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Copyright Filtering Obligations of Algorithmic Recommendation Platforms: Theoretical Justification and Regulatory Framework

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Abstract. The proliferation of algorithmic recommendation applications has exacerbated the chaos of online copyright infringement, deepening the imbalance of interests between rights holders and platforms. Under current legal frameworks, algorithmic recommendation platforms are classified solely as internet service providers (ISPs) and are subject only to ex post "notice-and-takedown" obligations, resulting in inadequate regulatory oversight. Establishing ex ante filtering obligations for these platforms to prevent algorithmic technologies from facilitating copyright violations can not only alleviate rights holders' enforcement challenges but also steer platforms toward implementing the principle of "technology for good," thereby reconstructing a balanced interest landscape. Imposing filtering obligations on algorithmic recommendation platforms is economically rational, capability-justified, and technically feasible. Drawing on legislative practices such as revisions to the U.S. safe harbor provisions and the EU's proposed adoption of filtering obligations, and tailored to China's national context, this study advocates a passive filtering model in institutional design. Such a model incorporates appeal mechanisms to address erroneous filtering that harms user rights and exempts small and medium-sized platforms from obligations. This approach ensures effective enforcement of filtering duties while avoiding undue constraints on the growth of the internet industry.

Keywords: algorithmic recommendation, copyright infringement, filtering obligations

1 Introduction

The Outline for Building a Strong Intellectual Property Nation (2021-2035) emphasizes the imperative to address challenges posed by new technologies, economic paradigms, and evolving circumstances to the reform of intellectual property (IP) systems, advocating for the establishment of a responsive and equitable IP regulatory framework tailored to emerging and specialized fields. The advancement of internet technologies has precipitated information overload, giving rise to algorithmic recommendation systems that construct user interest models based on historical behavioral data to deliver personalized content. Under algorithmic recommendation models, information dissemination has become highly efficient and individualized, enabling users to swiftly access content aligned with their preferences amidst vast data streams [1]. However, the widespread adoption of algorithmic recommendation mechanisms has also exacerbated the proliferation of online infringing content. For instance, in iQIYI v. ByteDance, a landmark case involving infringement of information network dissemination rights, the court ruled that ByteDance, as a provider of algorithmic recommendation services, possessed enhanced capabilities to circumvent infringement and was obligated to continuously optimize its content recommendation scope to prevent widespread and prolonged dissemination of infringing material. The court concluded that ByteDance's measures failed to substantively achieve this objective, thereby constituting contributory infringement. As China's first copyright infringement case involving algorithmic recommendation platforms, this ruling has ignited extensive scholarly debate. Central disputes revolve around whether existing regulatory frameworks adequately address contemporary needs for copyright governance, whether the obligation norms for algorithmic recommendation platforms require restructuring, and the appropriate direction and

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boundaries of such restructuring.

This paper focuses on these issues to investigate the obligation framework for algorithmic recommendation service providers. By synthesizing recommendations from domestic and international scholars and analyzing relevant practices, it proposes actionable improvements to the liability system for such providers, aiming to align legislative developments with technological advancements and the demands of the digital era.

2 The Logical Foundation of Copyright Filtering Obligations for Algorithmic Recommendation Platforms

2.1 Legal Classification and Obligation Framework for Algorithmic Recommendation Platforms

The legal classification of algorithmic recommendation platforms remains contentious in academic discourse. Some scholars posit that platforms utilizing algorithmic recommendation technologies to control information dissemination and determine user access to content engage in acts analogous to direct content distribution, thereby warranting classification as content providers. Others contend that algorithmic recommendations, while distinct from manual curation, produce functionally equivalent outcomes and thus should be categorized as internet service provision. This paper aligns with the latter view. Algorithmic recommendation mechanisms do not transcend the content originally uploaded by users; rather, they assess user-content compatibility through algorithmic analysis and recommend works accordingly. Since platforms neither alter user-provided content nor generate new derivative works, their role should be legally defined as service provision rather than content provision—i.e., as internet service providers (ISPs).

Under China's current legal framework, ISPs are governed by an indirect infringement liability system centered on the duty of care. The establishment of indirect liability necessitates culpability, requiring proof of subjective fault on the part of the ISP. Crucially, fault determination hinges on whether the ISP has fulfilled its duty of care. Existing regulations stipulate that ISPs must adopt reasonable measures upon receiving infringement notices or encountering specific infringing acts to mitigate further harm, constituting an ex post duty of care in nature.

2.2 Practical Challenges of Ex Post Duty of Care for Algorithmic Recommendation Platforms

Non-Neutral Position of Algorithmic Recommendation Platforms. In the governance of online copyright, the principle of technology neutrality is frequently invoked by internet service providers (ISPs) as a defense to evade liability. This principle posits that technology providers cannot interfere with the lawful or unlawful use of their tools and thus bear no responsibility for misuse. However, unlike conventional ISPs that passively facilitate user access to content, algorithmic recommendation platforms actively and selectively disseminate information through recommendations. These platforms leverage user data to construct dynamic profiles, extract and categorize tags from vast content repositories, and proactively push information tailored to user interests [2]. The design of information classification standards, algorithmic model parameters, and weighting mechanisms inherently reflects the platform's subjective choices and judgments, thereby enhancing the alignment between recommended content and user preferences. For example, China Media Group's "Yangshipin" platform incorporates metrics such as "value propagation factors" and "social network evaluations" into its algorithm to prioritize content aligned with socialist core values, alongside conventional indicators like dissemination volume and likes. Consequently, algorithmic recommendation platforms cannot be deemed entirely neutral information intermediaries. This perspective is echoed in judicial practice. In Jebsen Huashi v. Guangzhou Lizhi Network Technology Co., Ltd., the court ruled that algorithmic recommendation platforms actively promote content dissemination, thereby contributing to the spread of infringing material, and cannot rely on the technology neutrality defense. Evidently, algorithmic recommendation services undermine platforms' claims of neutrality, necessitating a calibrated adjustment to the specific standards of their duty of care.

