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IS MIDJOURNEY-AI A NEW ANTI-HERO OF ARCHITECTURAL IMAGERY AND CREATIVITY? : AN ATYPICAL ERA OF AI-BASED REPRESENTATION & ITS EFFECT ON CREATIVITY IN THE ARCHITECTURAL DESIGN PROCESS.

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Abstract

By nature, technology such as artificial intelligence (AI) brings boon-bane situations during advancement in any field. However, AI has begun to tamper with one such area: the creative process of creating art and architectural imagery. During the mid of 2022, AI-Art tools like MidJourney and DALL-E aimed to effortlessly replicate the creative human mind by enabling digital responses based on text-based prompts. However, though this AI-Art thrives in art, the architectural field raises concerns. Research indicates that AI-Art's drawbacks are: a shallow understanding of sublimity in architecture, relevance, thoughtfulness and even job replacement. Therefore, the paper raises the question: Is MidJourney-AI a new Anti-hero of Architectural Creativity?

Methods of this research are through literature review and a live and digital experiment. This paper combines a literature review and a research experiment to provide a more thoughtful interpretation of the research question to answer strategically. First, this paper clarifies AI's influence on art and architectural expression. It is also analysed how AI cuts down the authentic creation model regarding architectural thinking. This paper provides a new research investigation combining artificial intelligence and architecture. Firstly, recent investigations in architecture and AI-Art have been studied (Berg, 2022; Mello-Klein et al., 2022; Panicker, 2022). Secondly, two experiments of the creative process, i.e., the traditional and AI-induced design processes, are performed to understand and distinguish various digital and experiential factors influencing them. It finally discusses how AI can be cautiously practised without hindering the creative process. Finally, the study concludes on mindfully using AI and the importance of architectural pedagogy to teach and help such mindful usage of AI for upcoming art and architect generations.

Keywords: Artificial Intelligence; Creativity; Architectural Representation; MidJourney; AI-Art.

1. Introduction

Expansion in technology has both benefitting and adverse effects. Nevertheless, the prospects of now-age art and creative searches are continually expanding - exclusively with the upcoming technologies like AI. Artificial Intelligence has become more powerful and is multi-layered with technological advancement. Ranging from simple computers and machine learning, artificial intelligence continues to improve daily. Computation and AI are regularly experimented with various streamlines like computing, IT and even art. Whereas recently, AI has shown evident cases of interrupting the authenticity of original expressions of human thought processes, i.e., creativity. These novel experimentations have expanded into art and art-related streams forming AI-Art that indirectly affects the creative aspects. AI-Art is artificial intelligence used to create art and artistic expressions digitally. AI-Art evolution takes on a storm to art and artists, causing ripples of disturbances to creativity in design. One such evolution is starting to hinder and contemplate the creative process in art, especially the architectural design process. This hindrance is predominately caused for architects who formulate concepts in the design process.

The process of AI-Art formulating concepts might sound technologically easy and advantageous. However, there are higher indications of weaknesses when AI-Art head-starts architectural design concepts. Regarding the anticipation of AI's future direction, solutions to mitigate such hindrances are also researched and discussed. The aims of this research can be summarised as follows:

(1) To examine the intersectional relationship between the function of AI-Art and how human creativity works are studied and distinguished for ground research.
(2) The working impact of MidJourney AI on creative thinking in architecture is studied based on exploring the pros and cons of AI-Art.
(3) Then, two experiments are conducted. First, AI-Art Processes and, secondly, human mind thought processes are conducted separately with the same word prompts to distinguish the efficacy of creative thinking. Later these results are discussed and reflected on the findings.
(4) Finally, recommendations are made after researching and extracting from the motive for this research.

2. Human Mind and its creative process

The human mind is complex and has millions of neural networks capacitating us in various ways. The instant communication of the "Imagination Network and focus sharpening tools of the Executive Attention Network yields true creative thought as a final product" in the brain (Koontz, 2020). These creative thoughts follow a few patterns. According to Boden, M. (2009), there are three types of creativity:

1. Combinational creativity encompasses the generation of "unfamiliar" combinations of familiar ideas.
2. In exploratory creativity, the existing stylistic rules generate new ideas whose options may not have existed before the exploration.
3. Transformational creativity is unique; the variation is more noteworthy and has a deeper stylistic understanding and striking dimension.

Rather than that, material, atmosphere, mood, and several other intangible factors are also responsible for the creation of art. (Panicker, 2022). These types of creativity are understood to review later the kind of creativity that AI-Art reflects in its product.

