

# Information Dissemination Crisis and Collaborative Co-Governance Model of Algorithmic Recommendation in China

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**Abstract—** While algorithmic recommendation is a new technology being able to collect, filter, and recommend information, this technology has not only the technical attribute which considers the technology as a tool to improve social efficiency, but also the value loaded attribute since it includes the ability of value judgement. The dual attributes could intensify the split of general social value and then different isolated communities are created, leading to the growth of group polarization and the risk of information manipulation and disrupting the ecosystem of information dissemination. To get rid of these negative effects brought by algorithmic recommendation, China should attach importance to build a model of joint governance mainly by the efforts from three subjects, including the intelligent media platforms who should strengthen their social responsibilities and promote their self-regulation; the government who should strengthen regulation on algorithm and improve a more comprehensive legal framework of it; and the users who should be given the right to require the interpretation of how algorithms work and participate in algorithm governance as the co-rulers.

**Keywords—** algorithmic recommendation; technical attribute; value loaded attribute; information dissemination crisis; collaborative governance model

## I. INTRODUCTION

In the era of intelligence, the Internet carries a huge amount of information data, and intelligent media platforms such as Sina and Tiktok have introduced algorithmic recommendation to effectively integrate information data and achieve accurate matching between information distribution and users' personalized needs. The algorithm accurately pictures the *personal portrait* of users, and feeds personalized information to users precisely, thus enhancing users' reliance of these platforms. Algorithms have reshaped the discourse pattern of information dissemination and also brought many challenges of it. Therefore, this paper intends to combine the dual attributes of algorithmic recommendation: *technical and value loaded attributes*, to illustrate the information dissemination crisis caused by algorithmic recommendation, and propose

that China should focus on the collaborative governance model by the joint efforts of three main subjects.

## II. DUAL ATTRIBUTES: TECHNICAL AND VALUE LOADED ATTRIBUTES OF ALGORITHMIC RECOMMENDATION

### A. Technical Attribute of algorithmic recommendations

By collecting, filtering and organizing digital footprints such as registration, reading, searching, browsing and commenting records left by users in cyberspace, algorithmic recommendation can analyze users' parameters comprehensively and systematically, and precisely outline users' interests and preferences, picturing an accurate *personal portrait* of user, thus realizing the technical abilities of algorithmic recommendation for accurately predicting, feeding information and giving feedback.

It should be noted that the process of algorithms is usually seen as *black box*. Put simply, an algorithm is a computer program, which is based on data collection and training, according to the setting mathematical rules to operate and output results. However, even people are informed of what data input and output, they are still unable to understand how the internal process operates. As the definition of *black box* in cybernetics: *A black box is a system in which we can only get its input and output without knowing its internal structure.* [1] Therefore, given the highly technical and complex nature of the *programming plus mathematical rules* of algorithms, non-algorithm professionals, especially the public, will not be able to understand the operation about algorithmic decision-making.

### B. Value Loaded Attributes of Algorithmic Recommendation

Algorithmic recommendation also has the value loaded attribute while promoting huge changes in human life as an edged technology, since this technology is of abilities to collect, filter, feed information with different value preferences like human, which means algorithmic recommendation can actually be the gate keeper of news spread.

The reason why algorithmic recommendation can value something is because there is a whole system including algorithmic operation teams and news values behind

information dissemination.[3] The embedded rules of the code determine that algorithmic recommendation inevitably carries human judgement, manifesting value loaded attributes. In other words, algorithm designers or deployers will embed their own values or subjective intentions more or less in the algorithm. For example, when it comes to data setting selection, variable selection or weight setting, ideas of the developers or deployers are related to the operating logic of algorithmic recommendation. For example, some intelligent media platforms are more likely to embed profit-oriented values into the deployment of algorithmic recommendation for the purpose of enhancing users' reliance, maximizing browsing flow and making biggest profits. [4] However, this value may probably create *dirty data* to pollute the ecosystem of media platforms since it has ignored other positive values like fairness and justice. At the same time, algorithmic recommendation with big data and deep learning skills can dynamically grasp users' value tendencies based on their clicks, dwell time, blocked, retweeted, commented records, and then gradually reshape users' customs and values through accurate distribution of information.

