Perception and bias towards AI music.

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ABSTRACT:

The advent of new information technology (IT) has brought about a profound transformation in the realm of music production and consumption. Notably, Artificial Intelligence (AI) has emerged as a significant catalyst in this process. AI's influence extends to various facets of music, including the completion of Schubert's unfinished symphony and the creation of original compositions by machines. Moreover, AI is even involved in the selection of our next musical preferences. It is evident that the impact of AI extends beyond music, encompassing other artistic domains such as painting. The awareness that certain artistic works are generated by AI systems has been found to alter people's perception. Consequently, it becomes crucial to explore the presence of bias in these contexts. The objective of this paper is to conduct an analysis of pertinent literature to ascertain the existence of bias but also the perspective of the audience towards AI-generated music. Additionally, we propose the implementation of two distinct surveys, one with disclosed artist identity and the other with undisclosed artist identity. Two musical compositions were meticulously chosen to serve as subjects for the conducted surveys. Notably, the AI generated song was deliberately selected to possess a heightened level of auditory appeal in accordance with the personal preference of the author. This deliberate choice was made with the intention of subsequently identifying and examining any potential bias that may arise during the survey analysis phase. Participants will be divided into two groups, each assigned to complete only one of the surveys. The aim of this approach is to confirm the presence of bias, if any, within the surveyed groups and collect the beliefs of the participants towards AI-generated music. The outcomes of this investigation hold significant potential in the scientific realm, as they can be compared with findings from different branches of the art world, thereby illuminating patterns regarding the perceptions of the audience.

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KEYWORDS:

Music, future, ai, artificial intelligence, ai generated, music selection.

1. INTRODUCTION:

Music has perpetually served as an artistic medium that provides entertainment, evokes emotions corresponding to various situations, and fosters audience engagement with both performers and compositions. However, in contemporary times, the music industry has witnessed the extensive integration of advanced technologies, particularly artificial intelligence (AI). Notably, the present era demonstrates instances where centuries-old musical pieces are

finalized, deceased artists continue to "produce" music, and songs are composed within mere seconds, raising questions regarding potential implications for the future of music. This prompts inquiries regarding whether these developments pose concerns or represent advantageous enhancements. Additionally, there arises a contemplation of the eventual replacement of human artists by AI-driven systems [6]. The present research endeavors to explore society's perspectives on AI-artists but also to try and find potential bias towards them [4], considering a dichotomy between individuals who have undergone formal musical training and dedicated their lives to becoming accomplished artists through traditional means, such as guitarists and non-digital songwriters, and those who lack musical expertise but derive pleasure from music consumption.

2. PROBLEM STATEMENT:

In the contemporary era, Artificial Intelligence (AI) has demonstrated its capacity to generate musical compositions at a significantly accelerated rate when compared to human counterparts. Furthermore, AI-produced music exhibits a distinct ability to captivate a vast audience, benefiting from the multifarious promotional avenues available within the music industry. The potential affordability and heightened efficiency offered by AI present an enticing prospect for the creation and commercialization of music. This research paper aims to delve into the perspectives held by both artists and audiences regarding AI-generated music, thereby analyzing societal opinions concerning AI artists.

2.1 RESEARCH QUESTION:

The problem statement will lead to the following research question:

What is the perception of society and what potential bias does exist towards AI-music artists?

3. METHODOLOGY:

In order to address the research question at hand, our approach encompasses a blend of methodological techniques, including a systematic literature review and subsequent quantitative research in the form of surveys. The systematic literature review will adhere to the Grounded Theory approach, encompassing five sequential steps: Definition, Search, Selection, Analysis, and Presentation. This process, informed by the framework derived from [1], will establish a solid foundation for our investigation by critically evaluating existing scholarly works. Following the establishment of preliminary expectations through the literature study, we will proceed to administer two distinct surveys aimed at confirming these expectations and drawing meaningful conclusions. The surveys will focus on gathering perspectives from individuals who are not professionally involved in the field of music, thereby representing the wider society but also on musicians, thereby gaining insights from within the industry itself. The sole distinction between the two surveys lies in the anonymity of the author in the first survey, while in the second survey, the author is disclosed. Given our preference for the AI song, it is anticipated that the audience will exhibit a similar inclination towards it. These surveys will provide valuable data to supplement our research and facilitate comprehensive analysis and interpretation.

