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The threat of artificial intelligence to elections worldwide: A review of the 2024 landscape

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Abstract

One area that might experience an immense transformation owing to the adoption of AI is the electoral system. Artificial intelligence (AI) holds tremendous potential for enhancing polls, campaign methods, and voter registration, but it also presents substantial challenges to the integrity of elections around the globe. This article discusses the political scene of 2024 and AI's role, balancing the pros and cons of AI deployment. Case studies of nations that have implemented AI for voting purposes are presented in the article, along with an analysis of the merits and disadvantages of these systems. The article goes on to warn of the perils of AI in elections and provides solutions to these concerns. It is of the most significant necessity to secure both the security and legitimacy of voting procedures, as the employment of artificial intelligence in elections is popular. This paper asks politicians, election authorities, and people in general to handle the challenges brought by AI in elections.

Keywords: Artificial Intelligence (AI); Elections; Vote counting; Cyber security; Threats; Case studies

1. Introduction

There are growing worries regarding the possible influence of artificial intelligence (AI) on the security and integrity of election processes throughout the globe as it becomes more embedded in many parts of contemporary society. Thoroughly analyzing the consequences of using AI in elections becomes more critical as the political scene of 2024 takes shape. This paper examines the intricate web of connections between artificial intelligence (AI) and the voting process, looking at the possible advantages and worrying dangers that this tech development presents. Although artificial intelligence has the potential to increase election reliability, streamline the registration process, and aid in detecting and preventing fraud, the authors caution that these advancements are not without risks.

This article reviews case studies from countries that have done so to understand better the pros and cons of using AI in voting processes. Among the most pressing issues highlighted by the research are the potential for AI algorithms to perpetuate preexisting prejudices and the increased susceptibility of electoral infrastructure to cyberattacks. This article emphasizes the need for lawmakers, election officials, and the public to work together in a multipronged strategy to guarantee free and fair elections in the AI era. It stresses the need to develop and use AI technologies inside the voting system with transparency, accountability, and ethical issues in mind. By taking a proactive approach to these concerns, the authors want to lay out a plan to protect democracy and ensure fair elections worldwide as AI advances.

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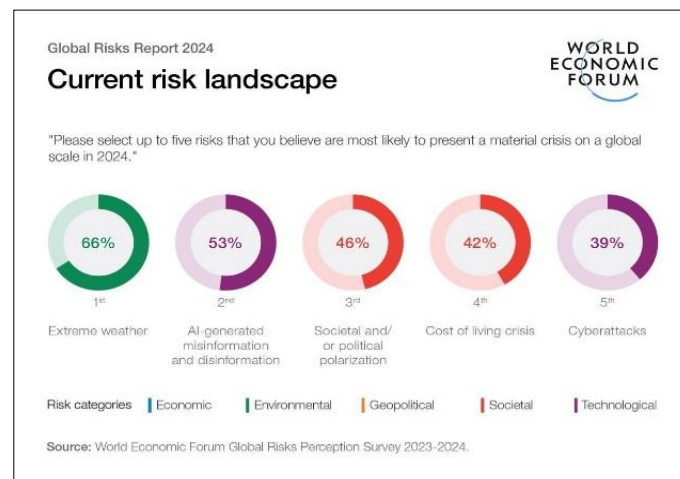
Figure 1 AI elections

Figure 2 Global Risks Report 2024

2. Advantages of AI in Electoral Processes

Improving the precision and effectiveness of polls: Artificial intelligence algorithms may sort through electoral records, demographic information, and social media postings. Artificial intelligence (AI) can better forecast voter behaviour and election results by analyzing and interpreting this data. Political campaigns may use this enhanced precision to plan better and focus their strategies, resulting in more efficient and focused campaigning.

Efficient methods for registering to vote: Voter registration processes may be made more accessible and effective by automating and streamlining them. Automated systems powered by AI can manage voter registration, minimizing human error and guaranteeing the accurate registration of eligible voters. A more inclusive voting system and higher voter turnout are possible outcomes.

Voter fraud detection and prevention: The use of AI to identify and prevent election fraud is becoming more critical. Machine learning algorithms examine enormous volumes of data to find anomalies like voting fraud or duplicate registrations. This assures an accurate vote count and safeguards the voting process's integrity.