### III. THE INFORMATION DISSEMINATION CRISIS TRIGGERED BY ALGORITHMIC RECOMMENDATION

The above dual attributes of the technology will trigger a crisis in mainstream ideological dissemination, which is reflected in the following two aspects:

#### A. Intensifying the Divergence of Social Values

*Values Divergence* is the process of social ideological structure moving from homogeneous and unidirectional to heterogeneous and pluralistic, splitting into different value biases [5]. Although the algorithm only feed similar information to users, and does not create new contents, similar of same recommendations will form closed information groups, isolating the possibility of various information interactions. In the long run, when the views contained in these groups are repeated and deepened, the received information tends to be homogenized. In this closed circle, people will only hear voices that are similar and same with themselves, which may create deeper prejudices, thus rejecting and refusing other reasonable views and opinions [7]. In this condition, users with the same or similar values will be easily attracted to each other and form similar communities, which are only a kind of pluralistic niche space. The solidification of values in such a pluralistic niche will, to a certain extent, weaken the foundation of social dominant values, increase the risk of collapse of social value consensus, and intensify the divergence of social values.

#### B. Disrupting the Ecosystem of Online Information

As mentioned above, algorithmic distribution of information can easily form a closed information community, giving rise to diverse niche communities with a high degree of homogeneity. In the long run, the different values of different communities will gradually evolve into stereotypical labels that individuals in different communities can use to

distinguish from each other, forming a *Circle Segmentation*. The circle division tends to breed group polarization. As American scholar Keith Sunstein points out: *The Internet is a hotbed of extremism because like-minded people can communicate easily and frequently without hearing different perspectives. Continuing exposure to those extreme opinions may gradually convince people to believe in them.* [8] In addition, the single information environment of algorithmic recommendation makes the online information ecosystem implicitly risky due to information manipulation as *Circle Segmentation* caused by algorithmic recommendation may create opportunities for the spread of disinformation, which is usually spread when public emergencies occur. When the investigation results are not disclosed timely, some may disseminate disinformation and take advantage of people's subconscious customs formed under the algorithmic accurate distribution of information, further spreading disinformation and finally disrupting the online information ecosystem.

### IV. BUILDING A COLLABORATIVE AND CO-GOVERNING ALGORITHMIC RECOMMENDATION MODEL IN CHINA

In response to the mentioned crises triggered by algorithmic recommendation, it is necessary to give full play to the governance functions of intelligent media platforms, governments and users, building a collaborative governance model from the joint efforts of these subjects.

#### A. The Intelligent Media Platform Should Strengthen Social Responsibility and Its Self-regulation of The Algorithm

It is more beneficial for algorithm deployers themselves to regulate the design and operation of algorithms in a self-regulatory manner than relying on regulations from other subjects, since self regulation can achieve higher efficiency about making use of the insights as well as the participation of relevant experts, in which way the regulation can acquire better effects in timeliness and flexibility. [10] Therefore, intelligent media platforms, as the deployers of algorithmic recommendation, should strengthen their own social responsibility and become the subject of collaborative governance especially about dealing with technical problems.

First of all, the platforms should implant some legal and ethical principles such as fairness, justice, public order and morality in the initial design of the algorithm, so as to optimize and dominate the information production, output and distribution with algorithmic recommendation.

Second, given the existence of *black boxes* of algorithm, the fact that value bias of algorithm developers hiding behind the code is often difficult to detect. Therefore, the platforms should provide specialized ethics training services to algorithm developers, so that the front-end containment of ethics training can significantly prevent the operation of algorithms from being embedded with negative value bias.

Finally, in all processes including algorithm production, output and distribution of information, data involving historical nihilism, personal hedonism, extreme nationalism should be blocked intelligently. However, the current intelligent filter cannot function well and it is not easy to

identify the *hidden semantics* among those a bunch of processing information, so it is still necessary to have human intervention when involving filter jobs.