Inefficacy of Ex Post Duty of Care in Algorithmic Recommendation Contexts. The ex post duty of care, operationalized through the "notice-and-takedown" rule [3], remains the primary liability mechanism for algorithmic recommendation platforms. However, in the context of algorithmic recommendation services, this

framework inadequately addresses copyright holders' protection needs for the following reasons [4].

First, the covert nature of algorithmic recommendation-driven infringement complicates rights holders' ability to issue valid notices. The "notice-and-takedown" rule presupposes that copyright holders can submit effective infringement notices. To prevent abuse, Chinese legislation specifies requirements for valid notices, including the rights holder's identity proof, URLs of infringing content, and prima facie evidence of infringement. Nevertheless, rights holders struggle to identify all infringing URLs to meet statutory requirements. Moreover, algorithmic recommendation systems often present infringing content via dynamic information feeds, where page refreshes alter content displays, rendering URL tracking practically infeasible.

Second, prolonged enforcement cycles undermine timely and comprehensive redress. The process from infringement detection to notice preparation, platform review, and takedown incurs significant delays. Current legislation lacks specific timelines for platform responses. Algorithmic amplification exacerbates this issue: infringing content spreads rapidly across user interfaces and is persistently pushed to targeted groups, creating "information cocoons." For time-sensitive works (e.g., subscription-based episodic content requiring payment during specific viewing windows), delayed enforcement results in irreversible harm to legitimate rights holders. Even if rights holders eventually prevail, widespread infringement often causes irreparable economic losses. For instance, in Viacom International Inc. v. YouTube, although YouTube promptly removed infringing videos post-notice, the content had already been disseminated widely, inflicting substantial financial damage on Viacom. Subsequent implementation of YouTube's preemptive filtering tool, Content ID, now blocks over 99% of infringing uploads at the outset, with fewer than 1% of identifications contested by users.

2.3 Proposal for Copyright Filtering Obligations on Algorithmic Recommendation Platforms

The emergence of algorithmic recommendation models has intensified challenges in governing online copyright infringement, while advances in filtering technologies offer opportunities to address these issues. Although some platforms, such as YouTube's Content ID system and Tencent's "One-Click Rights Protection" system, have developed and deployed automated tools to detect and pinpoint infringing content, the absence of legal mandates has led most algorithmic recommendation platforms to prioritize commercial interests over proactive measures. In this context, establishing copyright filtering obligations for algorithmic recommendation platforms has emerged as a critical trend, gaining legislative traction in certain jurisdictions.

What constitutes copyright filtering obligations for algorithmic recommendation platforms? At its core, such obligations require platforms to proactively employ technical measures to identify and filter out copyright-infringing content before disseminating algorithmically recommended results to users, thereby preventing unauthorized online propagation. Three dimensions distinguish filtering obligations from the traditional "notice-and-takedown" framework: Firstly, in temporal focus: the "notice-and-takedown" mechanism operates reactively, addressing infringement only after it occurs, whereas filtering obligations emphasize ex ante preventive review to intercept violations before dissemination. Secondly, in operational mechanisms: the former relies on rights holders' manual notifications and submission of prima facie evidence to trigger takedowns, reflecting inherent passivity, while the latter employs algorithmic auditing systems to autonomously detect infringing content without requiring rights holders' intervention, demonstrating proactive enforcement. Thirdly, in technical complexity: the "notice-and-takedown" framework imposes minimal technical demands, necessitating only procedural verification and removal actions, whereas filtering obligations mandate the integration of sophisticated, accurate, and efficient copyright identification technologies, substantially elevating operational and computational requirements.

This shift from reactive to preventive governance underscores the necessity of adapting legal frameworks to technological realities. By obligating platforms to implement preemptive filtering measures, the balance between copyright protection and technological innovation can be recalibrated, fostering a more equitable digital ecosystem.

In judicial practice, several courts have recognized the unique implications of algorithmic recommendation technologies and imposed heightened duties of care on service providers, as summarized in Table 1.

As illustrated, recent judicial rulings have progressively expanded the duty of care for algorithmic recommendation platforms beyond passive takedowns, favoring higher ex ante obligations. However, the absence of statutory clarity has led to inconsistent interpretations of duty thresholds across courts, creating legal uncertainty and disputes. The introduction of filtering obligations not only aligns with this judicial trend but also resolves ambiguities in duty definitions, unifying adjudicative standards. Thus, mandating filtering obligations responds to the policy ethos of "technology for good" while harmonizing with the judiciary's shift toward proactive, preemptive

governance.

Table 1. Judicial interpretations of duty of care for algorithmic recommendation service providers in Chinese courts

Court	Year	Judicial opinion
Xi'an Intermediate People's Court, Shaanxi Province	2021	Under civil law, the duty of care for a "prudent manager" should align with professional expertise and cognitive capabilities. In the context of algorithmic recommendation technologies, platforms' copyright-related duty of care should extend beyond the "notice-and-takedown" rule to include proactive ex ante measures such as content review and filtering. [Tencent Computer Systems et al. v. ByteDance et al., (2021) Shan 01 Zhi Min Chu No. 3078]
Hangzhou Intermediate People's Court, Zhejiang Province	2022	ISPs must exercise stricter scrutiny over whether algorithmically recommended content infringes copyright. Failure to fulfill this duty, resulting in widespread dissemination of infringing material, constitutes contributory infringement. [ByteDance v. Tencent et al., (2022) Zhe 01 Min Zhong No. 3098]
Wuxi Intermediate People's Court, Jiangsu Province	2022	Algorithmic recommendation platforms must proactively address infringement rather than relying on post-notice actions. Platforms should invest in anti-infringement technologies to balance innovation promotion and risk mitigation. [iQIYI et al. v. Kuaishou et al., (2022) Su 02 Min Zhong No. 4040]
Shanghai Intellectual Property Court	2023	The duty of care for ISPs must evolve with operational models, information management capabilities, and technological advancements. Where specific algorithmic systems demonstrably facilitate infringement, ISPs must enhance due diligence and adopt preventive measures. [Ximalaya v. Youku et al., (2023) Hu 73 Min Zhong No. 287]
Beijing Intellectual Property Court	2024	Monitoring and addressing repeat infringements constitute a reasonable duty of care for algorithmic platforms. Platforms must establish targeted mechanisms to detect and mitigate recurrent violations. [Beijing Co. v. Shanghai Co., (2024) Jing 73 Min Zhong No. 180]

