Fleshed Networks

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Abstract

This paper explores the transformative impact of artificial intelligence (AI) in art, focusing on its role in creating virtual reality (VR) environments. These ideas are explored through the *Fleshed Networks* VR WebX project, developed for the 2024 International Symposium of Electronic Art (ISEA). *Fleshed Network* was developed in collaboration with an AI image generator that was prompted by themes related to female reproductive organs, reflecting Dr Megan Beckwith's ongoing exploration of digital representations of femininity. The paper discusses AI image generation, development, its current nature, significance, and the complexities of AI randomness in artistic creation. The research explores these notions through the author's creative journey with AI, revealing challenges and ethical considerations that view the impact of AI through a continuum ranging from innovation to disruption. Through experimentation with AI prompts, the paper reveals one artistic insight into the collaborative nature of AI creativity and its intersection with virtual reality art.

Keywords

AI-generated art, virtual reality (VR), Styly platform, gender representation, AI image generator, machine learning algorithms, algorithmic bias, ethical considerations, censorship, data feminism, AR/VR experiences, evolution of AI.

Introduction

We are in a moment of change as new non-code AI tools are having a transformative effect on all areas of our lives, including art practices. *Fleshed Networks* is a WebGL VR environment developed on the *Styly* platform for presentation as an online creative work for the ISEA Conference, Brisbane 2024. [1] The *Fleshed Networks* environment was created by employing an AI image generator prompted by themes related to the female body and reproductive organs, which are arguably among the most heavily censored aspects of women's anatomy online and subject to AI bias.
Dr Beckwith continues to delve into the portrayal of femininity through AI in this ongoing project.

AI Image Generation

In 2018, the AI-generated portrait named *Edmond De Belamy* reached a staggering $432,500 at a Christie's auction in New York, underscoring the growing significance of AI-generated art [2]. In 2022, there was a rapid proliferation of domestic online image generation AI applications,

