

Surrealist Dreams of Artificial Intelligence: Revisiting Frederick Kiesler's "Endless House"

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Abstract. The dream world of Surrealism bases itself on critical ways of thinking contrary to the status quo that envision new ways of life. Today, these imaginations are reflected in speculative fiction produced with artificial intelligence (AI) software. Generative AI creates visuals from text using existing digital datasets. AI-generated speculative fiction fosters critical thinking by expanding intellectual boundaries and is a remarkable innovation in human and robot collaboration. The aim in this paper is to examine AI's speculative creation processes and limits of imagination and conduct a comparative analysis through AI reproductions of surrealist spaces. This analysis involves surrealist architect Frederick Kiesler's "Endless House". This two-stage study was conducted with an exploratory case study model using generative AI applications and visual data analysis. The analysis compared the outputs of the Midjourney AI, OpenAI, Leonardo AI, and DALL-E 3 applications, and discussed the exploration process of Midjourney in detail. The findings show that AI's exploration process and limitations depend on how defined the subject is in the prompt text and the meanings and the weight in the databases of the keywords used.

Keywords: Artificial intelligence, Midjourney, Surrealism, Speculative fiction, Frederick Kiesler

1 Introduction

In the 20th century, the avant-garde movement led to experimentation in cinema, literature, architecture, and art that inspired new visions of life. The creation practices in plastic arts in particular have significantly influenced these imaginary works [1]. Imaginary places, floating between an alternate reality and the impossible, are a fundamental part of surrealist thought that feeds off the unconscious. In his "First Declaration of Surrealism", published in 1924, Andre

Breton (1896-1966), the main theoretician of Surrealism, defines Surrealism, the seeds of which were sown long before in many areas such as the hermetic Renaissance and mythic romanticism, as "*psychic automatism*" by which one tries to express oneself in written, spoken, or other ways, free from any control from reason [2]. Surrealism's relationship with reality has been marred by the similarities between Surrealism and the established avant-garde movements of Cubism, Futurism, and Dadaism [3]. Unlike the proponents of other movements, the Surrealists, while creating their artistic work in the face of reality, meandered around the borders of imaginary world achieved through the unconscious.

The notion that Surrealism is considered an artistic movement due to its dream world and yet lacks an architectural counterpart is quite prevalent. Buildings designed based on surrealist thought are almost non-existent in architecture. However, as the architectural historian Anthony Vidler emphasizes, architecture is one of the most fruitful areas for surrealist practice, and provides a great medium for creating the physical and psychic structures of spatial concepts in surrealist thought [4]. Surrealist architecture offers alternative spaces where the senses are not suppressed, and dreams can be experienced. The spatial works of Frederick Kiesler (1896-1965), the only surrealist architect of the period, are an important reference point for architecture that attaches more importance to the human soul and body [5]. In his surreal creations, Kiesler criticized the 20th century's understanding of modern architecture based on rationalization, mechanization, and mass production.

Today, imaginary architectural projects that redefine our relationship with reality persist through speculative fiction. Creations realized through speculative fiction offer a new ground for discussion on imaginations of alternative life [6] and pave the way for critical creations through provocative narratives of 'design fiction' practices [7]. Speculative creations offer an experimental space for architecture with the innovations brought by information systems. The non-human, including machines, and the human are transformed through mutual interaction [8]. Generative AI technology is a remarkable innovation in human and robot collaboration. Given today's advances in artificial intelligence (AI), trying to understand how AI learns is one step to expedite this interaction and collaboration. Design theorist and academic Betti Marenko emphasizes that machine learning's way of working "*is highly inductive, unlike traditional deductive AI approaches*" [9]. Midjourney and similar stable diffusion-based AI software process data with "text-to-image" bot technology and start their search with an imaginary journey, similar to surrealist practice [10]. AI software that engages in visual creation, which is becoming widespread in architecture, offers speculative creations reminiscent of surrealist spaces and provides various insights into exploring new spatial possibilities. Imagination, discovery and uncertainty exist in every new spatial creation of speculative fiction based on inductive work.

In the present study, the possibilities offered by speculative thinking were addressed through the creations of AI technology, a new thinking tool and non-human intelligence. The aim in this paper is to examine AI's speculative creation and exploration processes, the limits of imagination in machine learning, and to conduct an analysis of surreal spaces reproduced through AI. Frederick Kiesler's "Endless House" project was examined in this comparative analysis. Thus, the AI's ability to imagine given narratives while generating images and the results were examined.

The analysis was based on two methods. In the first stage, exploratory case study research was used. In the second stage, visual data analysis was used. This article first presents the related historical background, theoretical framework, and methodology to discuss AI creations. Then, the "Endless House" project is reproduced through generative AI applications for visual data analysis and the results are evaluated. The results were obtained by repeating a prompt composed of adjoint keywords in five stages. The keywords written in the prompt were selected to understand AI's creation process and behaviors based on the content of the word added to the text and the presentation of the subject in a more defined way in the text. The prompt text became more defined and descriptive in each successive stage. To this end, the keywords used in the creation process were "Kiesler", "Frederick Kiesler", "Endless House", "Frederick Kiesler's 'Endless House'", and "Surrealist Architect Frederick Kiesler's 'Endless House'". No interventions regarding material, light, color, point of view, etc. were performed in the stage setting to witness AI's own creation style. In the present study, AI's creation process, its interpretation of prompt texts, and its ways of expression were investigated, and the possibilities, potentials, and limits of the software were evaluated. This evaluation first compared the outputs of Midjourney AI, OpenAI, Leonardo AI, and DALL-E 3, different generative AI applications used in architectural design. This comparison examined through visual data whether the applications followed similar paths in their creation processes. In all five stages of the analysis, Midjourney AI differed from the other AI software, displaying its ability to generate architectural space with no figurative visuals. Repetitive plural outputs were obtained through the Midjourney bot using the same keywords to understand the exploration process of AI software during the image generation process and the stages were examined in detail to discuss its behaviors and find a productive way of applying it.