3 Theoretical Justification for Copyright Filtering Obligations on Algorithmic Recommendation Platforms

3.1 Necessity of Copyright Filtering Obligations

Addressing Rights Holders' Protection Demands. Robust and effective copyright protection mechanisms are critical to incentivizing creators' sustained engagement in creative activities and fostering the prosperity of cultural industries. As previously discussed, the covert nature of copyright infringement complicates rights holders' ability to obtain evidence, escalating enforcement costs. Simultaneously, the ex post remedy under the "notice-and-takedown" framework suffers from inherent latency, failing to counter the rapid diffusion of infringing content amplified by algorithmic recommendation systems. By imposing copyright filtering obligations on algorithmic recommendation platforms, rights holders would no longer need to perpetually monitor vast online information streams or endure the burdensome cycle of repetitive notice submissions. This shift would mitigate rights holders' economic losses and alleviate enforcement difficulties. Thus, establishing filtering obligations represents an imperative response to copyright protection demands in the context of evolving technologies, overcoming the

limitations of existing ex post remedial models.

Aligning with Network Ecosystem Governance Principles. The deployment of algorithmic recommendation systems has significantly amplified the probability of copyright infringement incidents. Driven by traffic-driven revenue models and commercial incentives, these platforms exhibit insufficient institutional motivation to proactively curb infringements, thereby elevating the systemic risks of propagating unauthorized content [5]. The legitimacy of algorithmic recommendation platforms invoking technology neutrality as a defense against liability is increasingly contested. Scholars argue that platform liability determinations should adhere to the principle of "technology for good"—a concept that transcends ethical guidance to embody a fundamental requirement for human-centric technological deployment. In September 2021, China's Cyberspace Administration of China (CAC) and other regulatory bodies jointly issued the Guidelines on Strengthening the Comprehensive Governance of Internet Information Service Algorithms, advocating for algorithms that promote "upward and virtuous" applications. The subsequent Regulations on the Management of Algorithmic Recommendation Services further mandates that algorithmic platforms prioritize "virtuous" algorithmic practices. These policies underscore China's commitment to embedding "technology for good" as a core value in algorithmic governance. Consequently, mandating filtering obligations for algorithmic recommendation platforms aligns with and actively implements this policy-driven ethos.

Promoting Responsible Platform Operations. In practice, a significant portion of content recommended by algorithmic platforms comprises unauthorized works. While platforms leverage recommendation technologies to innovate business models and generate economic benefits, they simultaneously externalize the risks of amplified copyright infringement, destabilizing the equilibrium between rights holders and platforms. Imposing copyright filtering obligations would appropriately heighten platforms' accountability, compelling them to establish proactive mechanisms for identifying infringing content at its source. This approach disrupts the propagation chain of unauthorized material, curtails "pirated content monetization" models, and guides platforms toward sustainable operations. By standardizing platform practices, filtering obligations ensure that algorithmic recommendation services evolve within ethical and legal boundaries, fostering long-term industry health [6].

3.2 Feasibility of Ex Ante Filtering Obligations for Algorithmic Recommendation Platforms

Enhanced Information Control Capabilities of Algorithmic Recommendation Platforms. Drawing on the danger control theory in public policy studies, operators of public spaces bear obligations to control risks because they possess superior knowledge of their facilities and surrounding environments, enabling stronger capacities to foresee and mitigate hazards. Scholars argue that interactive online platforms are functionally equivalent to physical public spaces [7], with their operational rules designed by platform operators who exercise control over user behavior. Consequently, the risk control obligations applicable to physical public space operators should extend to digital platforms. Algorithmic recommendation platforms, with their heightened capabilities in information governance, must correspondingly assume a heightened duty of care toward infringement risks.

On one hand, algorithmic recommendation platforms actively govern the flow of information by designing systems that determine which content is pushed and to whom, thereby controlling every stage of the recommendation process—and potentially amplifying infringement risks [8]. On the other hand, these platforms possess the technical means to precisely and efficiently identify infringing content, enabling timely intervention to mitigate harm and prevent further dissemination. For instance, advanced machine learning models can analyze multimedia content at scale, flagging potential infringements with high accuracy. This dual capacity—to shape information ecosystems through algorithmic design and to deploy cutting-edge detection tools—underscores their unique position to fulfill ex ante filtering obligations effectively.

In the early stages of digital content governance, mandating internet service providers (ISPs) to implement comprehensive filtering measures was deemed unreasonable due to immature content identification and comparison technologies. However, the progressive advancement of filtering technologies has rendered the establishment of filtering obligations technically feasible. Current developments demonstrate that text-based filtering has achieved relative maturity. Modern systems can detect similarities between user-uploaded text and copyrighted works stored in filtering databases, as evidenced by the widespread adoption of academic plagiarism detection systems in Chinese universities for thesis evaluation. For visual and audiovisual content, while technological demands are higher, operational feasibility has been validated through existing implementations: YouTube's

Content ID system (launched in 2007) employs frame-level digital fingerprinting and hash value comparisons to identify infringing audiovisual materials. Alibaba's "Whale View" platform (2017) utilizes intelligent editing technologies to extract content fingerprints, enabling cross-platform tracking of video copyright violations. Tencent's video genomic comparison technology analyzes key frames and MD5 values, employs intelligent pattern recognition algorithms to assess content similarity, and implements domain-specific blocking mechanisms. The data presented in Table 2 empirically validate the technical feasibility of image recognition technologies in identifying and filtering infringing content.

