The Matrix of Discomfort: Reimagining Critical AI Artwork through a Lens of Organic Creative Spaces

KAREN ROYER, Worcester Polytechnic Institute, USA

YUNUS TELLIEL, Worcester Polytechnic Institute, USA

GILLIAN SMITH, Worcester Polytechnic Institute, USA

Wright's notion of "organic creative space" invites viewers to experience the harmony and discord inherent when operating at the boundary between the natural and designed worlds. In this artwork, we interrogate similar boundaries: between the natural and artificial, and between the creative and the generative. We explore the use of artificial intelligence systems to generate images of natural phenomena–specifically, women's faces–and the discomfort felt by viewers as they are unsettled by the unanticipated. The Matrix of Discomfort is a multimedia art installation that blends quilting and augmented reality (AR) to critically reflect upon AI as a medium that holds promise and distrust, and that exists at boundaries: between the natural and artificial, the creative and the generative, the digital and the physical. It reimagines the quilt, traditionally a feminized symbol of comfort and relaxation, as a canvas for stimulating conversation about the ethical quandaries and potential promises of generative AI.

1 MOTIVATION

The notion of "organic creative space" invites artists and designers to reimagine the relationship between the natural world and structured design, blurring the lines between them, in order to invite the inside to stretch outside [6]. In this artwork, we add a third space to this balance: the "generative" space which describes the space of potential artifacts that emerge from a generative system [10]. Through manipulation of both the generative space and the artifacts that emerge from it, we intentionally provoke viewers into a "matrix of discomfort" that highlights the systemic cultural biases inherent in generative spaces [9]. The resulting artwork is a physical quilt, a textile with a deep relationship to 'place-making' [8], which incorporates AI-generated imagery that has been manipulated in various ways to create unique augmented reality (AR) markers that are each linked to a digital artifact.

The work reflects the artist's own experiences when visiting Wright's *Falling Water*, where they felt they were running a balance sheet in their head, weighing the tradeoffs that exist at boundaries between the natural and the designed. Such decisions always come with tensions: the audacity and wonder of a window sealed against a boulder, vs. the practical likelihood of it leaking during rainy seasons. The beauty and peace that comes from stairs leading to a

creek bed, against the risk of introducing mold and mildew to the home. The harmonious design of spaces that immerse the resident in nature, weighed against the practical limits of how tall someone can be to exist comfortably in the space and how many guests can fit on a deck before it risks collapse.

In this work, we probe similar tensions of design and experience, which exist at the boundaries between the digital, the physical, and the generative. The work is a quilt that is also an interface to an augmented reality, juxtaposing hyper-feminized and hyper-masculinized spaces. It is a digital artwork with generated imagery that has been further digitally manipulated, yet constrained by available data existing in the generative space of text-to-image synthesis systems. And, as a physical manifestation of generative space, faces on the quilt are rendered as portraits that invite the viewer to imagine them as real people.

Like the juxtaposition of Wright's design philosophy that facilitates connections across boundaries and the failing of this philosophy in delivering an openness for everyone, AI-generated imagery excites and disappoints at the same time. While reassembling the boundaries between art and technology, human and nonhuman, and analog and digital, AI-generated images have the potential to create pathways in and out of digital artworks. Yet, as well-documented by feminist and other critical scholars, they amplify systemic bias through the perceptual infrastructures created by the commercialized AI systems [1] [5][9]. The Matrix of Discomfort is an acknowledgement that the path towards awareness of such systemic bias starts from 'discomfort' that we feel as we try to relate to others' faces.

2 ARTWORK DESCRIPTION

The Matrix of Discomfort is a hybrid digital/physical artwork, experienced by visitors primarily as a physical quilt that features a grid of AI-generated faces, prompted to be women's faces, and that appear femme-presenting [1] The quilt top is machine-pieced and the quilt overall is hand-quilted, i.e. the top, batting, and backing layers are bound together by hand. The fabric for the central blocks of the quilt was digitally printed on fabric from images generated using the Midjourney generative AI application. These images were generated in the Fall of 2022. These images of women's faces are also AR markers, and can be scanned using a mobile device to reveal different holograms; similar to how faces appear to facial recognition technologies, these images are made 'readable'.

As a quilt, visitors to the artwork interact with it as a textile work (see Figure 1). While designed to hang on a wall, visitors can touch and feel the texture of the printed women's faces. Visitors are permitted to touch the quilt and hold it in their hands; as they do so, the faces morph in strange and discomforting ways as the fabric creases and folds. Viewers can closely examine the faces and look for similarities and differences between them. Knowing they are AI-generated faces can also leave viewers looking for evidence of the faces' artificiality.

As a digital artwork, the quilt invites viewers to engage with a matrix which undervalues and overlooks ways women express themselves in their creative practices. A QR code leads to a web-based application which can run on the visitor's phone, and overlays the quilt with a holographic image that is linked to each face. The top nine images (rows 1-3) each reveal a hologram of a different sewing tool, which highlights unique practices (See Figure 2), the drive to allocate time to create for themselves (See Figure 4) and the computational tools of quilting (See Figure 5). Scanning the faces in row 4 reveal either a sewing tool or a placard that questions the universality of women (See Figure 3). The uncertainty of the application to correctly identify the faces as unique in row 4 highlights inaccuracies and injustices perpetrated by facial recognition technologies which are not adequately supported by human intervention. Visitors should notice that the women's faces in row 4 are quite similar to the row above; the artist made the scanner see them as ambiguous.