3. Case Studies

South Korea: In the 2020 parliamentary elections, South Korea used an AI-powered method to tally votes. This country is a big fan of AI technology. This technology reduced counting time and human mistakes by properly analyzing paper votes using machine learning techniques. This integration improved the overall efficiency of the election process.

Estonia: Estonia has been using artificial intelligence (AI) in its voting systems since 2005, adding to its reputation for cutting-edge e-governance projects. An example of this is the implementation of the i-Voting system, which enables anyone to safely vote online. Artificial intelligence algorithms play a crucial role in ensuring the honesty of the voting

process, authenticating voter identities, and preventing fraud. During elections, a large percentage of Estonians use the well-accepted electronic voting method.

Switzerland: This inventive nation has been at the forefront of technological transformation, experimenting with new voting techniques based on blockchain and artificial intelligence. In 2018, the city of Zug tried a blockchain-based municipal election system that allowed citizens to vote using their mobile devices. AI algorithms increased voter identification accuracy and reduced fraud, while blockchain technology enabled a transparent, secure, and unchangeable voting process.

Brazil: In 2020, during a municipal election, Brazil tested an AI-powered face recognition system, testing the limits of AI's capability. This technique compared voter ID images to voter registration photos to reduce the possibility of impersonation. AI technology protected the integrity of the election and simplified the verification procedure.

United States: To make voting more manageable and more accessible, the US has been looking into using AI in voting systems. West Virginia is a good example; in 2018, it launched a test program to let service members abroad vote via Voatz, a mobile voting software. To ensure that votes are safe and legitimate, the Voatz app employs AI algorithms and blockchain technology. The system uses biometric data and face recognition technology to provide accurate voter identification and prevent fraud.

4. Difficulties and Perils of Artificial Intelligence in Elections:

The potential difficulties and dangers of utilizing AI in elections must be carefully considered. A significant concern is the protection of private data. The reliance of AI algorithms on vast quantities of voter records creates serious concerns about data security. To maintain public trust, it is critical to prevent disclosure, misuse, or unlawful access to voter records. If voting systems dependent on AI are susceptible to hacking, it could jeopardize the legitimacy of elections. Encryption, intrusion detection, and a secure network design are essential cybersecurity techniques that may mitigate these threats. Algorithmic bias and fairness are also significant issues with AI in elections. Algorithms trained on biased input reinforce preexisting biases, potentially skewing the algorithm's output.

The concept of fair representation and voting rights may suffer if specific populations experience disproportionate effects. Advanced AI systems are opaque and difficult to understand, which is another exacerbating aspect. Transparency about decision-making processes and the identification of bias are essential for holding individuals accountable.

Consideration of accessibility and inclusion must precede the use of AI in elections. Some technologically driven programs may exclude people due to a lack of digital literacy or fair access to technology. To ensure that everyone has an equal opportunity to cast a ballot, we must accommodate individuals who choose not to or are unable to use AI technologies. People who are already at a disadvantage, such as non-native speakers or disadvantaged communities, may be even more affected if AI systems unintentionally perpetuate cultural or linguistic stereotypes. It is essential to take artistic and linguistic diversity into account to ensure equitable access and understanding.

The public's faith in and embrace of AI is crucial for its effective use in elections. Because they lack sufficient knowledge about the technology, some individuals may be suspicious or wary. To trust and use AI in elections, people need to understand its benefits, risks, and limitations. Ethical concerns include things like the potential for manipulation, voter surveillance, and the over-impact of algorithms. It is essential to adhere to ethical standards and regulatory frameworks to protect democratic principles and prevent their exploitation. Addressing the challenges and threats associated with AI in elections requires a collaborative effort by politicians, developers, and election officials. The creation of transparent and responsible AI systems that uphold privacy, inclusivity, equity, and public trust is crucial to the credibility and honesty of voting procedures.

Worldwide views on the relationship between artificial intelligence, false information, and elections vary significantly according to cultural, political, and technological considerations. There is enthusiasm in certain quarters about how artificial intelligence (AI) may enhance voter participation, efficiency, and security measures against cyberattacks and disinformation efforts during elections.

