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# *Artificial Intelligence and International Law in the Context of Information Globalization: The Problem of Technological Hegemony as an Example*

**Yubo Lu**[1,a,*]

[1]*School of Humanities and Social Sciences, Xi'an Jiaotong-Liverpool University, Xie tang Street, Suzhou, China*
*a. Yubo.Lu21@student.xjtlu.edu.cn*
**corresponding author*

***Abstract:*** Against the backdrop of the globalization of information, artificial intelligence (AI) technology has become a core driving force for the development of all countries. It also has a profound impact on the field of international law, and the issue of technological hegemony is one of the core issues. Technological hegemony refers to an asymmetrical relationship between technologically developed countries and other countries by taking advantage of their dominant position in the field of technology. This paper focuses on the issue of technological hegemony in the relationship between AI and international law, and analyses in depth the nature, impact and coping strategies of the phenomenon of technological hegemony, aiming to build a more fair and reasonable international AI governance system. Methodologically, this paper adopts the literature analysis method and comparative research method. By collecting, collating and analyzing relevant academic literature, policy documents and legal precedents at home and abroad, and comparing the legislative practices, policy orientations and international cooperation modes of different countries and regions, the paper explores in-depth the international law strategies for responding to the issue of technological hegemony. In general, to address the issue of technological hegemony, it is necessary to strengthen international legal regulation, promote multilateral cooperation and dialogue, and facilitate technology sharing and cooperation to enhance the technological capabilities of developing countries, and current policies still need to be changed and evolved in line with the changing international environment.

***Keywords:*** Artificial Intelligence (AI), International Law, Technological Hegemony, Global Governance, Digital Globalization.

## 1. Introduction

In the context of digital globalization, Artificial Intelligence (AI) technology has become the core driving force for the development of all countries.AI has profoundly changed the socio-economic structure of society and has brought many challenges to the international legal system, such as the management of transnational data flows and the international protection of intellectual property rights. These problems require the international community to jointly seek solutions to maintain a fair and reasonable international order. Among the many problems, the issue of technological hegemony is

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particularly prominent. Technological hegemony refers to an asymmetrical relationship between technologically developed countries and other countries established through their dominant position in the field of technology, which is manifested in the elevation of domestic intellectual property protection standards to international rules [1]. Developed countries, represented by the United States and Europe, have tried to curb the technological development of emerging countries through legislation and technical standard-setting. The European Chip Act of the European Union and the Chip and Science Act 2022 of the United States are typical examples. These legislative measures have not only intensified international scientific and technological competition, but also exposed the lagging nature of the existing international law system in responding to emerging technological challenges. The goal of this paper is to explore the issue of technological hegemony in the relationship between artificial intelligence and international law under digital globalization. In-depth analysis of the nature and impact of the phenomenon of technological hegemony, and existing coping strategies. By analyzing the deficiencies and challenges of the existing international legal system in the field of AI, combined with specific cases, it puts forward international law strategies to deal with the issue of technological hegemony. Finally, this paper will further explore how to build a more fair and reasonable international AI governance system while respecting the technological sovereignty of each country. To maintain the healthy order of global scientific and technological development.

## 2. Global Development Status of Artificial Intelligence Technology

This paragraph begins with an overview of the basic state of the art of AI utility, and then, turning to the trend of global technological competition, describes national actions in the field of AI to draw out the issues of technological inequality and technological monopoly brought about by the trend of globalization.

### 2.1. Innovation and Application of AI Technology

In recent years, AI technology has made significant progress in the fields of computer vision, natural language processing, and machine learning. These technological breakthroughs have provided strong support for the development of autonomous driving, smart manufacturing, smart healthcare, smart cities and other fields. One example is that advances in autonomous driving technology have made travelling more convenient and safer; smart manufacturing has also improved productivity and quality through intelligent production lines; Intelligent healthcare, on the other hand, uses AI technology for disease diagnosis and optimization of treatment plans to provide patients with more precise services. These innovative applications not only promote the rapid development of related industries, but also greatly improve people's quality of life. Beyond these applications, academics have focused on the potential costs, benefits and uncertainties of AI technologies, concluding that a certain precautionary approach should be taken, and that AI needs to be monitored as a technology, rather than focusing solely on its downstream applications [2].

