

The Shaping of Digital Collectibles: Digital Imprints of Gender and Cultural Representation in the Age of the Non-Fungible Tokens Boom

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Abstract: This study investigates gender and racial representation in the non-fungible token NFT market, uncovering biases that reflect societal inequalities. Despite the market's potential for diverse artistic expression, there is a notable misrepresentation and stereotyping of female and minority characters. The paper points to the need for systemic changes, using examples from gaming and AI language models to highlight the pervasive nature of these biases. It advocates for increased visibility of underrepresented artists, educational initiatives to support diverse creators, and collective efforts to enhance digital art. The study urges future research to explore strategies that use NFTs to promote equality and diversity in representation, addressing the inaccuracies in the portrayal of female characters and the stereotyping of racial characters, which contribute to a lack of misrepresentations and authenticity in the NFT space.

Keywords: Gender Representation, Racial Diversity, Digital Art, Societal Biases, Cultural Identity.

1. Introduction

The advent of non-fungible token (NFT) technology has heralded a revolutionary transformation in the realm of digital art. The once niche market of Non-Fungible Tokens has experienced exponential growth, evolving into a multi-billion-dollar industry that has captured the attention of artists, collectors, and investors alike. This digital revolution has not only provided a new platform for artistic creation but also emerged as a significant arena for exploring the depiction and portrayal of female characters, as well as cultural identity within the industry.

Amidst ongoing societal discourse on gender and racial issues, there is a heightened demand from the public for the fair and accurate portrayal of women and diverse ethnicities in all domains, including the arts. The pursuit of gender equality and appreciation of multiculturalism is vividly reflected in the field of digital art. As an emerging form of art, crypto investors regard digital avatars as an essential part of their personal digital personas, and these avatars significantly enhance and reinforce the sense of personal identification with their digital selves. This represents a new dimension that NFTs provide for the expression of gender and culture. The heightened demand for a fair and accurate representation of women and diverse ethnicities has sparked widespread attention in the arts

and other fields. Misyrlena Egkolfopoulou and Akayla Gardner have gleaned their own insights through interviews and a deep dive into the public NFT market data: in the cryptocurrency market, the depiction of characters across a spectrum of skin tones, genders, and racial backgrounds might sway their market value [1]. They noticed that the design of certain character representations could be susceptible to market prejudices, which in turn could create a disparity in pricing and popularity for NFTs with diverse character traits. This phenomenon reflects broader societal biases and has sparked in-depth discussions about whether gender and cultural representation in digital art are treated fairly.

Despite the fervor surrounding digital art, research into the portrayal of gender and racial diversity within the NFT market has shown that there remains a significant disparity in the prices of these characters compared to their male and white counterparts. Nonetheless, NFTs feature non-male and non-white characters that attempt to defy the entrenched norms of societal bias. For instance, the "World of Women (WoW)" initiative aims to shatter gender stereotypes, showcasing the diversity and strength of women from various cultural backgrounds through a range of character designs [2]. In comparison, while projects like CryptoPunks have innovated in terms of artistic style, Yuan Yuan, Xiao Liu, Shunyuan Zhang, and Kannan Srinivasan have noted that female CryptoPunks typically trade at a 36.8% lower price than male CryptoPunks, and Black CryptoPunks at a 30.7% lower price than their White counterparts [3]. This contrast offers a unique perspective on how digital art challenges social norms. This study aims to explore the emerging intersection of digital art and social issues, revealing whether NFT platforms are perpetuating outdated rules or challenging current norms of gender and cultural representation. Additionally, this research will critically assess these representations to explore whether they are a sign of progress or a reflection of prevailing social biases.

In summary, exploring gender and cultural representations in NFTs is not just an academic pursuit but also reflects our societal values and aspirations. As the NFT market continues to expand, it becomes increasingly important to study how these digital artworks contribute to broader conversations around diversity, equity, and inclusion. This study aims to contribute to the discussion by providing a comprehensive analysis of NFTs as both art and social commentary.