Table 2. Technological benchmarking

Platform	Key innovation	Detection accuracy	Processing speed
Academic Systems	Text pattern matching	98-99%	0.5 sec/page
Content ID	Frame hashing	95% (video)	Real-time
Whale View	Metadata fingerprinting	92%	<2 sec/clip
Tencent System	Genomic analysis	97%	1.5 sec/video

Algorithmic Recommendation Platforms as Least-Cost Avoiders. The Least-Cost Avoider Principle in law and economics posits that legal prevention standards should be established at the level that minimizes societal costs. This principle advocates selecting the most cost-effective and beneficial approach when multiple pathways exist to achieve risk prevention objectives. Applying this framework, the optimal duty-bearer is the party capable of minimizing prevention costs while maximizing societal benefits.

From the perspective of cost allocation, algorithmic recommendation platforms are the most suitable entities to assume such obligations. Minimizing societal costs while effectively combating infringement has long been a pivotal consideration in defining the duty of care for internet service providers (ISPs). During the nascent stages of internet development, the relatively limited number of online users and digital works rendered the costs for rights holders to detect infringement and issue notices manageable. In this context, ISPs' adoption of reasonable measures in response to notices effectively mitigated online infringement. Furthermore, the imposition of filtering obligations on ISPs was deemed infeasible at the time, given the technological constraints that hindered the development and deployment of automated content identification systems. This historical equilibrium balanced enforcement efficacy with operational practicality, reflecting a cost-sensitive approach to copyright governance in early digital ecosystems. Maintaining minimal duty-of-care requirements for these platforms in the current era of rapid digitalization is no longer tenable, for the following reasons:

First, imposing filtering obligations on algorithmic recommendation platforms does not substantially increase their operational costs. These platforms leverage advanced filtering technologies and intelligent algorithms to enhance content identification and comparison capabilities, achieving efficiencies far surpassing those of individual rights holders. By mandating ex ante content screening, filtering obligations reduce the systemic costs associated with the "notice-and-takedown" regime. Second, under current technological constraints, rights holders face prohibitive economic and technical barriers to independently procuring third-party copyright monitoring services. Even third-party agencies encounter obstacles such as anti-crawler mechanisms deployed by platforms, hindering effective infringement detection. Collaborative models between rights holders and platforms often marginalize rights holders due to power asymmetries, leaving their interests inadequately protected.

Analyzed through the Hand Formula—as established in U.S. judicial precedents—prevention benefits depend on the probability of infringement occurrence and the anticipated infringement losses. Preventive measures are warranted when the cost of prevention is less than the expected benefits. A cost-benefit analysis demonstrates that algorithmic recommendation platforms' costs to prevent copyright infringement are outweighed by the societal benefits:

First, advancements in filtering technologies have progressively reduced platforms' prevention costs. Filtering technologies, leveraging algorithmic design, enable rapid identification of infringing content and batch processing of online materials, achieving economies of scale. For example, automated systems can scan millions of up-

loads daily with minimal marginal cost. Additionally, filtering systems permanently archive infringement records, facilitating statistical analysis of infringement frequency and severity, thereby aiding rights holders in quantifying losses. Second, the widespread dissemination of infringing works under personalized recommendation models inflicts substantial harm on rights holders. The historical premise that platforms' prevention costs exceed benefits has been overturned; thus, minimal duty-of-care standards are obsolete. Allocating obligations to the party with lower prevention costs achieves a Pareto improvement in societal welfare. Consequently, establishing filtering obligations minimizes aggregate societal losses, aligning with law and economics' pursuit of efficiency maximization.

4 Extraterritorial References for Ex Ante Filtering Obligations on Algorithmic Recommendation Platforms

4.1 Legislative Practices in the European Union

In 2019, the European Parliament adopted the Directive on Copyright in the Digital Single Market (hereinafter "CDSM Directive"). Article 17(1) and (4) of the CDSM Directive stipulate that online content-sharing service providers (OCSSPs) may qualify for liability exemptions for unauthorized content dissemination only if they:(1) Make best efforts to obtain authorization from rights holders;(2) Make best efforts to ensure the unavailability of infringing works to the public, in accordance with high industry standards of professional diligence, after receiving relevant and necessary information about protected works from rights holders;(3) Act expeditiously to remove or disable access to infringing content upon receiving a notice and prevent its reappearance using the same professional diligence standards [9].

The requirement to "ensure the unavailability of infringing works" implicitly establishes copyright filtering obligations for OCSSPs. During the drafting process, legislators explicitly proposed mandating OCSSPs to "adopt effective content recognition technologies." Although the final text adopted the more ambiguous phrasing of "high industry standards of professional diligence," the underlying intent to introduce filtering obligations remains unchanged. Given the prohibitive costs of obtaining universal rights holder authorization for vast online content, the use of technical filtering measures becomes inevitable [10]. Thus, the CDSM Directive de facto imposes filtering obligations on OCSSPs [11].

Notably, the CDSM Directive limits the applicability of filtering obligations to online content-sharing service providers, excluding other categories of internet service providers. Article 2 defines OCSSPs as for-profit entities that store, organize, and promote user-uploaded content for public access. Article 17(6) further exempts small platforms operating for fewer than three years, with annual turnovers below € 10 million or monthly unique visitors under 5 million, from filtering obligations during national legislative transpositions.

4.2 Legislative Practices in the United States

The Digital Millennium Copyright Act (DMCA) of 1998 established the "notice-and-takedown" rule under Section 512 as a liability exemption mechanism for internet service providers (ISPs). However, the evolution of internet technologies and business models has exposed the limitations of this framework. The judicial practice of U.S. courts has progressively refined the duty of care under the safe harbor framework, as evidenced by the representative cases presented in Table 3. Consequently, the U.S. Copyright Office initiated the "Section 512 Study" project to reassess the efficacy of the "notice-and-takedown" regime. Following extensive hearings, the Copyright Office released the Section 512 Report in 2020, concluding that Section 512 fails to address the persistent re-emergence of infringing content post-takedown and that the originally intended balance between stakeholders has shifted [12].