### 2.2. Trend of Globalization of Technological Competition

With the increasing maturity and wide application of AI technology, technology competition on a global scale has become increasingly fierce. Countries increase their R&D investment in AI to compete for the technological high ground. At the same time, multinational enterprises and research institutions are also promoting the innovative application of AI technology through cooperation and competition. This trend of globalization has facilitated rapid technological progress and exacerbated the inequality of international competition in science and technology. Some technologically developed countries take advantage of their leading position in the field of AI to set up technical

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barriers and patent layouts. To limit the technological development space of other countries and maintain their own technological monopoly.

## 3. Manifestations and Impacts of Technological Hegemony in the Field of AI

This paragraph explores the manifestations of technological hegemony in the field of AI, including the monopolization of technical standards, the control of data resources, and the creation of market access and trade barriers, which have exacerbated the inequality of international scientific and technological competition and hindered the healthy development of the global AI industry.

### 3.1. Monopoly and Promotion of Technical Standards

As the essence of competition in the context of the digital economy transforms into a struggle for technological hegemony, AI has also evolved from an object in the struggle for technological governance among countries to a tool in the struggle for technological hegemony [3]. One of the manifestations of technological hegemony in the field of AI is the monopoly and promotion of technical standards. Firstly, technologically developed countries use their leading position in AI to dominate the development and promotion of international technical standards. The goal of strengthening European autonomy and competitiveness in the field of semiconductor technology by supporting the establishment of integrated production facilities and open EU foundries, as well as promoting the development of cutting-edge technologies such as advanced pilot production lines and quantum chips, is clearly stated in the Euro chip Act, which will be published and introduced in 2023 [3]. Secondly, by promoting their own technical standards, technologically developed countries are also attempting to incorporate other countries into their technological systems, thereby further consolidating their technological superiority. In the ibid. bill, industry is encouraged to jointly develop reference certification procedures for specific sectors and technologies to promote the establishment of green, safe and credible standards for semiconductor products. This is Europe promoting its own technical standards and trying to incorporate other countries into its technical system. In this way, Europe has consolidated its dominant position in the field of semiconductor technology and further restricted the space for technological development of other countries.

### 3.2. Control and Utilization of Data Resources

The development of AI technology is highly dependent on data resources. Technologically developed countries strengthen the regulation and control of transnational data flow through legislation and technical means. The purpose of accessing and utilizing data resources on a global scale is achieved. These countries restrict other countries from accessing and utilizing their data resources by setting up data barriers, strengthening data protection and other measures. At the same time, they also monitor and analyze transnational data flows through technical means to obtain sensitive information and strategic intelligence. Such practices exacerbate the inequality of international scientific and technological competition and undermine the interests and sovereignty of other countries.

### 3.3. Market Access and Trade Barriers

By setting market access conditions and trade barriers, technologically developed countries restrict the entry of foreign AI products and services into their markets and prevent the flow of domestic products to competing countries. This practice exacerbates the inequality of international technological competition and hinders the healthy development of the global AI industry. In terms of market access, the EU has set access conditions to support the establishment of integrated production facilities and open EU foundries, i.e., these facilities must be “first-of-a-kind” to ensure that only

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firms with advanced technology and innovation capabilities can gain a foothold in the European market [4]. The U.S. National Commission on Artificial Intelligence Security has similarly recommended that the U.S. government continue to maintain U.S. dominance in AI hardware, particularly semiconductor manufacturing equipment, through export controls [5]. These measures have led to a trend of fragmentation and fragmentation in the global AI market, which is not conducive to mutual benefits and common development among countries.

## 4. Challenges to AI Governance at the International Law Level

This paragraph explores the challenges to AI governance at the international legal level, including lagging rules of international law, barriers to legal regulation of transnational data flows, and insufficient international coordination of intellectual property protection and copyright. These issues limit the transnational application and cooperation of AI technologies.

