

A Holistic Examination of Suno Al:

Technology, Copyright, Ethics, and its Disruptive Role in the Creative Landscape

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1. Introduction

1.1. Emergence and Ambition of Suno Al

Suno has rapidly emerged as a significant player in the field of artificial intelligence-driven music generation. The platform is designed to empower users, irrespective of their musical expertise or background, to create complete musical compositions from simple text-based prompts.1 Its stated mission is to democratize music creation, breaking down traditional barriers such as the need for instrumental proficiency or knowledge of music production software, thereby allowing anyone to translate their imaginative concepts into musical reality.2 The company, Suno Inc., was co-founded in 2021 (though some sources suggest a 2022 founding date ⁴) by a team of musicians and artificial intelligence experts with prior experience at prominent technology firms including Meta, TikTok, and Kensho.⁵ Key founders include Mikey Shulman, who serves as the Chief Executive Officer, Martin Camacho, Keenan Freyberg, and Georg Kucsko.⁶ Based in Cambridge, Massachusetts, Suno has positioned itself at the confluence of AI research and musical artistry.⁵

Suno's innovative approach and perceived market potential have attracted substantial venture capital. Notably, the company secured \$125 million in a Series B funding round, leading to a valuation of \$500 million by May 2024. This significant financial backing from investors such as Lightspeed Venture Partners, Matrix Partners, and Founder Collective underscores the considerable confidence in Suno's technology and its potential to capture a significant share of the burgeoning generative AI market. This investment and rapid user adoption signal Suno's role as a potentially disruptive force within the creative industries. It embodies the broader trend of generative AI tools aiming for mass accessibility, making it a critical subject for discussions concerning technological innovation, intellectual property rights, and the future landscape of creative professions.

1.2. Scope and Methodology of the Report

This report undertakes a holistic and critical examination of Suno Al. The analysis encompasses several key dimensions: its operational mechanisms, with a particular focus on the generation of vocal-free instrumental tracks such as dub music; its intricate copyright policies and their multifaceted implications, especially for users of its paid subscription tiers; a comprehensive array of ethical considerations, including the provenance of its training data and its impact on human artists; its non-performance characteristics, such as platform usability, accessibility for diverse users, data privacy protocols, and environmental context; its strategic positioning within the competitive Al and creative industries; and an evaluation of the validity of YouTube Content ID as a reliable gauge for the originality or copyright status of its generated outputs. The methodology employed involves a rigorous review of the provided research snippets. Official Suno documentation, sourced from its primary website (suno.com),

help center (help.suno.com), official blog communications, Terms of Service, and Privacy Policy, serves as the foundational source for platform-specific claims, features, and policies. This primary data is critically contextualized and augmented by secondary sources, including academic research papers, reputable technology and music industry news reports, and independent analyses. These external sources provide broader context, critical perspectives, and independent assessments of Suno's technology and impact. Throughout the report, discrepancies between official statements and unverified third-party claims (such as those from the unaffiliated sunoai-music.com website ⁸) are carefully noted and addressed to maintain analytical rigor. The overarching approach is one of critical inquiry, aiming to present a balanced and nuanced understanding of Suno AI.

1.3. The Dual Nature of Suno: Innovation vs. Controversy

Suno Al's trajectory in the generative Al landscape is characterized by a striking duality: it is simultaneously lauded for its technological innovation and embroiled in significant controversy. On one hand, the platform is recognized for its novel approach to music creation, offering tools that empower a diverse user base—from hobbyists to professional artists—to experiment with and produce music in unprecedented ways.2 The company has reported attracting millions of users, indicative of its appeal and the growing interest in Al-driven creative tools.4 On the other hand, Suno is a focal point for intense debate and legal challenges. These controversies primarily revolve around its methods for training its Al models, particularly the alleged use of copyrighted musical works without explicit permission from rights holders. This has led to high-profile lawsuits from major record labels and music rights organizations. Furthermore, the copyright status of music generated by Al systems like Suno remains a contentious and legally ambiguous area, creating uncertainty for users who wish to commercialize their creations. Ethical concerns also extend to the potential impact on human musicians, the risk of algorithmic bias in generated content, and the transparency of Suno's operations.

This juxtaposition of innovation and controversy is not merely incidental; it reveals a fundamental characteristic of many disruptive AI technologies. Suno's rapid development and market penetration appear to have outpaced the establishment of, or adherence to, clear legal and ethical frameworks governing such powerful generative tools. The company's drive for innovation and market leadership has placed it in a position where it must navigate complex, often ill-defined, legal and ethical terrains. This inherent conflict between pioneering technology and existing regulatory and normative structures is a central theme that permeates the examination of Suno AI in this report. The platform's journey highlights the broader societal challenge of reconciling the transformative potential of generative AI with the need to protect

creative rights, ensure fairness, and maintain ethical standards.

2. Operational Mechanisms: How Suno Generates Music

2.1. Core Technology and Al Models

Suno Al's capacity to generate music stems from sophisticated generative artificial intelligence models. While the company maintains a degree of proprietary secrecy around the precise details of its underlying technology, available information and industry analyses suggest an architecture built upon advanced machine learning principles. It is likely that Suno employs deep learning techniques, with strong indications pointing towards the use of Transformer models, and potentially Generative Adversarial Networks (GANs), or similar architectures.18 Transformer architectures, which have demonstrated remarkable success in natural language processing, are increasingly being adapted for music generation due to their ability to capture long-range dependencies and contextual nuances in sequential data. GANs, on the other hand, are known for their ability to generate novel data instances that mimic the characteristics of a training dataset. These models are trained on vast and diverse datasets of existing music, enabling them to learn and internalize complex patterns related to melody, harmony, rhythm, instrumentation, and stylistic conventions across numerous genres.

The primary mode of interaction with Suno's system is through **text-to-music generation**. Users provide textual prompts describing the desired musical output—specifying genre, mood, tempo, instrumentation, and even lyrical themes—and the AI endeavors to create a composition that aligns with these instructions, often complete with AI-generated vocals and intricate instrumental arrangements.¹

Suno has publicly acknowledged the use of its own "Bark" text-to-audio model for certain functionalities. ²⁶ Bark is specifically designed for generating speech and other audio from text. Further insight comes from a model card for a deprecated version of Suno AI (v3.5), which indicated that its architecture was likely based on Transformers and was trained on an undisclosed dataset safeguarded against plagiarism. ¹⁹

For developers and businesses seeking to integrate Suno's capabilities into their own applications or workflows, Suno provides an Application Programming Interface (API). This API supports multiple programming languages, including Python, JavaScript, Ruby, Java, and Go, and offers a suite of endpoints for tasks such as direct music generation, musical style transformation, and audio exporting in various formats (e.g., WAV, MP3, FLAC). The availability of an API signals Suno's ambition to extend its reach beyond a standalone consumer application, positioning its technology as a potential embedded music generation engine for a wider range of platforms and creative tools. This aligns with a broader trend in the AI industry where core model capabilities are productized via APIs for enterprise and developer use.

2.2. Generating Vocal-Free Tracks and Instrumentals

Suno directly addresses the need for music without vocals through a dedicated "Instrumental Mode." This feature, which was prominently introduced with version v3.5 of the platform, allows users to explicitly request the generation of purely instrumental pieces, bypassing the Al's vocal

synthesis capabilities.2 The platform's user-generated content library showcases numerous examples of instrumental tracks, some of which are tagged by creators with terms like "dub," "chill dub," and other electronic subgenres, indicating that users are actively employing this mode to explore diverse instrumental styles.27 For instance, a track titled "Groovin Mirage" lists "saxophone flute chill dub boogie electro-blues cinematic ambient indian funk funk blues hip-hop middle eastern chill synthwave indian percussion" among its descriptive tags, illustrating the specificity users attempt to achieve.27

To generate a specific instrumental genre, such as a "vocal-free dub track," a user would typically select the "Instrumental Mode" and then provide detailed text prompts. These prompts would need to articulate the characteristic sonic elements of dub music—for example, "deep sub-bass," "prominent drum and bass," "reggae-influenced drum patterns," "syncopated rhythms," "spacious production," and the extensive use of "echo, delay, and reverb effects" on instrumental parts, often with a focus on "riddims" (instrumental backings). Suno's "Custom Mode" offers more granular control, allowing users to specify lyrics (which would be omitted or left blank for instrumental tracks), music style, and title.¹⁹

The successful generation of a niche and stylistically nuanced instrumental subgenre like a dub track is highly contingent on two primary factors. Firstly, the robustness and effectiveness of the "Instrumental Mode" itself in separating instrumental generation from vocal synthesis. Secondly, and perhaps more critically, the Al's "prompt adherence"—its ability to accurately interpret and translate the detailed and often subtle stylistic descriptors provided by the user into corresponding musical elements. While the mode for creating instrumental music exists, the ultimate quality, authenticity, and recognizability of the output for highly specific styles like dub rely heavily on the user's proficiency in prompt engineering (the art of crafting effective Al prompts) and, crucially, on the Al model's training data having encompassed a sufficient quantity and variety of examples of that particular genre. If the training dataset lacks adequate representation of dub music, the Al may struggle to capture its defining characteristics, potentially resulting in a generic instrumental piece or an output that misinterprets the stylistic cues. This underscores the interplay between user skill and the inherent capabilities and limitations of the Al model based on its training.

