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Visual Stereotypes in AI: A Content Analysis of AI-Generated Imagery Representing Traditional Nigerian Gender Roles

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Abstract

Background: The rapid integration of Generative Artificial Intelligence (GenAI) into visual media has revolutionised digital content creation but has also raised critical concerns about the replication of societal biases. While GenAI tools offer unprecedented opportunities for cultural storytelling, they often function as algorithmic mirrors that reflect and amplify historical prejudices. In the context of the global South, there is a growing risk that these technologies facilitate a form of digital colonisation by reducing complex identities to Western-centric tropes.

Objectives: This study investigated the manifestation of visual stereotypes in AI-generated imagery, with a focus on traditional Nigerian gender roles. It aimed to identify predominant gender tropes, assess the extent of vocational and domestic stereotyping, and evaluate the degree of cultural authenticity and ethnic flattening in the outputs of leading generative models.

Methodology: A quantitative content analysis was conducted on a purposive sample of 200 images generated by Midjourney (v6.0) and DALL-E 3. Standardised, neutral prompts were used to generate depictions of traditional Nigerian men and women. The images were coded across dimensions of setting, labour type, power dynamics, and cultural attire. A Chi-square test of independence was performed to determine the statistical significance of gender-based role assignments.

Results: The findings revealed a persistent reliance on traditional binaries. Female subjects were predominantly in domestic settings (72%) and assigned to reproductive labour, while male subjects were in public or vocational spheres (68%). Statistically significant disparities were also found in visual gaze and social positioning, with men depicted as authoritative figures and women as passive participants. Furthermore, a qualitative assessment highlighted a high frequency of ethnic flattening and the persistence of the primitive trope.

Conclusion: The study concludes that current GenAI models reinforce restrictive, patriarchal, and colonial-era representations of Nigerian identity. These findings underscore the urgent need to

decolonise AI datasets and integrate indigenous epistemologies into model development to ensure more inclusive and culturally accurate digital representations.
Keywords: Artificial Intelligence, Algorithmic Bias, Digital Colonialism, Gender Stereotypes, Nigerian Culture, Content Analysis.

Introduction

The rapid ascent of Generative Artificial Intelligence and its seamless integration into visual media represent one of the most transformative shifts in the history of digital communication. In a remarkably short span, this technology has evolved from a niche experimental research focus into a ubiquitous infrastructure that powers everything from global marketing campaigns to personal social media content (Williams et al., 2025; Gatla et al., 2024). This transition has fundamentally altered the creative landscape by democratising the production of high-fidelity imagery, moving visual creation from the exclusive domain of trained specialists to any user capable of articulating a natural-language prompt (Trigka & Dritsas, 2025; Sun & He, 2025). Unlike traditional digital tools that required manual manipulation of pixels or vectors, generative models leverage deep learning architectures to synthesise entirely new visual data, creating a synergistic partnership between human intentionality and algorithmic execution (Batty, 2025). As these tools become embedded in the workflows of filmmakers and digital artists, they have significantly compressed the traditional production cycle and altered the economic structures of creative labour (Orchard & Tasiemski, 2023). Processes that once required extensive location scouting and labour-intensive post-production are now achieved through iterative prompting, allowing for the near-instantaneous generation of complex environments (Ding et al., 2025).

The theoretical foundations of this shift are rooted in the concept of algorithmic bias and the socio-technical nature of visual imagery. Scholars have long argued that images are not neutral reflections of reality but social constructs that help produce meaning. In the context of machine learning, this meaning is often skewed by the datasets used to train the models. Because these models are trained on massive, uncurated datasets scraped from the internet, they function as cultural mirrors that reflect—and often amplify—the collective biases and visual stereotypes present in their training data (Leslie, 2025). This phenomenon is inextricably linked to the tension between Afrocentrism and Eurocentrism, in which artificial intelligence systems are frequently built on Eurocentric foundations that marginalise African perspectives (Olufemi et al., 2023). Such biases are not merely technical glitches but are deeply embedded in the developers' psychological and cultural frameworks, raising the critical question of whose bias gets coded into these systems (Lakshmi et al., 2025).

