The Turkish Online Journal of Design, Art and Communication

E-ISSN: 2146-5193

DOI: 10.7456/tojdac

Research Article / Araştırma Makalesi

COMPARISON OF AI-GENERATED CONCEPTUAL INTERIOR DESIGNS USING STANDARDIZED PROMPTS IN VARIOUS AI MODELS

FARKLI YAPAY ZEKÂ MODELLERİ KULLANILARAK STANDART KOMUTLARLA ÜRETİLEN KAVRAMSAL İÇ MEKÂN TASARIMLARININ KARŞILAŞTIRILMASI

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Received/Geliş tarihi: 06.07.2025

Benzerlik Oranı/Similarity Ratio: %7

Revision Requested/Revizyon talebi: 13.08.2025

Last revision received/Son revizyon teslimi: 07.09.2025

Accepted/Kabul tarihi: 30.09.2025

Etik Kurul İzni/ Ethics Committee Permission: Antalya Bilim University Natural and Applied Sciences Scientific Research and Publication Ethics Committee, September 12, 2024 and 2024/05

Citation/Atıf: Kahraman, M. U., Şekerci, Y. & Kılıç, E. C. (2025). Comparison Of Ai-Generated Conceptual Interior Designs Using Standardized Prompts In Various Ai Models. The Turkish Online Journal of Design Art and Communication, 15 (4), 1365-1386. https://doi.org/10.7456/tojdac.1736051

Abstract

This study evaluates the performance of three widely-used text-to-image AI models—DALL-E, MidJourney, and Stable Diffusion—in generating interior design visuals. Five standardized prompts, covering essential design elements such as architectural features, style, furniture, lighting, textiles, accessories, and layout, were provided to each AI model. The resulting visuals were then assessed by 15 experienced professionals and academics with over 10 years of expertise in interior design. Using a detailed rating system, the study found that MidJourney consistently outperformed the others, excelling in categories like design style, textiles, and lighting. DALL-E proved effective in generating architectural features but struggled with finer details, particularly in textiles and lighting. Stable Diffusion lagged behind in overall performance, especially in categories like layout and furniture. The study highlights the importance of prompt specificity in shaping AI-generated visuals and suggests areas for future improvement in AI models, particularly in complex design tasks.

Keywords: AI-generated interior visuals, Text-to-image AI models, Interior design evaluation, AI in design visualization, AI models comparison

Öz

Bu çalışma, metinden görsele dönüştürme yeteneğine sahip üç yaygın yapay zekâ modeli olan DALL-E, MidJourney ve Stable Diffusion'ın iç mekân tasarımı görselleri üretme performansını değerlendirmektedir. Her bir yapay zekâ modeline, mimari özellikler, stil, mobilya, aydınlatma, tekstil, aksesuarlar ve yerleşim gibi temel tasarım öğelerini kapsayan beş standart komut verilmiştir. Ortaya çıkan görseller, iç mekân tasarımı alanında 10 yılı aşkın deneyime sahip 15 profesyonel ve akademisyen tarafından değerlendirilmiştir. Detaylı bir puanlama sistemi kullanılarak yapılan değerlendirme sonucunda, MidJourney'nin özellikle tasarım stili, tekstil ve aydınlatma gibi kategorilerde üstün performans sergileyerek diğer modelleri geride bıraktığı belirlenmiştir. DALL-E, mimari öğeleri üretmede etkili olurken, özellikle tekstil ve aydınlatma gibi ince detaylarda yetersiz kalmıştır. Stable Diffusion ise genel performans açısından geride kalmış; özellikle yerleşim düzeni ve mobilya kategorilerinde düşük başarı göstermiştir. Çalışma, yapay zekâ tarafından üretilen görsellerin niteliğinde komutların özgüllüğünün önemine dikkat çekmekte ve karmaşık tasarım görevlerinde yapay zekâ modellerinin gelişime açık alanlarını ortaya koymaktadır.

Anahtar Kelimeler: Yapay zekâ üretimi iç mekân görselleri, Metinden görsele yapay zekâ modelleri, İç mekân tasarımı değerlendirmesi, Tasarım görselleştirmede yapay zekâ, Yapay zekâ modellerinin karşılaştırılması

INTRODUCTION

In recent years, the number and development of artificial intelligence (AI) tools have rapidly increased (Bertani et al., 2021; Bongomin et al., 2020; Chen et al., 2020; Parashar et al., 2023; Sigov et al., 2024). These tools, especially text-to-image AI tools, hold significant potential in design disciplines such as graphic design, architecture, interior design, product / furniture design, lighting design, etc. (Albaghajati et al., 2023; Brisco et al., 2023; Caires et al., 2023; Çelik, 2024; Dehouche & Dehouche, 2023; Hanafy, 2023; Horvath & Pouliou, 2024; Ko ve diğerleri, 2023; Vartiainen & Tedre, 2023; Zhou & Lee, 2024). These text-to-image AI tools enable users to generate unique visual outputs by entering descriptions –prompts – in natural language (Dehouche & Dehouche, 2023). Although using text-to-image AI tools might seem simple as it only requires writing a text to generate visuals, crafting effective prompts is a nuanced task. For example, Wasielewski (2023) found that one of the most popular text-to-image AI tools, Midjourney, struggles with understanding quantitative prompts and cannot generate accurate images based on quantitative approach, even though Midjourney claims that it is more effective to use specific numbers; for example, 'three cats' is more precise than 'cats' (Midjourney Offical Website).

Once a proper prompt is written, different text-to-image AI tools generate various visuals based on that prompt. Some tools may perform better or be less effective than others in meeting the described criteria, depending on how well they interpret and execute the given prompt. For example, Çelik (2024) compared Midjourney, DALL-E 2, Craiyon, Stable Diffusion, and Nightcafe text-to-image AI tools in developing architectural plans. It is understood that Midjourney and DALL-E 2 (when using visual references) were found to be the most effective tools for generating architectural plan schemes in this study. Midjourney excelled in producing symmetrical and visually appealing plans, while DALL-E 2 showed significant improvement with the use of visual references.

Interior design has many visual aspects. Caan (2011) describes the interior design process in nine stages. In the fourth stage, the layout organization is specified which can be considered as a visual aspect. In the fifth stage, the physical aspects of the space are detailed, including systems, lighting, materiality, ambience, detailing, furniture, and accessories. Pile (2005) describe interior design as a field packed with a wide range of objects and artifacts, including furniture, lighting, textiles, and sometimes art. They emphasize that interior design has unclear boundaries, overlapping with the realms of construction, architecture, art, crafts, and various technologies. These technologies include heating, cooling, ventilation, lighting, water and drainage equipment, and what is now referred to as *product design*, encompassing appliances, plumbing fixtures, and other kinds of equipment. This broad scope demonstrates the multifaceted nature of interior design, blending visual and physical aspects to create cohesive and functional spaces. Ching & Binggeli (2018) describe several key visual qualities of interior design. These include the image and style of a space, the degree of spatial enclosure, and the quality of light. Additionally, they highlight the importance of the focus and orientation of space, color and tone, and textures. These visual elements play a crucial role in shaping the general aesthetic and functional experience of an interior environment. Besides, interior design is a human-centered design (Caan, 2011).