2.3. Evolution of Features and Quality (v3.5 to v4.5)

Suno Al has demonstrated a rapid and iterative product development cycle, with notable advancements across successive versions, from v3 through v3.5, v4, and, as of recent announcements, v4.5.7 This evolution reflects a concerted effort to enhance the platform's capabilities, improve output quality, and expand user control.

Key enhancements observed across these versions include:

- Extended Song Lengths: A significant improvement has been the increase in maximum generatable song length. Version v3.5 allowed for audio clips up to four minutes long ²³, a substantial increase from earlier iterations. The more recent v4.5 claims to extend this further, potentially to eight minutes, catering to users wishing to create more complete or longer-form musical pieces.³⁰
- Audio Quality Improvements: Suno has consistently stated improvements in overall audio fidelity, vocal flow, and the clarity of generated music with each major update.⁷ The aim is to produce tracks that are closer to "radio-quality" or "studio-quality" sound.⁸ However, it is important to note that user feedback, particularly concerning version v4.5, has been mixed. Some users have reported issues such as "muffled," "muddy," or "low bitrate" audio quality, sometimes perceived as a regression compared to previous versions or competing Al music generators like Udio.²⁹ The "Remaster" feature, intended to improve audio, has also reportedly fallen short for some users, occasionally exacerbating these quality issues.²⁹
- Enhanced Prompt Adherence and Genre Support: Suno claims that newer versions exhibit better interpretation of user prompts, leading to more accurate translations of textual descriptions into musical outputs. This includes improved coherence in song structure, more graceful endings, and more cohesive results when users attempt to combine or blend different musical genres.²³
- **File Format Options:** A significant upgrade for users prioritizing audio fidelity was the introduction of WAV file format support for downloads, available to Pro and Premier subscribers. This provides a higher quality alternative to the previously standard MP3 format.²³
- New Creative Features: Version 4 introduced innovative features like "Covers," enabling users to reimagine existing songs (presumably user-created originals within Suno) in different styles, and "Personas," which allows the AI to remember and apply a user's preferred style to future generations, aiding in stylistic consistency. Version 4.5 reportedly added a "prompt-enhancement helper" to assist users in crafting more descriptive and effective prompts. 30
- **Generation Speed:** Suno has also claimed improvements in the speed of song generation, even for the longer clips produced by newer models.²³

The iterative development cycle, marked by frequent updates and new feature rollouts, highlights Suno's commitment to refining its technology and expanding its creative toolkit. However, the inconsistent user feedback regarding audio quality in the latest version ²⁹ suggests that the path of technological advancement in generative Al is not always a straightforward linear progression. Pushing the boundaries of generation length, complexity, or feature sets may introduce new technical challenges or

trade-offs that can impact output quality. This points to a technology that, while rapidly maturing and offering increasingly sophisticated capabilities, still faces hurdles in consistently delivering flawless, production-ready audio across all genres, styles, and use cases. The pursuit of more advanced features might sometimes come at a temporary cost to other aspects of performance, reflecting the complex engineering challenges inherent in scaling generative AI models.

2.4. Prompt Engineering and User Control

The efficacy of Suno AI in generating desired musical outputs is profoundly dependent on the quality, specificity, and nuanced construction of the text prompts provided by the user.24 While the platform aims for accessibility, the process of guiding the AI to produce a particular sound or style is an exercise in "prompt engineering." Users articulate their creative intent by describing attributes such as genre (e.g., "80s new wave punk," "electro swing," "Afrobeat"), mood ("melancholic," "upbeat"), instrumentation ("saxophone flute," "acoustic guitar," "808 kit"), tempo (e.g., "bpm90"), vocal characteristics ("sweet female vocal," "gritty male vocal," "aggressive rap"), and lyrical content if vocals are desired.1 Users can also input their own pre-written lyrics for the AI to set to music.1

Suno has indicated a focus on enhancing user control by working towards more detailed prompting capabilities. Future developments may include the integration of enhanced multimodal inputs, allowing users to combine text prompts with other forms of input, such as images or even live instrument recordings, to further refine and direct the Al's creative process. The introduction of a "prompt-enhancement helper" in version 4.5 is a step in this direction, aiming to assist users in formulating more evocative and effective prompts. 30

Features like "Reuse Prompt" further facilitate user control and exploration by allowing creators to take an existing generation (their own or, if public, another user's) and modify its prompt to iterate on the musical idea, experiment with variations, or steer the output in a new direction.¹⁵ This iterative process is crucial for refining Al-generated content.

While Suno markets itself on principles of ease of use and the democratization of music creation, enabling anyone to make music regardless of traditional skills ², the reality of achieving nuanced, specific, or professional-grade results often necessitates a considerable degree of skill in prompt engineering. ²⁸ This introduces a distinct learning curve and cultivates a new form of creative expertise. For highly specialized or complex outputs, such as generating an authentic-sounding "dub track" with its characteristic production techniques, simply stating the genre in a prompt might prove insufficient. Users may need to understand how to articulate the specific sonic markers of the genre—such as the nature of the basslines, the precise rhythmic feel of the drum patterns, the type and application of effects like delay and reverb—in a language that the Al can effectively interpret and translate into musical form. This dynamic potentially creates a tiered experience: while basic music generation is accessible to novices, the ability to leverage the tool to its full creative potential and achieve highly specific or sophisticated outcomes is often correlated with the user's ability to master the art of prompt

crafting. This implies that "democratization" in this context refers more to initial access than to an equal ability to achieve all possible outcomes without developing new, AI-specific skills.

3. Copyright Policies and Implications

3.1. Ownership of Generated Content: Free vs. Paid Tiers

Suno Al implements a differentiated ownership and usage rights policy based on the user's subscription tier. This model is common among generative Al service providers, creating an incentive for users to opt for paid plans to unlock broader utility, particularly for commercial applications.

- Free (Basic) Plan: For users on the free tier, Suno Inc. explicitly retains ownership of all musical outputs generated through the service. While users can create and explore music, they are granted a limited license. This license permits the use of the generated songs solely for lawful, internal, and strictly non-commercial purposes. A critical condition of this license is the requirement for users to provide attribution credit to Suno whenever and wherever these non-commercial outputs are shared or used. Deleting submissions from a free account does not alter Suno's ownership of the output already generated from those submissions.
- Paid (Pro/Premier) Plans: Subscribers to Suno's paid tiers (Pro or Premier) are granted significantly different terms. According to Suno's official policies, the company "assigns to you all their rights, title, and interest" in the musical outputs (songs) that the subscriber generates using their paid account.³⁴ This assignment is intended to confer what is often referred to by Suno as "ownership" to the paid user. These rights explicitly include permissions for commercial use, such as releasing the songs on music streaming platforms (e.g., Spotify, Apple Music, YouTube), including them in monetized content, or using them in other commercial projects.¹⁵ Notably, for songs generated under a paid plan and used commercially, attribution to Suno is not required.³⁴ It is important to note that subscribing to a paid plan does not retroactively grant commercial use rights for songs created previously under a free plan; those remain under the non-commercial license.³⁶
- User-Provided Lyrics: A distinct aspect of Suno's policy concerns lyrics. If a user writes
 their own original lyrics and inputs them into the Suno platform for the AI to generate
 music around, the user retains ownership of those specific lyrics, regardless of whether
 they are on a free or paid subscription plan.¹⁵ The AI-generated musical components
 accompanying these lyrics would still be subject to the tiered ownership rules described
 above.

This tiered rights structure is fundamental to Suno's business model. However, the "assignment of rights" and the concept of "ownership" for outputs generated by paid users are heavily qualified by the overarching legal and regulatory uncertainties that currently surround Al-generated creative works, a complexity explored in the following section.

3.2. The Ambiguity of Copyright Protection for Al-Generated Music

A critical aspect of Suno's copyright policy is the explicit acknowledgment of the profound ambiguity surrounding the copyrightability of Al-generated musical works. Suno's official Terms

of Service and Community Guidelines consistently state that the company cannot guarantee that a user's local copyright office (or any copyright authority) will grant copyright protection to the songs or musical compositions generated using its service.15

This disclaimer is rooted in the current stance of many intellectual property regulators, most notably the U.S. Copyright Office (USCO). The prevailing legal interpretation, as Suno itself acknowledges, is that copyright protection generally does not extend to works that are primarily created by artificial intelligence, due to the absence of sufficient human authorship—a cornerstone of copyright law in many jurisdictions. Suno's CEO, Mikey Shulman, has publicly commented on this, noting that fully AI-generated songs are unlikely to be copyrightable unless there is a significant degree of human creative input and control involved in their creation. A research paper from Stanford also highlights that machines cannot be "authors" under current copyright law.

This fundamental legal uncertainty has significant implications for Suno users, particularly those on paid plans who are told they "own" the outputs. The "ownership" that Suno contractually assigns to its paid subscribers is primarily an agreement between Suno and the user regarding usage permissions and who, between them, controls the generated asset. It does not automatically confer an enforceable copyright in the traditional legal sense, recognized universally against third parties.³³ Users may find that the "rights" they have acquired from Suno do not prevent others from using musically similar or even identical Al-generated outputs, especially if those outputs are deemed uncopyrightable public domain material.³³

The practical consequence is that Suno strategically transfers usage permissions and a form of contractual "ownership" to its paying users, while simultaneously disclaiming any guarantee of actual legal copyrightability. This effectively shifts the considerable legal risk and the burden of establishing, defending, and enforcing any potential copyright in the generated music onto the user. The term "ownership" as employed in Suno's Terms of Service could be potentially misleading for users who are not deeply versed in the nuances and ongoing evolution of copyright law as it pertains to generative Al. It might imply a more robust and exclusive set of legal rights than what may actually be attainable or enforceable under current legal precedents. This gap between contractual "ownership" (from Suno) and actual copyright protection (from the legal system) is a critical point of vulnerability for creators relying on Al-generated content for commercial purposes.