### *B. The Government Should Strengthen Algorithm Regulation and Form An Algorithm Regulated Framework*

The government, as the center of the public power, should also strengthen the supervision of algorithmic recommendation and build a regulatory system for algorithm. It should be noted that there are some legal documents about the regulation of algorithms like *2021 Guidance on Strengthening the Comprehensive Governance of Internet Information Service Algorithms* and the *Draft of Regulations on the Management of Internet Information Service Algorithmic Recommendations* have been released in China. By analyzing these legislation, it is clearly that Chinese government plans to establish a legal framework of algorithm regulation with the idea of classification and grading, and the framework can cover pre-event through post-event.

The primary prerequisite for establishing a classification and grading management system for service providers algorithmic recommendation is to reasonably classify the risk levels of algorithm. Article 55(2) and Article 56(3) of *China's Personal Information Protection Law* have already form a normative group of impact assessment system of personal information protection. Although the law directly refers to personal information protection, it can actually be applied to algorithm regulation. Therefore the risk levels of algorithms can also be set with reference to this normative group. In other words, the algorithms can be also classified into three levels: low risk, medium risk and high risk based on the degree of autonomous decision making, impact on individual rights and interests and applicable conditions. More specifically, the algorithms that process data completely according to the predetermined procedures and do not have algorithmic autonomy and affect personal rights and interests or social public interests can be classified as low-risk algorithms, which are currently mainly used in the place like online translation, games and entertainment; Algorithms that are operated by collecting user information and acting as an aid to human decision-making, which may infringe on personal rights and interests and social public interest, can be classified as medium-risk algorithms, which are mainly used in search engines, news feeding, judicial assistance and other similar conditions. High-risk algorithms refer to those that completely replace human decision-making by algorithmic autonomous decision-making and have a direct impact on personal rights and interests and social public interests, which are currently mainly used in the ares such as financial areas, credit scoring and administrative decision-making.

Based on the above classification, in terms of pre-event supervision, a loose filing system should be adopted for algorithmic recommendation providers using low-risk algorithm, while an approval system should be adopted for those using medium and high-risk algorithm, and a corresponding degree of algorithmic information disclosure should be mandatory to these groups. The degree of this

disclosure obligation should consider the balance between the right to know of the the public and the intellectual property rights of the providers, preventing the providers from disclosing too many technical details involving trade secrets, which have great deal with the profits of the providers. What's more, as for the regulation of ongoing algorithm deployment, it is necessary to establish a sound monitoring and evaluation system about whether the security degree of algorithm is under the scope of the mentioned risk levels. More specifically, for low-risk algorithms, the relevant authorities should carry out regular monitoring and assessment, while for the medium and high-risk algorithms, they should not only carry out regular detection and assessment, but also real-time monitoring and assessment of defects and vulnerabilities in algorithm design, deployment and application, in order to timely find out and respond to the problems of algorithm application security. In post-event supervision, the providers should be required to effectively record and properly store information related to the core aspects of algorithmic recommendation such as the selection of data sets, so that the relevant authorities can examine whether the providers have obeyed the regulation at any time.

### *C. Users Should be Empowered with The Right to Require Algorithm Interpretation and to Act as Governance Co-rulers*

as the service object of algorithmic recommendation, users' interests are directly related to algorithmic recommendation, so the user should be eligible to enjoy the corresponding rights, and should also be an important part of algorithm regulation.

The key to users to be algorithm governance collaborators is to make them have the right to require algorithm interpretation. Regarding this right, Article 24(3) of the *Personal Information Protection Law* has already mentioned: *If a decision that significantly affects the rights and interests of an individual is made by means of automated decision-making, the individual has the right to request the processor of personal information to explain it.* This article limits the scope of application of the right in the use of automated decision-making. Article 73(2) of the Law defines automated decision-making as: *activities that automatically analyze and evaluate the behavior, interests, or economic, health, or credit status of individuals through computer programs and make decisions.* Therefore, if analyzed the article 73(2) purely in contextual way, it seems that automated decision-making only relates to decisions made exclusively by computer programs, and does not include assisted algorithmic decisions with human intervention. Under this rule, it seems that intelligent media platforms that use algorithmic recommendation to accurately distribute information may not be included in the scope of regulated entities since algorithmic recommendation may involves human factors.