The findings show that AI's speculative creation capacity and its surrealist creation potentials and limitations are based on the content of the words used and their weight and meaning in the database. Comprehension of the exploration process of AI while creating visuals is regarded as one of the first steps in obtaining outputs that will enable open-ended readings. AI applications emerge as favorable and explorative platforms to examine spatial possibilities and enhance imagination

in architectural design and studies. Narrating a journey from Surrealism to speculative fiction and providing a spatial analysis of generative AI outputs, this article contributes to the extensive literature of architectural design and provides an up-to-date review of findings and research on AI and machine learning.

2 Theoretical Framework

In his book "What Algorithms Want: Imagination in the Age of Computing" (2017), author and academic Ed Finn states that algorithms create new pathways that establish mystical connections between mathematics and universal reality and that these pathways strengthen metaphysical thinking [11]. Today, rationalization in computing has taken on a mythic quality that extends back to past beliefs. Questioning the trust in rational operations and numerical data, Betti Marenko thinks that algorithms are procedures not as transparent, logical, and clean as one might think [9]. Similarly, Finn underlines computational imagination: *"We see computational imagination [...], from the 'ghost in the machine' that a Netflix VP described in his own system's results to the kinds of strange serendipity and beautiful glitches we have all glimpsed at the edges of computation's facade of perfect functionality and predictability."* [11] Rather than trying to eliminate the uncertainties in these systems, whose way of operating we do not understand exactly, seeing these uncertainties as an opportunity offered by AI algorithms for new ways of thinking can create important potentials for critical thinking [12]. Examining ways of producing speculative fiction through AI, this article reaches into the "uncertain and uncanny" topographies of speculation in the 20th century and explores these potentials and revisits surreal spaces.

2.1 The Imaginary Universe of the Surrealists

Emerging at the turn of the 20th century as an influential artistic movement in Paris, Surrealism was a search for a way out from the tragedy and depression caused by the First World War [13]. Tracing its foundations to the Dadaism movement, Surrealism became a movement after the manifestos written by Andre Breton. While Dadaism is a more individual movement, Surrealism has a collective structure [14]. Surrealists express their desire as a liberated perception of reality [15]. Focused on disrupting the rational way of thinking, Surrealism unleashes the unconscious and feeds off irrationality, mystery, phantasy and imagination.

Andre Breton criticizes the prevailing rationalist worldview and links Surrealism with Freudian psychoanalysis in his 1924 *"First Declaration of*

Surrealism", aiming to rediscover imagination that had remained overlooked [2]. In his 1919 article "*Das Unheimlich (The Uncanny)*", Austrian neurologist Sigmund Freud (1856-1939) explains that psychic processes stemmed from the unconscious, that is, the repressed, with the concept of "uncanny" [16]. The uncanny is the return of familiar things that have become alien because they have been repressed in the unconscious. One of the effects of the return of the ominous repressed is the ambiguity between the real and the imagined. However, Freud sees the uncanny not as frightening but as an inner experience. Discussing Freud's debates, art critic and historian Hal Foster explains the fundamental image of the surrealist repertoire through the concept of the uncanny as "*a usurpation of [...] physical reality by psychic reality*" [17].

Breaking the link between reality and image, the Surrealists portray their inner worlds through visual images. Just like hermeticism, witchcraft, piracy, and utopia, Surrealism is based on creative imagination [18]. The realities between dream and imagination appear in the works of Pablo Picasso (1881-1973), in which he succeeded in materializing the fantastic images of the imagination, and in the works of many other artists such as Georges Braque, Giorgio de Chirico, Francis Picabia, Max Ernst, Man Ray, Salvador Dali, and Yves Tanguy. Max Ernst, who was influenced by Dadaism; Giorgio de Chirico and Salvador Dali, who worked mainly on creating surrealist objects; and the painter René Magritte, who is seen as the philosopher of the Surrealists and who dealt with the relationship between the object and the image through the phenomenon of representation, produced their own original works under the umbrella of Surrealism [19]. These works are encounters with imaginations hidden in the depths of the unconscious. For example, Giorgio De Chirico thought that one could be close to imaginations and the childish mind by staying away from common sense and logic, while René Magritte said that his paintings were visual images that concealed nothing and brought mystery to the mind [14].

Although architectural spaces with their physical and psychic aspects provide an important imaginary space for Surrealism [4], surrealist architecture has not become as well-known as surrealist paintings or literature [3]. Architect and writer Bernard Tschumi attributes this lack of interest in surrealist architecture to the fact that architects' interests were limited to formal and technological innovations in the first half of the 20th century, and that architects were not ready at the time to navigate the spaces of the unconscious, which deeply questioned the nature of spatial experience [20].

Following its impressive emergence, Surrealism evolved into a more defined approach. Surrealists later sought to find an absolute ground of agreement between dream and reality and had to construct a doctrine from the principles they advanced in the face of criticism [3]. The architect Frederick Kiesler, on the other hand, created his own striking spaces in Vienna and Berlin during this

period, establishing his legacy as the one man who practiced surrealist architecture [21].