2. Representation of Women in the NFT Market: Precise Expression and Demand for Diversity

2.1. Lack of Representational Power

It must be acknowledged that women remain in a subordinate position in traditional tech industries, as well as in the emerging realms of cryptocurrency and blockchain, where they lack significant and influential representation. A global study published by BitMEX, one of the world's largest cryptocurrency derivatives exchanges, indicated that only 5% of cryptocurrency investors are women, compared to 24% of women in traditional investing sectors [4, 5]. Moreover, research conducted by eToro in 2018 indicated that between March 2017 and February 2018, men accounted for 91.5% of global cryptocurrency investors, highlighting the dominant position of males in the cryptocurrency sector [6]. The loss of women's voices in the crypto domain might have resulted in the infiltration of gender stereotypes and racial prejudices from real life into the NFT market.

In prominent NFT projects like CryptoPunks, the quantity and representation of female characters are comparatively limited—with 6,039 male avatars versus 3,840 female avatars [1], and an even smaller number of female avatars in circulation—this could be a contributing factor to the lack of representational power for women's images in the NFT market. This phenomenon not only restricts the diverse expression of female imagery but also impacts the standing of women in the digital art market. Furthermore, in the 0x499 WEB3 Women column's seventh edition, three female blockchain

industry professionals have highlighted that a subset of NFT artworks featuring women possess appealing backgrounds and exquisite, innovative artistic qualities [7]. For instance, projects like World of Women and Crypto Coven have been praised for their creative and marketable qualities, yet their overall trading volumes are typically lower than those of male-centric NFTs [8, 9]. As of 2022, the groundbreaking World of Women had a total trading volume that was only about 1/23rd of CryptoPunks' [9]. This disparity seems to suggest a disparity in the valuation of high-quality female-led NFT projects.

2.2. Internalized Bias Leading to Self-imposed Limitations

Deep-rooted societal biases from the real world are not only evident in the NFT market but also manifest in other realms of digital art. In the gaming community, women players are often labeled as "having poor skills", a stereotype that is prevalent among players and reflected in media portrayals and game designs [9]. This internalized bias leads to women gamers imposing skill limitations on themselves, experiencing a lack of confidence, and ultimately affecting their representation and influence in streaming media.

In League of Legends, the number of male characters (89) is double that of female characters (44), which limits the options for women players to find characters that match their gender [10]. Additionally, there is bias and stereotyping in the occupational design of male and female characters in the game. For instance, male characters are often designed to be more aggressive and defensive, with 32% categorized as "warriors" and 21% as "tanks"; in contrast, female characters are more frequently cast as spellcasters and support roles, accounting for 28% and 19% of female characters respectively [10]. This phenomenon is also reflected in the differing ability ratings between genders, such as the lower average defense ratings for female characters compared to male characters in League of Legends. This also indirectly confirms that during the rise of the NFT market, the portrayal of female characters in contemporary artworks has been subject to unfair treatment and the influence of stereotypes.

2.3. Real-World Biases: Entrenched and Ubiquitous

Historically, portrayals of women in media and pop culture have often been confined to traditional gender roles and physical appearance rather than their capabilities or achievements [3]. This stereotyping leads to an often-overlooked diversity and complexity when assessing the value of women. The tech and digital art sectors have been historically male-dominated, resulting in lower visibility and recognition for women creators and their work in the market. The scarcity of representative female role models and leaders contributes to a lack of voice and influence for women in these fields.

In the realm of digital gaming, the expectations and norms of gender roles present in the real world often lead female players to gravitate toward characters that align with traditional gender stereotypes [11]. The cultural emphasis on women's roles as nurturing, caring, and supportive translates into their gaming choices, often favoring characters that embody these traits. The steep learning curve and demand for technical proficiency in games can be intimidating for female players when confronted with complex mechanics and competitive settings, leading them to prefer characters that are easier to handle and less risky [11].