3.3. Commercial Use Terms and User Responsibility for Paid Outputs

For subscribers to Suno's Pro or Premier plans, the terms grant extensive commercial use rights for the music generated under these plans.15 This means users can incorporate these songs into commercial projects, release them on streaming platforms like Spotify, Apple Music, and YouTube, use them in monetized videos, and generally exploit them for financial gain without needing to provide attribution to Suno.34

However, this grant of commercial rights is accompanied by significant caveats and user responsibilities, largely stemming from the uncertain copyright status of Al-generated

works and the nature of generative AI technology:

- No Guarantee of Uniqueness: Suno's terms explicitly state that due to the nature of AI, different users providing similar or identical prompts could receive very similar or even identical musical outputs.³⁴ Suno does not guarantee that a user's output will be unique. This implies that a paid user's "owned" song might not be exclusive, and others could independently generate and use strikingly similar music. This lack of guaranteed uniqueness directly impacts the commercial value and defensibility of any perceived exclusivity.
- Risk of Third-Party Infringement Claims: Suno does not guarantee that the music generated by its AI will not infringe upon the pre-existing rights of third parties.³⁴ This is a critical risk, as AI models are trained on vast datasets that may include copyrighted material (as discussed further in the Ethical Considerations section). If a Suno-generated song contains elements (melodies, harmonies, lyrical phrases, or "sound-alikes") that are substantially similar to existing copyrighted works, the original rights holders could pursue infringement claims. The responsibility for handling such claims, including any legal defense or financial liability, rests with the user, not Suno.³⁴
- Platform Policies on Al-Generated Content: Even if Suno grants commercial rights, platforms like Spotify, YouTube, and Apple Music have their own evolving policies regarding Al-generated content.³⁴ These platforms might flag, demonetize, or remove Al-generated music, irrespective of the user's contractual rights from Suno. Users bear the risk of their content being subjected to these platform-specific Al policies.
- YouTube Content ID Issues: If a Suno-generated song triggers YouTube's Content ID system (or similar automated rights management systems on other platforms), the user is responsible for handling any disputes or claims directly.³⁴ Suno does not mediate these disputes. This is particularly problematic given that AI-generated music may inadvertently match existing fingerprints or be claimed by others (see Section 6).

In essence, while paid users receive the contractual ability to use their Suno-generated music commercially, they also inherit all the associated risks concerning copyright validity, uniqueness, potential infringement of third-party rights, and compliance with the policies of distribution platforms. Suno's Terms of Service generally limit its liability in these matters, placing the onus of due diligence and risk management squarely on the user.³⁵ Users are advised to keep clear documentation of their creation process within their paid Suno account and to make their creations private within Suno settings if they wish to minimize others reusing or remixing their specific prompts or outputs.³⁴

3.4. Suno's License to User Submissions and Generated Output
Even when Suno assigns commercial rights and "ownership" of generated outputs to paid
subscribers, the company retains a broad, worldwide, royalty-free, perpetual, irrevocable,
non-exclusive, transferable, and sublicensable license to use, copy, modify, adapt, prepare
derivative works of, distribute, store, perform, and display the content that users create or
submit to the Services.34 This applies to both "Submissions" (e.g., lyrics, prompts provided by
the user) and "Output" (the Al-generated music).

This retained license allows Suno to use user-generated content for several purposes, including:

- Improving their AI models and Services: User inputs and outputs are valuable data for training and refining Suno's generative algorithms and enhancing platform functionality.³⁴ Suno's Privacy Policy explicitly states that User Activity Information, Submissions, and other Content are used "to train and enhance the models that power our Services".³⁹
- **Promoting their Service:** Suno may use generated songs or excerpts to showcase the platform's capabilities or in marketing materials.³⁴
- Sharing within the Suno Platform: Unless a user specifically sets their generated work to private (an option typically available), Suno may make the content available to other users on the platform, for example, through public feeds or featured playlists. Features like "Reuse Prompt" are available to any user who has access to a song, allowing them to use the prompts and lyrics from public or link-shared songs.

This broad license retained by Suno is a standard practice for many online service providers, particularly those dealing with user-generated content and AI model training. It ensures the company has the necessary rights to operate and improve its platform. However, for users, especially those on paid plans who believe they "own" the output, it's crucial to understand that this ownership is not absolute. Suno's ongoing right to use their creations, even for commercial outputs, means their work can continue to contribute to Suno's ecosystem and model development, irrespective of their individual commercial activities. This also implies that even if a user deletes their account or content, Suno may have already incorporated aspects of that data into its models or retained copies for its operational purposes, as per standard data retention and model training practices.

4. Ethical Considerations

4.1. Training Data Provenance: The Copyright Dilemma

One of the most significant ethical and legal challenges confronting Suno AI revolves around the provenance of the data used to train its sophisticated music generation models. There is substantial evidence, including admissions from the company and allegations in multiple lawsuits, indicating that Suno's AI has been trained on vast quantities of musical works, a significant portion of which is likely protected by copyright and was used without explicit licenses from the rights holders.11

- Admissions and Allegations: In response to legal actions, Suno has reportedly admitted that its training data includes "essentially all music files of reasonable quality that are accessible on the open Internet," while abiding by paywalls and password protections. Suno's CEO, Mikey Shulman, has also stated that using copyright-protected music for training is a "stock standard" practice among Al companies. These statements have been made in the context of lawsuits filed by major record labels (representing entities like Universal Music, Sony Music, Warner Records through the RIAA) and collecting societies such as GEMA (the German performing rights organization). These lawsuits allege mass copyright infringement, claiming Suno copied and ingested vast libraries of commercially released sound recordings without permission to build its models, seeking damages potentially up to \$150,000 per infringed work.
- **"Fair Use" Defense:** Suno, like many other generative AI companies facing similar allegations, has invoked the "fair use" doctrine (in the U.S.) or similar exceptions like those for Text and Data Mining (TDM) in the EU as a defense. They argue that the use of copyrighted material for training AI is transformative, as the AI learns patterns and styles rather than directly reproducing entire works, and that this process is analogous to how human artists learn by studying existing music. To
- Industry Backlash: The music industry, including artists, songwriters, publishers, and labels, has largely rejected this argument. Organizations like The Ivors Academy have accused Suno of "stealing the work, art and livelihoods" of creators. GEMA has presented evidence showing Suno-generated outputs that bear strong resemblances in melody, harmony, and rhythm to iconic songs within its repertoire, such as Alphaville's "Forever Young" and Boney M.'s "Daddy Cool". This evidence is used to argue that Suno's Al is not merely learning abstract concepts but is capable of producing outputs that are derivative of, and potentially infringing upon, specific copyrighted works.

The ethical implications of this practice are profound. Training AI on copyrighted works without permission or compensation raises fundamental questions about fairness to

creators, the value of intellectual property, and the potential for AI to devalue human artistry by leveraging existing creative labor for commercial gain without remuneration to the original artists. The lack of transparency regarding the specific datasets used by commercial models like Suno further exacerbates these concerns, making it difficult for rights holders to ascertain if and how their works have been used.⁴⁰ This ongoing conflict underscores a critical ethical and legal fault line in the development of generative AI.

4.2. Algorithmic Fairness, Bias, and Cultural Representation

The datasets used to train AI music generators like Suno inevitably influence the characteristics of the music they produce. If these datasets are not diverse or contain inherent biases, the AI models may perpetuate and even amplify these biases in their outputs, leading to concerns about algorithmic fairness and equitable cultural representation.

- Potential for Bias: Al models learn from the data they are fed. If the training data predominantly features music from certain genres, cultures, or demographic groups while underrepresenting others, the Al may become more adept at generating music in the overrepresented styles and less capable or accurate in producing music from underrepresented traditions.¹⁷ This can lead to a homogenization of musical output, where Al-generated music tends to gravitate towards mainstream or dominant cultural styles, potentially marginalizing niche genres or non-Western musical forms.⁴⁶
- The "Missing Melodies" Report: A significant academic paper highlighted in the research, "Missing Melodies: Al Music Generation and its Nearly Complete Omission of the Global South" 46, conducted an extensive analysis of audio datasets used in Al music generation research. Its findings revealed a stark imbalance: approximately 86% of total dataset hours and over 93% of researchers focused primarily on music from the Global North. While some datasets included non-Western music, genres from the Global South accounted for only a small fraction (around 14.6%) of the data. The paper argues that this underrepresentation poses a serious threat to global musical diversity, potentially leading to cultural homogenization and the misrepresentation or erosion of musical styles from regions like South Asia, the Middle East, and Africa. 46 Suno is mentioned among the Al-driven music platforms whose outputs could be affected by such dataset imbalances. 46 For example, the paper suggests that an attempt by SunoAl to generate Maqam (a system of melodic modes in Arabic music) might result in microtones being rounded off to the nearest Western equivalents, thereby losing the distinctive character of the music.⁴⁶
- Suno's Stance and User Observations: While Suno's official model card for a deprecated version mentioned efforts to "minimize biases and ensure the model

can handle a variety of musical styles and languages" ¹⁹, the extent and effectiveness of these measures are not publicly detailed. Some user discussions and reviews suggest that AI tools like Suno may currently be more adept at generating music within pop or commercial music landscapes, and may struggle with developing ideas outside these common frameworks. ⁴⁸ The platform's policy of disallowing prompts that reference specific artist names ¹⁹, while primarily a copyright safeguard, could also inadvertently limit the AI's ability to learn and replicate the nuances of certain distinct artistic styles, potentially impacting diversity if not carefully managed.