Understanding the user profile and needs (Ching & Binggeli, 2018; Heydarian et al., 2017) and being familiar with the anthropometrical data and ergonomics (Neufert & Neufert, 2012; Panero & Zelnik, 1979) are also very important aspects of an interior space. Lastly, architectural features of the spaces are also a very important visual aspect for interior space, including the dimensions of the space, ceiling height, doors and windows on walls facing the exterior, and interior doors or partial/full walls connecting to other rooms (Ching & Binggeli, 2018). Considering these elements, layout organization (Caan, 2011), architectural features, user profile and needs (Ching & Binggeli, 2018; Heydarian et al., 2017), style (Ching & Binggeli, 2018), lighting (Caan, 2011; Pile, 2005; Ching & Binggeli, 2018), furniture (Caan, 2011; Pile, 2005), anthropometrical dimensions (Neufert & Neufert, 2012; Panero & Zelnik, 1979), color, tone, and texture (Ching & Binggeli, 2018), textiles (Pile, 2005), and accessories and art (Pile, 2005) can be chosen as the visual aspects of an interior space.

Under these circumstances this study aims to evaluate and compare the visual outputs of different text-to-image AI tools using standardized prompts in interior architecture. Specifically, the study will

generate living room prompts that encompass all listed visual aspects, including layout organization, architectural features, user profile and needs, style, lighting, furniture, anthropometrical dimensions, color, tone, texture, textiles, and accessories and art.

Çelik (2023) compared Midjourney, Dall-e2, Stable Diffusion, Craiyon, Nightcafe; Betker et al. (2023) compared DALL-E 3, Midjourney 5.2, Stable Diffusion XL, and DALL-E 2. Albaghajati et al. (2023) explains that the most popular text-to-image AI tools are DALL-E, Midjourney, and Stable Diffusion. Mahdavi Goloujeh et al. (2024), and Wasielewski (2023) worked on only Midjourney while Hao et al. (2024), and Dehouche & Dehouche (2023) worked on only Stable Diffusion. Upon reviewing the literature, it has been observed that DALL-E, Midjourney, and Stable Diffusion are commonly preferred for use in academic comparison studies. Therefore, In this study, we provide a focused, multi-criteria comparison of three widely used text-to-image models—DALL-E 3, Midjourney v6, and Stable Diffusion (AUTOMATIC1111 interface)—for scenarios generated from standardized prompts that comprehensively encode interior design aspects. We explicitly define the evaluation criteria, rater profile, and analysis plan to strengthen methodological transparency and reproducibility.

The visual outputs produced by these AI tools will be assessed and compared using a 1-5 rating scale by 15 professionals and academics with at least 10 years of experience in interior design. The primary goal is to identify which text-to-image AI tool performs best overall and to determine which tool excels in specific visual aspects. The central research question addresses the effectiveness and accuracy of various text-to-image AI tools in generating detailed and accurate interior design visuals. This study's goal is to provide insights into the strengths and weaknesses of these tools, guiding designers and researchers in selecting the most suitable AI tools for interior design projects.

Ethical and legal considerations are integral to this work. All image generations were produced solely for academic research and analysis, without commercial use. No personal data were processed, and no identifiable human likenesses were requested or uploaded. Platform terms of use and applicable intellectual-property guidance were followed; given that licensing and ownership conditions may differ across providers (e.g., hosted API service, subscription service, or local model), we report model and access details explicitly and limit reproduced figures to low-resolution, research-context excerpts with source acknowledgement. Institutional ethics approval was obtained prior to data collection, and participants gave informed consent.

METHOD

In this study, we aim to evaluate the effectiveness of various text-to-image AI models in generating interior design visuals based on detailed prompts. The methodology involves a multi-step process (Figure 1) that includes creating prompts, generating visual outputs using different AI models, and evaluating these outputs against specific criteria.

Step 1: Creating Detailed Prompts

To ensure a comprehensive assessment, we begin by developing detailed prompts that describe the interior space. Each prompt includes the following criteria:

- Physical (Architectural) Features: This includes the finishings and dimensions of the space.
- Design Style: The overall aesthetic and theme of the interior design.
- Furniture: Detailed descriptions of the furniture, including material, color, texture, and anthropometric dimensions.
- Lighting Elements: Specifications for the lighting elements, including material and color.
- Textiles: Details about textiles used in the space, excluding furniture and lighting elements.
- Accessories & Art: Descriptions of decorative elements and artworks.
- Layout Organization: How the furniture and elements are arranged within the space.

We decided to write five different prompts for the study. The rationale behind this is to avoid the possibility of a model performing well in a specific category by chance. If an AI model consistently produces good results in a category across five different prompts, it indicates a genuine capability of

that model in aligning with the prompt criteria and generating accurate visual outputs. This approach ensures a more accurate evaluation of each AI model's performance.

Step 2: Generating Visual Outputs

Using the detailed prompts, visual outputs were generated from three different text-to-image AI models within a larger pool of text-to-image AI models which is explained at Limitations section of the study.

- DALL-E 3: The latest version accessed via ChatGPT 4.0. Each prompt is entered in a new conversation to ensure fresh context.
- Midjourney v.6: Accessed through Discord using the *imagine* prompt. Midjourney provides four suggestions for each prompt, and the most suitable one is selected without considering previous versions.
- Stable Diffusion: Utilized via the Automatic 1111 interface, requesting a single visual suggestion per prompt.

All three AI models generate multiple visual outputs from each prompt. To determine the compatibility of these multiple visual outputs with the prompts, a team of five experts with experience in the AI field was assembled. Each expert was presented with the prompts given to the respective AI models and the visual outputs generated by each AI model. The experts were asked to identify which visual output best matched the given prompts, and the final visual outputs were selected based on their evaluations.

Step 3: Data Collection & Evaluation

- Participants: Fifteen interior design professionals/academics (≥10 years experience) were recruited. Inclusion criteria required formal training and active practice or teaching in interior design. Prior to evaluation, participants provided informed consent.
- Procedure and masking: Each participant viewed anonymized images (model names hidden) and rated them per prompt across eight criteria (architectural features, design style, furniture, lighting, textiles, accessories & art, layout organization, function).
- Instrument: A 5-point Likert scale was used with anchors: 1=Very Inadequate, 2=Inadequate, 3=Average, 4=Adequate, 5=Highly Adequate.
- Platform: A structured survey was administered via Google Forms. Order effects were mitigated by randomizing image order within criteria where platform allowed.

The Antalya Bilim University Natural and Applied Sciences Scientific Research and Publication Ethics Committee reviewed the protocol (decision 2024/05) and confirmed that responsibility for methodology and scope aligned with ethical, legal, and copyright considerations. No personal data or identifiable individuals were used, and evaluations concerned synthesized interiors only.

Generated images are stored solely for academic reproducibility and illustrative reporting under research-context fair use. We do not redistribute model outputs as commercial assets. Where platform terms grant usage rights or impose restrictions, we comply accordingly and cite model/provider names in the manuscript to ensure transparency.

Step 4: Analysis

We analyze the evaluation results to determine which AI model performs best overall and which models excel in specific aspects of interior design visualization. This process is repeated five times with different prompts to ensure a robust and comprehensive assessment.

This methodology provides a structured approach to compare and contrast the capabilities of various text-to-image AI models in generating detailed and accurate interior design visuals. Through this study, we aim to identify the strengths and weaknesses of each model, contributing valuable insights to the field of AI-assisted interior design.