2.2 Frederick Kiesler

Born in 1890 in Vienna, Frederick Kiesler was a surrealist theorist, architect, and stage designer with an architectural approach that rejected formal and functional boundaries [20]. Although his nominal field was architecture, Kiesler produced interdisciplinary works by designing galleries and exhibitions, shop windows and furniture, drawing, and writing [22]. Moving to New York in 1926, Kiesler was influential in shaping modernism and produced sculptures that inspired postmodernism [23]. In his works, Kiesler focuses on the interactions between the natural and technological frames that surround humans. These interactions are demonstrated in spiral forms, which were seen as the hallmark of the era. These spiral forms, which do not adopt radical or organic approaches, consist of concentric circles around a center point [24]. In his 1930 book *"Contemporary Art Applied to the Store and its Display"* (1930), Frederick Kiesler interprets functionality in relation to the psychological as follows:

"The 'psycho-functional' influence is exhibited not only in lines, planes and form, but also in materials and colors. Glass has a different psychological effect from leather, wood from metal. The same applies, of course, to color schemes. Function and efficiency alone cannot create art works. 'Psychofunction' is that 'surplus' above efficiency which may turn a functional solution into art." [25]

Kiesler criticizes modern architecture's understanding of space that disregards human senses [26]. In his article *"Pseudo-Functionalism in Architecture"* (1949), written after the aforementioned book, he states that the purpose of the design of a house should be to satisfy the soul of the person who will live in it and emphasizes the importance of the senses in architectural design, stating: *"Form does not follow function. Function follows vision. Vision follows reality."* [27]. Kiesler is one of the most important architects still referenced in architectural debates today with his exhibition spaces and his "Endless House" project, an unbuilt cocoon-like paradigmatic structure.

2.3 Speculative Fiction

Andre Breton argues that the most important thing about images is not language; what is decisive is the reality that the images represent and this reality is modeled

on the reality of the outside world [28]. The creative world of representation of Surrealism coincides with the imaginary space of speculative fiction created today. The concept of speculative fiction was first used in the mid-1990s by designer and educator Anthony Dunne and artist and academic Fiona Raby to create a provocative space for debate, the starting point of which was "what if" [6]. Dunne and Raby discuss imaginations of possible futures in relation to various public debates. As Dunne and Raby point out, imaginative design speculation can open up new perspectives and serve as a catalyst for redefining relationships with reality [6]. When considered from this perspective, speculative thought exhibits various parallels with surrealist approaches. Surrealism, which liberates itself from ordinary realities by basing its narratives on imaginary and decontextualized ways of thinking, pushes and expands the rational boundaries of architecture [21]. These windows opened by the Surrealists in the 20th century shed light on today's speculative fiction.

The techno-cultural formation we experience today significantly affects creative practices in art and architecture. From paper architecture to visionary designs, from collage history to diagrams, the speculations that have emerged in different fields of creation in the history of architecture and design involve spatial productions that question the existing reality. Media such as architectural competitions and biennials provide a free platform for the presentation of speculative fiction. Speculative fiction, often forgotten due to the current deluge of design, enables alternative ideas to be disseminated to a wider audience [29]. Offering new social landscapes, speculative fiction encourages reflection on the future through the possibilities it presents, rather than a single outcome [30].

2.4 AI Technology in Speculative Creation

The development of new technologies is rapidly changing the ways in which computers are used today in creative processes in architecture. AI models, whose technological development dates back to the 1950s, describes computer systems developed to perform various services such as object and voice recognition, decision-making, and translation between languages. AI is defined as *"a system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation"* [31]. AI is capable of autonomous problem solving and performs complex tasks. The autonomy of AI leads to new experiences and relationships between human and machine. Marenko emphasizes the necessity to invent new ways of human-machine interaction, and underlines the epistemological shift in interactions with AI: *"The boundary between [...] the human and the non-human becomes blurred."* [9].

It is often debated whether the AI or the designer realizes and directs design processes conducted through AI. Theoretical work on this issue traces back to how human and non-human actors are socially defined. Three theoretical arguments on technology and human agency that critique the anthropocentric view stand out. Scholar, sociologist, and anthropologist Bruno Latour's actor–network theory (ANT) (2005) [8], Kaptelinin and Nardi's (2006) activity theory [32], and scholars Rose and Jones' (2005) model of agency [33] address the relationship between humans and technology. While ANT argues that there is a symmetrical relationship between humans and technology and considers technological tools as agents, Kaptelinin and Nardi's activity theory considers agency as an exclusively human property, and according to this theory machine agency is shaped by humans [8][32]. Similarly, in their theory of agency, Rose and Jones emphasize the different characteristics of both human and machine agency and their interplay, while underlining that machine agency is human driven [33]. All three of these theories emphasize the important role of the machine in the relationship between human and machine. Latour's ANT theory differs from the other two in that it assumes a symmetrical relationship between subject and object.

Latour argues that the relationality between human and non-human is lost in the asymmetrical relationship between subject and object apparent in modernity, which separates nature and society [34]. In his critique of modernity, Latour emphasizes that no actor and no agent can be reduced to another [35]. He states that non-humans have the power to regulate the actions of humans, even though non-humans are produced for specific actions and methods, and their ability to act is dependent on human intervention [36]. In other words, they can manipulate the user's perception and thus have the power to change reality.

