
Original Research Article

Interpretation of U.S. artificial intelligence policy of executive order 14110 from the perspective of digital hermeneutics

Jinfu Liao

College of Foreign Languages, National University of Defense Technology, Nanjing, Jiangsu, 210039, China

Abstract: The United States has consistently been a world leader in the development and governance of artificial intelligence (AI). This study focuses on U.S. AI policy, employing the theory of digital hermeneutics as the research method. By combining quantitative and qualitative analyses, it examines Executive Order 14110 from the perspective of attitude analysis and co-existence analysis. The results indicate that the United States maintains a proactive attitude toward AI technology while also paying attention to the regulation of "high-risk" AI. Overall, the approach is characterized by "promoting development, valuing talent, and mitigating risks," and this trend is expected to continue.

Keywords: united states; artificial intelligence policy; digital hermeneutics; executive order

1. Introduction

On October 30, 2023, then U.S. President Joe Biden issued Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence, namely Executive Order 14110, which provides more specific policy arrangements for artificial intelligence (AI) to address the risks and challenges posed by the new circumstances. As a country currently leading the wave of AI development, the United States holds unique advantages in policy design and talent cultivation. Analyzing U.S. AI policies and exploring their focal points may offer valuable insights for other countries in formulating their own AI development strategies. Therefore, this paper adopts digital hermeneutics as its theoretical perspective and takes Executive Order 14110 as a case study, with the aim of outlining a comprehensive policy profile.

2. Research methodology

The advent of the digital age has given rise to digital hermeneutics. Its essence lies in a new round of convergence and integration between hermeneutics and science and technology (Ihde 1998). Romele et al. (2020) demonstrates the application of digital hermeneutics in practical research through the analysis of Twitter data in the study of political opinions, encompassing the threefold mimesis of prefiguration, configuration, reconfiguration. Qin and Chai (2024), building upon existing research and integrating traditional Chinese philosophical thought, proposes digital hermeneutics of "co-existent". It aims to address the debates and challenges regarding human understanding and practice in the era of digital technology, and to harmonize the coexistence of humans and external entities within the integration of the perceptible and virtual worlds.

This article cites Romele's political analytical framework, combined with the interpretive dimension of co-existence digital hermeneutics, to conduct a case study of Executive Order 14110 issued in 2023, with the specific methodology illustrated in **Figure 1**.

This paper begins by examining Executive Order 14110's attitude on AI technology and the context of Executive Order 14110, dividing the study into three stages: prefiguration (data collection and processing), configuration (attitude analysis) and reconfiguration (co-existence analysis).

In prefiguration phase, this paper gathers the text of Executive Order 14110 and relevant policy documents, and selects marked phrases (i.e., attitudinal words) from the collected electronic text.

In configuration phase, attitudinal analysis is applied to statistically analyzing Executive Order 14110. Attitudinal analysis is based on sentimental words.

In reconfiguration phase, the texts processed in the previous phase are interpreted based on the frame of digital hermeneutics of co-existence, which includes technical co-existence, social co-existence, artistic co-existence and ethical co-existence.

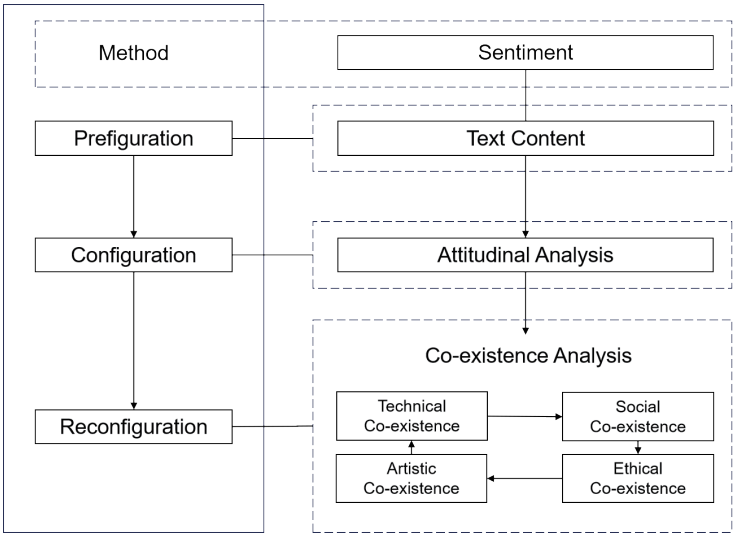


Figure 1. Illustration of research methods in digital hermeneutics.

3. Analysis of the order

This paper will analyze Executive Order 14110 from the perspectives of text attitude, related texts, and co-existence.

3.1. Attitudinal analysis

This paper primarily explores attitude analysis based on cognitive factors. Cognitive factors are evaluative statements made by an appraiser about an object of evaluation—whether it be a person, behavior, or thing—concerning its truthfulness, quality, or value. These statements include the appraiser's knowledge, understanding, approval, or disapproval of the object. Such approval or disapproval forms the basic structure of attitude analysis: polarity, that is, positive evaluation and negative evaluation.

Executive Order 14110 itself was issued in relation to the development and use of AI; therefore, the subject of evaluation analyzed in this paper is AI, and the evaluator is the White House, which aligns with the theme of the paper. This paper annotates the vocabulary related to attitudinal evaluation in Executive Order 14110, distinguishes the polarity of the vocabulary based on context, and conducts statistical analysis, with the results shown in Table 1.

Table 1. Distribution of polarity of attitudinal resources.

Polarity	Number	Percentage
Positive	212	65%
Negative	116	35%
Total	328	100%

This paper effectively tags 328 instances of sentiment words (phrases) in Executive Order 14110, including 212 positive words and 116 negative words. The proportion of positive words significantly exceeds that of negative words, generally reflecting the U.S. federal government's optimistic attitude toward AI technology. At the same time, the 35% proportion of negative words also indicates a cautious stance regarding the potential risks of AI technology.