4. DEFINE

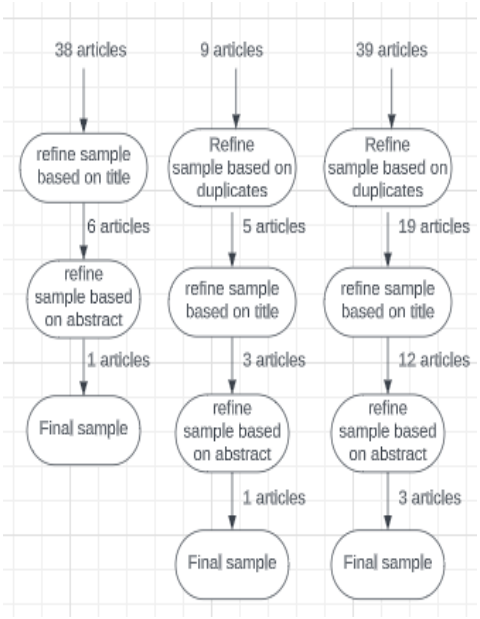
In order to do proper research about our topic we need to define inclusion/exclusion criteria. While AI music has existed since 1960, AI-artists really started taking over the music

industry in the past decade so we decided to set a publication time frame within 10 years. In order to find credible sources we are only going to be using papers coming from Scopus database, as it is proven that papers are peer-reviewed. We are going to only choose papers that are constructed in English. Lastly we are going to include papers that are directly addressing the opinion of society towards AI-music/AI-Artists as the technical aspects are not really relevant for our study. In order to gather related literature to the research domain we used search terms such as “music”, “artificial intelligence”, “ai”, “future”, “ai generated”, “music selection” several documents could be found that have done research in these fields.

5. SEARCH AND SELECTION

We used three queries for our search:

- “Society + ai + music”
- AI-Artists" OR "AI musicians" OR "AI-generated music" OR "AI in music" OR "artificial intelligence in music" AND "Society" OR "public opinion" OR "perceptions" OR "attitudes" OR "reception"
- AI-Artists" OR "AI musicians" OR "AI-generated music" OR "AI in music" OR "artificial intelligence in music. The results are below.



6. ANALYSIS

To facilitate our analysis, we will employ a systematic approach known as the grounded theory for literature review. Drawing from a comprehensive collection of empirical studies, we will identify pertinent categories that will serve as the foundation for our investigation. These categories will be carefully examined, and we will extract relevant information from the papers associated with each category. By scrutinizing the gathered data, we will formulate expectations regarding societal opinions concerning AI-artists. Subsequently, we will proceed to validate these expectations through the development and analysis of two distinct surveys.

During our extensive research, one particular paper, referenced as [6], stood out due to its highly insightful content, making it a valuable reference for our study. Consequently, we have identified five significant categories that will serve as the primary focal points for our analysis. These categories are as follows: overall satisfaction, AI-generated music, human-made music, manipulation of identity, and the

perception disparity between musicians and listeners. Table [7].

All of the articles below have researched to some degree the opinion of society towards AI artists. In an attempt to understand the perception of society and look for bias in AI music we will analyze the papers in three categories. Satisfaction, authorship of the pieces and perception of musicians and listeners.