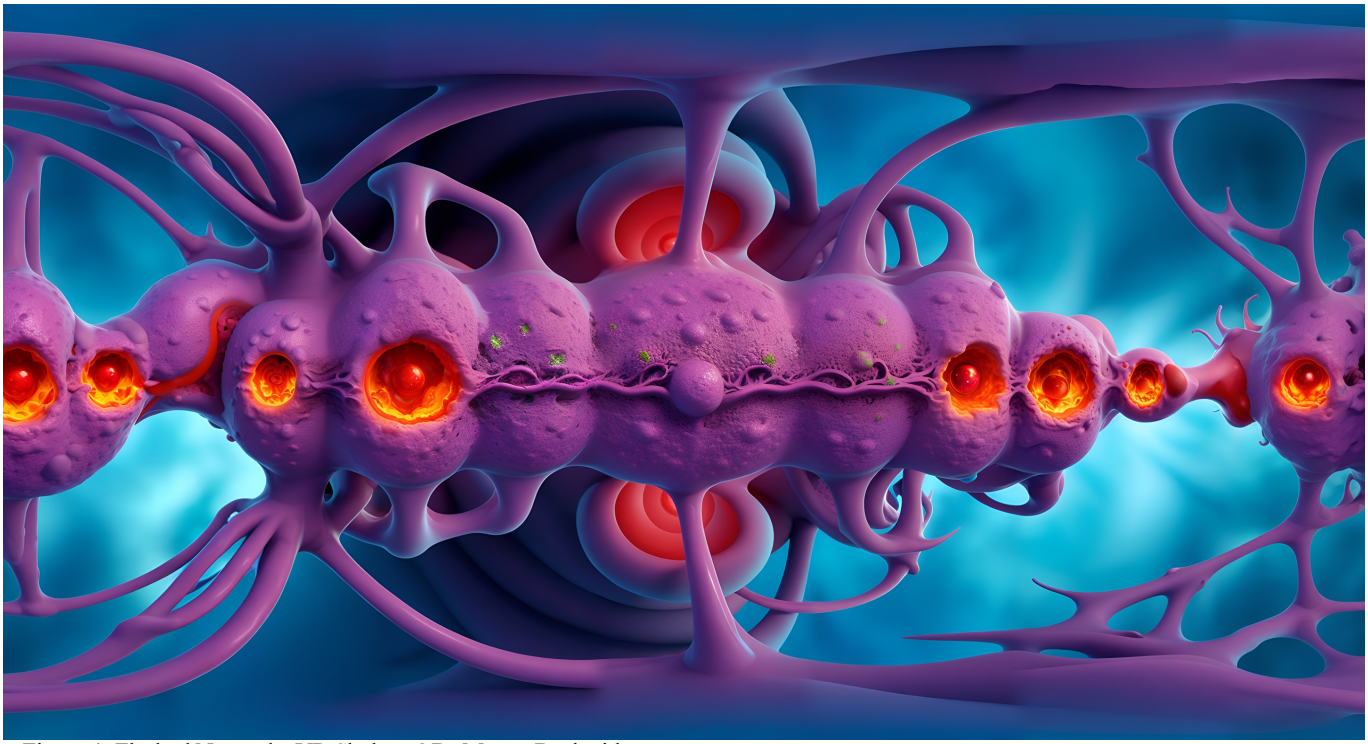

Figure 1. Fleshed Networks VR Skybox ©Dr Megan Beckwith

Figure 2. Landscape generated from ‘Vagina’ anatomical term prompts © Dr Megan Beckwith

exemplified by platforms such as *DALL E 3*, released in April, *Midjourney* in July, and *Stable Diffusion* in August of the same year. Since the release of *DALL E 3* alone, approximately 34 million images have been created daily by the AI generator [3]. While precise figures remain elusive, the sheer volume of images generated through AI platforms is staggering.

Significance and Complexity

The utilization of AI has been characterized as "relevant to any intellectual task; it is truly a universal field" [4]. However, viewpoints regarding the application of AI encompass a broad spectrum, ranging from perceptions of innovation to concerns about disruption. Opponents express trepidation, as evidenced by sentiments such as "I am frightened" [5]. At the same time, the optimistic view AI as a tool with the potential to advance humanity, expressing that "ultimately, we want agents that are provably beneficial to humans" [6].

Presently, the reality lies somewhere between these viewpoints. AI opens diverse creative possibilities that "span the spectrum from pure randomness to the deliberate exercise of authors' free will". [7] We currently find ourselves in a liminal phase where the trajectory of AI implementation remains uncertain, and its ultimate impact on society remains undetermined.

The current use of AI image generation is marked by a notable absence of control, where randomness is pivotal in the creative process. The incorporation of chance within art boasts a rich history, including Mozart's musical dice game in the 1700s and more contemporary artists, such as John Cage and Merce Cunningham, who famously used chance by incorporating dice throws into their artistic work. [8]

Challenges and Ethical Considerations

In my current research, I embrace the inherent randomness of AI-generated imagery, which appears to enrich and constrain a creative process. Within this framework, image generation resembles a metaphorical roll of the dice, wherein chance governs the outcome. Nonetheless, it is imperative to recognize that this represents a nascent stage of AI development poised to advance significantly. However, AI introduces a heightened level of complexity surpassing a mere dice-throw, leveraging AI's sophisticated algorithms and vast datasets to make predictions, discern patterns, and execute tasks that evolve and refine with experience. Yet, it is crucial to note that the AI dice metaphor is rolled on an uneven playing field.

