

The Application of Artificial Intelligence in News Communication: Practical Exploration and Ethical Dilemma

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Abstract

The application of artificial intelligence in news communication has evolved from saving labor costs and improving efficiency to extending the perception range of professional journalists and strengthening their judgment ability. Innovative practical explorations have been carried out in news production, presentation, and distribution. However, the application of artificial intelligence has also brought ethical dilemmas of social bias diffusion to news media. In the face of this challenge, the news and communication academic community and industry have worked together to open up innovative paths in eliminating bias and maintaining social equity through technological "algorithm verification evolution" and social "human-machine coupling".

Keywords

intelligent communication media integration technology, ethical algorithm, bias, news robot framework

1. Introduction

With the development of new media technology, the amount of information in the media environment is rapidly increasing. With the continuous advancement of computer technology and artificial intelligence technology, algorithm technology has become an important media tool for the public to receive information in the era of intelligent media, and is even regarded as a core technology by aggregation news platforms and clients such as Today's Headlines. The use of algorithm technology can achieve precise information delivery and bring certain convenience to users. However, with the changes in information dissemination channels and user consumption habits, algorithmic news recommendation mechanisms can also bring about problems such as "information cocoons" and personal privacy ambiguity, which have a negative impact on the online environment.

1.1 The cutting-edge application of artificial intelligence in news communication

From the perspective of technological availability, artificial intelligence (AI) is a general term for technologies in the field of computer science that can simulate, extend, and expand human intelligence. It not only has the ability to think and make autonomous judgments, but also has the ability to learn and collaborate. The initial use of artificial intelligence in the field of news communication was to replace repetitive and simple tasks. With the further deepening of intelligent communication, artificial intelligence has become a "booster" for news media to enhance their influence and credibility while promoting practical innovation in news communication.

The rapid development of information technology drives a comprehensive and in-depth transformation of society, and artificial intelligence, decentralization, disintermediation, and the Internet of Things together constitute the four major characteristics of the Web3.0 era. The artificial intelligence technology from machine learning (ML) to natural language processing (NLP) has optimized the news production chain,

providing practical tools that expand the efficiency and influence of practitioners, including automatic information detection, data extraction and validation, text and chart production, news curation, and text automatic annotation. Overall, the cutting-edge application of artificial intelligence in the news communication industry is mainly aimed at improving production efficiency, diversifying presentation methods, and achieving precise distribution.

However, the use of cutting-edge technology cannot guarantee the improvement of news dissemination quality, just as the authenticity and balance of news distributed by machines on the Internet and social platforms are not as good as those of traditional media relying on manual checks such as newspapers, radio and television. Essentially, the effectiveness of a news production system depends on the quality and availability of the information it inputs and outputs. For news communication systems that rely on both traditional and new media, the principle of "garbage in, garbage out" (GIGO) has been an enduring rule, and it is particularly prominent in the news communication ecosystem dominated by social platforms. Due to the lack of traditional media censorship, the control of information and data by journalists and editors in the communication system dominated by social platforms is deprived by algorithms, and the principles and mechanisms of their participation in news production and distribution are locked in a "black box" under the pretext of "commercial secrets", lacking transparency and ease of understanding. In the era of intelligent communication, the most significant ethical challenge faced by the news industry is the amplification and polarization of social biases by algorithms. Social bias is reproduced under the guise of "objectivity" in the process of machine produced news texts, and spreads through "customization" in the process of algorithm distribution. Prejudice and discrimination in intelligent communication have led to conflicts between parties and races, torn apart social consensus, and exacerbated the turmoil of the VUCA era.

This article takes the full chain reconstruction of intelligent news communication as the starting point, sorts out the cutting-edge dynamics of artificial intelligence application in the news communication industry, and analyzes the "negative" boosting effect of algorithms; Taking the cross-border cooperation between mainstream media organizations such as Reuters, BBC, academia, and the information technology industry as an example, this article analyzes the application of "news robots" and algorithms in content production, presentation, and distribution, as well as the media bias risks and solutions they generate, in order to provide a reference for domestic peers.