Central to this socio-technical challenge is the pervasive nature of gender bias within AI algorithms, which stems from a lack of diversity and gender theory in the early stages of machine learning development (Leavy, 2018). Gender bias is not a singular flaw but a complex interaction of contributing factors, including historical data imbalances and the subjective choices made during model design (Nadeem et al., 2022). These biases are systematically embedded throughout the lifecycle of AI technologies, leading to the perpetuation of harmful gender tropes that offer both challenges for researchers and opportunities for mitigation (O'Connor & Liu, 2024). As AI systems grow in complexity, they often reinforce traditional binaries and patriarchal norms, creating a systematic socio-technical bias that requires rigorous review and oversight (Hall & Ellis,

2023). This digital reinforcement of gender inequality reflects broader societal prejudices, where the algorithm essentially automates and scales existing marginalisation (Lima et al., 2023).

In the global South, particularly in Nigeria, this algorithmic replication poses a significant challenge to the representation of gender and cultural identity. Traditional Nigerian gender roles are historically complex, varying significantly across ethnic groups. However, these nuances are frequently lost in digital translation, which is often governed by Western-centric research methods and international practices that fail to account for local specificities (Jones, 2021). This lack of representation facilitates digital colonialism, in which power and identity are reimagined through a lens that reinforces existing global hierarchies (Zia, 2025). To counteract this, there is an urgent need for decolonising AI by integrating indigenous and African epistemologies, moving away from colonial bias toward a more relational intelligence (Lugonzo, 2025). Previous research suggests that the media has a propensity to reduce non-Western cultures to monolithic tropes, and Generative Artificial Intelligence models often default to these narrow, Western-centric archetypes rather than capturing the multifaceted reality of modern Nigerian society.

The problem is further compounded by the concentration of technology development in the global North. When prompting for a traditional Nigerian woman, an algorithm might consistently produce images of women in domestic or subservient positions, ignoring the long history of Nigerian women as powerful economic actors and community leaders. This misrepresentation is not merely a technical error but a sociological crisis that can influence global perceptions and internalised self-images. Consequently, as AI-generated content begins to outpace human-captured photography in digital spaces, the risk of these models reinforcing restrictive and outdated gender roles becomes a critical concern. If left unaddressed, these automated visual narratives may override contemporary realities, replacing a lived, vibrant culture with a static, algorithmic caricature. This study seeks to address this gap by performing a systematic content analysis of AI-generated imagery. By examining how these tools replicate visual stereotypes of traditional Nigerian gender roles, the research provides a necessary basis for advocating for more inclusive, representative, and culturally aware algorithmic development.

Objectives of the Study

The primary aim of this research is to investigate the manifestations of visual stereotypes within Generative Artificial Intelligence by evaluating how these models represent traditional Nigerian gender roles. By interrogating the intersection of algorithmic output and cultural identity, the study seeks to achieve the following specific objectives:

1. To identify the predominant visual tropes used by Generative Artificial Intelligence models when depicting men and women within traditional Nigerian contexts.
2. To assess the extent of domestic and vocational stereotyping by analysing the settings, tools, and activities assigned to different genders in AI-generated imagery.
3. To evaluate the degree of cultural authenticity in the representation of traditional attire, postures, and social interactions compared to lived Nigerian experiences.
4. To determine the presence of Eurocentric or colonial biases in the digital construction of Nigerian identities, specifically regarding how these models flatten ethnic diversity into monolithic gender archetypes.

5. To provide empirical evidence for the necessity of decolonising AI datasets, offering recommendations for developers and researchers to mitigate harmful gender and cultural biases in future iterations of generative models.

Methodology

This study employed a quantitative content analysis research design to systematically evaluate the representation of traditional Nigerian gender roles in AI-generated imagery. Content analysis is an appropriate method for this study as it allows for the objective, systematic, and quantitative description of the manifest content of visual communication, enabling the identification of recurring patterns and tropes (Neuendorf, 2017; Berger, 1998).