3. AI-Art, its creative process and architectural trends

AI-Art has seeped into digital art trends during the mid of 2022. MidJourney, DALL-E and other text-to-image tools are just one way that AI has made its way into the creative process. However, this creative process might be helpful in arts and graphic design but not for architecture. As an art tool, the AI takes all forms of prompts with limited capacity to produce sketching conceptual buildings. In contrast, various architects and architectural platforms like dezeen find AI-Art "drains and gutters", the creativity for architects. One such controversial AI-Art tool is MidJourney-Bot-AI.

3.1 MidJourney AI and its creative process

In April 2022, a San Francisco-based company founded MidJourney-AI as an extension within a chat server called " Discord® " (Salkowitz, 2022). Soon the global trends of AI-Art shifted its vision towards experimenting with graphics, art, sculpture and even architecture (Fig 1). MidJourney-AI works entirely based on a text-to-illustration-based system called "prompt". A particular order and system are built into "prompt "writing for AI to recognise it as a prompt. (Panicker, 2022). However, this prompt-based AI-Art tool has been recognised with multiple controversies, especially architectural imagery.

Figure 1: Ragab, H. (2022, September 5). Parametric Architecture. https://parametric-architecture.com/a-mid-journey-to-the-virtual-world-of-hassan-ragab/

4. AI-Art and its controversy

Controversially, the AI-Art tools were found to be both productive and problematic for various user groups. These are some of the benefits and drawbacks of AI-Art in architectural imagery and thought processes:

4.1 Benefits

1. <u>Creative invocation:</u> These AI-Art tools illustrate an idea or a feeling we want a particular space to evoke," than realistic illustrations. (Berg, 2022). But, the definite purpose at the beginning of a design project is when we are conceptualising and

"dreaming" about (Berg, 2022). So, they benefit by inducing creativity towards conceptual spaces which are "allegedly new".

2. <u>Speed:</u> Like any new technological application, AI produces images and art comparatively in a few minutes, faster than human work speed.

3. <u>Variations:</u> These AI-Art tools also produce four variations for a single promoting and four more variations on the primary variation allowing 16 variations for a single text prompt.

4.2 Drawbacks

1. <u>Understanding 'sublime':</u> Architects have begun to question AI's works, asking whether it [art produced] is "sublime"? (Panicker, 2022). To create art sublimely, one must think that something is sublime—"that feeling cannot perhaps be not taught". (Panicker, 2022)

2. <u>Cultural Relevancy:</u> Secondly, understanding the sublime's complexity differs from region to region and culture to culture (Panicker, 2022). However, AI can portray less or no cultural relevance during stances of architectural imagery.

3. <u>Limited references:</u> Even though AI is based on multiple images, even billions of them, it is eventually limited by what is in those previous images. (Berg, 2022). Similarly, Panicker (2022) also states that AI-Art "explicitly exhibits human design, intervention, and action; existing references". So, for example, if there is an existing pattern of discrimination, the AI takes only references from existing sources, which might end up illustrating similar discrimination patterns in visual arts.

4. <u>Job replacement:</u> Finally, similar to any technology and automation, there are chances that it can "replace" actual humans to do that particular work. (Mello-Klein et al., 2022).

With the limited research of the pros-cons list, AI-Art tends to incline with drawbacks that influence architecture's creative process. For example, AI might quickly produce artwork. However, in the real world, a creation by a human being with specific experiences, certain memories, and a particular skill set brings that artwork to fruition. (Panicker, 2022). After a detailed overview of AI-Art, "MidJourney Bot" is an example to review0 AI-Art's recent trend of creating architectural concepts.

5. Distinguishing Experiment of Human Thought Process and MidJourney AI in architectural imagery

In order to understand and distinguish the output of both creative processes, a simple investigation is carried out. The creative processes that are investigated are:

5.1 The traditional design process uses the human mind's creativity
5.2 The digital process using AI-Art based creativity

Both processes have prompts or words to produce creative results. These prompts are tested through two sets of prompts.

A. **Artistic:** Illustrate abstract art of these emotions (A1. Playfulness; A2. Curiosity; A3. Joy; A4. Need for Comfort; A5. Shy & A6. Scared)

B. **Architectural:** Illustrate those emotions in space as architecture (B1. Playfulness; B2. Curiosity; B3. Joy; B4. Need for Comfort; B5. Shy & B6. Scared in space as architecture)

Furthermore, both processes carried out similar prompts for an unbiased evaluation and examined cohesive comparisons through their outputs to maintain relevancy and consistency. These two sets of

prompts are instructed to architecture students in the first experiment. Then, the same prompts are fed as codes in the Discord® server to test "MidJourney-AI". Later the findings are summarised and discussed.