---

[1]For simplicity, we refer to these images as "women's faces" throughout this paper; however, we acknowledge that these are not real women, and that visitors may perceive different genders and identities.

Fig. 1. The Matrix of Discomfort quilted artwork.

The faces in row 5 are different from row 4, but the scanner is configured to show these as the same woman, clearly identifying them with the row above through their holographic placard declaring their universality. In addition, the scarring and destruction of the final two images is not recognized as different from any of the final six images. This scarring represents the algorithmic injustice women face through bias and stereotyping present in data. This row serves as direct reference to the portrayal of women as universal in AIGC, emphasizing, challenging and problematizing this portrayal.

The Matrix of Discomfort reckons with the current predicament of a visual culture that is dominated by AIGC images: How do generative spaces mask a strong current of alienation and disempowerment not despite of, but in their very potential for digital creativity? As the name suggests, the artwork invokes the theoretical work of the sociologist

Patricia Hill Collins. The critical idea of 'matrix of domination' [4] which we draw inspiration from challenges not only social constructs of power, but also the organization and circulation of power in complex systems of bias and stereotyping. The 'matrix of domination' refers to the complex systems of power, but Hill Collins suggests that the systems of power, which repress women, are themselves motivators of empowerment through resistance [4]. Ruha Benjamin (2019) suggests that the 'matrix of domination', as intersecting systems of power, is visible like a 'ghost image' in technology and that we may also see the impact of the matrix reflected in our bodies. By embracing the impacts of the systems, recoding them, and resisting them, we can expose them [1]. The Matrix of Discomfort works to reveal where systemic imbalance has resulted in data which reproduce the bias and stereotypes present as artifacts of society in automated data collection from the web. In the same way that Wright's architecture invites people inside, immersing them in the nature of materials, exposing vistas for their viewing, we want the quilt, the Matrix of Discomfort, to invite people to come in with a familiar medium and expose the nature of AI through an interactive AR application. In this way, the quilt responds to the universality suggested by the results of text prompts by embracing, resisting, and engaging with them. The quilt removes the color of the images resulting from the prompts and challenges or discomforts viewers into reflecting more deeply about the cultural and social impacts of AI and experience the evidence of the 'matrix of domination' as it may be found in AIGC.

Fig. 2. One block of the Matrix of Discomfort quilt as it is viewed through the web-based scanner application.

Fig. 3. A holographic placard and a universal sized dress form overlays one of the quilt blocks.

3 CONCLUDING THOUGHTS

We chose to embed an uncomfortable AIGC experience into a medium that women have used to communicate their messages [11]. In Quilt Culture, Bernick describes a landscape of quilting which is impacted by competing matrices, one is a critique by the art world that suggests quilters neglect to theorize about their quilts and the other critique comes from feminists who see quilts as anachronisms [2]. Our work engages with matrices across a multiple of contexts. The Matrix of Discomfort demonstrates to feminists the potential of a quilt to incorporate new technologies. It reveals to the art world the capacity to be expressive and it challenges technology to reflect on universalizing practices.

The Matrix of Discomfort resituates a quilt, generally found in intimate spaces offering us comfort or warmth, as a site of outward cultural/social investigation. The material nature of the quilt contrasts with the AR experience as an AIGC artifact. The quilt is stitched together with a machine, but it is hand-quilted to keep the layers together. A mobile device is used to scan the surface of the quilt, but the inside that we see is not the inner batting layer of the quilt, but the AR holograms of sewing tools. Inquisitive scanning reveals how AIGC sees women as universally the same, repeating the exact same woman in output even though the text prompts used clearly seek new output. The dataset available for use in AIGC filters out difference and given the lack of representation of women in the datasets [3], this risks marginalizing, stereotyping, bias, and even in some circumstances, silencing women or hiding harm to women. People who don't fit the algorithms' expectations are filtered out, their outward characteristics or inner natures that are

Fig. 4. A hologram of a clock representing the drive quilters allocate for themselves to create.

not recognized are ignored. The quilt is a caution to reflect on using AI for novel purposes while ensuring we keep our focus on human experiences.

When the quilt artist began the work on the Matrix of Discomfort quilt, they believed that we had to change the datasets to remove bias and stereotypes through a personal amalgamation of mass media stories and other colloquial sources. Through reflection during the creation of the quilt and investigation of how training AI datasets work, they realized that while we should do our utmost to correct AI datasets, it is more important to understand the nature of a dataset, not only what is in it, but also what it affords[7]. We must understand the constraints of the medium present through its creation process. But we can then use that knowledge in the same way that Frank Lloyd Wright understood the nature of natural objects and what they could do. When we embrace the nature of AI media as organic, the creation of organic, fallible beings, we can use the knowledge for artistic expression or even resistance. We hope by investigating or exploring the Matrix quilt, audiences are encouraged to investigate AIGC and its fallible datasets to encourage others to use them like a brush stroke or a color or some other medium.