### 4.1. Lagging of International Law Rules

As it stands, the application of AI is inevitably multi-disciplinary and global, therefore, only international norms can provide unified guidance [6]. However, the existing international law system appears to be lagging and insufficient in responding to the challenges of the emerging technology. At the international level, there are no relevant documents on the governance of AI introduced yet, only some documents without coercive force issued by each sovereign state one after another in order to seek development, such as China's "Global Initiative on Artificial Intelligence Governance", the U.S. "Executive Order on Safe, Reliable, and Trustworthy Artificial Intelligence" executive order, and the UK's "Understanding the Ethics and Safety of Artificial Intelligence". The rapid development of AI technology requires that the rules of international law be constantly updated and improved to adapt to the changes and challenges brought about by the new technology. However, the relatively complex and slow process of formulating and revising international law has resulted in the existing rules of international law being unable to respond to the new issues and challenges brought about by AI technology in a timely and effective manner. This lag makes it possible for some countries to use technological hegemony to engage in unfair competition and expansion.

### 4.2. Obstacles to Legal Regulation of Transnational Data Flows

Cross-border data flow is an important foundation for the development of AI technology. There are differences in laws and regulations between different countries in terms of data protection, privacy and security. In fact, it leads to transnational data flow facing many legal obstacles. In addition, some countries have set up strict data export restrictions and censorship systems to protect their own data resources and interests; this makes it impossible for other countries to access and utilize their data resources. At the same time, there are also differences in regulatory standards for cross-border data flows between different countries, making it difficult to obtain effective legal protection and regulation of transnational data flows. This inconsistency and uncertainty in legal regulation. As a result, it restricts the transnational application and co-operation of AI technology, and exacerbates the instability and inequality of international scientific and technological competition.

### 4.3. Insufficient International Coordination of Intellectual Property Protection and Copyrights

The innovation of AI technology cannot be separated from the protection of intellectual property rights; there are differences in the legal systems and standards of intellectual property protection between different countries, leading to frequent international intellectual property disputes. To protect

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their own technological innovation and industrial development, some countries have set up strict intellectual property protection systems and examination standards, which make the development of other countries in the relevant fields restricted. At the same time, the lack of coordination and consistency in the international intellectual property protection system has made it impossible for the rights and interests of some countries around intellectual property rights to be effectively safeguarded and defended.

In addition, the copyright issue brought about by AI itself has caused considerable controversy. In the usual sense, works protected by copyright law refer to the results of intellectual creation in the fields of literature, art and science, which are independently conceived and created by the author, i.e., they are original and are reproduced in some tangible form [7]. Artificial intelligence replaces human beings in creative endeavors, and with it comes questions about copyright rules: can works created by artificial intelligence be protected by copyright? The Berne Convention for the Protection of Literary and Artistic Works lists the author as the first subject of protection, emphasizing that the author is the subject of its protection; the Berne Convention emphasizes "nationals of one of the Member States of the Union", and it is currently believed that AI cannot be a national of a country and therefore does not enjoy copyright protection [8].

## 5. AI Governance Strategies to Cope with Technological Hegemony

This paragraph focuses on AI governance strategies to deal with technological hegemony, including three aspects: first, improving international legal rules in the field of AI and providing a clear and predictable legal environment; second, promoting intergovernmental and non-governmental multilateral cooperation and dialogue to enhance mutual trust; and third, insisting on the promotion of technology sharing and cooperation.

### 5.1. Improve International Legal Rules in the Field of AI

The current AI international governance system is still dominated by ethical rules. Before the establishment of international legal rules on AI, ethical norms and common value standards can try to ensure the accuracy and objectivity of the operation of technology with strong value orientation. Therefore, the international community should make joint efforts to promote the formulation and improvement of international legal rules in the field of AI. These rules should clarify the legal framework for cross-border data flow management and intellectual property protection, and provide a clear and predictable legal environment. In formulating these rules, full consideration should be given to the interests and demands of countries and the differences in their levels of development to ensure the fairness and reasonableness of the rules. At the same time, the construction of international legal supervision and enforcement mechanisms should be strengthened to ensure that countries comply with their international legal obligations and commitments, to cut down on the impact of technological hegemony.

Specifically, the international community can draw on existing international legal frameworks and principles, such as the rules of the World Trade Organization (WTO) and the United Nations Guiding Principles on Data Protection and Privacy, to formulate targeted international legal rules, considering the characteristics and challenges of AI technologies. These rules could include regulatory standards for cross-border flow of data, international coordination mechanisms for intellectual property protection, and mutual recognition systems for technical standards and certification. Through the formulation and implementation of these rules, cooperation and coordination among countries can be strengthened to promote the healthy development of AI technology and global technological innovation and progress.