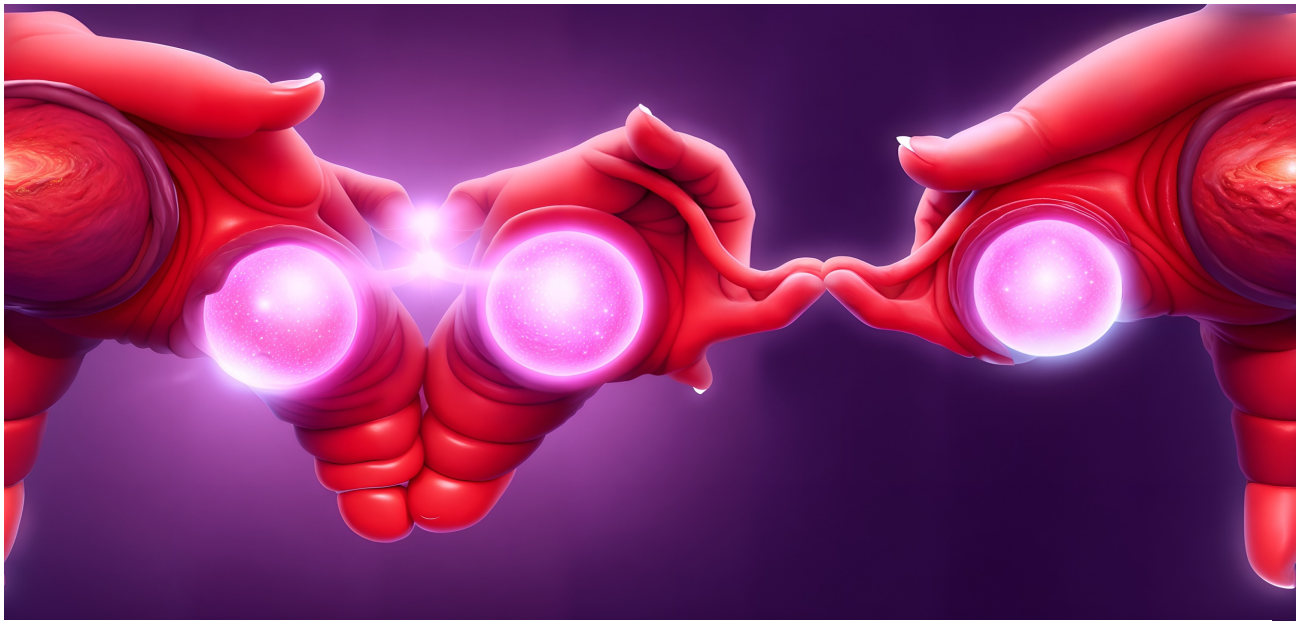

Figure 3. Landscape generated from ‘Vagina’ anatomical term prompts © Dr Megan Beckwith

Figure 3. Generic western faces generated from the 'Vagina' anatomical term prompts © Dr Megan Beckwith

Collaborative Nature of AI

The AI process involves using data sets to inform its analyses and decision-making. However, it is crucial to recognize that these data sets are currently fraught with notable biases. For instance, the widely used image data set *ImageNet* comprises over 14 million images categorized into over 20,000 classes or synsets, such as wombat, jellyfish, and sea anemone. [9] Each category contains several hundred images. *ImageNet* employs a crowdsourced annotation process for its images, introducing human bias into the data set. *ImageNet* currently strives to refine its dataset; nonetheless, unravelling its intricacies is a monumental challenge.

Within the *ImageNet* framework described by Crawford and Paglen in their journal article *Excavating AI: The Politics of Images in Machine Learning and Training Sets*, *ImageNet's* classification of persons reveals a notable divergence into categories, such as "Bad Person, Call Girl, Drug Addict, Closet Queen, Convict, Crazy, Failure, Flop, Fucker, Hypocrite, Jezebel, Kleptomaniac, Loser, Melancholic, Nonperson, Wanton Waverer, and Wimp". In their analysis, Crawford and Paglen further highlight that underlying assumptions, political biases, and cultural perspectives are evident at the image level of the training set. For instance, in 2019, "*ImageNet* labelled Sigourney Weaver as a hermaphrodite, a young man wearing a straw hat as a tosser, and a young woman lying on a beach towel as a kleptomaniac". [10]

In my artistic practice, I have predominantly fused dance with a digital process, initially by creating animations of prosthetic body parts for incorporation into dancers' performances, drawing inspiration from Donna Haraway's Cyborg Manifesto. In these early works, my dancers embodied cyborgs, engaging in synchronized duets propelled by their animated limbs [11][12]. I contemplated the hypothetical scenario of purchasing a body part and speculated on its behaviour. As I progressed through my ongoing digital creative process, I engaged in dialogue with the coders and software engineers responsible for the tools utilized, recognizing the profound impact of their decisions and aesthetics on my artistic work. I have both been influenced by and constrained by their choices, which reverberate throughout every aspect of my digital workflow. These influences harken back to Ada Lovelace and her algorithm for the Analytical Engine, as each iteration of code often builds upon preceding strings, syntax, and concepts.

