.org/10.3389/fpubh.2024.1350743
[38] Kawasaki, R. (2024). How Can Artificial Intelligence Be Implemented Effectively in Diabetic Reti-

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

nopathy Screening in Japan? MEDICINA-LITHUANIA, 60(2), 307–316. http://dx.doi.org/10.3390/medicina60020243

[39] Birkstedt, T., Minkkinen, M., Tandon, A., & Mäntymäki, M. (2023). AI governance: themes, knowledge gaps and future agendas. INTERNET RESEARCH, 33(7), 133–167. http://dx.doi.org/10.1108/INTR-01-2022-0042

[40] Ramezani, M., Takian, A., Bakhtiari, A., Rabiee, H. R., & Ghazanfari, S. (2023). Research agenda for using artificial intelligence in health governance: interpretive scoping review and framework. BIODATA MINING, 16(1), 705–713. http://dx.doi.org/10.1186/s13040-023-00346-w

[41] Bartl, G. (2024). Social and Ethical Implications of Digital Crisis Technologies: Case Study of Pandemic Simulation Models During the COVID-19 Pandemic. JOURNAL OF MEDICAL INTERNET RESEARCH, 26(2), 307–316. http://dx.doi.org/10.2196/45723

[42] Bareis, J. (2024). The trustification of AI. Disclosing the bridging pillars that tie trust and AI together. BIG DATA & SOCIETY. http://dx.doi.org/10.1177/20539517241249430

[43] Gamito, M. C. (2024). The role of ETSI in the EU's regulation and governance of artificial intelligence. INNOVATION-THE EUROPEAN JOURNAL OF SOCIAL SCIENCE RESEARCH. http://dx.doi.org/10.1080/13511610.2024.2349627

[44] Aronsson, A. S. (2024). Theorizing the Real in Social Robot Care Technologies in Japan. EAST ASIAN SCIENCE TECHNOLOGY AND SOCIETY-AN INTERNATIONAL JOURNAL. http://dx.doi.org/10.1080/18752160.2023.2275986

[45] Demir, E. (2023). The protection of human biodata: Is there any role for data ownership? COMPUTER LAW & SECURITY REVIEW. http://dx.doi.org/10.1016/j.clsr.2023.105905

[46] Coeckelbergh, M., & Saetra, H. S. (2023). Climate change and the political pathways of AI: The technocracy-democracy dilemma in light of artificial intelligence and human agency. TECHNOLOGY IN SOCIETY. http://dx.doi.org/10.1016/j.techsoc.2023.102406

[47] Robles, P., & Mallinson, D. J. (2023). Artificial intelligence technology, public trust, and effective governance. REVIEW OF POLICY RESEARCH. http://dx.doi.org/10.1111/ropr.12555

[48] Moon, M. J. (2023). Searching for inclusive artificial intelligence for social good: Participatory governance and policy recommendations for making AI more inclusive and benign for society. PUBLIC ADMINISTRATION REVIEW. http://dx.doi.org/10.1111/puar.13648

[49] Collins, F. L. (2023). Geographies of migration III: The digital migrant. PROGRESS IN HUMAN GEOGRAPHY. http://dx.doi.org/10.1177/03091325231157709

[50] Heeks, R., Ospina, A. V., Foster, C., Gao, P., Han, X., Jepson, N., Schindler, S., & Zhou, Q. N. (2024). China's digital expansion in the Global South: Systematic literature review and future research agenda. INFORMATION SOCIETY. http://dx.doi.org/10.1080/01972243.2024.2315875

[51] Feldstein, S. (2023). The Consequences of Generative AI for Democracy, Governance and War. Survival, 65(5), 117-142. http://dx.doi.org/10.1080/00396338.2023.2261260

[52] Sepasspour, R. (2023). A reality check and a way forward for the global governance of artificial intelligence. Bulletin of the Atomic Scientists, 79(5), 304-315. http://dx.doi.org/10.1080/00963402.2023.2245249

[53] Moodley, K. (2024). Artificial intelligence (AI) or augmented intelligence? How big data and AI are transforming healthcare: Challenges and opportunities. South African Medical Journal, 114(1), 16-20. http://dx.doi.org/10.7196/SAMJ.2024.v114i2.1631