1.1.1 News Production

First, the cutting-edge application of artificial intelligence in news communication Artificial intelligence entered the room. Liberate it from the repetitive labor of transcribing audio or video interviews, saving time and energy to devote to in-depth thinking and professional analysis, thereby improving the quality of news reporting. Early AI applications focused on writing formulaic topics related to stock market fluctuations and sports events. In recent years, AI has also begun to empower professional journalists and editors to handle more complex tasks such as in-depth analysis of data and identification of investigative reporting clues. In addition to financial and sports news reporting, AI has also entered more specialized fields such as legal news.

Second, recently, an artificial intelligence news reporting system called "Legislative News Tip Sheet" (LNTS) has been widely used in the reporting scenarios of rule of law news. This AI driven news reporting assistance tool can search and collect news worthy events related to the legislative conferences of various states in the United States through the system, providing timely background data for journalists and facilitating their access to more in-depth follow-up interviews. For example, after the US Supreme Court made an arbitration on "abortion rights" in June this year, it sparked high public attention. State legislative bodies have also engaged in debates and formulated corresponding bills. For highly controversial and concerning issues, System A can send a "news alert" to journalists when there is a data explosion or anomaly, providing template text containing relevant event background information. Professional journalists and editors from local media can use LNTS analysis to monitor and track the "antagonistic" relationship between legislators, accurately predict the results of state legislation, and influence the direction of public opinion.

Third, this AI news reporting system can also help journalists capture clues that are difficult to discover in their daily work, extending the "tentacles" of news producers to areas where previous reports were scarce or even completely missing. For example, through longitudinal data collection, the system can summarize the voting history of state legislators, determine whether the voting results of specific candidates contradict their previous positions, and provide relevant data to journalists in a timely manner, allowing them to invest more time and energy in in-depth thinking and interpretation.

It is obvious that this system can effectively save manpower and financial resources, and can automatically generate "menus" or "recipes" containing information clues collected from numerous news websites for journalists to call and match at any time. In addition, the system also utilizes sensor technology to assist news media in collecting remote information and data. In the coverage of the controversy over abortion legislation, news hotspots such as California, Florida, Texas, and New York City have opened up access to local legislative bodies and conferences to the system, greatly improving the cross regional reporting efficiency of news media. It is worth noting that LNTS is an innovative achievement jointly developed by multiple parties, with professional journalists, editors, data scientists, engineers, and professors from journalism schools working together to promote the full chain reconstruction of industry university research integration, and explore a new path to solve the long-standing problem of "decoupling" between the news industry, academia, and education.

1.1.2 News presentation

Secondly, news presentation. The application of AI can optimize and enrich the presentation of news reports, enhance the interaction between products, content, and users, help users obtain personalized on-site experiences, and also provide more efficient information services. Algorithmic recommendation systems can provide customized environmental information and services to users based on their preferences and context, effectively enhancing user stickiness.

In February 2022, Reuters and Synthesia, a company engaged in AI research and development, released the world's first automated broadcasting system centered around virtual anchors. The system is built on the basis of the Reuters video material library, combining the images of professional sports anchors with AI to create a programmable virtual anchor for event reporting and analysis. Reuters' image photography and video reporting provide information and perspectives for this virtual anchor, even down to the anchor's every move. Not only does it require no manual scripting, editing, or production, but it can also automatically create news summaries and subtitles, creating different playback versions adapted to the needs of traditional media and social platforms.

At the beginning of 2021, BBC management noticed that 62% of online users listened to podcasts every day, ranging from 30 minutes to 4 hours. To this end, BBC has collaborated with Microsoft to develop an AI assisted podcast app. Developed synthetic speech system. This system has a soft range of sound, giving people a warm feeling with its rounded and personified sound quality. In addition, synthesized speech also has more significant inclusiveness and adaptability. Audio can be automatically updated according to different needs during text editing, and the tone and timbre of the broadcast can be adjusted according to different content.

Thirdly, news distribution. In the era of information overload, using A can not only accurately distribute news media production content and improve reach, but also provide users with customized and personalized information. The first generation of "news push" function was mainly based on the consideration of timeliness, supplemented by AI that can combine content-based recommendation, collaborative filtering, and temporal popularity, adopting a new model of "mixed probability" instead of the traditional "similarity" principle for push. Google News is a pioneer of this new model, predicting user preferences by calculating historical click through data or interaction frequency, and tailoring "My Daily" to each user based on their different configuration information.