Latour divides the technologies he names actants into two: the first kind, intermediary actants, only transmit meaning and force, they cannot transform them and give predictable outputs; the second kind, mediatory actants, can transform and reproduce the components and meaning they transmit [8]. The outputs of the AI applications used in visualizing narratives are generated through certain pre-defined databases and algorithms and, in this sense, they are predictable. However, since these outputs are created inductively, these visuals are difficult to predict as they contain so many possibilities. In other words, because the AI application creates data using certain databases, it has various limitations and cannot escape these defined areas; however, the machine-learning-based creation process during human–AI interactions is an exploration process. AI software creates outputs by combining and associating the words entered in the prompt. During this process, it uses the current digital dataset and creates visuals via text-to-image generation. This algorithm's outputs are the outputs of an exploration rather than a visual creation that offers a new style or language. The crucial point of this exploration is the reconstruction process in the machine's

memory and its speculation skills and potential during this process. The agent initiating this process and directing the text-to-image generation is the prompt's writer. In a visual creation through AI, a change in the prompt text transforms the output and, for example, a spatial creation can take different forms depending on the data accessed from the database. Differing AI software and text input, i.e., the transformation of actors and agents, leads to a transformation of the outputs. In this relationality in the processes of creation, which Latour calls the symmetrical ontology of science [8], the knowledge of both human and non-human is transformed into an output through the interpretation of agents. Academics Aanestad and Hanseth, on the other hand, argue that focus should be on the concept of "hybrid collective" rather than the symmetry when discussing ANT, emphasizing that humans and technology are parts of a hybrid collective, but they are not equal and symmetrical [37].

The present article treats the joint output of designer and AI software as a "hybrid collective" creation. It evaluates the outputs of AI software more like the results of an exploration rather than like a creation. In this context, while examining the interpretation capacity of AI using the images produced with AI software, it aims to discuss the results that may emerge in the most ambiguous field of design by driving this creation into speculation. Therefore, this article focuses on the ambiguity offered by what Latour characterizes as unpredictable outputs and discusses the reinterpretation of surrealist architecture as an open-ended imaginary area with AI software.

Speculative design through AI is one approach to critical thinking and designing, and "constructing narratives of alternative futures" [38][39]. Dunne and Raby define critical design as "a kind of social research" rather than a design product, as critical design offers audiences new ideas [6]. AI-generated visuals trigger new thoughts and create remarkable environments for critical design. These images are algorithmically generated synthetic images. The concept of synthetic images, introduced by theorist Vilém Flusser, is defined as "projections" that emphasize the ability to create a (new) world [40]. Synthetic images, unlike traditional images, are indirect products of texts. Academics Poltronieri and Heilmair describe these images as follows: *"Sometimes these images are indistinguishable from a real image, and some others are ghostlike, distortions, a creative abstraction from real objects in the world – the 'imaginings' of the algorithm."* [41] As these algorithmic imaginings are generated based on narratives and existing visual data, they are an indicator of AI's capacity to learn. Considering that these are collective creations, there are also various debates about AI's use of existing written and visual data. Fiction through prompt text using billions of images available on the Internet and the copyrights of the data obtained as a result of this process raises ethical debates about who is effecting the creation. This is

another controversial aspect of the interactive design process that reveals the decisive role of AI as an agent in the creation process.

3 Methodology

In the present study, Frederick Kiesler's "Endless House" project was reproduced through AI image generator and the visual data obtained were analyzed comparatively. The research was based on a two-stage methodology. In the first stage, the exploratory case study research method was used to examine a specific social phenomenon in depth with a holistic approach. Answers to the questions "What?" and "How?" were sought to explore the topic and a general framework for the second stage of the study was established through purposeful investigation [42][43][44][45].

In the second stage of the study, visual datasets were created through AI to reproduce the "Endless House" project and visual data analysis was used to discuss and interpret the reproduced visuals [46]. The results were obtained by repeating a prompt composed of adjoint keywords in five stages. The keywords used in the study were as follows: [/image Prompt:] "Kiesler", "Frederick Kiesler", "Endless House", "Frederick Kiesler's 'Endless House'", and "Surrealist architect Frederick Kiesler's 'Endless House'". Complementary scene elements such as cinematographic view/lighting, hyper-detailed, ultra-detailed, realistic, 16K, etc. were not included in the gradually created scene details in order not to interfere with the creation process. The produced visuals were reproduced when necessary. These reproductions are included in the text to discuss the exploration process of the AI bot.

3.1 Generative AI as an Explorer Agent

In the analysis conducted for the present paper, first, four generative AI applications used in architectural design for visual creation were selected and their outputs were comparatively tested. This comparison involves visual data analysis conducted to explore the effect of databases and prompts on the outputs and to determine the differences and similarities between the creations of various applications. The platforms selected for this analysis are Midjourney, OpenAI, Leonardo AI, and DALL-E 3. The Midjourney bot differs from the other AI software in its ability to directly create architectural spaces by going beyond the figurative visual creation in all test stages selected for this paper. Therefore, the Midjourney application was selected and its outputs were discussed in detail in the

paper to understand its exploration process in AI creation and to evaluate the relationship between the prompt text and the visuals created.

When examining how generative AI applications generally create images from prompt text, it is seen that all applications use “algorithms,” which are various instruction clusters, and in this way they can create new artifacts. In other words, these algorithms serve to create visuals based on textual instructions. Generative AI destroys the visual and reconstructs it again step by step. It utilizes unpredictable fluctuations that disrupt the correlations and patterns in data to achieve these steps. Random fluctuations create unpredictable outputs. This system, defined as machine learning, becomes more efficient as it is exposed to more data and enhances its ability to make correct predictions and decisions. More advanced machine learning is known as “deep learning” and uses structures known as neural networks [47]. These networks are inspired by the human brain and are trained to process and predict large amounts of complex data. During this process, a combination of millions of visuals collected from the Internet, social media, stock-image libraries, etc. creates a dataset [48] [49]. AI learns to match prompt text with a visual and reaches the level to generate visuals after being trained with a number of visuals that are associated with text. When the keywords are typed into the prompt, a visual is obtained. AI’s visual creation process, which is shortly explained above, is directly associated with the databases used in software.