6.1 SATISFACTION

In an attempt to explore the concept of satisfaction in relation to AI-generated music, the authors of the scholarly article titled "Would You Like to Listen to My Music, My Friend? An Experiment on AI Musicians" [2] arrived at the conclusion that AI music possessing more anthropomorphic characteristics, resembling human composition, is more likely to be well-received by listeners. The presence of human-like qualities in the music enhances its appeal and satisfaction, as compared to AI-generated music lacking such human resemblances. Another study, outlined in the article "An Empirical Study on How People Perceive AI-generated Music" [3], investigated various music metrics to determine the most satisfying software for generating AI music. Although this research did not directly examine the influence of human characteristics in AI music, it focused on gauging individuals' satisfaction levels with different software options for AI music generation. The aim was to establish a correlation between satisfaction and the preference for AI-generated or human-generated music. In an intriguing endeavor, the researchers of the paper titled "Searching for Human Bias Against AI-Composed Music" [4] conducted an experiment to investigate the potential bias exhibited by individuals towards AI-composed music. The participants were asked to rate musical excerpts, each lasting 10 seconds, using a 7-point Likert scale, without any knowledge of the authorship (whether human or AI). Subsequently, the participants were divided into two groups: one group was informed of the correct composer, while the other was deceived by being provided with incorrect composer information. Surprisingly, the results indicated no significant difference in the participants' satisfaction levels with the music, even after they became aware of whether it was composed by a human or AI. Similarly, in the article "AI composer bias: Listeners like music less when they think it was composed by an AI" [5], researchers pursued a similar line of investigation, albeit with a slightly different approach. Instead of including a mixture of AI and human-composed excerpts, only human-composed pieces were selected and classified as either AI or human-made. The study comprised three stages. In the first stage, participants listened to the music and categorized them as either AI-composed or human-made, while also providing ratings. In the second stage, the researchers manipulated the identity of the composers for electronic and classical songs. At this point, no significant change in listener satisfaction was observed. However, in the final stage, focusing solely on classical music, the researchers discovered a bias indicating that people are less inclined to listen to classical music if it was composed by AI, resulting in decreased satisfaction. Finally, in the research paper titled "Artificial intelligence became Beethoven: how do listeners and music professionals perceive artificially composed music?" [6], a sizable sample of 446 participants, comprising both music listeners and music professionals, was gathered. Two AI-generated songs were chosen for the study. In the initial stage, a survey was conducted to gauge participants' perceptions of AI music. Overall, the findings revealed a negative

perception of AI music, particularly among music professionals. In the subsequent stage, the participants were divided into two groups. The first group was provided with an explanation of how humans composed the music based on experiences and emotions, while the second group was informed that the music was composed by AI. Surprisingly, no significant difference in satisfaction levels was observed between the two groups when they were aware that the music was AI-generated, contradicting the initial survey findings.

6.2 AUTHORSHIP OF PIECES

The aforementioned papers, namely [4], [5], and [6], aimed to explore potential biases by manipulating the authorship of musical compositions. The objective was to determine whether there was a discernible difference in song preference when individuals believed a particular piece was created by AI. However, the results obtained failed to substantiate the existence of such a bias, indicating that authorship was not a decisive factor in song selection. Nevertheless, the study described in [5] revealed a contrasting outcome in the final experiment, where a bias was indeed observed. It suggested that individuals exhibited a greater inclination to listen to classical pieces composed by humans rather than by AI. Notably, the article [6] presented a surprising finding, demonstrating no discernible bias among participants when asked to rate the two musical excerpts.

6.3 PARTICIPANTS PERCEPTION

Article [6] stands out as the sole publication that delves into the perception of both music listeners and musicians regarding AI-generated music. Initial expectations postulated that musicians would harbor a more pessimistic view regarding the prospect of AI being involved in music creation, and this notion was corroborated in the survey findings. However, when it came to the actual experimental phase, it was revealed that such negative perceptions did not significantly impact individuals' preferences. In light of the insights garnered from articles [4] and [6], it is advisable for future studies to explore the potential ramifications of AI music artists on unemployment rates. This important aspect warrants further investigation and could provide valuable insights into the broader societal impact of AI in the field of music.