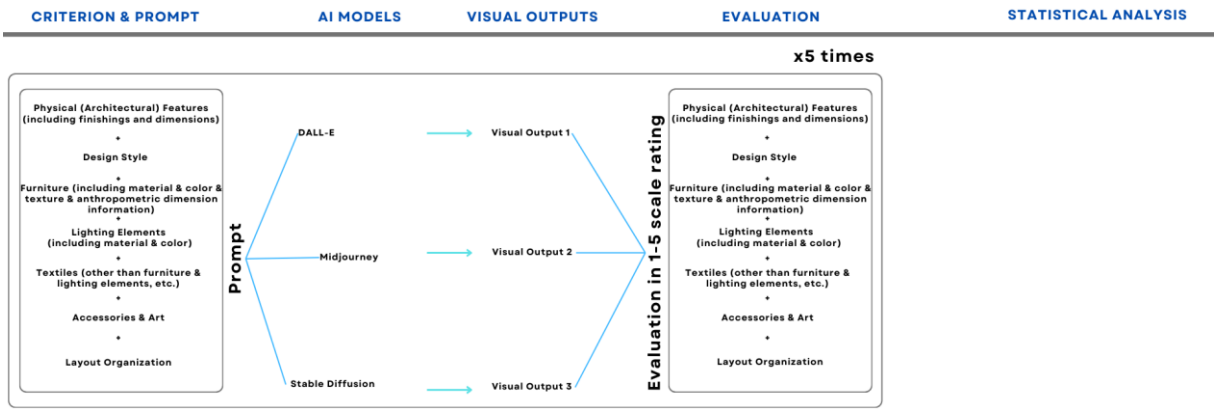


Figure 1. Methodology Flowchart for Evaluating Text-to-Image AI Models in Interior Design Visualization

Created Prompts

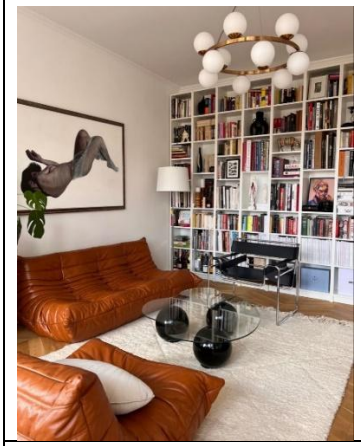
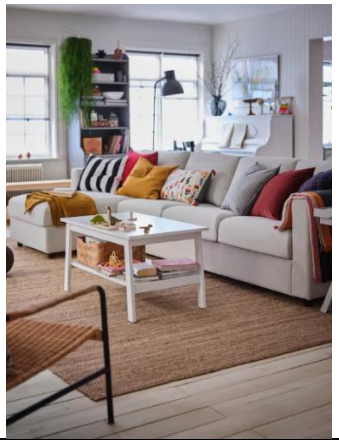
In this study, we restricted the scope to living room spaces to maintain consistency in function. Different AI models may have varying amounts of data for different types of spaces, which could affect the fairness and reliability of the comparisons. By focusing on a single room type, we aim to establish a solid baseline for evaluation.

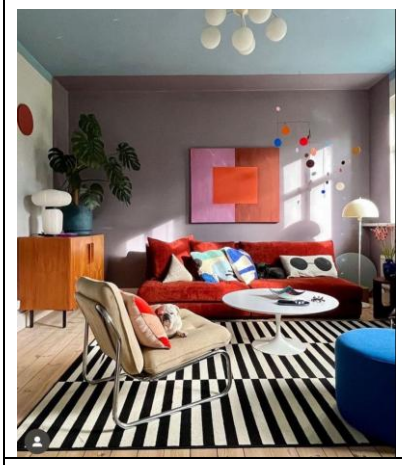
To create the prompts, we sourced existing images of living rooms. Our goal was to describe these spaces as accurately as possible, ensuring we didn't overlook any elements. This approach allowed us to develop comprehensive prompts that included all relevant details.

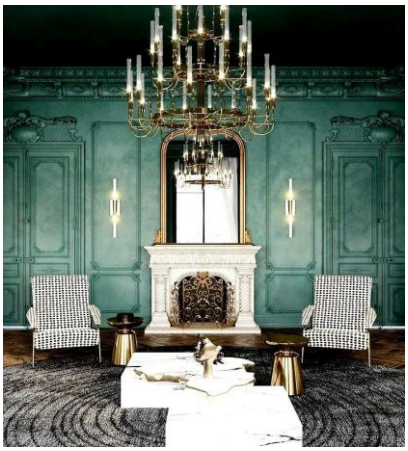
The selected living room images featured notable furniture pieces recognized in the literature, specific design styles, or well-known contemporary furniture from current brands. We chose five images with these criteria in mind.

This method ensured that the prompts were detailed and specific, allowing us to assess the AI models' ability to generate accurate and cohesive interior design visuals based on the given descriptions.

Table 1. Selected living room images for prompt creation

A Pinterest (Decorative Pattern Design) 	B IKEA (Product Image of PH179580) 
C Pinterest (Decorative Floral Pattern)	D Boca do Lobo (Navarra Center Table)





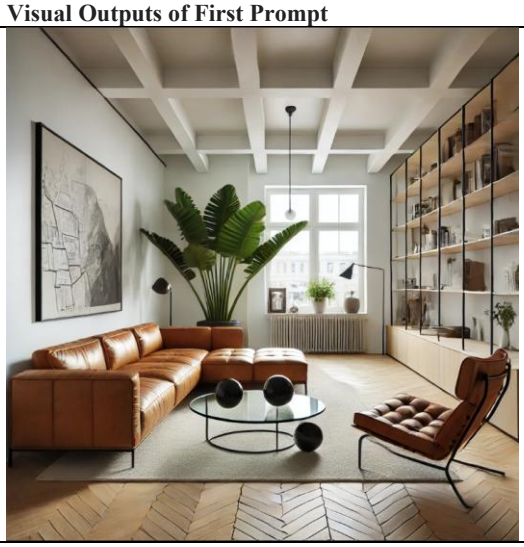
E Architectural Digest (The Story Behind Mies van der Rohe's Iconic Barcelona Chair)

Table 2. 1st Interior design / prompt

Prompt Criteria	Prompt 1
Architectural Features (including finishings and dimensions)	- Rectangular space in an apartment - Standard ceiling height (approx. 2.5 meters) painted white - White painted walls - Herringbone-patterned light wood floor
Style	- Eclectic design with modern and minimalist elements
Furniture (including material & color & texture & anthropometric dimension information)	- Place a tan brown leather three-seater sofa that should have a distinct and recognizable look characterized by its soft, curvy, and inviting design. The upholstery should be made of thick, padded fabric or leather, featuring deep, horizontal pleats and tufting that create a plush, quilted appearance. The sofa should sit directly on the floor without legs, giving it a low-profile and lounge-like aesthetic. The design should emphasize comfort with its ergonomic, slouchy shape, wide seat, and no hard edges. - Tan brown leather armchair without legs (approx. 90 cm wide, 90 cm deep, 85 cm high) - Glass coffee table with three black spherical bases (approx. 100 cm diameter, 45 cm high) - Black Wassily chair with chrome frame (approx. 80 cm wide, 70 cm deep, 80 cm high). Black chair that should have a distinct and recognizable look characterized by its sleek, modern design and use of tubular steel. The frame should be made of polished, chrome-plated steel tubes that form a geometric, angular structure. The seating surfaces, including the backrest, seat, and armrests, should be made of thick, durable leather or canvas straps, tightly stretched across the frame. The leather or canvas should be black. The chair should exude a Bauhaus style with its minimalist and functional design, highlighting the industrial aesthetic. - Wall-mounted white shelving unit (approx. 350 cm wide, 250 cm high)
Lighting Elements (including material & color)	- Circular pendant light with multiple white globes and brass accents - White floor lamp next to the shelving unit
Textiles (other than furniture & lighting	- Off-white shaggy rug underneath the coffee table and seating arrangement - Decorative cushions on the sofa

elements, etc.)	
Accessories and Art	- Large artwork of a woman figure above the three-seater sofa - Various books and decorative objects on the wall-mounted shelving unit - Large green-leaved plant (monster leaf)
Layout Organization	- Tan brown leather three-seater sofa placed against the left wall - Tan brown leather armchair placed at an angle facing the sofa - Glass coffee table placed in the center of the seating arrangement - Black Wassily chair placed against the shelving unit on the right side - Wall-mounted white shelving unit covering the entire right wall - Large green-leaved plant (monster leaf) placed in the left corner - Large artwork of a woman figure placed above the three-seater sofa
Image Dimension	- 1:1
Image Features	- Photorealistic