5.1 The traditional process using the human mind's creativity

Students were instructed to draw out the prompts manually to evaluate the creativity of the human mind. The given time for each of these prompts was 10 minutes. A batch of 40 second-year architecture students was exercised for this experiment (Fig 2). As mentioned earlier, they were instructed with two prompts, i.e., Artistic (Abstract) and Architecture expressions of emotions. Using pen-paper for this experiment would allow investigation of the creative authenticity of the human mind. The results are depicted in the following images:

The final output:

Figure 2: Student's Drawing Prompt Output on a Board, PMIST, Tanjore (Author, 2022)

Two sample sets (A1; B1 and A4; B4) were chosen for closer investigation.

First Sample of output :

Figure 3: EG:1 Playfulness; Playfulness in Architecture drawn by students. Photographed by (Author,2022)
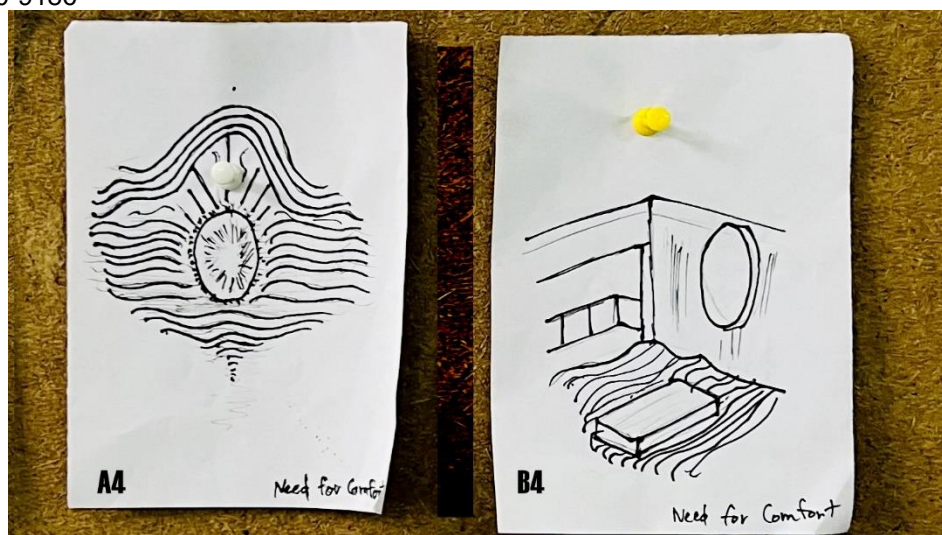
Second Sample of output:

Figure 4: EG:2 Need for Comfort; Need for Comfort in Architecture drawn by students, Photographed by (Author, 2022)

The observations are compared with the digital process and are listed in (Table 1.1). The findings are discussed in Section 5.3 and Section 6.

5.2 The digital process using AI-Art based creativity

For investigating AI-Art, the MidJourney server was chosen in Discord® to input the prompts to evaluate the creative digital results (Fig 5).
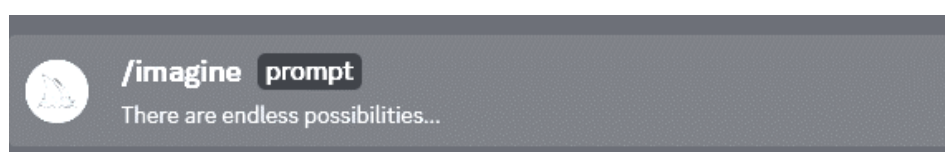

Figure 5: MidJourney bot in Discord Server

The approximate time to produce imagery for each prompt was 50 seconds to 1.5 minutes. This investigation was also instructed with two prompts, i.e., Artistic (Abstract) and Architecture expressions of emotions, to produce results digitally. The prompt code inputs are the following:

/imagine prompt: <emotions A1-A6>

/imagine prompt: <emotions B1-B6> in space as architecture

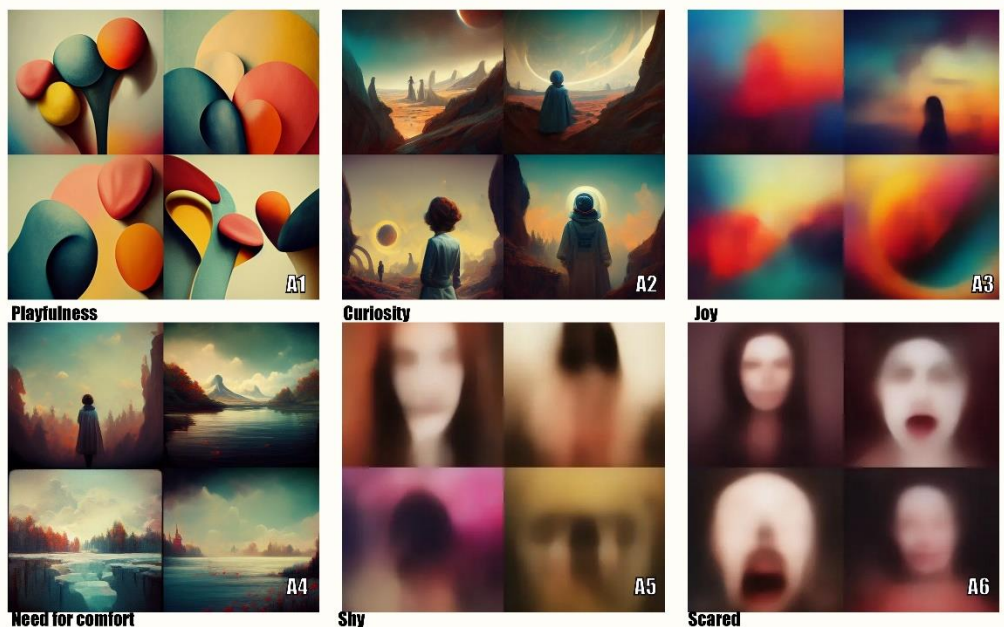The results are depicted in the following images:

Figure 6: Set 1: Artistic illustration of Emotions through MidJourney Bot (Author,2022)

Figure 7: Set 1: Architectural illustration of Emotions through MidJourney Bot (Author,2022)

There are only 12 image sets, so they are all closely investigated to compare and contrast the process.

5.3 Summary of findings

Long's (2014) parameters were used to create Table 1.1. to examine the creative outputs. He suggests those parameters can be "criteria of assessing creative products in science tasks", where they are categorised in the findings table (Table 1.1). Along with those parameters, 'sublime factor' & 'speed' are included for evaluation. Finally, a group of panellists [architecture assistant professors] (See Acknowledgement) reviewed, compared and contrasted them in the below table:

Experiment	S.no	Parameters (Long, 2014)	Human Mind Output (A')	MidJourney Bot Outputs (B')
A. Artistic Experiment Illustration of Emotions through abstract art:	1	**Interesting:** *Creative Invocation*	Moderately creative	Highly creative
	2	**Novelty:** *Uniqueness of the response form*	Outputs with variations and options	Outputs with variations and options
	3	**Thoughtfulness:** *Relevance*	*Invalid parameters to assess and examine abstract art*	
	4	**Appropriateness:** *Practicality*		
	5	*Sublime Factor*	Moderate	High
	6	*Speed*	8-10 minutes (Low)	50-100 seconds (High)
B. Architectural Experiment Illustration of Emotions in spaces as architectural imagery:	1	**Interesting:** *Creative translation from emotion*	High creative translation	Less creative translation
	2	**Novelty:** *Uniqueness of the response form*	Outputs with variations and options	A vague and highly similar variety
	3	**Thoughtfulness:** *Relevance*	Adequate Relevance	Inadequate and visible Irrelevance
	4	**Appropriateness:** *Practicality: Can it be built?*	Highly practical: Yes	Rare evidence of the practicality: Highly Utopian visuals
	5	*Sublime Factor*	Moderate	Moderate
	6	*Speed*	6-8 minutes (Low)	60-120 seconds (High)

Overall, from the table above, it is summarised:
1.

Table 1.1: Distinguishing Table indicating outputs of the research experiment, Source (Author, 2022)

Artistic – Both have outputs with variations and options.

2. **Architectural** – Human mind outputs indicate a high level of appropriateness and adequate relevance. However, AI outputs are imaginative images with no relevant references and a significant stretch in materiality.

These are key takeaway observations for this research. The above findings will be discussed in detail in the upcoming sections.

6. Discussion of the research question

This research reflects and discusses the experiment's findings and recommends solutions to mitigate the drawbacks of AI-Art.

6.1 Discussion and Reflection:

The research discusses the following using the literature review and experiment:

1. As observed in BB'2 (Tab 1.1), the architectural imagery produced are highly similar, with little variety in outputs. Furthermore, it is observed that feeding a particular algorithm to a machine produces limited results. Mello-Klein et al. (2022) add that "it [AI-Art] cannot produce anything that it has not already been trained on, so it is impossible to create legitimately new things".

