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MUSIC IN THE XXI CENTURY: NEW OBJECTS AND SUBJECTS SHAPED BY DIGITAL DEVELOPMENT

Summary: The XXI century has witnessed a profound transformation in the landscape of music production, discovery, and consumption, primarily driven by digital technologies and artificial intelligence (AI). These advances have not only altered the mechanics of music creation but have also reshaped the cultural, economic, and social fabric of music itself. This article explores the interconnected themes of automation and AI in music production, the rise of human-AI collaborations, the impact of algorithmic curation on musical diversity, and the broader consequences for artists and listeners. Through a comprehensive analysis of current trends and research, we examine how new objects (technologies, compositions, markets) and subjects (artists, listeners, AI agents) are emerging in the digital music era.

Music production has evolved from analog processes to highly automated digital environments. Automation now enables software-controlled adjustment of parameters such as volume, effects, and spatial placement, delivering dynamic, polished mixes without the need for constant manual intervention. This evolution has democratized music production, granting more creators access to sophisticated tools that were previously the domain of specialized engineers.

Impact on Creativity The automation of technical processes empowers artists to dedicate their focus to creative expression rather than the intricacies of technical details. Within genres such as electronic music, where AI adoption rates reached 54% in 2024, and hip-hop (53%), creators now utilize AI-driven tools to explore novel sonic landscapes, structural arrangements, and stylistic approaches, thereby broadening the spectrum of musical possibilities. Automation facilitates the emergence of hybrid forms and the convergence of genres, encouraging artists to move beyond conventional boundaries and redefine the very essence of a musical composition.

Key words: Digital music, Artificial intelligence, Music production, Algorithmic composition, Listener behaviour.

AI-Generated Music and Human-AI Collaboration: Forging Novel Musical Forms

The Surge in AI-Generated Music

AI-generated music has transcended its status as a niche phenomenon. As of early 2025, platforms like Deezer have reported that 18% of all newly uploaded tracks were created by AI, with over 20,000 AI-generated tracks being added daily – nearly doubling the figure from just four months prior. The global market for AI in music reached \$2.9 billion in 2024, with generative AI alone valued at \$642.8 million and projected to expand to \$3 billion by 2030 [3]; [1]; [2].

Human-AI Collaboration and the Rise of Hybrid Creativity Instead of functioning merely as a tool for automation, artificial intelligence is increasingly evolving into a genuine creative partner for human musicians. In this collaborative paradigm, artists provide initial creative input – be it in the form of nascent melodies, stylistic frameworks, or even fragmented musical ideas – and AI systems respond by generating algorithmically derived compositions. These AI-generated outputs then serve as a springboard for further human iteration, fostering a dynamic and reciprocal creative exchange. This dialogic process, where human intuition and machine learning intertwine, culminates in the creation of truly novel musical forms that bear the distinct hallmarks of both human artistry and artificial intelligence. A range of innovative tools, including platforms like AIVA, Amper Music, Soundraw, and Boomy, perfectly illustrate this burgeoning trend. They offer musicians unprecedented avenues for sonic experimentation, the blending of diverse genres, and the incorporation of a wider spectrum of cultural influences into their work [Soundraw.io, DigitalOcean, 2025].

Economic and Cultural Implications

While the integration of AI into creative processes undeniably unlocks new avenues for innovation, it also brings forth significant economic considerations. A 2024 study conducted by CISAC (the International Confederation of Societies of Authors and Composers) has projected a potential revenue loss of \$10.5 billion for human music creators between the years 2024

and 2028 as a direct consequence of generative AI. Furthermore, the study anticipates that revenue losses specifically attributable to AI in music could exceed 24% over a five-year period [5]. This disruptive shift underscores the pressing need to develop and implement new models for value creation and fair compensation within a musical landscape where the traditional boundaries between human and machine authorship are becoming increasingly indistinct.

AI in the Music Creation Process: Algorithmic Composition and Genre Fusion

Algorithmic Composition

Artificial intelligence has now assumed a pivotal and increasingly indispensable role within the music compositional process itself. Leveraging the power of machine learning algorithms and sophisticated neural networks, AI systems analyze vast and diverse datasets of existing musical works. This analysis enables them to generate entirely new musical content, including original melodies, intricate harmonies, and complex rhythmic patterns. This technological capability allows for the rapid creation of music that can be precisely tailored to evoke specific moods, align with particular genres, or even cater to the unique and individualized preferences of listeners. Major technology corporations, including the renowned DeepMind, have actively integrated generative AI tools into popular platforms such as MusicFX DJ and YouTube Shorts. This strategic integration is further mainstreaming the adoption and utilization of AI-driven composition within the broader musical landscape [8].