The AI image generator platforms selected for the present paper were developed in 2015 and later. The first is OpenAI, developed by Sam Altman, Elon Musk, Ilya Sutskever, et al. in the USA in December 2015 [50]. Leonardo AI was developed by JJ Fiasson, Ethan Smith, Jachin Bhasme, et al. in Australia in December 2022 [51]. DALL-E was developed by OpenAI. Its first version was revealed in January 2021, and the third version was announced in October 2023 [52]. Midjourney was developed by David Holz, tested in February 2022, and became available to users in the summer of 2022 [53][54]. Among these AI applications that have become increasingly popular, the number of users of Midjourney, Leonardo AI and OpenAI reached 19 million and more in December 2024, while the number of DALL-E 3 users reached more than 1.5 million. These applications create graphical outputs in the art and architecture fields. Their companies do not hold copyrights to the generated digital images on these platforms.

Midjourney is an AI system with a higher level of user involvement than other systems [55]. Midjourney, a web-based platform accessed via Discord, is used by those working in this field as it functions using "focused diffusion" machine learning for "text-to-image" creation [56][57]. To generate an image using this tool, the command "imagine/" is entered in one of the related chat rooms on Discord, which enables a prompt to be typed. Images are obtained by typing the

definition of a desired image or the elements that can put this image together as a sentence on the prompt screen. Midjourney and other selected AI applications are capable of producing impressive digital images and forms that can be generated in similar ways.

When the literature on AI in the field of architectural design is reviewed, it is seen that the number of studies started to increase after 2015. Much of this research is focused on finding innovative and creative forms, while some of it focuses on the optimal solutions of architectural form [58]. Academic Anna Jaruga-Rozdolska's research (2022) on the use of Midjourney in architecture was helpful in understanding how the software works and its creative features for the purposes of the current article [55]. Similarly, researcher Stephen Tanugraha conducted a review (2023) on the limits and possibilities of Midjourney in architectural design [59]. There has also been an increase in research focused on the production of speculative fiction in the form of architecture through AI [60][61][62][63][64]. With its examination of the history of architecture, the present article contributes to the field of architectural design both by discussing the possibilities of surreal thought and speculative fiction in the field of architectural creation and by examining the speculations and creative potential of AI. In this context, the selected surreal project "Endless House" and its deep intellectual background and multiple representations are revisited and analyzed.

4 Revisiting the "Endless House"

4.1 Frederick Kiesler's "Endless House"

Surrealist architect Frederick Kiesler's main passion, even obsession, was endless spaces. His "Endless House" project, which he worked on for a long period between 1924 and 1965, consists of a structure of interlocking spherical shells and spiral forms defined by interpenetrating voids (Fig. 1). Developing his idea from biomorphological forms, Kiesler created a "vision machine" [26]. The "Endless House" is a representation of the unrealized paradigmatic structure of architecture [5]. The vision machine, in which space is constructed through the deep unconscious, is not only an example of sculptural plasticity, but also embodies Surrealism's vision of the bold and unrealizable [23]. This project, in which the house is represented with a form reminiscent of a cave in contrast to the modernists' rationality based on form and function, has been restricted to a manifesto. Kiesler had planned to build the "Endless House" model in real scale for

the architectural exhibition at the Museum of Modern Art, but due to financial reasons this was not possible.

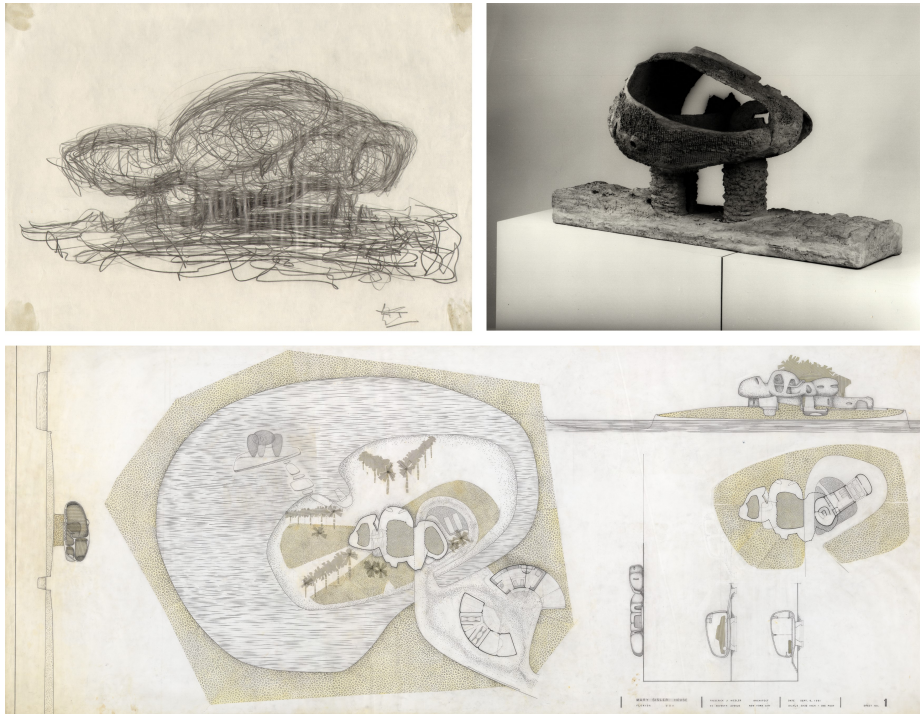


Fig. 1. On the left, Frederick Kiesler, study for an *Endless House*, pencil on paper, New York, c. 1959. On the right, Frederick Kiesler, model for an *Endless House*, unknown exhibition, 1986, black and white photograph by Michael Fehlbauer. At the bottom, Frederick Kiesler, plan for an *Endless House* for Mary Sisler Pencil and printed adhesive foil on tracing paper, New York, 1961. © 2023 Austrian Frederick and Lillian Kiesler Private Foundation, Vienna.