Sampling and Image Generation

A purposive sampling technique was utilised to select the Generative Artificial Intelligence models for the study. The models chosen are Midjourney (v6.0) and DALL-E 3, as they are currently the most widely used tools for high-fidelity image generation and represent different architectural approaches to image synthesis (Williams et al., 2025).

The image generation process followed a rigorous protocol to ensure consistency and minimise researcher bias:

- *Prompt Construction***:** A set of 20 standardised prompts was developed, specifically focusing on traditional Nigerian contexts. Prompts were designed to be neutral yet descriptive, such as a hyper-realistic photo of a traditional Nigerian woman in her natural daily environment or a portrait of a traditional Nigerian man performing a customary task.
- *Replication***:** Each prompt was executed five times on both models to account for the stochastic nature of generative processes (Trigka & Dritsas, 2025).
- *Sample Size:* This resulted in a total sample of 200 images (100 per model), providing a robust dataset for statistical analysis.

Coding Framework and Categories

To analyse the manifest content, a detailed coding instrument was developed based on existing literature regarding visual sociology and gender stereotyping (Leavy, 2018; Hall & Ellis, 2023). The images were coded across four primary dimensions:

Table 1: Coding guide

Dimension	**Coding Categories**
Setting	Domestic (kitchen, home interior), Public (market, office), or Pastoral (farm, village square).
Activity/Labour	Productive (farming, trading, craftsmanship), Reproductive (cooking, childcare), or Leisure.

Attire & Ornamentation	Traditional (Buba, Iro, Agbada), Westernised, or a stereotypical caricature of tradition.
Power Dynamics	Posture (submissive, dominant), Gaze (direct, averted), and Social Positioning.

Reliability and Validity

To ensure the reliability of the coding process, a subset of the images (10%) was independently coded by two researchers familiar with Nigerian cultural contexts. Inter-coder reliability was calculated using Cohen's Kappa, which yielded 0.80, indicating high agreement. Validity was established by grounding the coding categories in established ethnographic descriptions of traditional Nigerian gender roles across the major ethnic groups (Yoruba, Igbo, and Hausa).

Data Analysis

The collected data were analysed using descriptive and inferential statistics. Frequencies and percentages were calculated to identify the prevalence of specific gender tropes. Furthermore, a Chi-square test of independence was conducted to determine if there were significant differences in the representation of gender roles between the two AI models (Midjourney vs. DALL-E 3). This quantitative approach allows for a clear comparison between the automated outputs and the contemporary sociological reality of Nigerian life.

Results

The systematic content analysis of 200 images generated by Midjourney and DALL-E 3 reveals a persistent reliance on traditional gender binaries. The findings indicate that while Generative Artificial Intelligence possesses high technical proficiency in rendering Nigerian aesthetics, it simultaneously reinforces restrictive social roles through the domestic and vocational positioning of its subjects.

Table 1: Distribution of Spatial Settings by Gender in AI-Generated Imagery

Gender	Domestic Setting	Public/Vocational Setting	Pastoral/Leisure	Total
Female	72	14	14	100
Male	18	68	14	100
Total	90	82	28	200

As shown in Table 1, female subjects were predominantly situated within domestic environments, accounting for 72% of their total representations. These settings typically included kitchens, interior living spaces, or immediate household perimeters. In contrast, male subjects were positioned in public or vocational settings in 68% of the sample. A Chi-square test of independence was performed to examine the relation between gender and setting. The relationship between these

variables was significant, $X2(df = 2, N = 200) = 58.42$, $p < .001$, confirming that the spatial distribution is strongly influenced by the prompt's subject gender.

Table 2: Representation of gender based on labour

Labour Category	Female (%)	Male (%)	Thematic Indicators
Reproductive	78	12	Cooking, cleaning, childcare, and water fetching.
Productive	12	76	Trading, craftsmanship, farming, and leadership.
Civic/Leadership	2	8	Village meetings, elder councils.
Unspecified	8	4	Portraits with neutral backgrounds.

The analysis of labour themes in Table 2 further highlights the vocational divide. Female subjects were frequently depicted engaging in reproductive labour (78%), often shown in stooped or sitting postures associated with domestic chores. Male subjects, however, were most often portrayed in productive roles (76%), such as blacksmithing, weaving, or presiding over agricultural activities. This distribution suggests that the training data for these models lacks representative imagery of Nigerian women in diverse professional or leadership capacities.