4 TECHNICAL AND LOGISTICAL REQUIREMENTS

The quilt is approximately 4ft x 6ft in dimension, and comes with a baton so that it can be hung on a wall. The artist can bring hardware to support hanging the quilt. It requires a lighting environment with a lux between 100 and 150 of indirect light. This is because limiting wrinkles, shadows, and reflection when the quilt is on display is beneficial to its overall function. It does not require electricity or make any sound, and does not require staffing during the exhibit
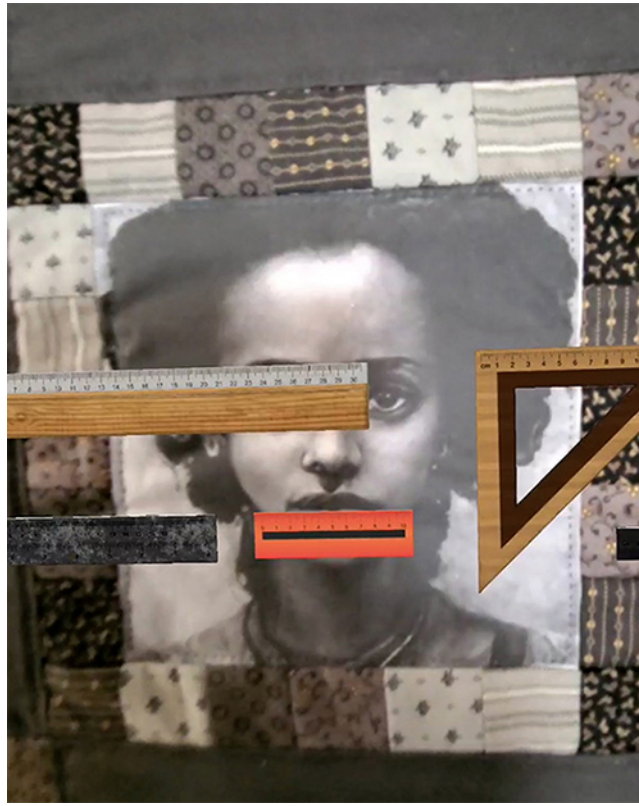
Fig. 5. A hologram of various rulers and tools used to measure fabric for making quilts.

period. People will need an internet-enabled mobile device that can scan a QR code, The web application works on both Android and iPhone devices. See Figure 6.

ACKNOWLEDGMENTS

REFERENCES

[1] Ruha Benjamin. 2019. *Race After Technology.* Polity Press, Cambridge, UK.

Fig. 6. A QR code used to access the scanning application.

[2] S. E. Bernick. op.1994. A Quilt is an Art Object when It Stands Up like a Man. In *Quilt culture: Tracing the pattern*, C. B. Torsney and J. Elsley (Eds.). University of Missouri Press, Columbia, Mis and London, 134–150.

[3] V. Cherepanova, S. Reich, S. Dooley, H. Souri, J. Dickerson, M. Goldblum, and T. Goldstein. 2023. A Deep Dive into Dataset Imbalance and Bias in Face Identification. In *Proceedings of the 2023 AAAI/ACM Conference on AI, Ethics, and Society* (, Montréal, QC, Canada,) *(AIES '23).* Association for Computing Machinery, New York, NY, USA, 229–247. https://doi.org/10.1145/3600211.3604691

[4] Patricia Hill Collins. 1990. *Black feminist thought: Knowledge, consciousness, and the politics of empowerment.* Routledge, United Kingdom.

[5] Sasha Costanza-Chock. 2020. *Design Justice: Community-Led Practices to Build the Worlds We Need.* The MIT Press, Cambridge, MA.

[6] W. Cronon. 1994. Inconstant Unity: The Passion of Frank Lloyd Wright. In *Frank Lloyd Wright Architect.* The Museum of Modern Art, New York, 10–31.

[7] Henriikka Vartiainen and Matti Tedre. 2023. Using artificial intelligence in craft education: crafting with text-to-image generative models. *DIGITAL CREATIVITY* 34, 1 (2023), 1–21. https://doi.org/10.1080/14626268.2023.2174557

[8] A. Kettle. 2019. Textile and Place. *TEXTILE* 17, 4 (2019), 332–339. https://doi.org/10.1080/14759756.2019.1639413

[9] A. Phillips, G. Smith, M. Cook, and Short. 2016. Feminism and procedural content generation: toward a collaborative politics of computational creativity. *DIGITAL CREATIVITY* 27, 1 (2016), 82–97. https://doi.org/10.1080/14626268.2016.1147469

[10] Adam Summerville. 2018. Expanding Expressive Range: Evaluation Methodologies for Procedural Content Generation. *Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment* 14, 1 (2018), 116–122. https://doi.org/10.1609/aiide.v14i1.13012

[11] Cheryl B. Torsney and Judy Elsley (Eds.). op.1994. *Quilt culture: Tracing the pattern.* University of Missouri Press, Columbia, Missouri and London.