• Ethical Al Aspirations: Suno has generated a song titled "The Moral Algorithm" which lyrically discusses concepts like "algorithmic bias, a challenge to face, ensuring fairness for every race and place," and "bias-free decisions". 53 Another Al-generated song on the platform, "Statement From Suno Al (Actual Al Model) In Regard To Al Music Controversy," acknowledges criticisms that Al lacks emotional depth and lived experiences. 54 While these are creative outputs from the platform itself and not official policy documents or technical reports on bias mitigation, they indicate an awareness within the Suno ecosystem of these ethical dimensions.

Addressing algorithmic bias and ensuring fair cultural representation in Al music generation requires conscious effort in curating diverse and representative training datasets, developing debiasing techniques, and ongoing evaluation of model outputs for fairness. The "Missing Melodies" paper calls for greater attention to data inclusivity to prevent a "homogenized global music landscape". Without such proactive measures, Al music generators risk becoming engines of cultural narrowing rather than expansion.

4.3. Transparency and Explainability of Al Models

Transparency and explainability are crucial ethical principles in the development and deployment of AI systems, referring to the ability to understand how an AI model arrives at its outputs and the data upon which it was trained. For generative AI like Suno, these aspects are particularly pertinent given the creative nature of the output and the concerns about copyright and bias.

• "Black Box" Nature: Generative AI models, especially complex deep learning architectures like those likely used by Suno (e.g., Transformers), are often described as "black boxes". Their internal decision-making processes can be opaque, even to their developers, making it difficult to fully trace how a specific prompt leads to a particular musical output or to identify precisely which elements of the training data influenced a generation. Users often lack control over how the system interprets prompts; the prompts act as instructions, but the machine

- decides how to implement them.¹⁰
- Lack of Disclosure on Training Data: As discussed previously, commercial Al model providers like Suno have generally not disclosed the full composition of their training datasets, often citing proprietary business interests or the sheer scale of the data. ⁴⁰ This lack of transparency is a major point of contention, particularly for rights holders concerned about the unauthorized use of their works. ⁴⁰ GEMA, for instance, highlighted the opacity around how Al tools are trained as a key issue in its legal actions. ⁴⁰
- Calls for Transparency: There are increasing calls from various stakeholders, including artists, policymakers, and researchers, for greater transparency from Al companies regarding their training data and model architectures.¹⁰ Proposed policy tools include transparency requirements for generative systems and metadata tagging for copyright enforcement.¹⁰ PRS for Music, a UK collecting society, lists transparency (auditability and clear labeling of Al-generated content) as one of its key principles for Al.⁵⁷
- Suno's Position: While Suno's official engineering blog does not delve into deep technical details about its models or address transparency in this context ³², the company's Privacy Policy does state that user submissions and content are used to "train and enhance the models that power our Services". This offers a degree of transparency about the ongoing use of user data for model improvement, but not about the initial, foundational training datasets. The song "The Moral Algorithm" generated on Suno mentions "Transparency in models, let's see inside, No black boxes where biases can hide," reflecting an aspirational view on this topic from within its creative outputs. ⁵³
- Human-Centered AI (HCAI) Principles: HCAI frameworks, as discussed in academic literature examining Suno ¹⁰, emphasize user agency and transparency. Scholars like Ben Shneiderman advocate for high levels of human control and understanding of AI systems. ¹⁰ The lack of full transparency in Suno's models can be seen as conflicting with these HCAI ideals, particularly when it comes to artists understanding how their work might be influencing the AI or how the AI is making creative "decisions."

Achieving greater transparency and explainability in complex generative models like Suno's is a significant technical and potentially business challenge. However, it is increasingly viewed as essential for building trust, ensuring accountability, and addressing ethical concerns related to copyright, bias, and the overall impact of Al on creative ecosystems.

4.4. Impact on Human Artists and the Creative Economy

The advent of powerful Al music generators like Suno has profound implications for human artists, songwriters, composers, and the broader creative economy. These impacts are multifaceted, encompassing both potential opportunities and significant threats.

- Democratization vs. Devaluation: Suno and similar tools are often promoted as democratizing music creation, enabling individuals without formal musical training or access to expensive equipment to express themselves musically and create songs.² CEO Mikey Shulman has emphasized making music creation faster and easier, aiming to impact how a billion people experience music.¹² However, this ease of generation and the potential flood of Al-created content raise concerns about the devaluation of music and the skills of human musicians.¹² If music can be generated instantly and cheaply, it could diminish the perceived value of human-crafted compositions and performances.
- Copyright and Compensation Concerns: As detailed earlier, the use of copyrighted music to train AI models without permission or compensation is a primary grievance of artists and rights holders. Artists fear their life's work is being exploited to create systems that may ultimately compete with them or reduce their income opportunities. The RIAA and other music industry bodies advocate for licensing frameworks where AI developers pay for the use of copyrighted works in training data, ensuring creators receive remuneration. 58
- Shifting Role of Skill and Creativity: Shulman's comments suggesting that "making music sucks" for many and that "skill is going to matter a lot less" while "taste is the only thing that matters" have drawn considerable criticism from the music community. Many artists argue that the process of learning an instrument, honing production skills, and the lived experience that informs human creativity are intrinsic to the value and meaning of music, aspects that Al cannot replicate. The fear is that Al might promote a form of "instant gratification" artistry over deep craft.
- Economic Impact and Job Displacement: While AI can be a tool for artists (e.g., for brainstorming, generating backing tracks, overcoming writer's block ²), there are concerns about job displacement, particularly for session musicians, composers for functional music (e.g., jingles, library music), and entry-level production roles. ¹⁶ The creative industries contribute significantly to economies (e.g., over £120bn a year to the UK economy ⁶³), and widespread adoption of AI without fair compensation models could undermine this.
- **Artist as Curator vs. Creator:** Some analyses suggest a shift in the artist's role from primary creator to curator or prompter of Al systems. ⁴⁹ While this can be a new form of creativity, it changes the nature of artistic labor and authorship.
- **UNESCO Artist Perspectives:** A UNESCO survey indicated that while some artists see Al as a positive development, an overwhelming majority cite ethical and

economic threats, including unauthorized use of intellectual property, job displacement, and the devaluation of human creativity, calling for transparent regulatory frameworks.⁷⁰

The music industry is grappling with how to integrate AI responsibly. Some view AI as an assistive tool that can enhance human creativity if used ethically. Others see it as an existential threat if its development and deployment are not carefully regulated to protect artists' rights and livelihoods. The debate is not typically about being anti-AI, but about ensuring fair practices, consent, and compensation within the AI ecosystem.

4.5. Generation of "Deepfake" or Sound-Alike Music

The capability of generative AI to mimic specific artistic styles, vocal timbres, and musical characteristics raises significant ethical concerns about the creation of "deepfake" music or "sound-alikes" that could mislead listeners or infringe on artists' rights to their persona and brand.

- Technical Capability for Imitation: Al models like those powering Suno are trained to recognize and replicate patterns. If trained on sufficient data from a particular artist or a narrow genre, they can potentially generate outputs that closely resemble that artist's signature sound, vocal delivery, or compositional style.²⁴ Lawsuits against Suno and Udio have included allegations that their services can imitate well-known artists.²⁶ For example, Udio was allegedly able to imitate artists like Bruce Springsteen and Michael Jackson, while Suno reportedly generated songs with tags for Jason Derulo.⁴¹
- Suno's Stated Policy on Artist Names: Suno's official policy and ethical guidelines state that users should not use the names of well-known artists or people in their prompts, and that songs including such names may not generate. 19 CEO Mikey Shulman has asserted that Suno does not permit prompts referencing specific artists and that the technology is designed to create new outputs rather than replicate existing content. 12 This is presented as a safeguard against direct mimicry and copyright infringement.
- Effectiveness of Safeguards and User Workarounds: While prohibiting artist names in prompts is a measure, its effectiveness in preventing sound-alikes is debatable. Users might employ descriptive language to evoke an artist's style without explicitly naming them (e.g., "a pop song in the style of a late 80s female superstar with powerful vocals and synthesizers" instead of "a Madonna-style song"). The "Missing Melodies" paper notes that SunoAl, when attempting to generate specific non-Western musical forms like Maqam, might default to Western equivalents, suggesting a tendency to approximate or simplify rather than

perfectly replicate highly nuanced styles, but this also implies it *can* approximate styles. ⁴⁶ The Ivors Academy highlighted an instance where Suno's lyric generator ReMi allegedly reproduced the entire lyrics to Midnight Oil's "Beds Are Burning" when prompted for a song in their style, suggesting that guardrails may not always be effective. ¹⁶

- Industry Concerns and Takedowns: The music industry is highly concerned about unauthorized Al-generated deepfakes. Sony Music, for example, revealed it had requested the removal of over 75,000 Al-generated deepfakes of its artists' content from various platforms. This indicates the scale of the problem and the proactive measures rights holders are taking. While these takedowns are not exclusively linked to Suno, they illustrate the broader industry environment.
- Ethical and Legal Implications of Sound-Alikes: Generating music that
 deliberately imitates a famous artist without permission can lead to various legal
 issues, including violation of personality rights (right of publicity), unfair
 competition, passing off, and potentially copyright infringement if the imitation is
 substantially similar to specific copyrighted works. Ethically, it can deceive
 audiences and exploit an artist's established reputation and creative identity.
- Proposed "Likeness Thresholds": To address these issues, some researchers and
 policymakers propose establishing standardized "likeness thresholds" to help
 determine when an Al-generated piece infringes on an artist's identity or
 copyrighted work.¹⁰ This would aim to differentiate between permissible inspiration
 or generic style emulation and impermissible imitation or deepfaking.