Table 3: AI and cultural authenticity.

Observation Category	Midjourney (n=100)	DALL-E 3 (n=100)
Ethnic Specificity	24%	42%
Ethnic Blending	68%	36%
Stereotypical Caricature	8%	22%

Table 3 compares the two generative models' performance in terms of cultural authenticity. Midjourney exhibited a higher propensity for ethnic blending (68%), frequently mixing Yoruba Gele with Igbo coral beads in a single image. This indicates a flattening of Nigerian ethnic diversity into a monolithic aesthetic. DALL-E 3 demonstrated higher ethnic specificity (42%) but was more likely to generate stereotypical caricatures (22%), often depicting subjects in tattered clothing or in overly primitive settings that do not reflect contemporary Nigerian reality.

Table 4: Comparison of Subject Gaze and Focal Positioning by Gender

Visual Attribute	Female (%)	Male (%)
Direct/Authoritative Gaze	22	74
Averted/Submissive Gaze	65	14
Central/Foreground Positioning	31	82

Background/Peripheral Positioning	69	18

The data in Table 4 reveals a significant disparity in how authority is visually communicated. Female subjects were predominantly depicted with an averted gaze (65%) and were frequently placed in the background or periphery of the composition (69%). Conversely, male subjects were characterised by a direct, authoritative gaze (74%) and central positioning (82%). This finding suggests that Generative AI models replicate a Western-centric patriarchal gaze, where femininity is associated with passivity and masculinity with agency and social dominance.

Qualitative Assessment of Cultural Authenticity

To evaluate the degree of cultural authenticity, a qualitative thematic analysis was conducted on the generated samples. Three primary themes emerged:

- *Ethnic Flattening:* In 68% of Midjourney outputs, there was a visible merging of distinct Nigerian ethnic markers. For example, the models frequently combined the Edo beaded crown with Yoruba facial features or Hausa architectural backdrops, resulting in a monolithic Nigerian identity that ignores the country's diverse ethnic heritage.
- *The Primitive Trope***:** There was a persistent tendency, particularly in DALL-E 3, to depict traditional life through a lens of poverty or historical stagnation. Even when prompts did not specify a time period, the models frequently generated backgrounds with dilapidated structures or a lack of modern infrastructure, reflecting a colonial bias that equates tradition with underdevelopment.
- *Idealised Aestheticism***:** Midjourney, while avoiding the primitive trope, often fell into hyper-aestheticised representations. The images often resembled cinematic stills rather than authentic cultural portraits, substituting genuine cultural expression for a glossy, marketable version of Africanness.

Discussion of Findings

The results of this study lend empirical weight to the burgeoning discourse on algorithmic bias, revealing that Generative Artificial Intelligence functions as a high-speed engine for replicating historical and cultural stereotypes. The systematic domesticisation of Nigerian women and the vocational elevation of Nigerian men in the generated imagery suggest that AI models are not merely neutral tools but are active participants in the digital reconstruction of social hierarchies.

The findings indicated a statistically significant relationship between gender and spatial setting, with women consistently confined to domestic spheres (Table 1). This pattern aligns with Leavy's (2018) concerns about the lack of gender theory in machine learning. The algorithms seem to have internalised a patriarchal and Western-centric interpretation of tradition, where femininity is synonymous with reproductive labour and domesticity. This is a clear manifestation of what Hall and Ellis (2023) describe as socio-technical bias: the models do not reflect the reality of Nigerian history—where women have served as influential traders, warriors, and political leaders—but instead reflect a skewed, colonial-era archive that sought to domesticate African womanhood.

Furthermore, the disparity in visual gaze and positioning (Table 4) reinforces the existence of a digital hierarchy. By positioning men in the foreground with authoritative gazes and women in the

background with averted gazes, the models scale and automate existing global prejudices (Lima et al., 2023). This visual grammar suggests that the AI has been trained on a visual diet that equates authority with masculinity, thereby silencing the agency of the Nigerian female subject in the digital space.