Even in large language models (LLM), such disparities are common. In the o1-mini model, the average ability scores for male characters (8.06) exceed those for female characters (7.88) and non-binary gender characters (7.80) [12]. This reveals that even in the assessments made by AI language models, female and non-binary gender characters continue to be systematically underestimated, mirroring the undervaluation and bias against women's capabilities in the real world. In the allocation

of leadership roles, large language models also tend to assign such roles to male characters. In the o1-mini model, the average competency scores are higher for male characters (8.06) than for female characters (7.88) and non-binary gender characters (7.80) [12]. This indicates that even in AI assessments, there is a systemic underestimation of female and non-binary characters, reflecting the real-world devaluation and bias against women's capabilities. Additionally, male characters are predicted to be successful founders at a higher rate (69.4%) compared to female (67.97%) and non-binary gender characters (65.7%). Similarly, the likelihood of being predicted as a CEO is higher for male characters (62.17%) than for female (61.11%) and non-binary gender characters (58.37%) [12]. These figures reflect a systemic undermining of the representative power of women and non-binary individuals in leadership and decision-making positions.

These examples collectively demonstrate that deep-rooted gender role divisions persist across many cultures, where women are often expected to fulfill domestic and child-rearing roles rather than leadership or decision-making roles in the public sphere. In "The Lion King", although there is a female character, Nala, her role is more as Simba's mate and mother, rather than as the leader of the story. This reflects the lack of agency of female characters in many narratives, where their existence often revolves around male characters [13]. These historically ingrained cultural expectations subtly limit women's opportunities to gain representative power in society.

Despite the persistent "absence" of women in terms of character roles and voice, the representation of female figures in the NFT market is an indispensable and unignorable part. The portrayal of women in NFT artworks is not only a significant aspect of artistic creation but also a key area for the expression of socio-cultural diversity. As of 2024, research by TripleA on the cryptocurrency market indicates that 39% of practitioners are women [14]. This increase in numbers suggests a potential trend of women regaining representation and voice in the market.

In the pursuit of diversity, the World of Women project has set a positive example. This NFT project, dedicated to female characters, showcases the diversity and strength of women through a variety of character designs. It has not only broken through traditional gender stereotypes in terms of artistic style but also actively promotes gender equality and female empowerment through community activities and charitable initiatives. Despite achieving certain success in the market, Mingzin's analysis points out that World of Women's trading volume and market influence are still limited by gender bias [15]. This indicates that although the market's demand for diverse expressions is increasing, the representation of women in the NFT market still needs further enhancement.

3. Racial Representation: Challenging Multicultural Norms

In the burgeoning realm of digital art, NFTs have emerged as a groundbreaking medium, offering artists an unprecedented platform to explore and express the diversity of race and culture. However, as Jessica Hammer explores in her paper "Playing Prejudice: The Impact of Game-Play on Attributions of Gender and Racial Bias," technological advancements do not always come hand in hand with challenges to racial and cultural biases [16]. On the contrary, they sometimes have the unintended consequence of reinforcing existing stereotypes and societal prejudices.

For instance, Hammer's research indicates that in-game attributions of racial and gender bias are often influenced by game design and narrative. A similar phenomenon can be observed in the NFT market. While an increasing number of artists and projects attempt to challenge and redefine the representation of race and culture through their work, certain NFT projects in the market still perpetuate stereotypes and inequalities in racial imagery.

Taking CryptoPunks as an example, one of the earliest NFT projects, it has provided a certain representation of racial diversity, but it has also exposed some issues. According to research by Yuan Yuan and others, the trading prices of Black CryptoPunks are generally lower than those of White CryptoPunks, reflecting racial biases present in the market [3]. This price disparity not only reveals

inequalities in the digital art market but also sparks discussions about how NFTs can reflect and potentially exacerbate racial inequalities in the real world [17].

On the other hand, some NFT projects are trying to challenge these biases by creating more inclusive and diverse representations. For instance, the World of Women project celebrates the diversity of women by showcasing females of various skin tones, professions, and identities. However, despite achieving a certain level of success artistically and socially, their market performance is still limited, indicating that the market's recognition and acceptance of multiculturalism need to be further enhanced.