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

[54] Stef, N., Basagaoglu, H., Chakraborty, D., & Ben Jabeur, S. (2023). Does institutional quality affect CO2 emissions? Evidence from explainable artificial intelligence models. Energy Economics, 124, 821-823. http://dx.doi.org/10.1016/j.eneco.2023.106822

[55] Price, W. N. II, Sendak, M., Balu, S., & Singh, K. (2023). Enabling collaborative governance of medical AI. Nature Machine Intelligence, 5(8), 821-823. http://dx.doi.org/10.1038/s42256-023-00699-1

[56] Jones, E. (2023). Digital disruption: artificial intelligence and international trade policy. Oxford Review of Economic Policy, 39(1), 70-84. http://dx.doi.org/10.1093/oxrep/grac049

[57] Chung, C., & Jaffray, D. A. (2021). Cancer Needs a Robust Metadata Supply Chain to Realize the Promise of Artificial Intelligence. Cancer Research, 81(23), 5810-5812. http://dx.doi.org/10.1158/0008-5472.CAN-21-1929

[58] Sutcliffe, H. R., & Brown, S. (2021). Trust and Soft Law for AI. IEEE Technology and Society Magazine, 40(4), 14-24. http://dx.doi.org/10.1109/MTS.2021.3123741

[59] Zeng, J. H. (2020). Artificial intelligence and China's authoritarian governance. International Affairs, 96(6), 1441-. http://dx.doi.org/10.1093/ia/iiaa172

[60] Morin, J. F., Dobson, H., Peacock, C., Prys-Hansen, M., Anne, A., Bélanger, L., Dietsch, P., Fabian, J., Kirton, J., Marchetti, R., Romano, S., Schreurs, M., & Silve, A. (2019). How Informality Can Address Emerging Issues: Making the Most of the G7. Global Policy, 10(2), 267-273. http://dx.doi.org/10.1111/1758-5899.12668

[61] Helbing, D., & Ienca, M. (2024). Why converging technologies need converging international regulation. Ethics and Information Technology, 26(1), 171-179. http://dx.doi.org/10.1007/s10676-024-09756-8

[62] Kshetri, N. (2024). Economics of Artificial Intelligence Governance. Computer, 57(4), 113-118. http://dx.doi.org/10.1109/MC.2024.3357951

[63] Baeza-Yates, R. (2023). LECTURE HELD AT THE ACADEMIA EUROPAEA BUILDING BRIDGES CONFERENCE 2022 An Introduction to Responsible AI. European Review, 31(4), 406-421. http://dx.doi.org/10.1017/S1062798723000145

[64] Peckham, J. B. (2024). An AI Harms and Governance Framework for Trustworthy AI. Computer, 57(3), 59-68. http://dx.doi.org/10.1109/MC.2024.3354040

[65] Cao, L. B. (2023). AI in Finance: Challenges, Techniques, and Opportunities. ACM Computing Surveys, 55(3), 597-610. http://dx.doi.org/10.1145/3502289

[66] Davis, M. A., Lim, N., Jordan, J., Yee, J., Gichoya, J. W., & Lee, R. (2023). Imaging Artificial Intelligence: A Framework for Radiologists to Address Health Equity, From the AJR Special Series on DEI. American Journal of Roentgenology, 221(3), 302-308. http://dx.doi.org/10.2214/AJR.22.28802

[67] Sit, M., Demiray, B. Z., Xiang, Z. R., Ewing, G. J., Sermet, Y., & Demir, I. (2020). A comprehensive review of deep learning applications in hydrology and water resources. Water Science and Technology, 82(12), 2635-2670. http://dx.doi.org/10.2166/wst.2020.369

[68] Conti, L. G., & Seele, P. (2023). The contested role of AI ethics boards in smart societies: a step towards improvement based on board composition by sortition. Ethics and Information Technology, 25(4). http://dx.doi.org/10.1007/s10676-023-09724-8

[69] Veale, M., Matus, K., & Gorwa, R. (2023). AI and Global Governance: Modalities, Rationales, Tensions. Annual Review of Law and Social Science, 19(6). http://dx.doi.org/10.1146/annurev-lawsocsci-020223-040749