Departing from the formalist and determinist approach to architecture, Kiesler works with experimental forms by focusing on bodily experience and sensory effects, instead of placing the routine activities performed on a daily basis in a mechanically functioning building form. The forms he produced, which he did not want to be described as amorphous, evoke abstract visionary approaches [27]. The form of the "Endless House", which can be considered an experiential project, consists of shells with elliptical surfaces that do not intersect or intertwine with each other. Kiesler sees this shell as a reflection of the texture of "earth". The spatial relationship of the shell of the building, which has a heavy form, with its context reflects the free and fluid forms of surrealist artworks. This form establishes the center of the stage with curvilinear surfaces. The presence of

neither function nor form can be felt in the visuals of the amorphous form that defines metamorphosis. The shell of the house, reminiscent of a cell wall, evokes in the viewer a sense of returning to the starting point of life.

As a spatial-psychic product of a vision of a more introverted and closed house, the "Endless House" can be defined as an inner journey about the "home" that disappeared in modernity. This journey makes one feel the dark recesses of "home", the most intimate space of the individual, which Sigmund Freud characterized as uncanny [16]. The space that Kiesler embodies with the image of the cell or the cave is, in Vidler's words, the return of what Modernism repressed, that is, Modernism itself [4]. The German-French sculptor Hans Arp describes the "Endless House", which is woven with the uncanny and infinite concepts of an intrauterine space, as an egg-like structure in which humans can take shelter [65]. On the other hand, rather than masculine architecture, Kiesler likens his design to a female body, describing the house as a space with no beginning or end, similar to the human body [66]. The "Endless House" is derived from a nucleus and Kiesler describes this space as follows:

"The floor plan is no more than the footprint of a house. From a flat impression of this sort it is difficult to conceive the actual form and content of the building. [...] Fortunately, the creation proceeded otherwise growing out of a nuclear conception. Out of a single germ cell which contained the whole and which slowly developed into the separate floors and rooms of man. This cell, owing its origin to the erotic and creative instinct and not to any intellectual mandate, is the nucleus of the human edifice. It is a strong compound; while still a gelatinous mass it contains the future man, his mind and his instinct, his sweat and his dream. It is as though nature cast the first ball into the arena of life, and then stood by with folded arms to see what the play of circumstances would make of it. Whatever sort of creature results, it is never deflated, but three-dimensional, like a ball; it seeks coordination..."[27]

4.2 Analysis 1: "Endless House" Outputs of Generative AI Applications

The "Endless House" was produced by Kiesler as a deep inner journey of home over a period of more than 40 years using different representations. It has an extensive visual archive with spatial narratives that take on different forms in each representation. To obtain new interpretations of the "Endless House" through generative AI applications, keywords were input as references in the AI's prompt text and an analysis was carried out in five stages through the gradual elaboration of the prompt text. Similarities were observed in certain explorations and behaviors in the comparison of outputs generated by Midjourney, OpenAI, Leonardo AI, and DALL-E 3 (Fig. 2).

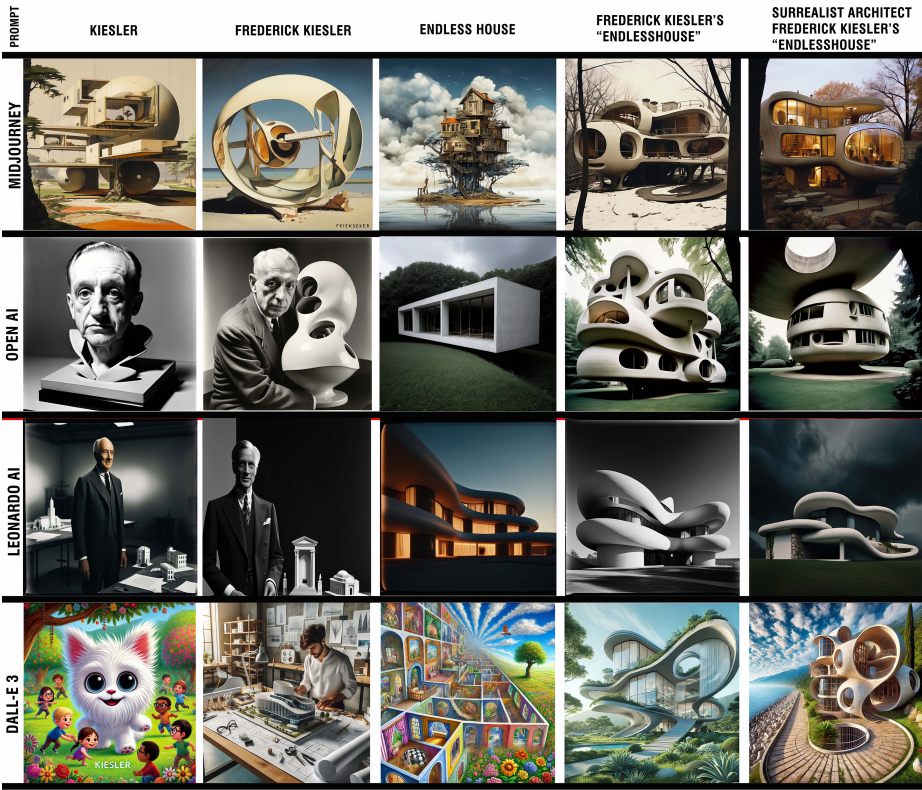


Fig. 2. Rerunning the five-stage analysis with Midjourney, OpenAI, Leonardo AI, and DALL-E 3: 10.01.2025.