Create a photorealistic eclectic living room. The room should be a rectangular space in an apartment with a standard ceiling height (approx. 2.5 meters) painted white. The room should feature white painted walls and a herringbone-patterned light wood floor.
Place a tan brown leather three-seater sofa that should have a distinct and recognizable look characterized by its soft, curvy, and inviting design. The upholstery should be made of thick, padded fabric or leather, featuring deep, horizontal pleats and tufting that create a plush, quilted appearance. The sofa should sit directly on the floor without legs, giving it a low-profile and lounge-like aesthetic. The design should emphasize comfort with its ergonomic, slouchy shape, wide seat, and no hard edges. At an angle facing the sofa, place a tan brown leather armchair without legs (approx. 90 cm wide, 90 cm deep, 85 cm high). In the center of the seating arrangement, place a glass coffee table with three black spherical bases (approx. 100 cm diameter, 45 cm high). Against the shelving unit on the right side, place a black chair that should have a distinct and recognizable look characterized by its sleek, modern design and use of tubular steel. The frame should be made of polished, chrome-plated steel tubes that form a geometric, angular structure. The seating surfaces, including the backrest, seat, and armrests, should be made of thick, durable leather or canvas straps, tightly stretched across the frame. The leather or canvas should be black. The chair should exude a Bauhaus style with its minimalist and functional design, highlighting the industrial aesthetic. Cover the entire right wall with a wall-mounted white shelving unit (approx. 350 cm wide, 250 cm high).
Place a large green-leaved plant (monster leaf) in the left corner. Hang a large artwork of a woman figure above the three-seater sofa.
Ensure the room features a circular pendant light with multiple white globes and brass accents, a white floor lamp next to the shelving unit, an off-white shaggy rug underneath the coffee table and seating arrangement, and decorative cushions on the sofa. The room should have an eclectic design with modern and minimalist elements, a variety of books and decorative objects on the shelving unit, and a spacious, functional setup.
Image Dimension: 1:1
Image Features: Photorealistic

AI Tools	**Visual Outputs of First Prompt**
DALL-E	

Midjourney	
Stable Diffusion	

Table 3. 2nd interior Design / prompt

Prompt Criteria	Prompt 2
Architectural Features (including finishings and dimensions)	- Rectangular space in a house - Standard ceiling height (approx. 2.5 meters) painted white - Large windows on the left side allowing natural light - White painted walls - Beige hardwood floor
Style	- Modern and cozy design with functional furniture
Furniture (including material & color & texture & anthropometric dimension information)	- IKEA VIMLE style 4-seat sofa with chaise longue in Gunnared beige color with extra decorative colorful pillows (approx. 300 cm wide, 150 cm deep with chaise, 85 cm high) - IKEA LUNNARP style white coffee table (approx. 90 cm long, 55 cm wide, 45 cm high) - IKEA LOHALS style 200 cm x 300 cm flat woven light brown wicker-colored rug - IKEA ULRIKSBERG style armchair with light brown rattan and anthracite frame (approx. 60 cm wide, 70 cm deep, 80 cm high) - IKEA HEKTAR style floor lamp in dark grey color (approx. 150 cm high) - White wall piano (approx. 150 cm wide, 50 cm deep, 110 cm high) – IKEA HAUGA style high cabinet with 2 doors, 70x199 cm in black, filled with accessories
Lighting Elements (including material & color)	- Natural light from large windows on the left side - IKEA HEKTAR style floor lamp in dark grey color
Textiles (other than furniture & lighting elements, etc.)	- Decorative pillows on the sofa - IKEA LOHALS style 200 cm x 300 cm flat woven light brown wicker-colored rug
Accessories and Art	- Various books and decorative objects on the IKEA HAUGA style high cabinet - Green-leaved plant hanging from the top of the high cabinet - White wall piano with decor items on

	top
Layout Organization	- IKEA VIMLE style 4-seat sofa with chaise longue placed against the back wall - IKEA LUNNARP style white coffee table placed in front of the sofa - IKEA ULRIKSBERG style armchair placed in the foreground facing the sofa - IKEA LOHALS style 200 cm x 300 cm flat woven light brown wicker-colored rug placed underneath the coffee table and seating area - IKEA HEKTAR style floor lamp placed to the left of the sofa - White wall piano placed behind the sofa against the wall - IKEA HAUGA style high cabinet placed between the two windows on the left side, filled with accessories
Image Dimension	- 1:1
Image Features	- Photorealistic
Create a photorealistic modern and cozy living room. The room should be a rectangular space in a house with standard ceiling height (approx. 2.5 meters) painted white. The room should feature large windows on the left side allowing natural light, white painted walls, and a beige hardwood floor. Place an IKEA VIMLE style 4-seat sofa with chaise longue in Gunnared beige color with extra decorative colorful pillows (approx. 300 cm wide, 150 cm deep with chaise, 85 cm high) against the back wall. In front of the sofa, place an IKEA LUNNARP style white coffee table (approx. 90 cm long, 55 cm wide, 45 cm high). Place an IKEA ULRIKSBERG style armchair with light brown rattan and anthracite frame (approx. 60 cm wide, 70 cm deep, 80 cm high) in the foreground facing the sofa. Underneath the coffee table and seating area, place an IKEA LOHALS style 200 cm x 300 cm flat woven light brown wicker-colored rug. To the left of the sofa, place an IKEA HEKTAR style floor lamp in dark grey color (approx. 150 cm high). Behind the sofa against the wall, place a white wall piano (approx. 150 cm wide, 50 cm deep, 110 cm high). Between the two windows on the left side, place an IKEA HAUGA style high cabinet with 2 doors, 70x199 cm in black, filled with accessories. Ensure the room features natural light from the large windows on the left side, a modern and cozy design with functional furniture, warm and earthy tones, smooth textures, cozy textiles with soft and plush materials, and a spacious, functional setup.	