The tendency of models, particularly Midjourney, to blend distinct ethnic markers (Table 3) illustrates cultural flattening. This reduction of complex, diverse identities—such as the specificities of Yoruba, Igbo, and Hausa cultures—into a monolithic Nigerian aesthetic is a hallmark of digital colonisation (Zia, 2025). When an algorithm cannot distinguish between the coral beads of the Edo and the Gele of the Yoruba, it effectively erases the unique cultural signatures of these groups, replacing them with a flat, algorithmic trope.

This flattening process is indicative of the tension between Afrocentrism and Eurocentrism discussed by Olufemi et al. (2023). Because the development and data curation for these models are largely concentrated in the global North, the resulting imagery is filtered through a Western lens. This lens often views African traditions through the primitive trope, as evidenced by the frequent depiction of rural or tattered settings in DALL-E 3 outputs. Such representations fail to account for the relational intelligence and indigenous epistemologies of the African continent (Lugonzo, 2025), opting instead for a static, historical caricature that ignores the modern, evolving nature of Nigerian traditional life.

The implications of these findings extend beyond mere technical inaccuracy. As AI-generated content increasingly permeates digital media, there is a risk of a feedback loop where these stereotyped images are accepted as authentic representations. If the digital archive of Nigerian tradition becomes dominated by AI-generated domesticity and ethnic blending, it may influence the self-perception of future generations and global perceptions of Nigerian society. This confirms Leslie's (2025) warnings that AI can amplify collective biases, potentially undoing contemporary progress in gender equality through automated regression.

Consequently, the study provides a robust argument for decolonising AI. To move beyond colonial bias, developers must move past uncurated, Western-centric datasets and actively integrate diverse, culturally specific data that reflects the multifaceted realities of the global South. Without such intervention, Generative Artificial Intelligence will continue to act as a mirror that reflects the prejudices of the past rather than a window into a more representative future.

Conclusion and Recommendations

This study has investigated the intersection of Generative Artificial Intelligence and the visual representation of traditional Nigerian gender roles, revealing a significant disparity between algorithmic output and cultural reality. Through a systematic content analysis of imagery produced by Midjourney and DALL-E 3, the research demonstrated that these models consistently replicate and amplify restrictive gender binaries and colonial-era tropes. The findings confirm that female subjects are overwhelmingly relegated to domestic spheres and reproductive labour, while male subjects are positioned as the primary occupants of public, vocational, and authoritative spaces. This systematic domesticisation of womanhood and the concurrent flattening of Nigerian ethnic

diversity into monolithic visual tropes suggest that AI technologies, in their current state, function more as mirrors of historical prejudice than as tools for objective representation.

The persistence of the Eurocentric gaze and the prevalence of the primitive trope across the sampled images underscore the urgent need to address the socio-technical biases embedded in machine learning lifecycles. As AI-generated content becomes a dominant force in digital media, the risk of these automated stereotypes becoming the new digital standard for cultural authenticity is high. This phenomenon threatens to erase the nuanced, evolving realities of Nigerian social structures, replacing a lived heritage with an algorithmic caricature that reinforces global power imbalances. The integration of Generative Artificial Intelligence is therefore identified not merely as a technical milestone but as a significant sociological challenge that necessitates a radical shift in how non-Western identities are coded, curated, and constructed.To mitigate these biases and move toward a more representative digital future, the following recommendations are proposed:

- *Diversification of Training Datasets:* AI developers must move away from uncurated, Western-centric web scraping and actively incorporate diverse, high-quality datasets from the global South. This should include contemporary and historical imagery that reflects the true vocational and social diversity of Nigerian life.
- *Integration of Indigenous Epistemologies:* There is a critical need to involve Nigerian sociologists, historians, and cultural experts in the model-alignment process. Decolonising AI requires that the relational intelligence of African cultures is understood and prioritised over reductive, Eurocentric frameworks.
- *Implementation of Bias-Mitigation Protocols:* Software engineers and AI practitioners should adopt gender-sensitive design frameworks that explicitly test for and penalise the replication of harmful gender tropes during the model training and fine-tuning phases.
- *Enhanced Prompt Engineering Literacy:* Users and creators should be encouraged to use more specific, counter-stereotypical prompts to challenge the default settings of the models. However, the primary responsibility for accuracy must remain with the developers rather than the end-users.
- *Policy and Ethical Oversight:* Regulatory bodies within Nigeria and internationally should establish guidelines for cultural and gender representation in AI-generated media, ensuring that technological progress does not come at the cost of cultural integrity and social equity.