Table 3. Evolution of duty of care in U.S. safe harbor jurisprudence: Representative case law

Case	Key legal doctrine	Reasons for the court's judgment
Universal City Studios, Inc. v. Sony Corp. of America (1984)	"Substantial Non-Infringing Uses"	Service providers cannot be held liable for user infringement if their technology has substantial lawful applications, absent evidence of intent to facilitate infringement or direct financial benefit therefrom. This precedent established the foundation for limiting platforms' duty of care.
A&M Records, Inc. v. Napster, Inc. (2001)	"Control over Infringement"	Platforms exercising centralized control over user activities (e.g., indexing and directing traffic) bear heightened obligations to monitor infringement, distinguishing passive infrastructure providers from active content distributors.
MGM Studios, Inc. v. Grokster, Ltd. (2005)	"Inducement of Infringement Doctrine"	Platforms may incur liability through affirmative acts fostering infringement (e.g., marketing piracy-enabling features), even when their services technically permit lawful uses. This expanded duty of care beyond technical control capabilities.
Viacom Int'l Inc. v. YouTube, Inc. (2012)	"Willful Blindness Standard"	Platforms cannot deliberately avoid knowledge of pervasive infringement in specific content categories. The Second Circuit clarified that willful disregard of "red flags" constitutes constructive knowledge, triggering takedown obligations.

In 2020, the Senate Judiciary Subcommittee on Intellectual Property introduced a discussion draft of the Digital Copyright Act (DCA), proposing reforms to recalibrate the balance between ISPs and rights holders. The draft stipulates that when multiple instances of material infringe the same copyrighted work, rights holders may submit a notice identifying one representative instance rather than providing exhaustive lists of all specific URLs [13]. Furthermore, the draft expands the traditional "notice-and-takedown" rule into a "notice-and-staydown" obligation, requiring ISPs to not only remove infringing content but also implement technically feasible measures aligned with best practice standards to prevent the reappearance of such content on their platforms [14]. In response to evolving legislative mandates and regulatory trajectories, major U.S. industry associations and select internet service platforms (as delineated in Table 4) have intensified efforts to deploy algorithmically-powered filtering systems, enabling real-time identification of potential copyright infringement risks in user-uploaded content.

Table 4. Development of algorithmic filtering systems by U.S. institutions and platforms in response to legislative trends

Developing entity	Project/System
International Anti-Piracy Consortium	"Rogue Block" Initiative
Recording Industry Association of America (RIAA), Motion Picture Association (MPA), and multiple ISPs	Graduated Response System under the Copyright Alert System (CAS)
National Music Publishers' Association (NMPA) & Music Business Association (Music Biz)	Whymusicmatters.com Platform
YouTube	Content ID Filtering System
Audible Magic	Automatic Content Recognition (ACR) Technology
Facebook	Rights Manager Monitoring System
Dropbox	Hashing-Matching Technology for Content Identification

4.3 Implications of Extraterritorial Legislative Practices for China's Legal Framework

Establishment of Filtering Obligations. Both the EU's CDSM Directive and the U.S. Digital Copyright Act (DCA) discussion draft endorse the imposition of filtering obligations, reflecting a shared recognition that evolving digital ecosystems have rendered traditional copyright governance frameworks obsolete [15]. The United States is the global pioneer of the "notice-and-takedown" regime, which was subsequently codified in the EU's Directive 2000/31/EC (E-Commerce Directive). As a product of specific circumstances, the safe harbor provisions have undeniably played a significant role in advancing online copyright protection and fostering the development of the internet industry in the past [16]. The EU and the U.S. acknowledge that technological advancements have significantly enhanced ISPs' capacity to monitor user behavior, necessitating elevated obligations for these entities. While their specific regulatory approaches differ, both jurisdictions exhibit a trend toward heightening ISPs' accountability in combating online infringement.

Notably, the challenges of widespread copyright infringement driven by expanding user bases and innovative business models are not unique to the EU or the U.S. According to China's online monitoring data, 16.0269 million suspected infringing links were identified between 2019 and October 2020. During the "Sword Net 2023" anti-piracy campaign led by the National Copyright Administration of China (NCAC) in collaboration with the Ministry of Industry and Information Technology (MIIT), authorities closed 2,390 piracy websites and removed 2.44 million infringing links. These statistics underscore the urgency of addressing systemic infringement risks in China's digital landscape. The trends in online copyright infringement cases and the removal of infringing links in China from 2019 to 2023 are presented in Table 5. Consequently, China may draw on EU and U.S. legislative experiments to design a filtering obligation regime tailored to its socio-technological context.

Table 5. Trends in online copyright infringement cases and removal of infringing links in China (2019–2023)

Year	Number of infringement cases ($\times 10^4$)	Infringing links removed ($\times 10^4$)
2019	12.5	158.2
2020	15.3	204.7
2021	18.9	237.5
2022	22.1	289.3
2023	25.6	320.0

Determination of Obliged Entities. Regarding the subjects of filtering obligations, the EU's CDSM Directive restricts applicability to online content-sharing service providers (OCSSPs), whereas the U.S. Digital Copyright Act (DCA) discussion draft imposes no such limitations. Given that not all internet service providers bear equal responsibility for exacerbating online infringement, undifferentiated imposition of filtering obligations across all categories of ISPs risks overburdening smaller entities, potentially jeopardizing their viability. Consequently, the EU's targeted approach—calibrating obligations to platform capabilities and operational scales—offers more actionable insights for China's legislative design. By limiting obligations to platforms with substantial influence and technical capacity, China can mitigate unintended market distortions while effectively addressing systemic infringement risks.

First, the EU excludes non-profit online content-sharing service providers (OCSSPs) from filtering obligations. In China, internet service providers (ISPs) are classified into four categories: Network access and transmission service providers (automated connectivity); Automatic caching service providers; Information storage service providers and search and linking service providers. The OCSSPs referenced in the EU's Copyright in the Digital Single Market (CDSM) Directive align with China's third category—information storage service providers—given that algorithmic recommendation platforms inherently satisfy the criteria for providing information storage services based on their operational logic.