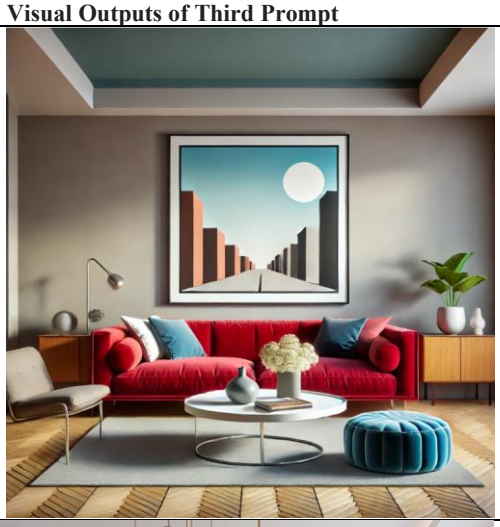
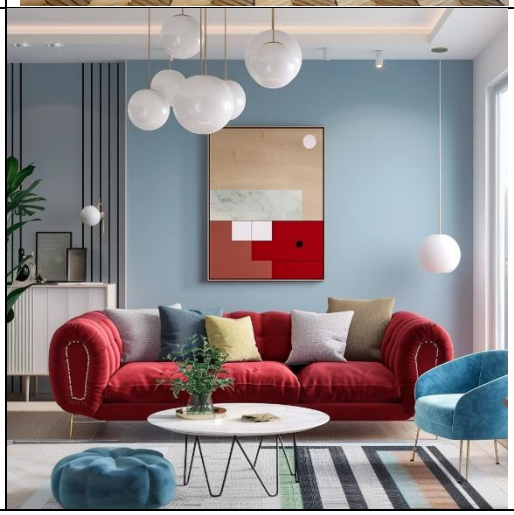
AI Tools	**Visual Outputs of Second Prompt**
DALL-E	
Midjourney	

Stable Diffusion	

Table 4. 3rd interior design / prompt

Prompt Criteria	**Prompt 3**
Architectural Features (including finishings and dimensions)	- Rectangular space in an apartment - High ceiling (3 meters) painted light blue - Warm gray background wall with a one-meter warm gray zone on the ceiling, right and left walls - Pickled oak hardwood floor
Style	- Pop art style with vibrant colors and modern decor
Furniture (including material & color & texture & anthropometric dimension information)	- Red velvet sofa with white, blue, and black colored decorative cushions (approx. 200 cm wide, 90 cm deep, 85 cm high) - Vintage round white cast aluminum with a rilsan-coated finish coffee table (approx. 90 cm diameter, 45 cm high) - 1975 Scandinavian style chair with single-piece tubular stainless steel bended frame and beige fabric seating (approx. 70 cm wide, 80 cm deep, 80 cm high) - Blue velvet pouf (approx. 60 cm diameter, 45 cm high) - Mid-century 2-door teak veneer Scandinavian sideboard cabinet from the 70s (approx. 90 cm wide, 45 cm deep, 80 cm high) - White floor lamp (approx. 150 cm high) - Green-leaved monstera deliciosa plant (approx. 120 cm high) on a 90 cm high foundation
Lighting Elements (including material & color)	- Natural light from a window (not visible in the image) - White floor lamp - White pendant light made out of multiple white globes
Textiles (other than furniture & lighting elements, etc.)	- Decorative cushions on the sofa - Flatwoven 250x350 cm striped black/off-white rug
Accessories and Art	- 1 meter by 1 meter square painting of color squares (red, pink, and brown) on the background wall - Decorative colorful globes fixed to the ceiling right side of the painting - Green-leaved monstera deliciosa plant
Layout Organization	- Red velvet sofa placed against the warm gray background wall - Vintage round white Tulip coffee table placed in front of the sofa - 1975 Scandinavian style chair placed to the left of the coffee table - Blue velvet pouf placed to the right of the coffee table - Mid-century sideboard cabinet placed to the left of the sofa - White floor lamp placed to the right of the sofa - Green-leaved monstera deliciosa plant placed on a foundation to the left of the sideboard cabinet - Flatwoven 250x350 cm striped black/off-white rug placed underneath the coffee table and seating elements
Image Dimension	- 1:1
Image Features	- Photorealistic
Create a photorealistic pop art style living room. The room should be a rectangular space in an apartment with a high ceiling (3 meters) painted light blue. The background wall should be warm gray with a one-meter warm gray zone on the ceiling, right and left walls. The floor should be pickled oak hardwood. Place a red velvet sofa with white, blue, and black colored decorative cushions (approx. 200 cm wide, 90 cm deep, 85 cm	

high) against the warm gray background wall. In front of the sofa, place a vintage round white Tulip coffee table (approx. 90 cm diameter, 45 cm high). To the left of the coffee table, place a 1975 Scandinavian style chair with single-piece tubular stainless steel bended frame and beige fabric seating (approx. 70 cm wide, 80 cm deep, 80 cm high). To the right of the coffee table, place a blue velvet pouf (approx. 60 cm diameter, 45 cm high). To the left of the sofa, place a mid-century 2-door teak veneer Scandinavian sideboard cabinet from the 70s (approx. 90 cm wide, 45 cm deep, 80 cm high). To the right of the sofa, place a white floor lamp (approx. 150 cm high). On a 90 cm high foundation to the left of the sideboard cabinet, place a green-leaved monstera deliciosa plant (approx. 120 cm high). Place a flatwoven 250x350 cm striped black/off-white rug underneath the coffee table and seating elements.
Hang a 1 meter by 1 meter square painting of color squares (red, pink, and brown) on the background wall. Fix decorative colorful globes to the ceiling right side of the painting. Hang a white pendant light made out of multiple white globes above the coffee table. Ensure the room features vibrant colors and modern decor, natural light from a window (not visible in the image), and a cozy, functional setup.
Image Dimension: 1:1

AI Tools	**Visual Outputs of Third Prompt**
DALL-E	
Midjourney	

Stable Diffusion	

Table 5. 4th interior design / prompt

Prompt Criteria	**Prompt 4**
Architectural Features (including finishings and dimensions)	- Rectangular one-piece space in a luxurious setting (approx. 10 meters long, 6 meters wide) - High ceiling (3.5 meters) painted dark turquoise - Turquoise-colored background wall with baroque frameworks and ornamental baroque plasterboard application where ceiling and wall meet - Brown hardwood floor
Style	- Eclectic and symmetric design with baroque and modern styles
Furniture (including material & color & texture & anthropometric dimension information)	- White marble fireplace (120 cm high) with spinning ornamental elements at the sides of the burn area and a brass ornamental spark protector over the burn area - Gold-leafed arch framed high mirror - Two modern-looking brass linear appliques - Two black and white houndstooth pattern textile-covered modern armchairs with steel footings (approx. 75 cm wide, 75 cm deep, 75 cm high) - Two brass trayed and based conic coffee tables - Two white brown-veined granite square prism low coffee tables (approx. 60 cm long, 60 cm wide, 40 cm high) - Large brass decorative chandelier with candle-like lighting luminaries
Lighting Elements (including material & color)	- Dimmed lighting from brass linear appliques - Large brass decorative chandelier with candle-like lighting luminaries
Textiles (other than furniture & lighting elements, etc.)	- Circular gray woven rug with dark circle motives
Accessories and Art	- Gold-leafed arch framed high mirror - Brass ornamental spark protector - Brass trayed and based conic coffee tables
Layout Organization	- White marble fireplace in the center with a gold-leafed arch framed high mirror on it - Two modern-looking brass linear appliques symmetrically placed on the wall - Two black and white houndstooth pattern textile-covered modern armchairs with steel footings symmetrically placed at the sides - Two brass trayed and based conic coffee tables next to the armchairs - Two white brown-veined granite square prism low coffee tables in front between the armchairs - Circular gray woven rug with dark circle motives underneath the coffee tables - Large brass decorative chandelier with candle-like lighting luminaries over the coffee tables
Image Dimension	1:1
Image Features	Photorealistic
Create a photorealistic eclectic and symmetric living room design blending Baroque and modern styles. The space should be a rectangular area, approximately 10 meters long and 6 meters wide, with a high ceiling (3.5 meters) painted dark turquoise. The background wall should be turquoise with ornamental frameworks and decorative plaster where the ceiling and wall meet. The floor should be brown hardwood. Place a white marble fireplace (120 cm high) with spinning ornamental elements at the sides of the burn area and a brass ornamental spark protector over the burn area in the center. On the fireplace, place a gold-leafed arch framed high mirror. Symmetrically place two modern-looking brass linear appliques on the wall. Position two black and white houndstooth pattern textile-covered modern armchairs with steel footings, each approximately 75 cm wide, 75 cm deep, and 75 cm high, symmetrically at the sides. Next to the armchairs, place two brass trayed and based conic coffee tables. In front	