In fact, the assisted algorithmic decision making with human intervention cannot be excluded from the scope of applicable condition of the right to require algorithmic interpretation metaphysically from the perspective of textual manner alone, but should be reasonably interpreted related to

the purpose of the law. The purpose of the *Personal Information Protection Law* is to protect the public rights and interests of personal information, regulate personal information processing activities and promote the reasonable use of personal information. As mentioned above, the risk levels of algorithms that operate by collecting user information and acting as an aid to human decision-making should be positioned as a medium-level algorithm, which is of the possibility of violating the rights and interests of individuals and the public interest. Therefore, it is not in line with the purpose of the law to totally exclude the condition of having human intervention, rather, the law should include the situation when the human factor has no actual supervisory significance and cannot change or influence the result of the decision, which should still be classified as a type of automated decision.

In addition, although Article 24(3) of the *Personal Information Protection Law* provides a legal basis for users to exercise their right to require algorithmic interpretation, it also limits the use of the rights: users only have the right when the decisions have a significant impact on the rights and interests of individuals. With regard to what constitutes a decision with significant impact on personal rights and interests, *China's Technology -Personal Information Security Impact Assessment Guideline* divides the impact on personal rights and interests into four dimensions: 1) restricting the individual rights to make decisions with their own will; 2) causing differential treatments; 3) damaging personal reputation or mental health; and 4) damaging personal body or property. In the appendix of this guideline, the degree of impact on personal rights and interests is classified as *severe, high, medium and low*, and the corresponding determination criteria is clearly defined. At the same time, the guideline also sets out the specific criteria for determining the degree of impact on personal rights and interests in the appendix, taking into account the above four dimensions of personal rights and interests. Accordingly, these criteria and standards can be referred to in practice to determine what decisions are with significant impacts on personal rights and interests, and those with serious and high levels of impacts on personal rights and interests will be defined as the decision having significant impacts.

As for the limitation of algorithm interpretation, social utility and applicable conditions should be considered. When the use of algorithm like the use in medical areas which is highly related to the personal interests and sensitive information of individuals, the messages of the algorithm explanation should be understood by individuals as much as possible. But if the use of algorithm is closely related to the commercial areas which are usually regarding business secrets, the right of requiring algorithm interpretation should not consider personal interests alone, and the interests between the individual and the enterprise should be balanced, reasonably constraining the contents of the explanation.[13] Since this paper mainly focuses on the problems related to the use of algorithmic recommendation in intelligent media platforms, the discussion about the limitation of the degree of algorithm

interpretation will be fixed in the scope of news recommendation and distribution.

As mentioned above, news recommendation and distribution play an extremely important role in the orientation of individual values, and the algorithmic recommendation may lead to individual social values gradually evolve into different groups values, resulting in the risk of polarization within different groups as well as information manipulation, thus jeopardizing the security of national ideology. Therefore, in terms of news recommendation and distribution, algorithmic interpretation is closely related to social public interests, and what should be explain to the public should consider the balance between individuals and enterprises. In addition, due to the the *black box* of algorithm, the legality of the algorithm model may be used as a way of regulation: When the algorithm model initially conforms to the legislative requirements, the deployer of the algorithm can be exempted from further explanation of the algorithm model, thus avoiding imposing excessive obligations of explanation on these subjects.

## V. CONCLUSIONS

The governance of algorithmic recommendations is a major issue in intelligent era, and this technology should be regulated as the subject that has both technical and value loaded Attributes . From current practices, this technology is not definitely neutral, and based on code embedded rules, algorithm deployers and users are more or less embedded their values into the algorithm. as Neil Postman has said: *Every technology has an intrinsic bias, and under its material appearance it often shows tendencies about what it is going to be used for. Only those who are ignorant of the history of technology can believe that it is completely neutral.* [14]. At the same time, algorithmic recommendations have intensified the formation of closed space of information due to reliably receiving similar or same values, deepening people's original bias and even forming circle compartments, breeding group polarization and deriving the risk of information manipulation, which in turn disrupts the online information ecosystem. The purpose of governance algorithmic recommendation is not to completely eliminate the algorithmic recommendation, but to figure out the technical operation logic and value judgment behind the it, and through systematic thinking and institutionalized regulation, to promote creation like the algorithmic recommendation is in the form of technical tools for the benefits of human beings.

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