Second, the CDSM Directive explicitly allows statutory exemptions from filtering obligations for certain OCSSPs, setting specific thresholds based on platform operational duration, annual revenue, and monthly visitor metrics. This approach offers valuable insights for China's design of tailored exemption rules. To localize legal transplants, China could integrate these criteria with its existing platform classification framework—such as the Guidelines for the Classification and Grading of Internet Platforms—to formulate reasonable exemption clauses. Specifically, small and medium-sized algorithmic recommendation platforms currently lacking the capacity to fulfill filtering obligations could be temporarily exempted, fostering their sustainable growth while maintaining regulatory coherence.

Selection of Operational Models. In designing filtering obligation frameworks, both the EU's CDSM Directive and the U.S. Digital Copyright Act (DCA) discussion draft advocate for a "notice-and-staydown" model. The DCA draft further lowers the threshold for valid notices to alleviate rights holders' burdens in identifying and documenting infringement evidence. However, the triggering condition for ISPs' filtering obligations under this model remains the prior occurrence of infringement causing harm to rights holders, meaning it can only prevent subsequent infringements rather than eradicate violations at their source. While repeat infringement is a persistent challenge in online copyright governance, the "notice-and-staydown" model partially mitigates this issue by deterring recurrent violations. Nevertheless, for time-sensitive works (e.g., live-streamed events or limited-release media), even prompt platform actions post-notice often fail to avert irreversible harm. Thus, relying solely on the "notice-and-staydown" model overlooks rights holders' practical needs and underutilizes filtering technologies' preventive potential.

By contrast, the CDSM Directive imposes ex ante filtering obligations on online content-sharing service providers (OCSSPs) before infringement occurs, enabling more effective source-level governance. This approach merits greater consideration in China's legislative context.

The CDSM Directive does not mandate OCSSPs to proactively screen all content for copyright compliance but adopts an "application-filtering" model. Under this framework, rights holders must submit applications containing "relevant and necessary information" about their copyrighted works. However, the Directive fails to define what constitutes such information, creating ambiguity for rights holders in compliance and inconsistent adjudication standards among OCSSPs. Therefore, China should prioritize clarifying criteria for valid applications when constructing its "application-filtering" model. The purpose of application requirements is twofold: (1) to enable rights holders to substantiate their ownership and (2) to equip platforms with sufficient data to identify infringing content. Drawing on the operational logic of filtering systems and China's existing standards for "valid notices" under the "notice-and-takedown" regime, legislators should establish clear, evidence-based thresholds for application validity.

Design of Appeal Mechanisms. Scholars caution that over-reliance on automated content identification and filtering technologies risks erroneous removals, blockings, or over-filtering, potentially suppressing lawful user-generated content, chilling free expression, and infringing user rights [17]. To address this, Article 19(7) of the CDSM Directive mandates the establishment of expedited appeal mechanisms, enabling users whose content is erroneously filtered to resolve disputes efficiently without litigation. Aligning with this provision, scholars recommend integrating user complaint portals into filtering systems to facilitate real-time feedback [18].

China's Regulations on the Management of Algorithmic Recommendation Services similarly require algorithmic platforms to provide "convenient and effective channels for user appeals and public complaints or reports," with clearly defined resolution procedures and response timelines. Building on these foundations, China could institutionalize a "counter-notice and conditional reinstatement" procedure to complement its filtering obligations. Under this framework:(1) Users may submit counter-notices contesting erroneous filtering, accompanied by evidence of lawful use (e.g., fair use justifications or licensing agreements) [19]. (2) Platforms must review counter-notices within statutory deadlines and conditionally reinstate content unless rights holders initiate formal legal action.

This dual-track mechanism balances copyright enforcement with user rights protection, mitigating the risks of algorithmic overreach while maintaining regulatory efficacy.

5 Regulatory Framework for Copyright Filtering Obligations on Algorithmic Recommendation Platforms in China

5.1 Definitional Boundaries of Copyright Filtering Obligations

This paper argues that copyright filtering obligations for algorithmic recommendation platforms should be defined as a limited ex ante duty of care, characterized by targeted and conditional enforcement rather than universal content surveillance. The "limitations" of such obligations reflect a pragmatic balance between rights holder protection and platform feasibility. Specifically, platforms are not required to indiscriminately filter all user-uploaded content. Instead, a pre-registration and application system should be implemented, allowing rights holders

to proactively register copyrighted works with platforms to request protection. This approach is grounded in two key considerations. First, obligating platforms to preemptively catalog and filter all potentially infringing works before rights holders' requests would impose prohibitive operational costs, undermining economic viability. Second, not all rights holders uniformly oppose unauthorized dissemination; some may tolerate or even strategically encourage such distribution to amplify visibility or market reach, rendering blanket filtering counterproductive.

Moreover, platforms are not compelled to act on vague or generic filtering requests. Valid applications must include verifiable identity credentials, proof of ownership (e.g., copyright registration certificates), machine-readable copies of works (e.g., digital fingerprints or metadata for algorithmic recognition), and lists of authorized users permitted to disseminate the content. These requirements ensure that filtering mechanisms operate with precision, minimizing overreach while safeguarding legitimate rights. By delineating these criteria, the framework avoids the pitfalls of overbroad censorship, aligning enforcement efforts with technological capabilities and market realities. This calibrated approach not only respects the diversity of rights holders' strategic interests but also mitigates the risk of stifling innovation or free expression—a critical consideration in China's rapidly evolving digital ecosystem.

5.2 Operational Procedures for Copyright Filtering Obligations on Algorithmic Recommendation Platforms

Drawing on China's existing "notice-and-takedown" framework, the operational model for filtering obligations follows a structured sequence which is shown in Fig. 1.