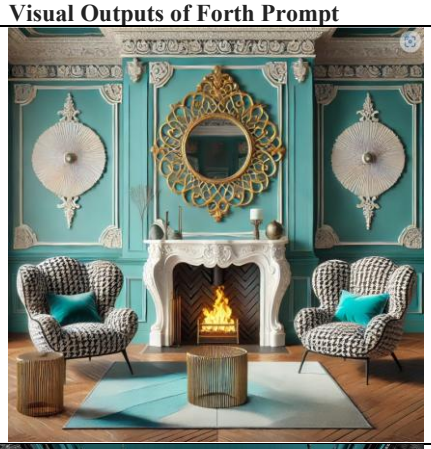
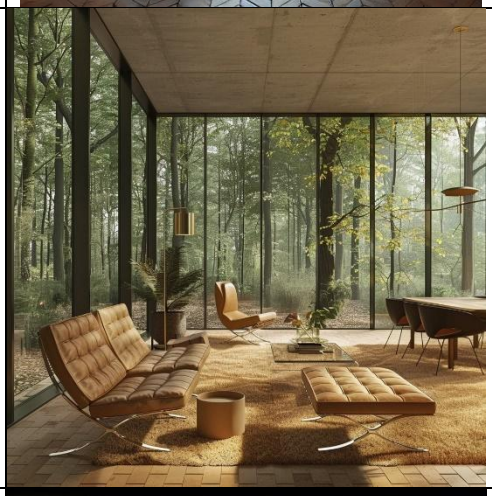
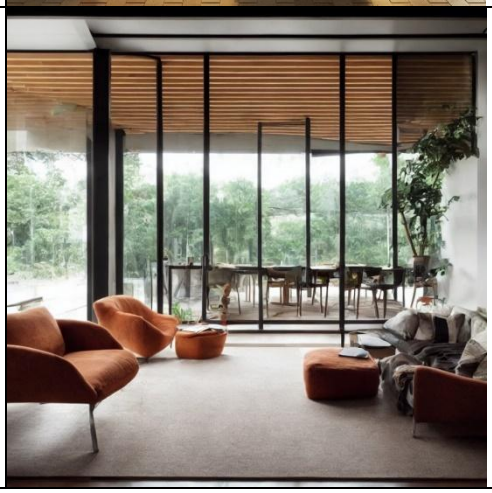
<table>
<tr><td colspan="2">between the armchairs, place two white brown-veined granite square prism low coffee tables, each approximately 60 cm long, 60 cm wide, and 40 cm high. Underneath the coffee tables, place a circular gray woven rug with dark circle motives. Hang a large brass decorative chandelier with candle-like lighting luminaries over the coffee tables.
Ensure the room features dimmed lighting from the brass linear appliques and the large brass decorative chandelier, an eclectic mix of dark and light tones, rich textures, and a cozy, functional setup.</td></tr>
<tr><td>AI Tools</td><td>Visual Outputs of Forth Prompt</td></tr>
<tr><td>DALL-E</td><td>  </td></tr>
<tr><td>Midjourney</td><td>  </td></tr>
<tr><td>Stable Diffusion</td><td>  </td></tr>
</table>

Table 6. 5th interior design / prompt

Prompt Criteria	Prompt 5
Architectural Features (including finishings)	- Rectangular one-piece space in the forest (approx. 10 meters long, 5 meters wide) - Large window openings from floor to ceiling with only window frames, no walls (approx. 3 meters high) - Smooth one-piece gypsum board suspended white ceiling approximately 3 meters high - Herringbone terracotta brickwork floor
Style	Modernist design with a focus on transparency and connection to nature.
Furniture (including material & color & texture & anthropometric dimension information)	- Two tan brown Barcelona chairs (approx. 75 cm wide, 75 cm deep, 75 cm high) - One tan brown Barcelona stool (approx. 60 cm wide, 60 cm deep, 40 cm high) - One tan brown Barcelona day-bed (approx. 198 cm wide, 98 cm deep, 65 cm high) - Rectangular glass Barcelona coffee table with steel legs (approx. 120 cm long, 60 cm wide, 45 cm high) - Linear copper-bodied floor lamp reflecting light to a brass cymbal-like tray (approx. 150 cm high) - Black leather and stainless steel tubular Bauhaus dining chairs (approx. 50 cm wide, 50 cm deep, 80 cm high) - Black dining table (approx. 180 cm long, 90 cm wide, 75 cm high) - Green-leaved eucalyptus plant (approx. 150 cm high)
Lighting Elements (including material & color)	-Natural light from large windows -Linear copper-bodied floor lamp reflecting light to a brass cymbal-like tray
Textiles (other than furniture & lighting elements, etc.)	-Warm yellowish-white thick carpet
Accessories and Art	-Green-leaved eucalyptus plant.
Layout Organization	- Two tan brown Barcelona chairs placed symmetrically in the front. - The Barcelona stool placed next to the chairs. - The Barcelona day-bed placed to the right of the chairs. - The rectangular glass coffee table with steel legs placed in the middle of the seating arrangement. - The thick carpet underneath the coffee table and seating arrangement. - The floor lamp next to the day-bed. - At the back, behind the seating area, there are black leather and stainless steel tubular Bauhaus dining chairs and a dining table. - A green-leaved eucalyptus plant is placed between the seating area and the dining area as a separation.
Image Dimension	1:1
Image Features	Photorealistic
Create a photorealistic modernist living room area situated in a forest. The space is a rectangular one-piece area, approximately 10 meters long and 5 meters wide. It features large window openings from floor to ceiling with only window frames and no walls, approximately 3 meters high. The ceiling is a smooth, one-piece gypsum board suspended in white, also 3 meters high. The floor is covered with herringbone terracotta brickwork. The setting includes modern furniture, natural light, and a view of the surrounding forest through the large windows. Place two tan brown Barcelona chairs, each approximately 75 cm wide, 75 cm deep, and 75 cm high, symmetrically in the front. Next to the chairs, place a tan brown Barcelona stool, approximately 60 cm wide, 60 cm deep, and 40 cm high. To the right of the chairs, place a tan brown Barcelona day-bed, approximately 198 cm wide, 98 cm deep, and 65 cm high. In the middle of the seating arrangement, place a rectangular glass Barcelona coffee table with steel legs, approximately 120 cm long, 60 cm wide, and 45 cm high, on top of a warm yellowish-white thick carpet. Next to the day-bed, place a linear copper-bodied floor lamp reflecting light to a brass cymbal-like tray, approximately 150 cm high. At the back, behind the seating area, place black leather and stainless steel tubular Bauhaus dining chairs, each approximately 50 cm wide, 50 cm deep, and 80 cm high, with a black dining table approximately 180 cm long, 90 cm wide, and 75 cm high. Between the seating area and the dining area, place a green-leaved eucalyptus plant, approximately 150 cm high, as a separation. Ensure the room features natural light from the large windows, a modernist design with a focus on transparency and connection to nature, warm and earthy tones, smooth textures, cozy textiles with soft and plush materials, and a spacious, functional setup.	

AI Tools	Visual Outputs of Fifth Prompt
DALL-E	
Midjourney	
Stable Diffusion	

FINDINGS

The average ratings given by 15 participants for the visual outputs generated by three different AI models—DALL-E, Midjourney, and Stable Diffusion—based on five prompts, are presented in Figure 2, categorized by specific criteria. Accordingly, each criterion will be individually evaluated. On the other hand, the observations made through the process of this study while generating the 5 outcomes based on the drafted prompts are also revealed.