Genre Fusion and Diversity

Artificial intelligence tools play a significant role in facilitating the fusion of various musical genres and the integration of cross-cultural influences, thereby contributing to an unprecedented level of musical diversity. By intelligently reassembling elements derived from distinctly different musical traditions, AI-generated compositions possess the potential to dismantle established aesthetic boundaries and serve as catalysts for innovation. For instance, music generators powered by AI enable the synthesis of the complex harmonic structures found in jazz with the driving rhythms of electronic music, or the incorporation of global folk music motifs into contemporary pop tracks, leading to a richer and more varied sonic environment [11].

Risks of Homogenization

Notwithstanding its inherent capacity to amplify diversity within music, there exists a tangible risk that an excessive dependence on widely adopted AI models could inadvertently lead to predictable or overly standardized musical outputs. Recognizing this potential pitfall, certain communities and specialized tools are actively working to counteract this trend by championing the representation of niche musical markets and fostering the creation of imaginative mashups that deliberately challenge and subvert conventional genre classifications (Eastside-online.org, LinkedIn – Ramloll, PhD).

The “Filter Bubble” Phenomenon and Its Consequences for Musical Horizons

Understanding the Filter Bubble

A notable consequence arising from algorithmic curation is the phenomenon known as the “filter bubble”. Within this context, listeners are predominantly presented with music that closely aligns with their pre-existing musical tastes and preferences. Machine learning models, including adaptive user interfaces (AUIs), operate by customizing recommendations based on an individual's past listening behavior. This process creates feedback loops that inadvertently reinforce established preferences, potentially limiting exposure to new and different musical styles [Flaxman, Goel, & Rao, 2016; Schneider-Hufschmidt, Küme, & Malinowski, 1993].

Evidence and Effects

Multiple research studies have provided evidence confirming that prominent music streaming platforms such as Spotify and Deezer exhibit the effects of filter bubbles. This phenomenon results in a reduced exposure of users to novel or diverse musical tracks and encourages patterns of repetitive listening to familiar music. The algorithmic feedback loops inherent in these platforms can inadvertently confine listeners within a limited range of musical experiences, thereby diminishing the potential for the serendipitous discovery of new artists and genres [6].

Implications for Diversity and Discovery

The filter bubble effect contributes to a constriction of musical horizons, as algorithms tend to prioritize familiar hits and widely popular content. This not only curtails individual musical exploration but also biases the broader

cultural ecosystem towards homogeneity, making it more difficult for independent or experimental artists to achieve recognition [13]; [14]; [KISD thesis].

The Growing Reliance on Algorithms and the Decline of Independent Discovery

The Shift from Serendipity to Convenience

The Increasing Reliance on Algorithms and the Erosion of Independent Discovery The Transition from Serendipity to Convenience Music discovery in the digital age is increasingly shaped by a tension between the element of chance and the pursuit of convenience. While algorithmically driven recommendations offer ease and efficiency, they can also lead to predictability, thereby diminishing the excitement and authenticity associated with unexpectedly encountering new music [Medium; The Guardian; SAGE Journals, <https://journals.sagepub.com/home/tvc>].

Declining Independent Discovery

Research suggests that as users become more reliant on algorithmic selection processes, their opportunities for self-directed musical discovery decrease. While personalized recommendations may cater to immediate preferences, they often reinforce existing listening habits rather than encouraging a broader exploration of music. This dynamic is particularly pronounced for adventurous listeners who place a high value on novelty and surprise

[ResearchGate](https://www.researchgate.net/publication/221519984_Auralist_Introducing_serendipity_into_music_recommendation]; researchswinger.org].

Impact on Independent Artists

Algorithmic curation presents a dual-edged sword for independent musicians, offering both potential avenues and significant obstacles. While curated playlists and algorithmic recommendations could theoretically expose niche artists to new audiences, the reality often sees these systems favoring mainstream content, making organic discovery and audience development more challenging without substantial promotional investment [sharetapros.com; medium.com; [newpublic.substack.com, <https://newpublic.substack.com/p/the-algorithmic-culture-of-music>]. Furthermore, social media algorithms add

complexity by often requiring artists to strategically manipulate the system or invest in paid advertising to gain visibility (saturnoart.com).