For example, an AI was used to write poems and was judged to identify the poems written by AI and human beings. All the lyrics written by AI were identified and distinguished. Ballenger (2017) states, "…some essence of poetry that a machine cannot capture."

2. When fed with prompts, humans use them as inspiration to create art. Both humans and AI benefit from prompts or word-based illustrations, but A.I. depends on them. AI does not "learn" to create from prompts. Instead, it manipulates its art with existing images beyond recognition as a deception to appear new. Humans can still visualise ideas without prompts, but AI cannot.

"The AI relies only on words to generate images" (Panicker, 2022). At the same time, creation's limitation is words. Our language has limitations and a subliminal meaning underneath any language that cannot be explained (Brillhart, 2021). Therefore, using such 'only prompts, only through words' can hinder architectural creativity.

3. As said earlier, there are three types of creativity. From the above two case studies, it was observed that: AI -art indicated references to combinational and exploratory creativity. However, the human mind exhibited all three types of creativity, i.e., combinational, exploratory and especially "transformational" creativity, which AI-Art cannot replicate.

Similarly, Gradecki agrees that "Creativity is the one thing that is not going to be able to be automated." (Mello-Klein et al., 2022). Consequently, this simple experiment and research identified that AI-Art could invoke creativity, but it cannot be systematised.

6.2 How can AI be helpful and better?

Observed from Tab 1.1, we can see that AI-Art has more advantages while creating artistic expressions (AB') than architectural imagery (BA'). In contrast, AI-Art can thrive and be helpful in graphic designing and other allied fields. In specific ways, AI-Art can be helpful in architecture. Firstly, even though AI-Art cannot ultimately create vastly new objects, it can evoke creativity for those who need a "head-start. Salkowitz (2022) expresses that MidJourney is designed to boost the creativity of artists by giving them these tools. Secondly, it can be a valuable tool for students of architecture. It can be helpful for those who are incapable of visualising the possibilities and those who need creative ignition. (Panicker, 2022)

Finally, circling back to the research question, is *MidJourney-AI the new Anti-hero of Architectural Creativity?*: No, AI-Art is not the anti-hero of the creative process in architecture. However, the humans' misuse of AI is the actual anti-hero. However, with the existing misusing trends of AI—art, the user can go either way. Gradecki and Curry (2022) recommend reducing this misuse by bridging the gap in technological literacy in AI.

6.3 Bridging the gap in technological literacy in AI:

"AI can pique imagination for us" (Panicker, 2022). Although AI might be helpful in creative induction, it could also prevent students from thinking individually, which is "debatable". Any literacy gaps in technology and science can be bridged through 'pedagogy [teaching]'. Hanrahan (2009) states, "Pedagogical knowledge relates to teaching methods and their application to promote student AI literacy learning". We can use architectural pedagogy to practice AI in the creative process among students safely. Therefore, it should be taught to use AI-Art as a secondary aiding tool. However, the human mind can only entail other thoughtful tangible and intangible aspects that need attention in an architectural design process.

7. Conclusion

By very nature, technology has its limits. AI-Art was studied in detail, and identified that it could be a helpful tool for artistic creation rather than architectural imagery. However, AI-Art is much more than a simple technical means of artistic creation. It is more of a reforming of art than creative thinking that impacts human cognition.

Recent research on AI-Art has provided a complete understanding of the technological processes, their outputs and their relationship with humans' creative response, especially towards architecture. Current findings recommend that the pedagogy of safe use of AI-Art in architecture plays a critical role in leaving the future of architectural creativity undisturbed. However, this complex relationship between AI & human creative mind is still unclear. Furthermore, additional detailed research experiments are required to provide an exact result of a particular creative ignition within the human mind. Therefore, comparing published case studies and the simple experiment conducted through this research is challenging. More complete and precise documentation of AI-Art and human creative process—including architectural understanding; usage of colour; and a physiological profile and mood of the artists, including sex, age and psychological condition—will facilitate a more precise comparison of individual processes. Whereas that can lead to a comprehensive knowledge of the creative processes of the architectural design process.

The research aimed to identify and check if the strategies of AI-Art hinder or block the creativity involved with architectural imagery. Therefore, a future exploration into how to use AI-Art at a conceptual level for inventing new material and texture techniques is necessary and worth exploring in architecture.

The limitations of creative tools bind the artists, and there is none other than the brain. This research found a need to bridge the literacy of AI usage and how we can safely exploit such tools. It is also observed that creativity will or cannot be automated, at least so far. Therefore, it is also essential to consider emerging technologies' challenges and ensure that creativity is protected. It remains to be seen if this democratisation of creativity supports humanity.

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