Figure 2 summarizes the top ten emotional words among all labeled vocabularies. As can be clearly seen from the figure, the federal government's evaluation of AI focuses on aspects such as potential technological risks (risk), responsible use of technology (responsible), and the relationship between technology and rights

(rights).

It has to be pointed out that attitudinal analysis goes far beyond simply distinguishing polarity; the attitudes themselves can also be further refined, yielding more detailed analytical results. For specifics, one can refer to more systematic attitudinal analysis techniques (Martin & White 2005). In addition, the textual content collected during the data collection phase can also support the conduct of discourse analysis (Romele et al. 2020). Based on discourse analysis, it is possible to more accurately grasp the appraiser's attitude and reduce errors caused by purely statistical data.

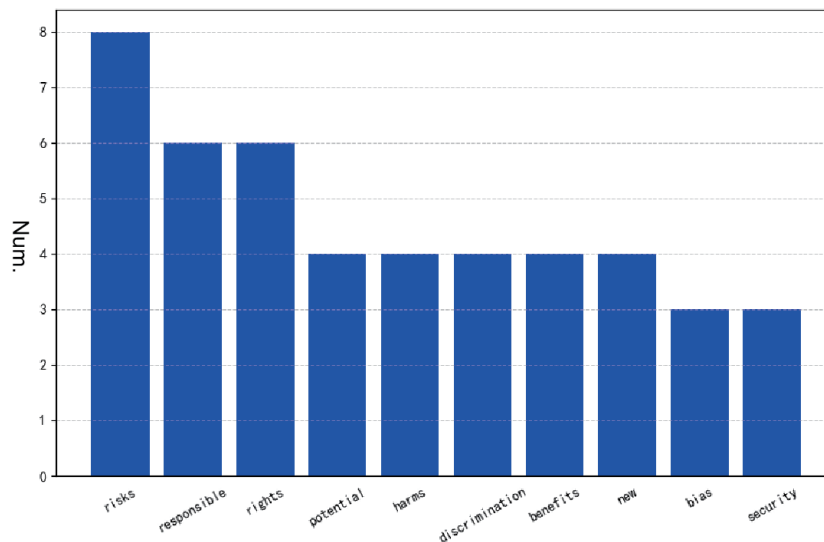


Figure 2. Frequency statistics of emotional vocabulary.

3.2. Co-existence analysis

Based on the four dimensions of co-existence analysis, this paper posits that U.S. AI policy exhibits the following characteristics:

3.2.1. Equal emphasis on technological development and the protection of human rights

The core mission of Executive Order 14110 is to attract and cultivate technical talent, promote the application of technology, and drive technological innovation through a series of government initiatives, thereby gaining an advantage in the competition of science and technology. Unlike previous technological innovations, AI poses significant challenges to human ethics and the protection of human rights. To prevent high-risk AI technologies, including AI-generated content, from infringing on personal privacy, defrauding consumers, causing medical accidents, or creating traffic issues, Executive Order 14110 provides detailed provisions on the protection of citizen rights in Articles 5 to 9. The fundamental reason behind this planning lies in the ethical coexistence of humans and technology in the digital age; technology has altered people's existence and ways of life, compelling a reevaluation of the new ethical issues arising from intelligent healthcare, finance, governance, and other areas.

3.2.2. Advancing both talent acquisition and skills training simultaneously

An important aspect of the United States' strategic layout for AI is the enhancement of talent recruitment and training. Specifically, this is carried out in three steps: attracting talent, retaining talent, and cultivating talent. The United States attracts elite professionals in the field of AI from around the world to study or work in the country by optimizing guidelines for international students, publishing development blueprints for AI, and expediting visa application and approval processes. To retain talent in relevant fields, the U.S. federal government has issued numerous job postings and also promotes competitive growth of AI enterprises through favorable policies and funding programs, thereby providing more employment opportunities for skilled professionals. Within the federal government, personnel receive skills training, and job requirements are reviewed to ensure that individuals are appropriately matched to positions, maximizing the use of talent and resources. AI has transformed societal talent

demands, imposing higher requirements for continuous learning and correspondingly adjusting the strategic positioning of specialized professionals. The United States' talent strategy reflects the coexistence of people and technology in society.

3.2.3. Proceeding the application of technology and risk prevention in parallel

The development of technology is inseparable from the feedback provided by its application. Problems identified during practical application drive technological innovation, which in turn addresses these issues and is reintegrated into use, forming a virtuous cycle. Although AI technology carries many potential risks, the United States has not let these risks hinder progress; instead, it actively promotes the application of AI technology, first encouraging cautious implementation within the federal government. Moreover, technological risks cannot be ignored. Executive Order 14110 thoroughly discusses how to assess the risk levels of AI to prevent "high-risk" AI technologies from harming national defense and citizens' rights. It is evident that the United States adopts a "dual approach" in the AI field, simultaneously advancing technological development and utilization while mitigating associated risks. In the era of artificial intelligence, human-technology relationships are closely intertwined, and the application of technology is an irreversible trend. Therefore, it is crucial to simultaneously implement risk prevention measures, which is arguably an inherent necessity in the context of technological coexistence.

4. Conclusion

Overall, the United States has a very optimistic outlook on the prospects of AI while simultaneously adopting a cautious approach to technological risks. Its policy-making exhibits the characteristics of "promoting development, emphasizing talent, and preventing risks." Executive Order 14110 provides detailed planning for AI policy and strategy formulation, including promoting technological innovation, developing technical talent, facilitating technology deployment, and mitigating technological risks.

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