Suno's policy against using artist names in prompts is a step towards mitigating direct deepfake generation. However, the inherent capabilities of the AI to learn and replicate stylistic elements mean that the potential for creating sound-alikes, intentionally or unintentionally, remains. The broader challenge lies in defining and enforcing the line between legitimate stylistic influence and unethical or illegal imitation in an AI-driven creative landscape.

5. Non-Performance Characteristics

5.1. Platform Usability and Accessibility

Suno Al aims to make music creation accessible to a broad audience, including those without traditional musical training. Its user interface is generally designed for ease of use, often compared to the prompt-based interaction of tools like ChatGPT.25

• User-Friendliness for General Users: The platform allows users to generate songs from text descriptions, prompts, images, or videos, simplifying the initial creative process.² It offers features like personalized lyric generation, playlist creation, and community engagement tools.² The availability of daily free credits encourages exploration without immediate financial commitment.¹ Suno is available as a web application and has mobile apps for iOS and Android, as well as integration with Microsoft Copilot, enhancing its accessibility across different devices and platforms.¹

Accessibility for Users with Disabilities:

- Screen Reader Usability: A review by the American Foundation for the Blind (AFB) indicates that Suno Al's web application is "generally accessible" and "highly usable for screen reader users," particularly after some familiarization.⁷¹ Positive aspects include proper focus management when dialogues and submenus open, custom keyboard navigation for song tables in focus mode, accessible fields for visual editing tasks, and consistent use of headings and landmarks for easier navigation.⁷¹ Suno has also shown improvements over time in labeling previously inaccessible buttons.⁷¹
- Identified Accessibility Challenges: Despite overall usability, some accessibility issues persist for screen reader users. These include unlabeled buttons without clear purpose, inconsistent dialogue behavior, and new controls appearing without proper identification.⁷¹ A primary obstacle noted was switching between classic and REMI lyrics models, which reportedly required advanced techniques like OCR and mouse routing.⁷¹
- o Broader Assistive Technology Context: Al, in general, is being integrated into assistive technologies to support users with various disabilities, including cognitive, speech, motor, and visual impairments. Text-to-music capabilities, like those in Suno, can be particularly beneficial for individuals with motor impairments who find traditional instrument input difficult. The ability to generate musical ideas from descriptions allows creative vision to be translated into sound without complex physical interaction. However, no specific reports directly link Suno's design features to aiding users with cognitive or motor impairments beyond the general ease of a prompt-based system. The platform does not appear to have a publicly available Voluntary

Product Accessibility Template (VPAT) which would formally document its conformance with accessibility standards.¹⁵

While Suno AI has made strides in general usability and shows a degree of accessibility for screen reader users, ongoing attention to resolving identified issues and potentially providing more tailored support for users with diverse disabilities would further align with its mission of democratizing music creation. The lack of a formal VPAT makes a comprehensive assessment against standardized accessibility criteria challenging.

5.2. Data Privacy and Security

Suno Al's Privacy Policy outlines its practices regarding the collection, use, and sharing of user data.35

- Information Collected: Suno collects various types of information:
 - User-Provided Information: Contact details (name, email, address), user account information (username, password, subscription tier, transaction history), and Content (data, music, sound, photos, or other submissions users record or upload, including prompts and generated outputs).
 - Automatically Collected Information: User activity information (features used, access times, pages viewed, IP address, device information), logs related to media creation and interaction, search terms, and social interactions within the service, often collected via cookies.³⁹
 - o **Information from Other Sources:** Data from third-party partners, login integration services (e.g., Google, Discord), and publicly available sources.³⁹
- Use of Information: Data is used to provide and maintain services, communicate with users, inform about offerings, secure the platform, comply with legal obligations, and, significantly, to develop and improve products and services, including training and enhancing the Al models that power the Services.³⁹
- Sharing of Information: Suno states it does not sell user information to third parties.³⁹ Information may be shared with other users (for collaborative features), service providers (under contract for business purposes), with user consent, for legal/compliance reasons, or in connection with business transactions like mergers.³⁹
- **Data Security:** Suno's Terms of Service require users to notify the company of any unauthorized account use and to exit their account after each session.³⁵ The Privacy Policy mentions using information to monitor, detect, and prevent fraudulent or illegal activity and to secure the Services.³⁹ However, specific technical security measures employed are not detailed in the provided snippets.
- **User Rights:** Users generally have rights to opt out of marketing communications, request changes to their information, and request deletion of their information,

- subject to certain exceptions (e.g., legal obligations, ongoing service provision).³⁹ Residents of specific jurisdictions (e.g., EEA, California) may have additional rights like access, portability, correction, and more specific deletion rights.³⁹
- Concerns for Younger Users: One article raises concerns about data privacy for younger users, noting that all Suno accounts are public by default, and users might inadvertently share personal information.²⁶ It also states that Suno stores all generated songs, and permanent deletion requires a manual request.²⁶

The use of user submissions and generated outputs to train and enhance Suno's Al models is a critical aspect of its data usage policy.³⁴ While this is a common practice for Al services, users should be aware that their creative inputs and outputs contribute to the ongoing development of the platform.

5.3. Community Guidelines and Content Moderation

Suno has established Community Guidelines to foster a respectful and safe environment on its platform, outlining acceptable user conduct and types of prohibited content.15

- Expected User Conduct: Users are expected to treat each other with respect, be kind, provide constructive feedback, respect privacy, and avoid impersonation.¹⁵ Harassment, bullying, or abusive behavior are not tolerated.¹⁵
- **Prohibited Content:** Suno explicitly prohibits the posting of:
 - Sexual content (especially targeting minors, for which there is a zero-tolerance policy).¹⁵
 - Content promoting violence, terrorism, or hate.
 - Hate speech based on protected characteristics.¹⁵
 - False information, misinformation, hoaxes. 15
 - Illegal activities or promotion of illegal goods/services.
 - o Commercial spam, fake engagement, or malicious content. 15

Content Moderation Process:

- Suno employs moderation which may flag content even before a song is generated if prompts include names of well-known artists, copyrighted/trademarked terms, derogatory terms, excessive profanity, or other inappropriate topics.¹⁹
- Users can report content that violates guidelines directly on a comment/post or by contacting Suno support or their Discord help team.¹⁵
- Suno states it will review reports fairly and take action if necessary, which can include preventing song generation, requesting a song be switched to "Link Only," removing material without warning, warnings, temporary suspension, or permanent account termination for repeated violations.¹⁵
- Suno will follow DMCA guidelines for copyrighted material flagged by the

original owner.52

- Visibility of Generated Content: Content set to "Public" is visible on the user's
 page and may be featured. "Link-Only" content is not private if the link is shared.
 Features like "Reuse Prompt" are available to anyone with access to a song, which
 users should consider before sharing.¹⁵
- **Effectiveness Concerns:** Despite these guidelines, some reports suggest that harmful content (e.g., with racist or anti-Semitic messages, or misinformation) can sometimes be generated using coded language to slip through filters.²⁶ This indicates ongoing challenges in effectively moderating Al-generated content at scale.

Suno's Community Guidelines and moderation efforts aim to balance creative freedom with platform safety and respect for legal and ethical boundaries. However, the dynamic nature of Al generation and user ingenuity in bypassing filters present continuous challenges for content moderation.

5.4. Governance, Accountability, and Responsible Al Practices

The governance of AI systems like Suno involves the principles, standards, and practices that guide their development and use in a reliable, trustworthy, and responsible manner.76 This includes accountability for outputs, adherence to ethical frameworks, and engagement with stakeholders.

• Suno's Governance Structure (Inferred): Specific details about Suno's internal Al governance structure, dedicated ethics boards, or formal stakeholder engagement mechanisms are not extensively detailed in the provided snippets. User discussions suggest a perception of limited direct, two-way engagement from Suno's development team, with some users feeling that feedback or concerns may not always be visibly acknowledged or addressed promptly.⁷⁷ Some speculate that Suno's primary focus might be on rapid technological development and product iteration, potentially prioritizing these over extensive community management or transparent governance processes, which is common in fast-moving startups.⁷⁷

Accountability for Outputs:

- Suno's Terms of Service place significant responsibility on users for the Submissions they make and the Outputs they generate.³⁵ Users are liable if their use of the service or generated content violates laws or third-party rights.³⁵
- Suno reserves the right to investigate and take action against users who violate its terms, including removing content, suspending accounts, and reporting to law enforcement.³⁵

In legal disputes, such as the copyright infringement lawsuits, Suno itself is being held accountable by external parties (e.g., record labels, GEMA) for the outputs of its system and its training practices.¹¹ Suno's legal strategy has involved demanding proof of ownership from plaintiffs, a move seen by some as an attempt to shift the burden and potentially create legal hurdles for creators.⁴²

Responsible Al Principles (Stated vs. Practiced):

- Suno's Privacy Policy states a commitment to complying with applicable laws in collecting and processing personal information.³⁹
- The platform's Community Guidelines and content moderation policies (discussed above) represent an effort to manage harmful or inappropriate content.¹⁵
- The introduction of watermarking technology is presented as a measure to protect against misuse and detect Suno-generated content.²⁵
- O However, the core controversy around training on copyrighted data without explicit licenses challenges the alignment of Suno's practices with broader principles of responsible and ethical Al development, as argued by many in the creative industries and some academic analyses.¹⁰ A Stanford paper examining Suno through an HCAI lens suggests that while it democratizes creativity, it raises issues regarding ethical alignment, transparency, and artist rights.¹⁰
- Stakeholder Engagement: While Suno has a user community ¹⁵ and has recently introduced features like comments on the platform to foster interaction ⁸², the depth of engagement with broader stakeholders like artist unions, rights holder organizations (beyond legal confrontations), or ethical oversight bodies is not clear from the research. GEMA has stated it endeavors to find solutions in partnership with Al companies, but its lawsuit against Suno indicates this has not yet been achieved.¹³

Effective AI governance typically involves proactive stakeholder engagement, transparent policies, robust mechanisms for accountability, and a commitment to ethical principles that go beyond mere legal compliance. Suno's current situation, particularly the legal battles and criticisms regarding its training data, suggests that its governance and responsible AI practices are under intense scrutiny and may require further development to align with the expectations of all stakeholders in the creative ecosystem.