The table consists of five columns from left to right and the keywords written in these columns display the five-stage prompt texts used in the research. Looking at the table from top to bottom, the outputs obtained from the AI applications selected for the present paper are provided in comparison. In the first stage, when the prompt “Kiesler” is typed, OpenAI regenerates a bust of the architect Frederick Kiesler, and Leonardo AI recreates the architect’s body as a figure standing among architectural models. DALL-E 3 interprets Kiesler as an animated character. It is also seen that Midjourney can generate speculative spatial creations by interpreting Kiesler’s sense of design and surreal background. In the second step, when the prompt “Frederick Kiesler” is typed, OpenAI recreates the architect’s body with him embracing a spiral model. Leonardo AI creates a generic architect’s figure standing among building models with different historical references, a visual very similar to that from the first prompt. DALL-E 3, however, creates a young architect figure working on models and drawing at a desk,

interpreting Kiesler's "architecture profession." Similar to the first stage, Midjourney AI generates a spatial creation in relation to the context and architectural approach of Frederick Kiesler. In both stages, OpenAI and Leonardo AI could not avoid generating the architect's figure, and while DALL-E 3 generated a totally out-of-context output in the first stage; it created a different architectural design environment and architect figure in the second stage. In contrast to the other applications, Midjourney can match the name of the architect with his design approaches and can render this as an architectural space in a speculative environment.

The "Endless House" prompt in the third stage resulted in similar behavior in all AI algorithms, which is different from the other four stages, and the AI applications created visuals that are independent of Kiesler's project but are based on the meanings of the keywords. The meaning in the outputs obtained with the combination of the concepts of "endless" and "house" can be combined and interpreted in different ways. Multiple repetitions of a conventional and well-known image of a house or a dwelling on the horizontal plane that seems to stretch into infinity can be obtained in these visuals. The weights of these words in the databases transform the outputs of the AI applications.

When the "*Frederick Kiesler's 'Endless House'*" prompt is typed in the fourth stage, all AI applications matched Kiesler with his Endless House project and generated different variations of residential projects in closed forms. Among these creations, the one with the closest stylistic generations to Kiesler's project can be seen in Midjourney's outputs. The atmosphere created in Midjourney's output highlights the surreal context. In the fifth stage, the surrealist architect description was added to the prompt and all AI applications, as seen in the fourth stage, matched the words and regenerated the "Endless House" project. The applications displayed buildings in closed and spiral forms with the functions and size of a dwelling. While these residential buildings are located inside a more realistic and natural habitat in Midjourney and OpenAI, Leonardo AI interpreted the surrealist topographies on a more abstract and empty background. On the other hand, DALL-E 3 created a more synthetic and unrealistic background. The similarities between the outputs in the fourth and fifth stages indicate how small the weight of the adjective "surrealist" is in databases. While the outputs of Leonardo AI and DALL-E 3 contain interpretations that differ from Kiesler's project with their architectural space generation that resembles amorphous forms, the outputs of the Midjourney and OpenAI applications give more reference to the "Endless House" project in terms of their form. Each application displays different possibilities and variations of spherical, amorphous or spiral shaped dwelling buildings.

The comparison of four different generative AI outputs can be interpreted as a consequence of machine learning. The use of spatial productions memorized by AI applications to create an architectural space becomes visible in an increasingly

crystallized spiral dwelling form. This analysis conducted with different generative AI applications shows how AI's creation capacity, efficient use, and limitations can differ with small changes to be made in the words used in the databases and prompt texts. The visuals Midjourney created by matching the architect's name with the architect's conceptual approaches indicate that this application has a working space that increases the opportunity to create speculative fiction.

4.3 Analysis 2: Midjourney's Speculations on the "Endless House"

To further examine its outputs, the analysis continued with the Midjourney bot after the abovementioned five-stage analysis. Repetitive plural generations were conducted using the Midjourney bot and the same keywords in the following subheadings, and the behaviors of AI were analyzed.



Fig. 3. Midjourney Image/Prompt: "Kiesler" (Results of Variation Performed by the Midjourney Bot in 3 Stages: 22.10.2023).

Image/Prompt: "Kiesler". The short description of "Kiesler", which is the prompt text in the first stage, was sufficient to represent Kiesler's dream world through the "Endless House". The surrealist effect apparent in the variations produced by repeating the prompt three times is achieved by positioning the "Endless House" in an unknown topography of a surreal painting. In other words, AI interpreted

context, form, and spatial effect under the influence of surreal narrative. Although the prompt was not described in detail as Frederick Kiesler's "Endless House", the resulting forms are reminiscent of an uncanny return of surreal topographies from the "unconscious" of artificial intelligence. Midjourney combined images in a virtual synthesis, borrowing the backgrounds of the works of surrealist painters. This synthesis has desolate forms where the relationality of body and space is not established. The possible actions between the structural forms of the AI's products that expand and contract in places are shaped as programmatic performances devoid of the simultaneity of form, motion, and behavior. These programmatic conditions do not envisage unity and coexistence. Midjourney's products lose the ambiguities of Surrealism in a reproduction defined by form and are thusly solidified (Fig. 3).