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In addition, there are several industry self-regulatory instruments that can be referred to. These are known as “super soft law”; although they are not formally binding, they fill a gap in international legal regulation. Super soft law is characterized by “weak sovereignty”, which makes it more suitable for internationalization [9]. It can provide a basis for the development of mandatory industry standards. It can also provide a basis for the invocation of AI rules and promote specific legislation. Finally, until there are sufficiently mature international legal rules, countries should also strengthen the construction of their own domestic laws to temporarily fill the gaps in international law [10].

### 5.2. Promote Intergovernmental and Non-governmental Multilateral Cooperation and Dialogue on the AI Governance System

To effectively address the issue of technological hegemony, the international community should strengthen multilateral cooperation and dialogue between governments and NGOs on the AI governance system. By strengthening the construction of multilateral cooperation and dialogue mechanisms among governments, international organizations and NGOs, mutual understanding and trust can be enhanced, and sensitive issues such as technological hegemony can be jointly addressed. In terms of practical methods, regular international conferences and forums can be established, inviting representatives from governments, international organizations, academia and industry to discuss the development trends and challenges of AI technology and propose governance strategies. Through these conferences and forums, information sharing and experience exchange among countries can be promoted to enhance understanding and recognition of each other's policies. At the same time, special working groups and expert groups can be set up for cooperation and coordination in specific areas, such as data protection and technical standards. Through the efforts of these working groups and expert groups, the development of more concrete and feasible cooperation plans and projects can be promoted to facilitate the global governance and development of AI technology.

Notably, the role of NGOs in AI governance can also be strengthened. As an independent third-party force, NGOs can play the roles of monitoring, advocating and educating to push governments and enterprises to develop and apply AI technologies more responsibly. Cooperation and dialogue with NGOs should also be strengthened to gain a more comprehensive understanding of the concerns and needs of all sectors of society and to provide a strong and realistic basis for the formulation of more scientific and reasonable international legal rules.

### 5.3. Countries Should Insist on Promoting Technology Sharing and Cooperation

To achieve the goal of building a fairer and more reasonable international AI governance system and addressing the issue of technological hegemony, countries should insist on promoting technology sharing and cooperation. By strengthening technology sharing and cooperation between technologically developed countries and developing countries, the balanced development of global AI technology can be promoted and the technology gap narrowed to achieve common prosperity.

Specifically, technologically developed countries can help developing countries enhance their own AI technological capabilities and innovation capacity through technology transfer, talent training and financial support. They can set up special funds and projects to support the R&D and application of AI technology in developing countries; they can carry out talent training and exchange activities to improve the level of professionals in developing countries in the field of AI; and they can strengthen cooperative R&D and innovation cooperation with developing countries to jointly promote the innovation and development of AI technology. Through the implementation of these measures, all of them can promote the balanced development of global AI technology.

At the same time, developing countries should also strengthen their own efforts in AI technology R&D and application. By increasing R&D investment, training professionals, strengthening

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international cooperation and other measures, they can improve their own level, and by actively participating in the construction and improvement of the international AI governance system, they can participate in the division of labor of the system, and contribute their own strength to the construction of a fairer and more reasonable international AI governance system.

## 6. Conclusion

In the context of digital globalization, the development of Artificial Intelligence (AI) technology has brought unprecedented challenges and opportunities to the international legal system. The issue of technological hegemony is a prominent topic in this change. To deal with the issue of technological hegemony, the international community needs to take a series of effective measures; the establishment of international legal regulation, the strengthening of transnational data flow management, and the construction of legal frameworks for intellectual property rights protection are the prerequisites and foundations for the construction of a fair and reasonable international AI governance system. At the same time, promoting multilateral cooperation and dialogue and enhancing mutual understanding and trust among countries are also key to solving the problem of technological hegemony. In addition, upgrading the technological capabilities of developing countries, promoting the balanced development of global AI technology, and strengthening international cooperation and rule-making are also important ways to address the issue of technological hegemony. Finally, with the rapid progress of science and technology and the continuous development and changes in international relations, all actors still need to continuously adjust and improve their relevant strategies to adapt to new challenges and requirements.

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