Content based algorithm recommendation and collaborative filtering between users can meet the customized content needs of different users in three aspects: cold start, short-term interests, and long-term preferences. Users' interests can be annotated as preferences for certain content features, thereby maintaining longer attention and minimizing the sparsity of user data caused by cold start.

With the help of collaborative filtering, users' recent interests and browsing behavior can be merged to meet their short-term needs for information freshness and popularity. Overall, artificial intelligence news push systems are beneficial in enhancing user stickiness and loyalty by providing personalized information, and boosting the value conversion of news products by increasing users' willingness to consume.

The current application of AI in the field of news communication can not only provide more convenience for news producers, but also make news presentation more humane and provide users with personalized content consumption experience. However, it cannot be ignored that while A algorithm improves the efficiency of news dissemination operations, it also contains a crisis of "gatekeeper power transfer", which becomes a catalyst for exacerbating the spread of prejudice and fallacies, leading to the division of the country and society on issues such as race, party affiliation, and gender.

1.1.3 The Spread of Prejudice in Intelligent Communication

Essentially, AI is the result of human programming based on specific goals and training on a vast amount of specific datasets. Based on the quality of data, deep-rooted social biases, and deliberate incitement of group conflicts, AI can be used to produce and spread false information, solidify biases, and exacerbate divisions. What's more, due to the existence of "algorithm black box", people cannot identify the source and formation mode of these false information and data, which further improves the difficulty of Internet governance.

In the process of news production, the main source of "algorithmic bias" is not the algorithm itself, but the collection and screening results of underlying data. The news production algorithm model is divided into two parts: the "trainer" and the "filter". The deviation of the "trainer" is mainly generated in the basic database and training process, while the "filter" can use data containing human decisions and social biases for "secondary training" based on the prediction model of the "trainer". For example, the "word embedding" technique trained on massive news texts reinforces inherent gender stereotypes, while algorithm designers, even without highlighting gender bias, still embed gender biased terms into the final displayed text due to being encoded by other variables.

Moreover, humans can intentionally use algorithmic biases to mislead and manipulate biases, which is the origin of 'computational propaganda'. In February 2022, Brian L. Due, a scholar conducting multimodal artificial intelligence perception research at the University of Copenhagen in Denmark, classified artificial intelligence technologies that spread social biases into three categories in his paper: social robots, platform built algorithm tools, and artificially synthesized fake character "profiles". Firstly, various computational propaganda methods utilizing artificial intelligence technology, ranging from "social bots" to "deepfakes," are constantly emerging. A large number of social bots intentionally spreading bias are rampant on global social platforms such as Facebook and Twitter. These "zombie armies" spread massive amounts of biased and discriminatory "misinformation" on key issues, misleading public awareness and opinion, reducing public trust in government, media.

2. The Spread of Prejudice in Intelligent Communication

The "essence" part is automatically selected as a thumbnail for display, but it often gives priority to white people rather than ethnic minorities.

Once again, there is the use of "virtual internet celebrities" to spread seemingly biased content. False 'synthetic personas' have more anthropomorphic and persuasive background information than 'social robots', making them more likely to become popular influencers and opinion leaders (KOLs) on social platforms. On social networking platforms such as LinkedIn, there has emerged an internet celebrity named "Katie Jones" who has established social networks with several top American politicians. After analyzing and comparing her photos, the Associated Press declared that the person did not exist. Her facial features were synthesized by artificial intelligence and classified this behavior as a "stealth spy" activity that has emerged on social platforms.

In terms of presenting news, the image design of robots reflects a certain degree of social stereotypes in appearance and voice, and promotes the deep "embedding" of bias through precise interaction with users. The most obvious ethical dilemma in the diverse presentation of news robots is gender bias, which mainly stems from the "anthropomorphic imagination" of robots. The most common is the "occupational preference" associated with robots with gender characteristics and different jobs and tasks. For example, virtual anchors are usually set as young women, while virtual commentators are usually set as middle-aged white men, which to some extent replicates the "stereotypes" in traditional media practices. In addition, the survey shows that users tend to develop emotional closeness and trust towards robots with female characteristics, and assume that "female" robots are more suitable for information service jobs.

The most commonly used AI robot currently is the "voice assistant", and voice assistants with "specialization" and "serviceability" are usually designed for young women, such as Windows' Cortana, Apple's Siri, and Amazon's Alexa. This kind of persona not only deepens the existing gender bias, but also leads to a large number of cases of users "teasing" voice assistants. The corpus writer of "Xiaona" revealed that during its initial launch, the conversation requests contained a large amount of explicit and pornographic content.