7. CONCLUSION/EXPECTATIONS

Based on our comprehensive literature analysis, several factors contribute to the overall satisfaction derived from AI music. Firstly, the study presented in [2] suggests that when AI-generated music possesses anthropomorphic characteristics, it tends to elicit greater satisfaction from listeners. Additionally, the choice of software, as highlighted in [3], can also impact satisfaction by influencing both anthropomorphic qualities and music quality. Notably, the findings in [4] indicate that when participants are unaware of whether a musical piece was composed by AI or a human, their opinions are less biased, resulting in a more unbiased assessment of satisfaction. However, the study described in [5] reveals an interesting bias regarding the genre of music generated by AI. Participants exhibited less satisfaction when classical music was identified as AI-composed compared to human-composed, whereas no such bias was observed in electronic music. This discrepancy may be attributed to the technical orientation of the audience, as suggested by the authors. Surprisingly, the research in [6] demonstrated a negative perception towards AI music in the survey phase, but no significant difference in satisfaction was observed during the actual listening phase, indicating a potential inconsistency between survey responses and

real-life experiences. Several studies identified a potential bias arising from concerns of unemployment among musicians, which may have influenced the perception of AI music. Based on previous research, it is evident that a bias exists towards AI-generated music when the author is known, although this phenomenon does not uniformly apply across all genres. Therefore, this bias will be investigated in our survey. Based on the insights gained from the literature analysis, we have designed two surveys to be administered to two distinct groups: musicians and music listeners. Each group will consist of ten participants, ensuring a diverse demographic composition. The surveys will present two classical music excerpts, one AI-generated and one human-composed, each lasting 45 seconds. Participants will rate the excerpts using a 7-point Likert scale. Subsequently, open-ended questions will be posed to elicit participants' opinions on AI music, encompassing both negative and positive perspectives. It is important to note that the participants were recruited through the author's acquaintances and, specifically for musicians, connections of the author's brother. This methodology ensures a range of perspectives from various backgrounds and age groups. The two groups will be differentiated by whether or not the authorship of the songs is disclosed. We hypothesize that the informed group will exhibit a lower percentage of preference for the AI-generated song compared to the human-composed one, due to the bias associated with AI authorship. In contrast, the uninformed group is expected to rate their satisfaction with both songs relatively equally. Moreover, we anticipate that musicians will express a more negative opinion on AI music in their responses to the open-ended questions. By comparing the results between the two groups, we aim to ascertain whether there is a bias in the perception of music when the artist is known to be AI-generated. If a significant difference is observed in the comparison of song ratings between the two groups, it would provide evidence supporting the existence of bias associated with AI authorship.

8.RESULTS/ANALYSIS

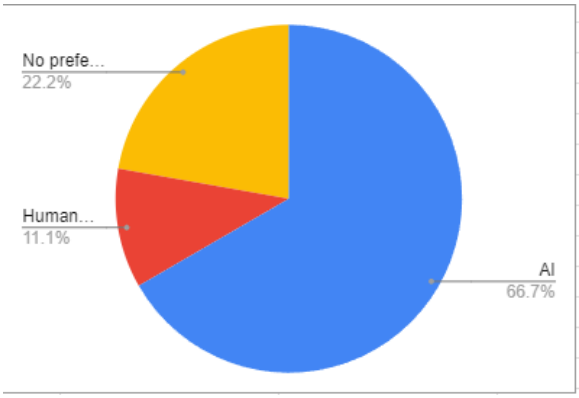


Figure 1: Group 1(uninformed)

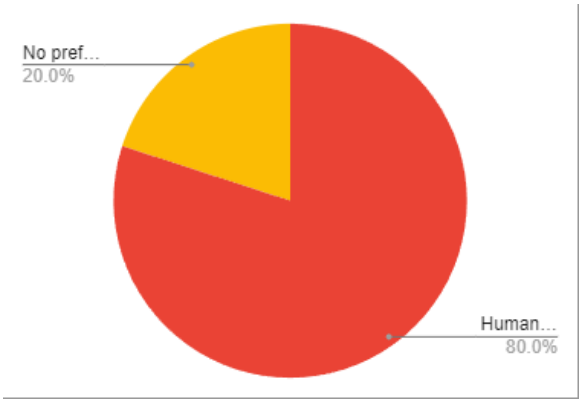


Figure 2: Group 2 (informed)