However, there are several worries about the abuse of artificial intelligence in elections. Many people are concerned that AI algorithms might perpetuate prejudices, distort public opinion, and undermine the democratic process by disseminating incorrect information or targeting certain voter groups with deceptive material. These concerns are

especially significant in nations with a history of election fraud or authoritarian governments that use technology for political control.
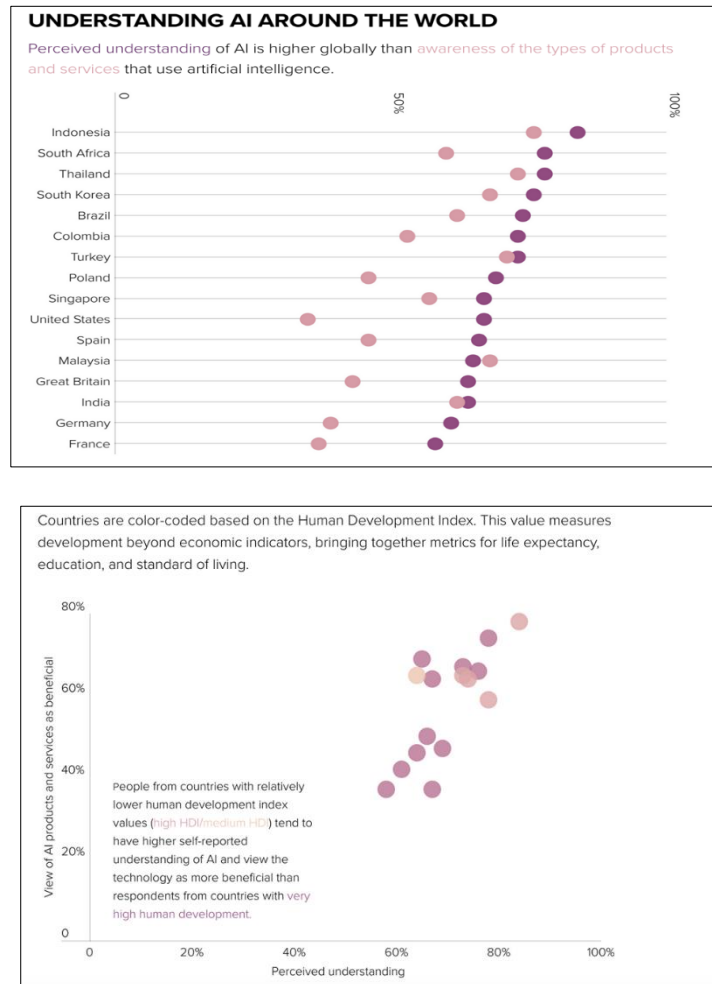

Figure 3 Understanding AI around the world

Understanding AI's significance in elections requires an awareness of the many views and issues that exist in different countries and locations. Technologically mature countries often have a more nuanced understanding of AI's potential and perils, leading to attempts to limit its use in electoral settings. Meanwhile, in less developed places, there may be a need for knowledge of AI's ramifications, raising worries about the possibility of exploitation by local or foreign players.

Building a global understanding of AI and its impact on elections through international engagement and information exchange is crucial for upholding democratic principles and maximizing the benefits of technological advancement.

5. Ensuring Fair and Free Elections in the Era of Artificial Intelligence:

Transparency is essential in voting systems that use AI. Clearly defining the use of AI algorithms at various stages of the voting process, such as voter registration, candidate selection, and result tally, is crucial. This means letting the public and other important people know about the decision-making process, data sources, and computer models. Voters can look closely at open and accountable AI systems, which can build trust. We need to design AI for voting to be fair and free from bias. When designing algorithms, developers and lawmakers should put ethics first at all stages of the process. This means carefully choosing algorithms and training them on data that is fair and accurate. It also entails regularly checking and reviewing their work to identify and correct any flaws that appear. Third-party reports and independent reviews can make AI systems even more fair and honest. To make sure that people fully understand how AI is used in voting, it is essential to encourage public participation and teaching. It is important to let people know about the pros, cons, and safety measures for AI technology through public information efforts, public meetings, and training programs. Getting people involved in making decisions and carrying them out helps build trust, encourages

more people to vote, and calms concerns about the use of AI in elections. In the age of AI, it is essential to keep voting data safe and make sure that systems are secure. We should implement strong data privacy rules and security measures to safeguard voting information from unauthorized viewing, access, or modification. To keep voting data private and accurate, it's important to use encryption, store data safely, and have strict access rules. Regular vulnerability tests and checks help find and fix any possible security problems. We should design AI-powered election systems that are accessible to all. It is essential to make sure that AI doesn't build obstacles or hurt some groups more than others. We should include:

- Accessibility features like support for multiple languages.
- Assistance for disabled individuals.
- Alternative voting methods for those unable or unwilling to use AI systems.

Regular evaluations and comments from users can help identify and fix accessibility problems. To ensure accountability and clarity in the use of AI in elections, we must establish independent monitoring and governing systems. Election boards and other independent groups should be able to monitor and regulate the use of AI systems, conduct checks, and ensure adherence to ethical standards and legal requirements. Working together with experts, civil society groups, and academics can help create thorough and valuable systems for review. By considering these factors and taking the appropriate actions, we can ensure fair and accessible voting in the era of AI. Using AI responsibly and morally, along with openness, public participation, data privacy, acceptance, and outside control, builds trust in the voting process and protects democratic ideals. In the age of AI, stakeholders must continue to work together to adapt to new technologies and protect poll purity.

5.1. Technology industry to combat deceptive use of AI in 2024 elections

The "Tech Accord to Fight Deceptive Use of Artificial Intelligence in 2024 Elections" is an agreement to use technology to fight against damaging AI-generated material that aims to mislead voters. In addition to other specific measures, signatories commit to collaborating on methods to identify and combat the internet dissemination of such AI material, launch educational campaigns, and be transparent. The need to increase public knowledge of the issue and the significance of tracing the origin of misleading election-related information are two of the many broad themes included in it. Consistent with the firm's previous efforts, the agreement is a significant step toward protecting online communities against damaging AI material.

The agreement covers digital content that uses artificial intelligence to misleadingly change the look, voice, or behaviour of political candidates, election officials, or other vital players in a democratic election. It also includes content that gives voters incorrect information about when, where, and how to vote. Members of the signing party include Adobe, Amazon, Anthropic, Arm, ElevenLabs, Google, IBM, Inflection AI, LinkedIn, McAfee, Meta, Microsoft, Nota, OpenAI, Snap, Stability AI, TikTok, TrendMicro, Truepic, and X.

6. Conclusion

There are a lot of chances to make elections more accessible, accurate, and efficient by using AI technology. However, we must thoroughly address some risks and difficulties to ensure free and fair elections in the era of artificial intelligence. Artificial intelligence (AI) voting systems must prioritize openness, explainability, and ethical concerns. Stakeholders may examine and regulate the systems by allowing the public access to the decision-making process and algorithmic models. To avoid biased results, it is essential to use neutral training data and conduct audits often.

Gaining the public's trust and understanding requires active participation and education. Voters are more likely to embrace and engage with AI if they are informed about its advantages, disadvantages, and safety measures. The confidentiality of voter records and the honesty of the voting process depend on stringent data privacy and security protocols. We should prioritize accessibility and inclusivity when developing AI systems for use in elections. One way to encourage inclusivity and prevent marginalization is to make sure that technology doesn't create obstacles. Another option is to provide alternate voting methods for people who don't want or can't use AI systems.

To guarantee that AI in elections is both transparent and accountable, independent regulation and supervision are required. A mechanism must be in place to monitor AI systems, ensure their adherence to rules, and conduct audits. By considering these aspects and taking the necessary steps, we can preserve fair and free elections in the age of AI. The responsible and ethical use of AI technology, in conjunction with transparency, public participation, data protection, inclusion, and independent monitoring, can uphold democratic ideals and foster confidence in the election process. Adapting to changing technologies, addressing issues, and ensuring that AI promotes the integrity and legitimacy of

elections requires ongoing cooperation between the public, technologists, election administrators, and lawmakers. Future election procedures may benefit from AI if they are well-planned and executed, making them more efficient, inclusive, and safe.

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