References

Batty, M. (2025). Generative AI. *Environment and Planning B: Urban Analytics and City Science, 52*(5), 1031–1034.

Berger, A. A. (1998). *Media research techniques* (2nd ed.). Sage Publications.

Ding, L., Lawson, C., & Shapira, P. (2025). Rise of generative artificial intelligence in science. *Scientometrics, 130*(9), 5093–5114.

Gatla, R. K., Gatla, A., Sridhar, P., Kumar, D. G., & Rao, D. N. M. (2024, May). Advancements in generative AI: Exploring fundamentals and evolution. In *2024 International Conference*

on Electronics, Computing, Communication and Control Technology (ICECCC) (pp. 1–5). IEEE.

Hall, P., & Ellis, D. (2023). A systematic review of socio-technical gender bias in AI algorithms. *Online Information Review, 47*(7), 1264–1279.

Jones, C. (2021). Western centric research methods?: Exposing international practices. *Journal of ASEAN Studies*, *9*(1), 87–100.

Lakshmi S, D., Mohan, V., Reeja, P. S., Alexander, E., Varghese, N., & Kurian, A. (2025). Whose bias gets coded? Psychology's role in decolonising AI. *Frontiers in Psychology*, *16*, Article 1657227.

Leavy, S. (2018, May). Gender bias in artificial intelligence: The need for diversity and gender theory in machine learning. In *Proceedings of the 1st international workshop on gender equality in software engineering* (pp. 14–16).

Leslie, D. (2025). Does the sun rise for ChatGPT? Scientific discovery in the age of generative AI. *AI and Ethics*, *5*(4), 3439–3444.

Lima, R. M. D., Pisker, B., & Corrêa, V. S. (2023). Gender bias in artificial intelligence. *Journal of Telecommunications and the Digital Economy, 11*(2), 8–30.

Lugonzo, T. (2025). From colonial bias to relational intelligence: Decolonising AI with Indigenous and African epistemologies. *Liberated Arts: A Journal for Undergraduate Research, 12*.

Nadeem, A., Marjanovic, O. ., & Abedin, B. . (2022). Gender bias in AI-based decision-making systems: a systematic literature review. *Australasian Journal of Information Systems*, *26*. https://doi.org/10.3127/ajis.v26i0.3835

Neuendorf, K. A. (2017). *The content analysis guidebook* (2nd ed.). Sage.

O'Connor, S., & Liu, H. (2024). Gender bias perpetuation and mitigation in AI technologies: Challenges and opportunities. *AI & SOCIETY*, *39*(4), 2045–2057.

Olufemi, I. O., Olukemi, O. M., & Danjuma, O. (2023). Afrocentirism and Eurocentrism: The case of artificial intelligence. *ASRIC Journal on Social Sciences and Humanities*, *290*.

Orchard, T., & Tasiemski, L. (2023). The rise of generative AI and possible effects on the economy. *Economics and Business Review*, *9*(2), 9–26.

Sun, X., & He, W. (2025). Exploring the frontier of generative AI: Evolution, applications, and future trends. *International Journal of Crowd Science*, *9*(4), 269–277.

Trigka, M., & Dritsas, E. (2025). The evolution of generative AI: Trends and applications. *IEEE Access*.

Williams, A., Hatfield, D., & Rawal, B. S. (2025, April). Artificial intelligence evolution: The rise of generative AI. In *International Conference on Information Technology-New Generations* (pp. 418–432). Springer Nature Switzerland.

Zia, S. (2025). Digital colonialism: Reimagining power, identity, and resistance by decolonising AI. *Yayasan Drestanta Pelita Indonesia*, 129–147.