3. Governance of algorithmic bias in the era of intelligent media

To address this issue, in March 2019, linguists and software engineers from the University of Copenhagen collaborated to launch the world's first gender free voice assistant Q. Its sound quality was collected from five prototypes of different genders and synthesized and trained. The system developers conducted 4600 tests in Europe and ultimately presented Q as a "neutral" sound with a frequency around 145 hertz. The emergence of Q is a revelation and rebellion against the inherent "unconscious bias" of AI, with the aim of completely eliminating gender stereotypes in the field of intelligent communication and fully demonstrating the social responsibility of new media. This means that the application of artificial intelligence in the field of news communication is gradually breaking away from the confines of technological centrism and becoming a tool for social reform and progress. It also means that in the practical innovation of AI in the field of news communication, higher product standards should be established and user characteristics should be more strictly defined.

In the recommendation and distribution of news, the impact of algorithms on content visibility and accessibility can lead to an imbalance in the weight of different perspectives on specific events in the "mimetic environment", resulting in the tearing and polarization of the news public opinion field. In the era of platformization, algorithms have taken over the role of traditional media "gatekeepers" for a long time. Therefore, communities with different positions attribute the spread of bias to the platform's selective presentation of the "news menu" for political purposes.

In addition to the bias of the algorithm itself, related studies have found that racial differences in online advertising positioning are quite significant, and user generated online data can create a "feedback loop" of fixed bias, leading to racial bias becoming a "resistance problem" in intelligent communication. Although theoretically, the principle of "weight balance" should be reflected in the storage of databases with different perspectives, user search behavior can disrupt this equilibrium state. They click on content containing a certain viewpoint more frequently, especially when induced by algorithm recommendations. In this way, the collaborative filtering mechanism in the algorithm will be more "sensitive" to specific viewpoints, and the visibility of information from one party will show a geometric increase. At present, social platforms have become the primary source of news, with billions of global users' clicks.

Eliminating behavior requires starting from three aspects: algorithm verification, intelligent bias detection, and human-machine coupling, fully leveraging the synergistic effect of artificial intelligence and human intelligence.

Firstly, there is algorithm verification. Starting from the application logic of algorithms in news dissemination, conduct fairness verification on the basic database and rules of algorithm operation that the algorithms rely on. And regulate the production, presentation, and distribution results of AI news products to eliminate the catalytic effect of algorithms on social bias.

The first step is to strengthen the "preprocessing" of data, so that the database stores data accurately and fairly, consciously reducing the correlation between algorithm recommendations and output results, thereby producing news texts that can present different positions and viewpoints. AI news should consciously increase the weight of non mainstream viewpoints by adding more "data points", and introduce "counterfactual fairness" verification methods in the data processing process, in order to "dilute" and "filter" discriminatory content against marginalized groups and ensure the fairness of information dissemination.

The second step is to improve the "post-processing" of the technology, and based on the predicted results of the model output, further revise the output content according to the principle of "adaptation fairness".

The third step is to enhance the "interpretability" of the algorithm system while enhancing transparency, mainly by rationalizing the interpretation of the specific decision-making methods and data characteristics that lead to results, and helping users verify whether the factors considered in the decision-making process contain biases.

Next is intelligent bias detection. In order to strengthen the crackdown on fake news and hate speech, the news communication academic community and industry have jointly developed various algorithmic tools to evaluate the bias and reliability of news texts. The common flaw of these tools is that AI usually relies on the original meaning of words and phrases in the process of recognizing information and viewpoints, and is unable to capture and understand the subtle and flexible semantic changes related to their extended meanings, such as parody, satire, and irony. These subtle and flexible semantic changes cannot be captured and understood by traditional "natural language processing" (NLP) techniques.

In early 2022, Dan Goldwasser, a computer science professor at Purdue University in the United States, combined machine learning techniques with social relationship and behavior models to develop an algorithmic tool for better understanding the intentions of social media post publishers. He pointed out that whether it is understanding the meaning of short tweets or "memes", algorithmic tools for identifying implicit biases need to increase their ability to understand narrative processes and contextual information. How to conceptualize the understanding of language symbols is the primary issue that should be addressed in the transformation and upgrading of future algorithmic tools.