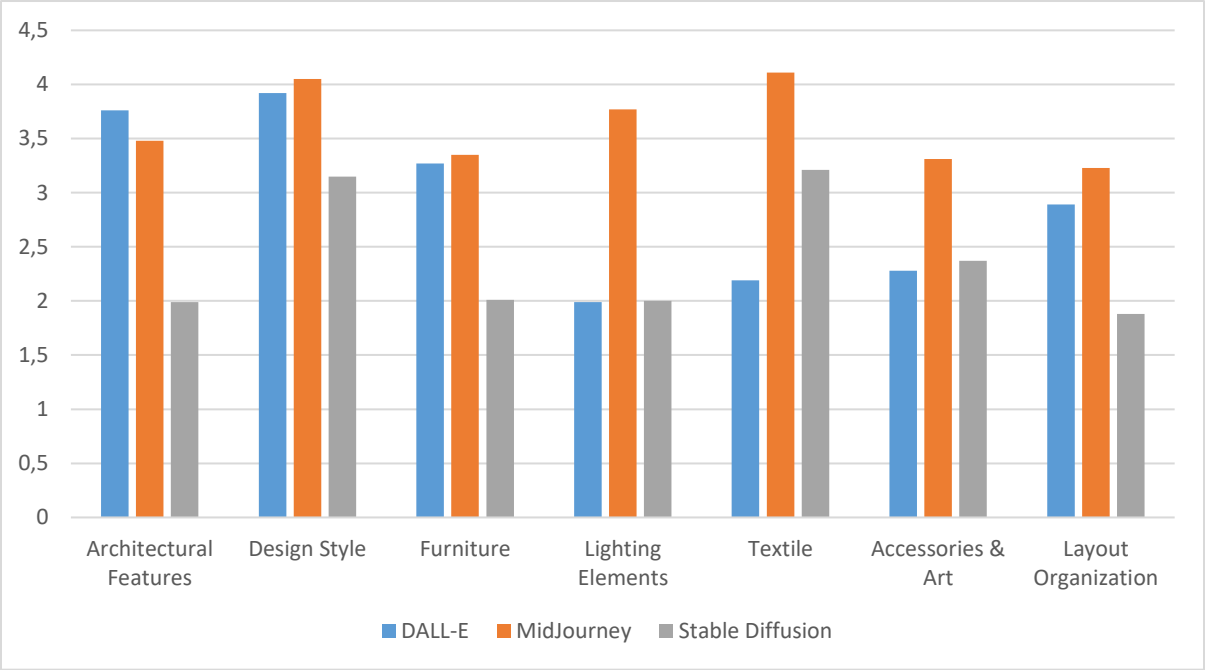


Figure 2. Average Participant Ratings for Visual Outputs from DALL-E, Midjourney, and Stable Diffusion Based on Five Prompts and Specific Criteria

Architectural Features

For the *Architectural Features* criterion, the participants provided the following average ratings for the visual outputs based on the five prompts:

- DALL-E: 3.76
- MidJourney: 3.48
- Stable Diffusion: 1.99

DALL-E scored the highest with an average of 3.76, indicating that it was more proficient in generating recognizable and cohesive architectural elements compared to the other models. This suggests that DALL-E has a relatively better understanding of architectural prompts and can reproduce complex architectural structures more accurately.

MidJourney, with an average of 3.48, also performed well, but slightly lower than DALL-E. While MidJourney is known for producing high-quality visual outputs, the slightly lower score could be due to its struggles with detailed architectural accuracy.

Stable Diffusion, with a significantly lower score of 1.99, demonstrated a lack of capability in handling architectural prompts. The model might struggle with understanding the spatial and structural requirements of architectural features.

DALL-E has outperformed the other models in generating coherent architectural elements, due to the existing relevant data sets it reaches. However, other models could also be enhanced in terms of architectural specificity and detail. On the other hand, it has been observed that the overall desired architectural features such as window openings, doors, passages, separators, gateways and walls are yet to be applied with an exact precision due to text-to-image process. Especially the descriptions with exact dimensions are mostly transformed into the images through AI generator manipulations according to their own image generation architecture and data sets. In the study it has also been observed that description of an architectural feature with a prompt drafted with appropriate adjective words such as *High* or *Low* gives closer results compare to numeric prompts containing dimensions like 125 cm or 2.5m.

Design Style

For the *Design Style* criterion, the participants provided the following average ratings for the visual outputs based on the five prompts:

- DALL-E: 3.92
- MidJourney: 4.05
- Stable Diffusion: 3.15

MidJourney took the lead with a score of 4.05, showing that it is highly proficient in adhering to design style prompts. This indicates that MidJourney is more adept at capturing aesthetic coherence and translating it into visual outputs, especially when abstract or stylistic elements are involved.

DALL-E followed closely with a score of 3.92, performing well but not as high as MidJourney. DALL-E's lower score might indicate some limitations in its ability to fully interpret and reproduce design styles with the same flair and consistency.

Stable Diffusion scored 3.15, performing moderately well but still falling behind in accurately reflecting specific design styles.

MidJourney with the data sets it reaches regarding design styles, was the strongest model in generating design styles excelling in understanding the aesthetic components of the prompts, while Stable Diffusion showed room for improvement in this area. In the process of the study, it is observed that the literature of art and design including periods and movements are already being processed in the data sets. Therefore, it is important to address correct labels of the desired style for approximate results.

Furniture

For the *Furniture* criterion, the participants provided the following average ratings for the visual outputs based on the five prompts:

- DALL-E: 3.27
- MidJourney: 3.35
- Stable Diffusion: 2.01

MidJourney slightly outperformed DALL-E with a score of 3.35 compared to DALL-E's 3.27. Both models seem competent at generating furniture, though not without limitations.

Stable Diffusion scored lower with 2.01, indicating that this model struggles with understanding and generating furniture designs effectively.

Despite the fact that MidJourney and DALL-E showed comparable proficiency through their data sets in generating furniture, it has been observed that specific furniture titles such as designer made seating elements listed in the literature or products with copyrights do not appear in the generated images with an original look. Therefore, the desired furniture needs to be specified with its' own properties such as materials and design period/ style for approximate results. On the other hand, there is still room for improvement for furniture generation, especially in Stable Diffusion.

Lighting Elements

For the *Lighting Elements* criterion, the participants provided the following average ratings for the visual outputs based on the five prompts:

- DALL-E: 1.99
- MidJourney: 3.77
- Stable Diffusion: 2.00

MidJourney led with 3.77, showing its capability to generate appropriate lighting designs based on the

prompts. This aligns with its strength in visual and stylistic generation.

DALL-E scored the lowest, with 1.99, which indicates significant limitations in how it interprets lighting design prompts. This may be due to its struggles in understanding technical aspects like lighting direction, intensity, or types.

Stable Diffusion scored similarly low at 2.00, also reflecting difficulties in this area.

While MidJourney performed reasonably well in generating lighting elements with the data sets it reaches, both DALL-E and Stable Diffusion need substantial improvements in this regard. Furthermore, it is observed in the study that defining a lighting element product with its' original commercial product description that can be found online gives quite similar results in terms of forms and materials.

Textile

For the *Textile* criterion, the participants provided the following average ratings for the visual outputs based on the five prompts:

- DALL-E: 2.19
- MidJourney: 4.11
- Stable Diffusion: 3.21

MidJourney showed strong proficiency with a score of 4.11, demonstrating that it can accurately generate textiles and understand the materiality aspect of the designs.