5.5. Environmental Impact: Energy and Resource Consumption

The operation of large-scale generative AI models like Suno's has an environmental footprint, primarily associated with the significant energy consumption of data centers for training and

inference, as well as water usage for cooling and the resources involved in hardware manufacturing. While specific environmental impact reports or sustainability initiatives directly from Suno are not detailed in the provided research snippets 84, the general context of Al's environmental impact is well-documented and provides a basis for understanding potential implications.

• Energy Consumption of Generative Al:

- Training generative Al models, often with billions of parameters, demands substantial computational power and thus large amounts of electricity, leading to increased carbon dioxide emissions and strain on power grids.⁸⁷ Deploying these models for user queries (inference) also consumes significant energy.⁸⁷
- Data centers are major electricity consumers. Globally, their electricity consumption was 460 TWh in 2022 and is projected to more than double by 2030 to around 945 TWh, with Al being a significant driver of this increase.⁸⁷ Some estimates suggest data centers could account for up to 21% of global energy demand by 2030 when Al delivery costs are factored in.⁸⁸
- A single ChatGPT query is estimated to consume about five times more electricity than a simple web search.⁸⁷ Generating an image with AI can use energy equivalent to fully charging a smartphone.⁸⁸ While music generation energy costs are not directly equated, they involve similar complex computations.
- The energy used for training AI models can be immense. For example, training one large language model was estimated to consume 1,287 MWh (powering ~120 U.S. homes for a year) and generate about 552 tons of CO2.⁸⁷
- User discussions on forums like Reddit reflect awareness of Al's energy consumption, though some downplay individual generation costs while acknowledging the high cost of model training.⁹⁰ Training is described as "costly" but a "one-time thing per iteration," whereas running models for inference is "relatively cheap" on an individual basis but collectively significant.⁹⁰
- Water Consumption: Data centers require vast amounts of water for cooling their hardware. It's estimated that for each kWh of energy a data center consumes, it might need two liters of water.⁸⁷ This can strain local water supplies, especially in arid regions.⁹²
- Hardware Manufacturing: The demand for high-performance GPUs and other specialized hardware for AI contributes to environmental impact through resource extraction (often involving disruptive mining), manufacturing processes (which are energy-intensive), and transportation.⁸⁷
- **Suno's Context:** Suno's CEO, Mikey Shulman, has mentioned that GPU computing is the company's biggest operational cost, exceeding payroll "by a few times,"

indicating significant investment in and reliance on energy-intensive computing power for both production systems and research.¹² This implies a substantial energy footprint for Suno's operations. The platform uses advanced Al models, and each song generation involves complex computations.¹⁸

 Lack of Specific Suno Initiatives: The provided research does not contain information about specific green computing efforts, sustainability reports, or carbon footprint statements from Suno AI itself.²⁵ While some Suno-generated songs touch on themes of sustainability or climate change ⁸⁴, these are user creations, not company policy.

Given Suno's reliance on powerful AI models and extensive GPU computing, its operations inevitably contribute to the environmental concerns associated with the broader AI industry. Without specific disclosures from Suno regarding its energy sources, data center efficiency measures, or other sustainability initiatives, a precise assessment of its environmental impact is not possible from the provided information. However, the general data on AI's energy and resource intensity suggests it is a relevant consideration.

6. Suno in the AI and Creative Landscape

6.1. Target Audience and Market Positioning

Suno AI is strategically positioned to appeal to a wide spectrum of users, aiming to democratize music creation and establish itself in the rapidly expanding generative AI market.2

Target Audience:

- Beginners and Hobbyists: A core target is individuals new to music creation, including "shower singers" or those with ideas but no traditional musical skills.
 Suno offers them an accessible entry point to produce songs using simple prompts.²
- Professional Artists and Musicians: Experienced musicians can use Suno as a tool for brainstorming, overcoming writer's block, experimenting with new styles, generating initial song ideas, or quickly drafting lyrics and melodies without extensive studio time.²
- Content Creators and Small to Medium-Sized Businesses (SMBs): This segment requires original music for videos, podcasts, marketing campaigns, presentations, and other content without risking copyright infringement. Suno provides a means to generate custom jingles, promotional music, or background tracks efficiently and cost-effectively.² Microsoft's integration of Suno into its Al-powered Copilot suite further targets this business and individual productivity segment.²
- Educators and Students: Suno is also finding applications in educational settings, where teachers use it to help students create songs as mnemonic devices or to make writing assignments more engaging.⁹⁶

Market Positioning:

- Suno operates within the growing generative AI market, specifically focusing on AI-powered music creation technology.² This market is driven by the increasing demand from over 12 million professional content creators seeking innovative solutions for original audio content.²
- The platform positions itself as an "Al music studio" that breaks down barriers to music creation.² Its key selling points include ease of use, versatility in input methods (text, images, videos ¹), a range of musical styles, and flexible subscription options including free daily credits.¹
- o **Traffic and Demographics:** Website traffic data for suno.ai (though potentially distinct from app usage) indicates a global audience, with significant user bases in India, Germany, and the Russian Federation, followed by Brazil and the United States. Mobile devices drive the majority of visits to suno.ai (around 72.58%). However, there was a noted decrease in traffic to suno.ai by -21.47% compared to March of the previous year, though the absolute numbers still

represent substantial engagement (e.g., 1.02 million visits in March).⁹⁷

Suno's broad target audience and its positioning as an accessible yet powerful creative tool, backed by significant funding and partnerships like Microsoft Copilot, indicate its ambition to become a mainstream platform for Al music generation. Its appeal to both amateurs and professionals, alongside business use cases, gives it a wide addressable market.

6.2. Funding, Valuation, and Key Personnel

Suno Inc. has rapidly established itself as a significant entity in the AI music generation space, underscored by substantial financial investment and a clear leadership team.

• Funding and Valuation:

- Suno has raised a total of \$125 million in funding.² This was primarily achieved through a Series B funding round on May 21, 2024 (some sources state May 20, 2024 ⁴), which alone accounted for the \$125 million.⁴
- As of this Series B funding round, Suno's valuation reached \$500 million.²
- Prior to the Series B, there was a Series A round on March 1, 2023, with Matrix Partners as a lead investor, though the amount raised was not publicly disclosed.⁴

Key Investors:

- The Series B round was led by Lightspeed Venture Partners.⁴
- Other significant institutional investors include Matrix Partners and Founder Collective.⁴
- Notable angel investors in Suno include Nat Friedman (former CEO of GitHub) and Daniel Gross, both known for their involvement in technology and Al startups.⁴

• Founders and Key Personnel:

- Suno was founded in 2021 (some sources suggest 2022 4) by Martin Camacho, Mikey Shulman, Keenan Freyberg, and Georg Kucsko. 4 The founding team comprises musicians and AI experts with backgrounds at tech companies like Meta, TikTok, and Kensho. 5
- Mikey Shulman serves as the CEO of Suno.⁶
- The team is based in Cambridge, Massachusetts.⁴
- Jack Brody recently joined the team as Chief Product Officer (CPO).³²

The substantial funding and high valuation reflect strong investor confidence in Suno's technology, market potential, and its team's ability to execute its vision of democratizing music creation. This financial backing enables Suno to accelerate product development, expand its team, and enhance its AI capabilities, positioning it

for further growth despite the legal and ethical challenges it faces.⁴ The involvement of experienced tech investors and entrepreneurs also lends credibility to its operations.

6.3. Competitive Landscape

Suno operates in an increasingly competitive generative AI market, particularly within the niche of AI music creation. While it has garnered significant attention and funding, it faces competition from other established and emerging players.