Navigating the Future: Balancing Innovation, Diversity, and Discovery

Toward a More Inclusive and Innovative Music Ecosystem

As artificial intelligence and automation persist in their transformation of the musical landscape, various stakeholders – including artists, digital platforms, and listeners themselves – are confronted with the intricate task of harmonizing innovation with the crucial elements of diversity and genuine discovery. Recognizing this need, digital platforms are beginning to explore novel approaches, such as integrating elements of serendipity into their algorithmic recommendation engines. The aim is to strike a balance between the convenience offered by algorithms and the delightful experience of encountering unexpected musical treasures [SAGE Journals]; [9].

Opportunities for Renewal

Artificial intelligence tools possess a significant potential to enrich musical diversity by facilitating the convergence of genres, promoting cultural inclusivity, and providing greater visibility to niche musical markets. By intentionally designing digital systems that prioritize exploration and experimentation, the music industry can cultivate a richer, more varied, and ultimately more engaging musical environment for all involved [Forbes 2023]; [DeepMind blog](<https://www.deepmind.com/blog>).

Addressing Economic and Ethical Concerns

The economic disruption brought about by generative artificial intelligence underscores the urgent need for the development of new frameworks that guarantee equitable compensation and appropriate recognition for human creative endeavors. Furthermore, as the distinctions between human and machine creativity become increasingly blurred, critical ethical considerations surrounding authorship, authenticity, and the potential for cultural appropriation must be thoughtfully and proactively addressed [CISAC]; Digital Music News; Hypebot].

Conclusion

The advancements in digital technology and the rise of artificial intelligence have fundamentally reshaped the very nature of music in the 21st century, influencing both the musical works themselves and the roles of those who create and consume them. While automation and algorithmic composition expand the horizons of creative expression, and collaborations between humans and AI give rise to entirely new musical forms, the growing reliance on algorithms also presents considerable challenges. These include the formation of filter bubbles, the potential for musical homogenization, and the marginalization of independent discovery and diverse voices. Navigating this evolving landscape necessitates a deliberate and conscious effort to find a balance between technological innovation and principles of inclusivity, ensuring that the music ecosystem of the future remains dynamic, diverse, and open to the unexpected joys of musical serendipity.

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МУЗЫКА В XXI ВЕКЕ: НОВЫЕ ОБЪЕКТЫ И СУБЪЕКТЫ, СФОРМИРОВАННЫЕ ЦИФРОВЫМ РАЗВИТИЕМ

Резюме: В XXI веке произошла глубокая трансформация ландшафта музыкального производства, открытия и потребления, в

первую очередь обусловленная цифровыми технологиями и искусственным интеллектом (ИИ). Эти достижения не только изменили механику создания музыки, но и изменили культурную, экономическую и социальную структуру самой музыки. В этой статье рассматриваются взаимосвязанные темы автоматизации и ИИ в музыкальном производстве, рост сотрудничества человека и ИИ, влияние алгоритмического кураторства на музыкальное разнообразие и более широкие последствия для артистов и слушателей. С помощью всестороннего анализа текущих тенденций и исследований мы изучаем, как в эпоху цифровой музыки появляются новые объекты (технологии, композиции, рынки) и субъекты (артисты, слушатели, агенты ИИ).

Ключевые слова: Цифровая музыка, Искусственный интеллект, Музыкальное производство, Алгоритмическая композиция, Поведение слушателя.

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XXI ƏSRDƏ MUSIQI: RƏQƏMSAL İNKİŞAFLA FORMALAŞAN YENİ OBYEKTlər VƏ SUBYEKTlər

Xülasə: XXI əsr musiqi istehsalı, kəşfi və istehlakı mənzərəsində, ilk növbədə rəqəmsal texnologiyalar və süni intellekt (AI) tərəfindən idarə olunan köklü transformasiyanın şahidi oldu. Bu irəliləyişlər nəinki musiqi yaradıcılığının mexanikasını dəyişdirdi, həm də musiqinin özünün mədəni, iqtisadi və sosial quruluşunu yenidən formalaşdırdı. Bu məqalə musiqi istehsalında avtomatlaşdırma və AI-nin bir-biri ilə əlaqəli mövzularını, insan-AI əməkdaşlığının yüksəlişini, alqoritmik kurasiyanın musiqi müxtəlifliyinə təsirini və sənətçilər və dinləyicilər üçün daha geniş nəticələrini araşdırır. Mövcud tendensiyaların və tədqiqatların hərtərəfli təhlili vasitəsilə biz rəqəmsal musiqi dövründə yeni obyektlərin (texnologiyalar, kompozisiyalar, bazarlar) və subyektlərin (sənətçilər, dinləyicilər, AI agentləri) necə yarandığını araşdırırıq.

Açar sözlər: Rəqəmsal musiqi, Süni intellekt, Musiqi istehsalı, Alqoritmik kompozisiya, Dinləyici davranışı.