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

[70] Ferrari, F., van Dijck, J., & van den Bosch, A. (2023). Observe, inspect, modify: Three conditions for generative AI governance. New Media & Society, 25(4). http://dx.doi.org/10.1177/14614448231214811
[71] Gaozhao, D., Wright, J. E., & Gainey, M. K. (2024). Bureaucrat or artificial intelligence: people's preferences and perceptions of government service. Public Management Review, 26(6). http://dx.doi.org/10.1080/14719037.2022.2160488
[72] Wang, Y. (2024). Do not go gentle into that good night: The European Union's and China's different approaches to the extraterritorial application of artificial intelligence laws and regulations. Computer Law & Security Review, 53(2). http://dx.doi.org/10.1016/j.clsr.2024.105965
[73] Sætra, H. S. (2023). The AI ESG protocol: Evaluating and disclosing the environment, social, and governance implications of artificial intelligence capabilities, assets, and activities. Sustainable Development, 31(2). http://dx.doi.org/10.1002/sd.2438
[74] Madan, R., & Ashok, M. (2023). AI adoption and diffusion in public administration: A systematic literature review and future research agenda. Government Information Quarterly, 40(1). http://dx.doi.org/10.1016/j.giq.2022.101774
[75] Buhmann, A., & Fieseler, C. (2023). Deep Learning Meets Deep Democracy: Deliberative Governance and Responsible Innovation in Artificial Intelligence. Business Ethics Quarterly, 33(1). http://dx.doi.org/10.1017/beq.2021.42
[76] Reddy, S. (2024). Generative AI in healthcare: an implementation science informed translational path on application, integration and governance. Implementation Science, 19(1). http://dx.doi.org/10.1186/s13012-024-01357-9
[77] Overgaard, S. M., Graham, M. G., Brereton, T., Pencina, M. J., Halamka, J. D., Vidal, D. E., & Economou-Zavlanos, N. J. (2023). Implementing quality management systems to close the AI translation gap and facilitate safe, ethical, and effective health AI solutions. NPJ Digital Medicine, 6(1). http://dx.doi.org/10.1038/s41746-023-00968-8
[78] Stogiannos, N., Malik, R., Kumar, A., Barnes, A., Harvey, H., Pogose, M., Mcentee, M. F., & Malamateniou, C. (2023). Black box no more: a scoping review of AI governance frameworks to guide procurement and adoption of AI in medical imaging and radiotherapy in the UK. British Journal of Radiology, 96(1152). http://dx.doi.org/10.1259/bjr.20221157
[79] Chithaluru, P., Singh, A., Dhatterwal, J. S., Sodhro, A. H., Albahar, M. A., Jurcut, A., & Alkhayyat, A. (2023). An Optimized Privacy Information Exchange Schema for Explainable AI Empowered WiMAX-based IoT networks. Future Generation Computer Systems-The International Journal of eScience, 148. http://dx.doi.org/10.1016/j.future.2023.06.003
[80] Khoury, P., Srinivasan, R., Kakumanu, S., Ochoa, S., Keswani, A., Sparks, R., & Rider, N. L. (2022). A Framework for Augmented Intelligence in Allergy and Immunology Practice and Research-A Work Group Report of the AAAAI Health Informatics, Technology, and Education Committee. Journal of Allergy and Clinical Immunology-Practice, 10(5). http://dx.doi.org/10.1016/j.jaip.2022.01.047
[81] Hashiguchi, T. C. O., Oderkirk, J., & Slawomirski, L. (2022). Fulfilling the Promise of Artificial Intelligence in the Health Sector: Let's Get Real. Value in Health, 25(3). http://dx.doi.org/10.1016/j.jval.2021.11.1369
[82] Hallows, R., Glazier, L., Katz, M. S., Aznar, M., & Williams, M. (2022). Safe and Ethical Artificial Intelligence in Radiotherapy - Lessons Learned From the Aviation Industry. Clinical Oncology, 34(2). http://

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)

dx.doi.org/10.1016/j.clon.2021.11.019

[83] Visram, S., Leyden, D., Annesley, O., Bappa, D., & Sebire, N. J. (2023). Engaging children and young people on the potential role of artificial intelligence in medicine. Pediatric Research, 93(2). http://dx.doi.org/10.1038/s41390-022-02053-4

[84] Wang, Q., Sun, T. T., & Li, R. R. (2023). Does artificial intelligence (AI) reduce ecological footprint? The role of globalization. Environmental Science and Pollution Research, 30(59).

© 2025 by the author(s); licensee Mason Publish Group, this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (http://creativecommons.org/licenses/by/4.0/)