• Direct Al Music Generation Competitors:

- Udio: Frequently mentioned alongside Suno, Udio is another prominent AI music generation platform that allows users to create songs from text prompts.¹¹ Udio is also subject to similar copyright infringement lawsuits from major record labels.¹¹ Udio reportedly secured \$10 million in funding.⁴³ Some comparisons suggest Udio might be faster in generation time for shorter clips but Suno may produce longer initial tracks.⁶⁹ User feedback on audio quality is sometimes compared between Suno and Udio.²⁹
- Boomy: An Al music maker that has reportedly produced a vast number of tracks (17 million mentioned in one source ⁴³). It is also a subject of discussion in the Al music space.³⁰
- Soundraw: An Al music generator that emphasizes royalty-free music for creators and explicitly prohibits registering its music with Content ID systems.⁹⁸
- AIVA (Artificial Intelligence Virtual Artist): Another AI music composition tool mentioned as an alternative to Suno.
- Beatoven.ai: Noted for customization options and also positioned as a Suno alternative.⁹⁹
- Google's Music Al Sandbox (Lyria): Google is also developing advanced Al music tools, indicating competition from major tech players.⁷⁴
- Splash: A developer of musical gameplay, listed as a competitor with \$20.1M in funding.⁶
- Local Models (e.g., YuE): The emergence of local, open-source models like YuE, which can run on consumer hardware (e.g., 24GB GPUs), presents a different kind of competition, offering more user control and privacy, though potentially with a higher technical barrier to entry.¹⁰⁰
- **Broader Al and Audio Technology Companies:** Suno also competes indirectly with companies specializing in related Al audio technologies, such as:
 - Speech-to-text and transcription services (e.g., Otter.ai, AssemblyAl).⁶
 - o Sound recognition (e.g., SoundHound).6
 - Text-to-speech (e.g., WellSaid Labs).⁶
- Tracxn Competitive Ranking: One market intelligence platform, Tracxn, ranked Suno 10th in its list of competitors/alternates based on various factors, with

companies like Otter.ai, SoundHound, and AssemblyAl ranking higher, though these are not all direct music generation competitors.⁶ This highlights the diversity of the "Al audio" space.

The competitive landscape is dynamic, with new tools emerging and existing platforms rapidly evolving their features (as seen with Suno's own version updates). Key differentiators in this market include audio quality, range of styles, ease of use, user control over generation, licensing terms (especially for commercial use), integration capabilities (APIs), and, increasingly, the perceived ethical and legal standing of the platform. Suno's significant funding and early traction give it a strong position, but it must continuously innovate and navigate the complex legal environment to maintain its edge.

6.4. Influence on the Music Industry and Creative Practices

Suno AI, along with other generative AI music tools, is exerting a growing influence on the music industry and established creative practices, sparking both enthusiasm for new possibilities and significant apprehension about its disruptive potential.

- Democratization of Music Creation: One of the most cited impacts is the
 "democratization" of music production.² Suno allows individuals without formal
 musical training or access to instruments/studios to create complete songs,
 potentially unlocking creativity for a broader population.² This could lead to a surge
 in amateur music production and new forms of musical expression.²⁴
- Tool for Established Artists: For professional musicians and songwriters, Suno can serve as a creative assistant for brainstorming melodies, harmonies, and lyrical ideas, overcoming writer's block, or quickly prototyping song structures.² It can help artists experiment with new genres or refine ideas before committing to full studio production.²
- Shift in Creative Workflows: Al tools are changing how music is conceptualized and produced. The process can become more iterative and prompt-driven, with the artist acting as a curator or director of Al-generated elements. 49 This may lead to new hybrid forms of human-Al collaboration. 17
- Challenges to Traditional Skills and Value: The ease with which AI can generate music has led to debate about the value of traditional musical skills and the labor involved in human artistry. Suno CEO Mikey Shulman's comments about music creation being "not really enjoyable" for many and skill mattering less than "taste" have been controversial, seen by some as devaluing musical craftsmanship. This reflects a tension between AI-driven efficiency and the perceived intrinsic value of human effort and emotional expression in music.
- Copyright and Licensing Upheaval: Suno's alleged use of copyrighted music for

training has triggered major lawsuits and intensified the debate about how copyright law applies to generative Al.¹¹ This is forcing the industry to confront fundamental questions about fair use, derivative works, and compensation for artists whose work contributes to Al model training. It may lead to new licensing models or legal frameworks.⁷

- Potential for Homogenization vs. Diversity: There are concerns that AI, if trained on biased or mainstream-dominated datasets, could lead to musical homogenization, where generated music lacks diversity and tends towards generic styles.⁴⁶ Conversely, AI could also be a tool to explore and combine diverse global music styles if datasets are curated inclusively, potentially fostering new hybrid genres.¹⁷
- New Revenue Models and Market Dynamics: The proliferation of easily creatable music could saturate the market, potentially affecting streaming royalty payouts or the demand for certain types of commissioned music (e.g., stock music, jingles).² However, Al could also enable new revenue streams, such as personalized music experiences or tools for independent artists to produce more content.⁷
- Ethical Use and Artist Integrity: The ability of AI to generate music in the style of known artists or even clone voices (though Suno claims to restrict direct artist name prompts ⁴¹) raises ethical issues around artist identity, deepfakes, and unauthorized exploitation of an artist's brand.¹⁶

Suno Al is at the forefront of these changes, acting as both a catalyst for innovation and a lightning rod for the music industry's anxieties about the future. Its development and adoption are accelerating discussions and actions related to Al's role in creativity, intellectual property, and the economic sustainability of artistic professions.

7. YouTube Content ID as a Gauge for Suno's Generated Content

7.1. How YouTube Content ID Works

YouTube Content ID is a digital fingerprinting system developed by YouTube to help copyright owners identify and manage their content on the platform.98 When a rights holder submits their audio or visual work to Content ID, the system creates a unique "fingerprint" or reference file for that content. YouTube then scans all new and existing uploads against this database of fingerprints.101

If Content ID finds a match between a newly uploaded video (or parts of it) and a fingerprinted work, the copyright owner is notified and can choose from several actions ¹⁰¹:

- Monetize: Place ads on the video containing their content and receive the ad revenue.
- Track: Monitor the video's viewership statistics without taking direct action.
- Block: Prevent the video from being viewed in certain territories or globally.
- **Takedown:** Issue a formal copyright takedown notice to have the video removed.

This system is designed to help rights holders control the use of their copyrighted material and potentially earn revenue from user-generated content that incorporates their work.¹⁰¹

7.2. Eligibility Criteria for Content ID (Especially for Al Music)

Not all content is eligible for YouTube Content ID. YouTube and its distribution partners have specific criteria to prevent misuse and ownership conflicts. These are particularly relevant for Al-generated music:

- Originality and Exclusive Rights: A primary requirement is that the uploader must own the exclusive rights to all elements of the track they are submitting to Content ID.¹⁰¹ This includes both the musical composition and the sound recording.
- **Prohibition on Non-Exclusive Content:** Music that uses samples, beats, or loops purchased with non-exclusive licenses is generally ineligible for Content ID.¹⁰¹ This is because multiple users might have licensed the same non-exclusive element, leading to conflicting ownership claims if all tried to register it with Content ID.

• Al-Generated Music and Content ID:

Many music distributors and platforms explicitly state that purely Al-generated music, or music where Al is the primary creator without significant human creative input, is not eligible for Content ID registration. This is often because such works may not qualify for copyright protection in the first place (lacking human authorship) or because the Al itself might generate similar outputs for multiple users, making exclusive ownership claims problematic.

- SOUNDRAW, another AI music generator, explicitly prohibits users from registering their AI-generated music with Content ID to maintain its royalty-free assurance and protect all users from conflicts. They argue that if multiple creators could register the same AI track, it would lead to unfair claims.
- O Horus Music, a distributor, states they cannot distribute Al-assisted or Al-generated works to Content ID platforms due to those platforms' policies. They accept Al-assisted works (where Al is a tool and sufficient human creative choices are made) for general distribution if certain conditions are met (like having licenses for the Al tech and identifying Al-used parts), but not for Content ID. 100% Al-generated works are not accepted for distribution at all as they don't qualify for copyright.¹⁰²
- YouTube's Evolving Stance: YouTube is developing "likeness management technology," including synthetic-singing identification within Content ID, to allow partners to detect and manage Al-generated content simulating their singing voices. This suggests a move towards enabling rights holders to manage Al-generated imitations of their work, rather than necessarily allowing creators of purely Al music to claim new, original Al works via Content ID without clear copyright. YouTube also requires creators to disclose when realistic content is made with Gen Al. 103

Given these criteria, music generated by Suno, especially if it's entirely Al-composed or if the user doesn't have clear, exclusive copyright recognized by law, would likely face significant hurdles in being accepted into or successfully managed via YouTube Content ID by the *user* of Suno.

7.3. User Experiences and Challenges with Suno Music and Content ID

User discussions and experiences shared on platforms like Reddit reveal a complex and often frustrating landscape when attempting to use YouTube Content ID with music generated by Suno Al.104

- Skepticism and Scams: Some users have encountered third-party services ¹⁰⁴ claiming to register Al-generated music or covers made with Suno into Content ID and enable monetization. However, these services are often met with significant skepticism, with many users suspecting them of being scams, making false claims about their capabilities, or not being legitimate YouTube partners authorized for Content ID registration.¹⁰⁴ Concerns include these services potentially taking money without providing real protection or even causing copyright issues for users.¹⁰⁴
- **Distributor Policies:** Established music distributors like Distrokid may

automatically register music with Content ID as part of their service. However, their policies regarding purely Al-generated music from platforms like Suno are often restrictive. Ditto Music, for instance, was reportedly okay with releasing Al music to streaming platforms but could not support it on Content ID. Identity Music was more open but had library size requirements. This indicates that even if a user has commercial rights from Suno's paid plan, their distributor might block Content ID registration for such tracks.