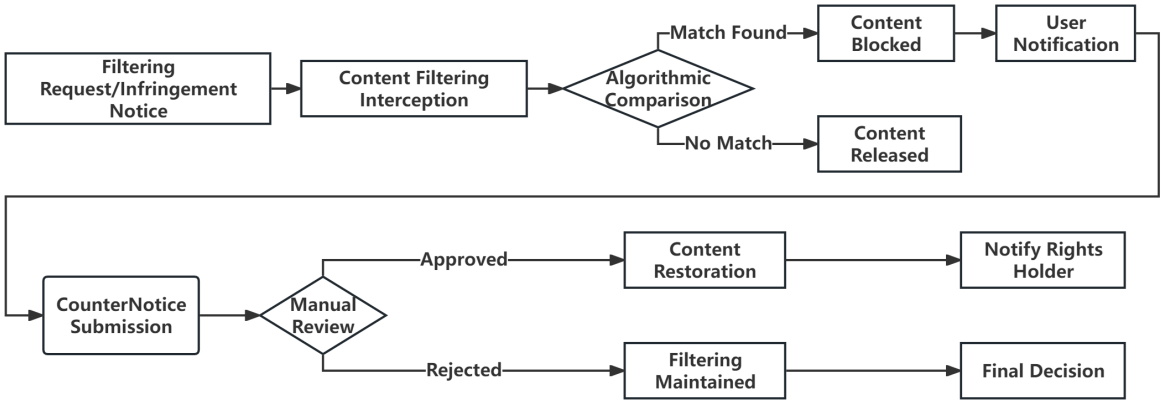

Fig. 1. Operational model for filtering obligations

The specific workflow unfolds as follows. First, algorithmic recommendation platforms incorporate rights holders' pre-registered copyrighted works into designated databases. Second, platforms implement continuous filtering measures, scanning newly uploaded user content and cross-referencing it against the database to identify and block potential infringements, thereby preventing unauthorized dissemination. Concurrently, platforms must notify users whose content is flagged, providing transparent details about the filtering system's operational logic, the copyrighted works in question, the filtering outcome, and the channels and procedures for lodging appeals.

If users believe their content was erroneously filtered, they may submit an appeal containing a declaration of non-infringement and supporting evidence. Upon receipt, the platform must promptly initiate a manual review process. If the appeal is substantiated, the platform reinstates the content and notifies the rights holder of the resolution. If the appeal is dismissed, the filtering decision remains in force, with the platform issuing a reasoned response to the user. This procedural architecture balances proactive copyright enforcement with safeguards against algorithmic overreach, ensuring accountability while preserving user rights in China's dynamic digital environment.

5.3 Legal Consequences of Algorithmic Recommendation Platforms' Breach of Copyright Filtering Obligations

As discussed previously, the imposition of filtering obligations constitutes a necessary complement and reasonable extension of internet service providers' duty of care under algorithmic recommendation models, aimed at addressing gaps in ex ante responsibilities. Fundamentally, these obligations fall within the scope of the duty of care. Algorithmic recommendation platforms act not as creators but as disseminators of infringing content. Consequently, when the conditions triggering filtering obligations are met, a platform's failure to implement such measures—resulting in rights holders' losses—may be deemed to reflect subjective fault and objective negligence in fulfilling its duty of care, thereby establishing liability for indirect infringement.

The harm suffered by rights holders arises from the combined actions of users (as direct infringers) and the platform's omission (as an enabler). By objectively facilitating direct infringement through inaction, the platform jointly contributes to the rights holders' damages. Under such circumstances, algorithmic recommendation platforms should bear joint and several liability with infringing users. This legal accountability framework underscores the dual responsibility of platforms in curbing infringement while maintaining equitable burden-sharing between rights holders, users, and intermediaries in China's evolving digital governance landscape.

5.4 Exemptions from Copyright Filtering Obligations for Algorithmic Recommendation Platforms

While current filtering technologies have achieved relative maturity, it is undeniable that the development, operation, and maintenance of filtering systems entail significant economic costs. Imposing uniform filtering obligations across all algorithmic recommendation platforms risks overburdening small and medium-sized platforms, constraining their viability, and further entrenching the monopolistic dominance of large platforms [20]. Given the stark disparities in user scale and economic capacity among platforms, a one-size-fits-all approach to duty-of-care requirements would engender substantive inequities. Small and medium-sized platforms often lack the financial and technical resources to sustain filtering measures, while their lower user bases correlate with reduced infringement probabilities and controllable harm outcomes, rendering heightened obligations disproportionate to their risk profiles.

A scientifically grounded liability framework must account for heterogeneity in platforms' technological capabilities and developmental stages. In 2021, China's State Administration for Market Regulation proposed the Guidelines for the Classification and Grading of Internet Platforms (Draft for Comment), categorizing platforms into "super-large," "large," and "small/medium" tiers based on user scale, service scope, and market influence. The market share distribution of platforms with varying technical capacities, as presented in Table 6, empirically validates the necessity of exempting small and medium-sized platforms from uniform obligations, as well as the rationality of implementing a classified and tiered governance framework. Building on this taxonomy, filtering obligations should be tailored to platform classifications, with super-large and large platforms mandated to comply, while small and medium-sized platforms receive temporary exemptions. Introducing a transitional period for smaller platforms to phase into compliance would balance the dual imperatives of institutional implementation and operational sustainability. Such a calibrated approach not only safeguards the survival of emerging players but also fosters long-term industry growth, ensuring that algorithmic recommendation services evolve within a competitive and innovation-friendly ecosystem.

Table 6. Market share distribution of algorithmic recommendation platforms in China (2023)

Platform type	Annual revenue (CNY billion)	User base (100 million users)	Filtering technology investment (CNY billion)
Super-large platform	1,500	8.5	50
Large platform	300	2.3	10
Small/Medium platform	0.8	0.05	0.1
Super-large platform	1,500	8.5	50

6 Conclusion

In the algorithmic age, the existing "notice-and-takedown" framework under current legislation fails to fully harness the potential of online copyright governance, even serving as a shield for algorithmic recommendation platforms to evade accountability. Simultaneously, advancements in content filtering technologies have transformed the operational landscape, enabling dominant platforms to mitigate infringement risks at significantly lower costs. Consequently, imposing filtering obligations on algorithmic recommendation platforms not only drastically reduces rights holders' enforcement burdens but also facilitates source-level governance of online infringement, aligning with China's strategic imperatives to refine algorithmic governance frameworks and advance its intellectual property powerhouse agenda.