Algorithm review is currently one of the more mature and effective tools. In the absence of human supervision and intervention, robots often choose biased morphemes as the best predictive factors for algorithm recommendations in terms of "feature priority". The use of such tools can help robots correct this trend. For example, for video websites such as YouTube, using "algorithm review" can help us understand which types of videos are prioritized for recommendation and whether their recommendation systems intentionally spread biased information. Although the cost of introducing tools such as "algorithmic auditing" and "counterfactual fairness" into the news communication industry is still relatively high and their practical application is limited, "intelligent bias prediction" has become a breakthrough point in improving the level of algorithmic governance, and future achievements and their wide range of applications are to be expected.

Once again, it is human-machine coupling. In the current era where artificial intelligence is widely used, the role of "human intelligence" has not been weakened, but has been strengthened in algorithmic governance, which is particularly prominent in the field of news communication. Human machine coupling and collaboration have also been proven to effectively block the spread of bias in the process of news production, presentation, and distribution, enhancing the credibility and reliability of news media. A survey shows that algorithms rely on the characteristics of databases to provide news users with an "objective" and "accurate" perception, but users have higher trust in real journalists than news bots and algorithm recommendations. Therefore, theoretically speaking, the combination of machine generated text Automated decision-making? These problems cannot be solved by optimizing algorithms, nor can they be fully delivered to machines. Compared to evaluating algorithms, reviewing and assessing the actual situation of human use of AI is much more complex, which has also sparked discussions about "procedural fairness" and "outcome fairness". When media practitioners realize that algorithms trained by humans are biased, they should not simply stop or disable them, but should consider whether potential human behavior violates social fairness principles, while also conducting relevant bias tests on human decisions. Raising the standards for automated decision-making in news media also means that higher demands should be placed on human decision-making. In short, from a moral and ethical perspective, the ultimate goal of "human-machine coupling" is to promote the common progress of human intelligence and artificial intelligence.

4. Conclusion

The application of artificial intelligence in news production has evolved from saving labor costs and improving efficiency to extending the perception range of professional journalists and enhancing their judgment ability. Artificial intelligence can expand the scope of news gathering for journalists in the production process, enhance their understanding of news content, provide users with a more diverse experience in the news presentation stage, and screen customized content similar to "My Daily" for users in the news distribution process. However, the use of AI has also brought ethical dilemmas of social bias diffusion to news media. In response to this challenge, the academic community of journalism and communication has worked together with the industry to open up innovative paths for eliminating bias and maintaining social equity through "algorithm verification evolution" in the technical dimension and "human-machine coupling" in the social dimension.

It should be noted that eliminating biases in machine algorithms is as challenging as eliminating biases in human society. In real life, prejudice subtly influences attitudes and behaviors towards specific groups and individuals. The main obstacle to eliminating prejudice is the "unconsciousness" of prejudice. This invisible bias is formed over time in the direct and indirect information about others that we constantly come into contact with in our daily lives, and overlaps with the development of our understanding of the 'other' throughout our entire life journey. Another difficulty in eliminating bias is the effectiveness of bias. Prejudice has to some extent evolved into a "protective mechanism" that can enhance the decision-making process, especially when the risks faced by decision-making are high. People often choose conservative "insurance plans" to maintain deep-rooted biases. An effective bias assessment tool used in the field of

psychology for predicting implicit bias is the Implicit Association Test (IAT). The results show that although technology can be used to prompt individuals for implicit social biases, it is still difficult to bring about changes in individual behavior.

Prejudice, as a chronic disease that cannot be eradicated in human society, should be addressed through more long-term and systematic measures to eliminate its negative impact and block its spread mechanism. In the era of intelligent communication, social platforms, as the primary channel for the public to obtain information, not only need to promote the deep application of artificial intelligence, but also reshape the communication ecology, bridge social rifts, and maintain the long-term stability of human society. From a more macro perspective, artificial intelligence technology that simulates and expands human intelligence should be embedded in all aspects of human social operation, promoting innovative exploration in various fields including news communication. In the context where human intelligence is insufficient, the use of artificial intelligence to effectively govern social biases should also drive the common improvement of human society's moral and ethical standards while "training" artificial intelligence to overcome its ethical dilemmas.

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