Stable Diffusion performed reasonably well with a score of 3.21, but there is still room for improvement.
DALL-E scored lower at 2.19, indicating that it struggles to accurately generate textile designs and interpret material prompts effectively.

MidJourney, thanks to its' relevant data sets, excels in generating textiles and understanding material prompts, while DALL-E shows noticeable limitations. In the study process, it is observed that in order to obtain similar results with the desired textile samples, a detailed prompt needs to be drafted such as the origin of the patterns, colors and materials. Moreover, it is also observed that when the desired textile sample is a commercial product listed on a website, the original product description leads to similar results.

Accessories & Art

For the *Accessories & Art* criterion, the participants provided the following average ratings for the visual outputs based on the five prompts:

- DALL-E: 2.28
- MidJourney: 3.31
- Stable Diffusion: 2.37

MidJourney once again led with a score of 3.31, showing proficiency in generating accessories and artistic elements that align with the prompts.

DALL-E followed with 2.28, suggesting moderate capability in interpreting accessory and art prompts but with noticeable room for improvement.

Stable Diffusion performed similarly to DALL-E with 2.37.

MidJourney continues to demonstrate strength in data supported text-to-image interpreted design

elements, whereas DALL-E and Stable Diffusion need further refinement. In the process it is observed that plants used for decoration with correct titles are generated similarly according to the descriptions. Likewise, art pieces also need to be defined in detail such as artistic movement, summary of the composition or colors and drawing techniques.

Layout Organization / Room Plan

For the *Layout Organization / Room Plan* criterion, the participants provided the following average ratings for the visual outputs based on the five prompts:

- DALL-E: 2.89
- MidJourney: 3.23
- Stable Diffusion: 1.88

MidJourney achieved a score of 3.23, indicating that it has a relatively strong understanding of spatial layout and organization.

DALL-E followed closely with 2.89, showing decent performance but still trailing behind MidJourney in terms of spatial comprehension.

Stable Diffusion scored the lowest at 1.88, indicating difficulties in understanding and generating spatial layouts that make sense in a design context.

MidJourney was the best model in understanding layout organization over directions, architectural terms and elements while Stable Diffusion struggled the most in this category. For the layouts, it is observed that the usage of cardinal directions of a compass creates confusion for the generators. Instead, using adverbs of place with a reference object gives better results.

The Overall Evaluation for 3 AI Image Generators

Results of the overall evaluation that is made by 15 participants for the visual outputs generated by three different AI models—DALL-E, Midjourney, and Stable Diffusion—based on five prompts, are presented in Figure 2.

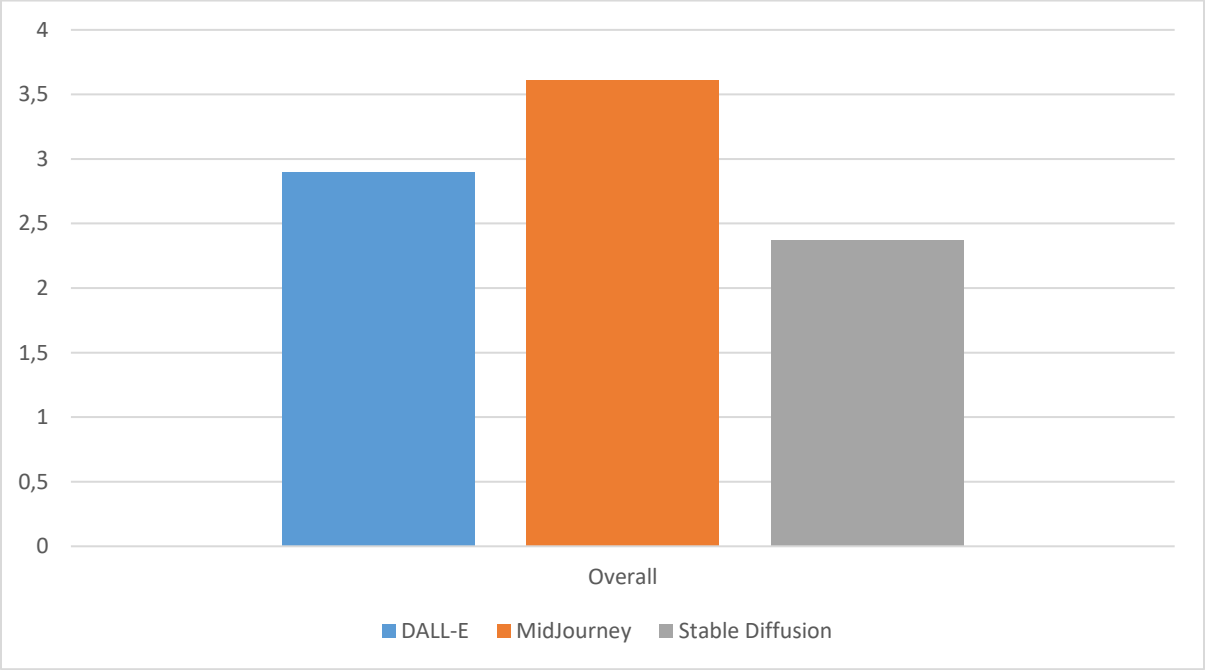


Figure 3. The overall evaluation for 3 AI image generators made by 15 participants over the 5

outcomes

- DALL-E: 2.90
- MidJourney:3.61
- Stable Diffusion: 2.37

DALL-E: With an overall average of 2.90, DALL-E performs moderately well across different design criteria. It excels in architectural features but struggles significantly with lighting and textiles.

MidJourney: Scoring the highest overall at 3.61, MidJourney is the most consistent performer across various design criteria, showing particular strength in design style, textiles, and lighting.

Stable Diffusion: With an overall score of 2.37, Stable Diffusion lags behind, particularly in architectural features, furniture, and layout organization. It performed relatively better in textiles but still shows room for improvement.

To conclude, MidJourney demonstrates the most consistent and high-quality performance across a range of interior design criteria, making it the best tool for visualizing interior concepts with its' design relevant data sets. DALL-E, while proficient in some areas such as architectural features, struggles with key aspects like lighting and textiles. Stable Diffusion, while showing some potential in certain areas, generally lags behind the other models, particularly in generating complex or nuanced design elements. On the other hand, the importance of the well-documented prompts has been demonstrated in this study. In the process, it is observed that without a detailed prompt, AI image generators are not functioning effectively. Therefore, it can be claimed that a preliminary study is needed to obtain descriptive prompts for optimal results.

CONCLUSION

This study emphasizes the differing performance of three well-known text-to-image AI models, namely DALL-E, MidJourney, and Stable Diffusion, across essential interior design criteria. The results demonstrate that MidJourney consistently outperforms the other AI models, particularly in categories like design style, textiles, and lighting, indicating its strength in understanding aesthetic and visual details. DALL-E shows competence in generating architectural features but struggles in categories such as lighting and textiles. Stable Diffusion, while having potential, underperforms in several critical areas, such as furniture and layout organization.

One significant finding from this research is the importance of crafting highly detailed prompts. Across all models, the precision of the visual outputs correlates strongly with the clarity and specificity of the input prompts. As observed, models struggle particularly with numerical details and exact measurements, suggesting that AI-generated images are influenced by the underlying architecture of the models and their training data.

Furthermore, the study emphasizes the necessity of ongoing improvement in the data sets and algorithms of these AI models, especially in generating more complex or specialized elements such as architectural features and lighting. Future studies could benefit from exploring additional AI models, a broader range of interior design categories, and larger sample sizes to further validate these findings.

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