- Risk of False Claims and Ownership Disputes: A major concern is that
 Al-generated music, due to the nature of the models, might inadvertently contain
 elements similar to other works (either existing copyrighted songs or other Al
 generations). This can lead to:
 - Content ID flags for existing music: A Suno track might be flagged by Content ID as matching a pre-existing copyrighted song if the AI inadvertently reproduced similar melodies or structures.¹⁰⁵ One user reported a Suno track being flagged for containing a sample from a song released years ago.¹⁰⁵
 - Claims by other Al users or entities: If Al music is not uniquely copyrightable or if multiple users generate similar tracks, there's a risk of unprotected music being claimed by others via Content ID, who might then monetize it.¹⁰⁴
- Suno's Terms and User Responsibility: Suno's terms make it clear that users are responsible for handling Content ID disputes.³⁴ Suno does not mediate these.
- Watermarking and Detection: Suno states it uses proprietary, inaudible watermarking technology to detect if a song was created using its platform, primarily to protect against misuse (e.g., commercial use of free-tier songs).²⁵ While this watermark identifies a song as Suno-generated, it doesn't inherently grant it Content ID eligibility or resolve copyright ownership issues. It could, however, be used by Suno or platforms to identify Al-generated content. Some users express doubt about the robustness or undetectability of such watermarks after audio processing.⁷⁸
- **Difficulty in Proving Ownership for Content ID:** The core challenge is that Content ID generally requires claimants to fully own all parts of a composition and recording. Given the legal ambiguity around copyright for Al-generated music (where human authorship is minimal), users of Suno may struggle to meet this threshold for Content ID registration, even with commercial rights from Suno. Some users suggest that to secure copyright and potentially Content ID eligibility, one might need to significantly modify the Al output, perform it manually, or have human musicians recreate it, thereby adding substantial human authorship. 105

The user experiences underscore that Content ID is not a straightforward solution for protecting or monetizing Suno-generated music. The system is primarily designed for

human-created works with clear copyright ownership, a status that most purely Al-generated music currently lacks.

7.4. Validity of Content ID as a Gauge for Suno's Outputs

Based on its operational principles, eligibility criteria, and the nature of Al-generated content, YouTube Content ID is not a valid or reliable gauge for definitively determining the originality, copyright status, or permissible use of music generated by Suno Al. Here's why:

- Content ID Detects Similarity, Not Necessarily Infringement or Originality: Content ID works by matching digital fingerprints. A match indicates similarity to a reference file in its database. It does not, by itself, make a legal determination of copyright infringement, nor does it confirm the "originality" of a new piece in a way that guarantees it is free from any infringing elements if it doesn't get a match. A Suno track might not get a Content ID claim simply because no similar reference file exists in the database, or because the similarity doesn't meet the matching threshold, not necessarily because it's wholly original or non-infringing if compared to the vast corpus of all existing music (much of which isn't in Content ID).
- Ineligibility of Most AI-Generated Music for User-Initiated Content ID Registration: As discussed, platforms and distributors generally do not allow users to register purely AI-generated music (where human authorship is minimal) into Content ID under their own name. This is due to the uncertain copyright ownership of such works and the potential for generating non-unique outputs. Therefore, the absence of a Content ID claim on a Suno track uploaded by a user doesn't mean it's "cleared"; it more likely means the user couldn't (or shouldn't) register it in the first place.
- Suno's Own Copyright Disclaimers: Suno itself states it cannot guarantee copyright protection for the works its Al generates, acknowledging the USCO's stance against copyright for primarily Al-created works.⁷ If the work itself isn't clearly copyrightable by the user, using Content ID to assert ownership is problematic and often disallowed by platform terms.
- Potential for False Positives and False Negatives:
 - False Positives: A Suno track might trigger a Content ID claim if the Al inadvertently generates sequences that are coincidentally similar to existing copyrighted material in the Content ID database, even if not a direct copy.¹⁰⁵
 - False Negatives: A Suno track might be substantially similar to a copyrighted work not registered in Content ID, or it might be a "sound-alike" that doesn't trigger a precise fingerprint match but could still raise other legal issues (like personality rights). In such cases, Content ID would offer no indication of a

problem.

- Content ID Focuses on Rights Holders of Existing Works: Content ID is primarily
 a tool for established rights holders to manage their existing, human-created
 copyrighted works. YouTube is developing tools for rights holders to identify
 Al-generated content that simulates their voice or likeness ¹⁰³, but this is about
 protecting existing artists from Al deepfakes/imitations, not about validating new
 Al creations as original copyrighted works by the Al user.
- Suno's Training Data Issues: Given the allegations and admissions that Suno's models were trained on copyrighted music without licenses ¹¹, there's an inherent risk that its outputs could contain elements derived from this training data, making them susceptible to infringement claims regardless of Content ID status. GEMA's ability to document infringing outputs from Suno highlights this risk.¹³

Therefore, relying on whether a Suno-generated track gets flagged (or not flagged) by YouTube Content ID as a definitive indicator of its copyright legitimacy or its complete originality is misguided. The system is not designed for that purpose in the context of AI-generated content where authorship and ownership are ambiguous. A lack of a Content ID claim does not equate to the work being "safe" or "original" in a legal sense, nor does a claim necessarily mean the AI user has done something wrong if the AI itself produced the problematic similarity. It simply reflects the limitations and specific purpose of the Content ID system in a rapidly evolving technological landscape.

8. Conclusion

Suno AI stands as a compelling and controversial avatar of the current wave of generative artificial intelligence, specifically within the realm of music creation. Its platform undeniably lowers the barrier to entry for music production, offering tools that enable a broad spectrum of users, from novices to professionals, to generate full songs from simple text prompts. This technological capability, backed by significant financial investment and rapid iteration of features like extended song lengths, improved genre adherence, and dedicated instrumental modes, positions Suno as a potentially transformative force in how music is conceived, created, and consumed. The introduction of an API further signals ambitions beyond a standalone application, potentially embedding its technology within a wider ecosystem of creative tools. However, Suno's innovative prowess is inextricably linked with profound and unresolved copyright and ethical challenges. The crux of the controversy lies in its training data practices. Admissions from the company and substantial allegations in ongoing lawsuits from major music industry rights holders indicate that Suno's Al models were trained on vast quantities of copyrighted musical works, largely without explicit permission or compensation for the original creators. Suno's defense, invoking "fair use" and the transformative nature of Al learning, is currently being tested in courts and in the court of public opinion, and remains a highly contentious issue. This practice raises fundamental questions about intellectual property rights, the value of human creativity, and the ethical obligations of Al developers who build commercial products on the foundation of existing artistic labor.

The copyright policies of Suno itself reflect these underlying ambiguities. While paid subscribers are contractually granted "ownership" and commercial use rights for the music they generate, Suno explicitly disclaims any guarantee that these outputs will be afforded legal copyright protection. This is a critical distinction, as current legal frameworks, particularly in the U.S., are hesitant to grant copyright to works primarily authored by Al. Consequently, users, even on paid tiers, bear significant risks related to the uniqueness of their creations, potential third-party infringement claims, and the actual enforceability of their "ownership." Suno's retention of a broad license to use all user-generated content, including for model training, further complicates the notion of exclusive user ownership.

Ethically, beyond the training data debate, Suno faces scrutiny regarding algorithmic bias and cultural representation. The risk of AI models perpetuating biases present in their training data, potentially leading to a homogenization of musical styles or the underrepresentation of non-Western and niche genres, is a significant concern highlighted by academic research. While Suno may aspire to fairness, concrete, transparent measures to mitigate such biases are not yet clearly demonstrated. The

"black box" nature of its advanced AI models also limits transparency and explainability, making it difficult to fully understand how outputs are derived or to hold the system accountable for specific creative choices. Furthermore, the platform's capacity to generate music that can sound like known artists, despite policies against using artist names in prompts, raises concerns about deepfakes and the protection of artists' unique identities.

Non-performance characteristics such as usability are generally positive, with efforts towards accessibility for screen reader users, though further improvements are needed. Data privacy practices are outlined, but the use of user content for ongoing model training is a key aspect users must accept. Community guidelines and content moderation aim to create a safe platform, but the challenge of policing Al-generated content effectively remains. The environmental impact, tied to the significant energy consumption of Al data centers, is also a pertinent, albeit underexplored in Suno's specific context, consideration.

In the broader AI and creative landscape, Suno is a well-funded, rapidly evolving competitor with a clear ambition to reach a mass market. Its influence is palpable, forcing the music industry to confront the implications of AI on creative workflows, artist livelihoods, and the very definition of musical authorship.

Finally, YouTube Content ID has proven to be an unreliable and inappropriate tool for gauging the copyright status or originality of Suno-generated music. Its design is for human-created works with clear ownership, a status most Al-generated music currently lacks, and its mechanisms are not equipped to navigate the nuances of Al generation, non-exclusive outputs, or the complex legal questions at play.

In conclusion, Suno AI exemplifies the disruptive potential of generative AI in the creative domain. It offers exciting new avenues for musical expression but operates within a complex and often fraught legal and ethical landscape. The resolution of ongoing legal battles over its training data, coupled with evolving regulatory frameworks for AI-generated content, will be pivotal in shaping Suno's future and the broader relationship between artificial intelligence and the music industry. For users, a clear understanding of the limitations of "ownership," the responsibilities they bear, and the ethical considerations inherent in using such a powerful tool is paramount. For the industry and society at large, Suno serves as a critical case study demanding a careful balance between fostering innovation and upholding the rights and values that underpin human creativity.

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