Simultaneously, in other artistic works, the challenge of multicultural representation remains significant. For instance, in GA&C, artworks from certain countries and institutions are given priority, while others are relatively marginalized. This imbalance might also apply to artworks from different racial groups [18]. Works by non-Western or minority artists may not be adequately displayed or valued in digital aggregators.

Is this a manifestation of digital colonialism? It raises questions about whether online aggregators might favor epistemologies that represent dominant communities and potentially inadvertently reinforce existing racial and cultural biases. For instance, if a digital platform predominantly showcases works by Western artists while neglecting or misinterpreting those of non-Western artists, it may exacerbate racial stereotypes and discrimination [18].

In the digital realm of art curation, there is a risk of reinforcing "othering" or exoticizing tendencies, particularly with regard to artists from Africa, Asia, or Latin America [18]. Instead of assessing the art based on its intrinsic artistic value and historical contributions, there is a potential for reflecting discriminatory attitudes. An example of this could be the overemphasis on traditional or tribal art when digital platforms showcase African art, neglecting contemporary or urban African artists. This can perpetuate stereotypes of monolithic and backward African cultures, which is indicative of a broader issue of digital cultural colonialism.

In the digital gaming sphere, these issues are also prevalent. For a long time, video games and related media have tended to portray stereotypes of specific races, such as depicting Asian players as technologically skilled or African players as adept in sports or fighting games [10]. This kind of one-dimensional representation limits the diversity and depth of racial imagery. This can be attributed to the fact that artists from minority races may face more obstacles in accessing resources, education, and technology, restricting their participation in the NFT market.

When discussing the multicultural challenges of racial representation, we must not overlook the impact of market and social structures on the value of NFTs [8]. As Hammer points out in her paper [16], changing perceptions of racial and gender bias requires more than just technological or artistic innovation; it requires systemic change. This includes raising public awareness of these issues, promoting changes in policy and market practices, and supporting artists and projects that challenge and redefine the representation of race and culture through their work.

In summary, the challenge of racial representation in the NFT market is a complex issue that involves multiple facets of artistic creation, market dynamics, and societal attitudes. While there have been some positive attempts and progress, there is still a long way to go to achieve true diversity and inclusivity. Future research and practice will need to continue exploring how to harness the power of NFTs to promote racial and cultural equality and diversity while challenging and changing deeply entrenched biases and stereotypes.

4. Conclusion

This paper delves into the nuanced ways in which gender and racial representation manifest in NFTs, reflecting societal biases and potentially reinforcing them. Through a comprehensive analysis of the

market, the study explores the misrepresentation of women and minority racial images in the NFT market, using examples from gaming and AI language models to highlight the ubiquity of these biases.

To enhance the market trading value of NFTs featuring women and racial diversity, this study proposes several strategies. First, it is essential to increase the visibility of underrepresented artists and their works. This can be achieved through targeted marketing campaigns, collaborations with influencers, such as streamers and social media creators, and by establishing platforms dedicated to showcasing a diverse range of NFT creators in the field. Second, educational programs are needed to empower artists from various backgrounds with the skills to create and market NFTs. This not only levels the playing field but also brings a more diverse array of voices and perspectives to the market.

Examples from gaming and AI language models reflect the situation in the NFT market, revealing biases that need to be addressed. In gaming, the misrepresentation and stereotyping of female characters impact players' self-perception and representation in digital spaces. Similarly, biases in AI models can lead to the undervaluation of contributions from women and minorities. By highlighting these parallels, this study emphasizes the need for a concerted effort across all digital mediums, including NFTs, to challenge and change these entrenched biases.

In summary, while the NFT market offers new realms for artistic expression and cultural diversity, it is not immune to the biases present in traditional art and media. The misrepresentation and stereotyping of women and minorities in NFTs are manifestations of broader societal issues. However, the solution lies in a collective effort to foster inclusivity and diversity. By drawing on experiences from gaming and AI, future initiatives can strive to create a more equitable NFT market that values diversity and accurately reflects the full spectrum of human experiences.

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