However, I am now confronted with drawing upon a biased database at the technical process's core. The AI's algorithms elevate the creative digital collaboration to a more complex, challenging and confronting process. It is not just a passive instrument or device. It possesses characteristics that extend beyond traditional tools, such as autonomy, learning ability and the capacity to make decisions and predictions based on data analysis.

The data set determining the output of my creations gives me an inherent lack of control over the creative process. Additionally, the difficulty in identifying the specific dataset the image generator uses adds another layer of uncertainty. The fact that the AI draws from existing images and artists' works and the classification of each image further complicates matters. Despite not understanding the content it processes, the AI's influence feels intrusive and unpredictable, akin to engaging in a conversation without fully comprehending the other party's intentions.

In my project, *Fleshed Networks*, the initial idea was to explore and create a skybox featuring representations of vaginas. The most censored part of the female body. However, it soon became evident that this objective was unattainable. I began by inputting prompts such as vagina and vulva, focusing on anatomical terms. However, the images generated by the AI were generic landscapes of trees. It became apparent that the data set did not align with my prompts, lacked relevant image references, or the queries I posed were infrequently encountered. At the time of writing this paper, available datasets containing the term vagina are predominantly related to medical contexts, such as the data set for the Reporting of Carcinomas of the Vagina [13].

The AI image generator appeared to lack a dataset that used anatomical terms for the vagina or images of the complete female form. The interaction between technical components such as algorithms and societal constructs like gender significantly influences AI's image creation. Gorska and Jemielniak note, "Given that AI systems are a product of human creation, they inherently embody the limitations and constraints characteristic of their developers." [14] My work appeared to be suffering from a void of elements of the feminine form.

Impact

Numerous examples highlight the biases present in AI, resulting in adverse outcomes that perpetuate sexism and racism. For instance, Amazon's algorithm for assessing job applicants favoured male candidates due to its reliance on predominantly male resume data [15]. Similarly, research by

Buolamwini and Gebru showed that darker-skinned women were significantly more likely to be misclassified than lighter-skinned males [16].

Over time, the echo chamber of my data set revealed itself. During my research, I generated hundreds of images, showing a consistent trend where the faces or facial features generated were typically young, white women who adhered to a Western airbrushed and homogenized beauty standard.

Nevertheless, the accuracy of the generated images also varied widely, creating a room in one generation and a twisted face in the next. I experimented with prompts focusing on various elements describing female genitalia, such as skin, flesh, wrinkles, veins, and hair. This approach proved more effective, creating fleshy, visceral environments reminiscent of compositions crafted from human flesh, often evoking the monstrous feminine. While some outcomes perpetuated discrimination and reinforced gender representation stereotypes, I found the AI's creative process to be collaborative, akin to human collaboration, albeit one that can't be argued with.

Through this collaborative process, I produced diverse images, ranging from traditional science fiction-inspired rooms and landscapes to more visually striking, fleshy environments. While the generated images differed significantly from my typical creations, traces of my influence were discernible in the final works. The AI consistently produced a wealth of imagery, requiring my role in collating and curating the output. Despite the biases inherent in AI, I am motivated to continue working with it as it pushes me toward new creative directions I may not have explored otherwise.

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Author Biography

Dr Megan Beckwith is an academic transmedia artist who combines dance and digital media. Her practice explores the intersection of physicality and technology through the figure of the post-human cyborg. Beckwith combines her dance performance with technologies such as stereoscopic 3D illusions, motion capture, and virtual and augmented reality. She creates performance installations that combine the body and 3D animation and visual effects in a process that layers one over the other, re-working the human figure into new forms. She Lecturers in Digital and Screen Dance and is the Virtual Production Fellow at the Victorian College of the Arts, Faculty of Fine Arts and Music, University of Melbourne, Australia.