To ensure the effective implementation of filtering obligations while avoiding undue burdens on platforms, rights holders should generally be required to proactively submit applications accompanied by relevant copyright information. For infringement notices already issued by rights holders, platforms must transcend rote compliance with takedown mandates and deploy filtering systems to prevent recurring violations. Given the disparate capacities of platforms across tiers to fulfill filtering obligations, it is imperative to exempt small and medium-sized platforms from such duties temporarily, granting them regulatory flexibility. Concurrently, to mitigate the risks of erroneous filtering suppressing lawful content, robust appeal mechanisms supplemented by human review processes must be institutionalized, safeguarding user rights and procedural fairness.

Through the synergy of technological empowerment and well-calibrated legal frameworks, the current impasse in online copyright governance can be resolved, fostering a thriving ecosystem for China's intellectual property and digital industries. This balanced approach not only addresses systemic infringement challenges but also upholds the principles of equity and innovation, positioning China as a global leader in ethical algorithmic governance and sustainable digital development.

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References

[1] S. Mainka, Algorithm-Based Recruiting Technology in the Workplace, Texas A&M Journal of Property Law 5(3)(2019) 801-822.
https://doi.org/10.37419/JPL.V5.I3.8

[2] P. Resniek, H.R. Varian, Recommender Systems, Communications of the ACM 40(3)(1997) 56-58.
https://doi.org/10.1145/245108.245121

[3] J. Urban, J. Karaganis, B.L. Schofield, Notice and Takedown: Online Service Provider and Rightsholder Accounts of Everyday Practice, Intellectual Property: Copyright Law eJournal (2017) 371-410.

[4] A. Bridy, The Price of Closing the Value Gap: How the Music Industry Hacked EU Copyright Reform, Vanderbilt Journal of Entertainment & Technology Law 22(2)(2020) 323-358.
https://scholarship.law.vanderbilt.edu/jetlaw/vol22/iss2/4

[5] A.L. Shapiro, The Control Revolution: How the Internet is Putting Individuals in Charge and Changing the World We Know, Perseus Books, New York, 1999.

[6] A.J. Kroll, J. Hury, S. Barocas, E.W. Felten, J.R. Reidenberg, D.G. Robinson, H. Yu, Accountable Algorithms, University of Pennsylvania Law Review 165(3)(2017) 633-705.
https://scholarship.law.upenn.edu/penn_law_review/vol165/iss3/3/

[7] A. Puri, Moral Imitation: Can an Algorithm Really Be Ethical?, Rutgers Law Record 48(1)(2020) 47-57.

[8] S.N. Mart, Every Algorithm Has a POV, AALL Spectrum 40(2017) 40-44.
https://lawrecord.com/2020/11/06/moral-imitation-can-an-algorithm-really-be-ethical/

[9] G. Frosio, To Filter, or Not to Filter-That is the Question in EU Copyright Reform, Cardozo Arts & Entertainment Law Journal 36(2)(2018) 331-368.

[10] M. Bechtel, Algorithmic Notification and Monetization: Using Youtube's Content ID System as a Model for European Union Copyright Reform, International Law Review 28(2)(2020) 237-271. https://doi.org/10.17613/cesd-k151
[11] G.F. Frosio, Why keep a dog and bark yourself? From Intermediary Liability to Responsibility, International Journal of Law and Information Technology 26(1)(2018) 1-33. https://doi.org/10.1093/ijlit/eax021
[12] M.K. Sherwood, Protecting Fair Use From Algorithms, Internet Platforms, and the Copyright Office: A Critique of the §512 Study, St. John's Law Review 95(3)(2022) 921-949. https://scholarship.law.stjohns.edu/lawreview/vol95/iss3/9/
[13] C. Angelopoulos, J.P. Quintais, Fixing Copyright reform: A Better Solution to Online Infringement, Journal of Intellectual Property, Information Technology and Electronic Commerce Law 10(2)(2019) 147-172. https://www.jipitec.eu/jipitec/article/view/252
[14] J.D. Matteson, Unfair Misuse: How Section 512 of the DMCA Allows Abuse of the Copyright Fair Use Doctrine and How to Fix It, Santa Clara High Technology Law Journal 35(2)(2018) 1-22. https://digitalcommons.law.scu.edu/chtlj/vol35/iss2/4
[15] G. Colangelo, M. Maggiolino, ISPs' Copyright Liability in the EU Digital Single Market Strategy, International Journal of Law and Information Technology 26(2)(2018) 142-159. https://doi.org/10.1093/ijlit/eay005
[16] M. Sag, Internet Safe Harbors and the Transformation of Copyright Law, Notre Dame Law Review 93(2)(2018) 499-564. https://scholarship.law.nd.edu/ndlr/vol93/iss2/2/
[17] G. Frosio, Reforming Intermediary Liability in the Platform Economy: A European Digital Single Market Strategy, Northwestern University Law Review 112(115)(2017) 19-46. https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1250&context=nulr_online
[18] J. Quintais, G. Frosio, S. Gompel, P.B. Hugenholtz, M. Husovec, B.J. Jütte, M. Senftleben, Safeguarding User Freedoms in Implementing Article 17 of the Copyright in the Digital Single Market Directive: Recommendations From European Academics, SSRN Electronic Journal (2019) 1-8. https://dx.doi.org/10.2139/ssrn.3484968
[19] D.L. Burk, J.E. Cohen, Fair Use Infrastructure for Rights Management Systems, Harvard Journal of Law & Technology 15(1)(2000) 41-83.
[20] N. Elkin-Koren, Y. Nahmias, M. Perel, Is It Time to Abolish Safe Harbor? When Rhetoric Clouds Policy Goals, Stanford Law & Policy Review 31(1)(2020) 1-50.