As the author, my primary objective was to investigate and establish the presence of bias within the parameters that I could control with a certain degree of precision. This involved the selection and sequencing of songs. I purposely chose a human-composed piece that I personally favored less than the AI-composed piece, strategically placing the human piece as the first selection and the AI piece as the second. The intention was to subtly influence the listeners' subconscious and potentially lead them to rate the AI song more favorably. The results of the study, presented in the form of pie charts, demonstrate a significant difference in the

ratings, providing clear evidence of the existence of bias. The first pie chart represents the group of participants who were unaware of the identity of the artist, while the second chart represents those who were informed. It is evident from the charts that in the first group, 66.7% of the participants expressed a preference for the AI song, 22.2% indicated no preference, and only 11.1% showed a preference for the human artist. Conversely, in the second group, 80% of the participants rated the human artist's song higher, with 20% expressing no preference. When participants were asked about their opinions on AI music, their responses varied but shared common themes. Participants tended to acknowledge the positive aspects of AI music, although concerns were raised regarding potential loss of creativity and the existing threat of unemployment. However, overall, participants recognized the potential of AI as a supportive tool in music creation. Notably, there were instances where participants highlighted the ability of AI to recreate or complete unfinished pieces of music. An interesting observation emerged when participants were asked if their perception would change upon learning that a piece of music was composed by AI. The responses differed between the two groups. The first group, who were unaware of the artist's identity, exhibited a negative perception, leaning towards disliking the piece or attributing lesser value to it upon discovering it was AI-generated. Conversely, the informed group maintained their initial perception, emphasizing that their liking or disliking of the music would remain unchanged. It is possible that this discrepancy in responses can be attributed to bias introduced in the rating process for the second group. However, participants in the first group appeared to be surprised when informed that a piece was composed by AI, indicating a lack of realization. Regarding the perceived threats of AI music, both listeners and musicians expressed clear concerns. They suggested that music would become overly complex and highlighted the significant risk of artists losing their jobs. Specifically, participants emphasized that the music industry could replace artists with AI, as it would be a more cost-effective solution. Additionally, participants voiced apprehensions about the potential loss of creativity, as even individuals without formal music education and training would have similar opportunities in music composition. However, participants also identified potential benefits of AI music. They noted that the production process could be expedited, their favorite artists could explore various genres, and AI could function as an assistant to human musicians. Furthermore, the creation of music was anticipated to become more cost-effective.

9.CONCLUSION/FUTURE STUDIES

The analysis of the obtained results unequivocally reveals the presence of bias in how individuals perceive AI-generated music. Remarkably, participants exhibited a stronger preference for AI music over the work of human artists. This finding suggests a prevailing negative perception towards the incorporation of AI in the realm of arts. Given that the arts industry already faces challenges with regard to remuneration, the advent of AI poses a potential threat to the human element within this domain. Concerns voiced by participants revolve around the apprehension that AI may supplant key human characteristics such as creativity and emotion. Furthermore, there is a palpable fear of job displacement among artists as a result of AI's involvement. Despite the prevailing negative perspective towards AI, participants also acknowledged the potential benefits and recognized AI's capacity to serve as a supportive tool in music creation. It is evident that while reservations exist, individuals can envision the integration of AI as a means to enhance the creative process. It is essential to acknowledge the limitations of this study, which primarily

stem from the restricted sample size of only 20 participants due to time constraints. Although the findings provide valuable insights into participants' perceptions and the presence of bias, further research with a larger participant pool, preferably through interview-based approaches, is warranted. It would be intriguing to directly disclose the identity of the authors of the music pieces to the participants after the rating process. This could involve probing whether their perception would change or soliciting their opinions on which songs they believe were composed by AI. Additionally, the exploration of different genres, such as pop or rock, would be advisable, as classical music may represent a distinctive case in this context.

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7.

	Concepts				
Articles	Overall Satisfaction	AI made music	Human made music	Identity Manipu-lation	Perception Musicians and Listeners
Article [2]	x	x			
Article [3]	x	x			
Article [4]	x	x	x	x	
Article [5]	x		x	x	
Article [6]	x	x	x	x	x