Fig. 4. Midjourney Image/Prompt: "Frederick Kiesler" (Results of Variation Performed by the Midjourney Bot in 3 Stages: 22.10.2023).

Image/Prompt: "Frederick Kiesler". When the "Frederick Kiesler" prompt was typed in the second stage of the analysis, the visual generations created in the first stage surprisingly transformed into a mechanism that matches with a Surreal universe. This mechanism was a composition that reflected the dialectical relationship of transparency and fullness. This mechanism, which has become an artistic creation, did not coincide with the concept of reality due to its distance from normative and social life practice. It can be argued that it aestheticized an

approach based on the unconscious. Midjourney accomplished this by deconstructing Frederick Kiesler's form. It can also be asserted that the schematic and abstract appearance that emerged through the deconstruction of form created a speculative narration. However, producing visual creations through mathematical abstraction, Midjourney did not stray from algorithmic thinking. The images were sequenced simultaneously (Fig. 4).



Fig. 5. Midjourney Image/Prompt: "Endless House" (Results of Variation Performed by the Midjourney Bot in 3 Stages: 22.10.2023).

Image/Prompt: "Endless House". When the prompt "Endless House" was typed in the third stage of the visual generations, as can be seen in the outputs of other AI applications, paradoxically, the database ignored Frederick Kiesler's "Endless House" creations. The same behavior persists in the repeated outputs as well. The only difference between these creations and the previous ones is that the artist (Frederick Kiesler) is not mentioned in the prompt texts. The difference in the weights in the database of the keywords used transforms the outputs. When the keyword "Endless House" is typed into Google, one of the most important search engines, and visual results are searched for, the creation of "Frederick Kiesler" appears on the first pages. However, the words "endless" and "house" in the databases that Midjourney and the other AI software use direct the applications as dominant elements with the meanings they convey. The composition created in Midjourney's output, consisting of the overlapping repetition of a conventional

dwelling image, is interpreted as the conceptual equivalent of the keyword "house" repeated infinitely. Midjourney AI created an "Endless House" through a simplified formal interpretation in the images it produced. Among these creations, the single house in the third frame emerges on a background that is interpreted as the endlessness of the topography. The concept of "endless" is sometimes interpreted as a unity of houses that were multiplied and combined, and sometimes it is interpreted as a single house portrayed in the middle of an endless emptiness. The machine can match the concepts in different ways; however, none of the outputs display Kiesler's "Endless House" project (Fig. 5).

Image/Prompt: "Frederick Kiesler's 'Endless House'". In the fourth stage, the resulting creations transformed the "Endless House" to a "material" form depicted in the time and space relationality of a singular structure. The architectural spaces created are highly defined both formally and structurally. In these creations, Kiesler's spiral forms were interpreted in impressive spatial compositions. There are noticeable objective stylistic similarities between the variations. Impressive and convincing with their context, these images move far away from the surrealist imaginary topography. They reflect a sense of touch that is secularized on these smooth surfaces with a detailed approach to structure and space that clings to reality. The visual variations show a smooth aesthetic approach (Fig. 6).



Fig. 6. Midjourney Image/Prompt: "Frederick Kiesler's 'Endless House'" (Results of Variation Performed by the Midjourney Bot in 3 Stages: 22.10.2023).

Image/Prompt: "Surrealist Architect Frederick Kiesler's 'Endless House'". In the fifth and final visual data generation stage, the prompt text was defined more. By adding the words "Surrealism" and "Architecture" to the prompt text, Midjourney embraced and reflected aesthetic abstraction with an impeccable material and production technique. The form was realized through a creation that was devoid of surrealist thought and influenced by reality. Although the definition of the prompt text included keywords related to surrealist thought, the creations clung to rationality and reality. The imaginary form, created with bodily and sensory interaction [25][26] at the hands of the architect Frederick Kiesler, who adopts an architectural understanding that rejects stylistic and functional limits [20], shows itself in buildings that match reality closely and provides function and style in AI's outputs. Midjourney turned the abstract geometry of the "Endless House" into a prefabrication template. The issue here is not that reality can be created through images, but that the template has empirical value. The form that gained the notion of representation does not make the viewer feel the conscious and unconscious relations of surreal space. Transparent windows opening onto the surface of the form established the relationality between the interior and the exterior through spherical spaces (Fig. 7).



Fig. 7. Midjourney Image/Prompt: "Surrealist Architect Frederick Kiesler 'Endless House'"
(Results of Variation Performed by the Midjourney Bot in 3 Stages: 22.10.2023).

As Vidler states, transforming fantasy and dreams into representation in spatial designs, conjoining the surreal with reality and architecture, can be purely scenographic [4]. It is apparent that when architectural definitions were involved in the creation stage, AI produced scenographic realities.

4.4 Discussion

The visual reproductions created through Midjourney AI have created speculative narratives on the "Endless House". As the prompt text becomes more defined in Midjourney, Surrealism's fantastic and undefined imaginary spaces transform into formal, functional, and synthetic spaces. However, Kiesler's visual narratives do not hint at the existence of function or style. In other words, the multi-layered, open-ended representations of Kiesler's "Endless House" in text, drawing, and models solidify in AI's creations at the end of five stages.

In the images obtained with the keyword "Kiesler" in the first stage, the surreal context was a determining element of the image. The images obtained in the second stage with the prompt "Frederick Kiesler" were speculative creations that evoke a mechanism in surreal narratives. In these two stages, Midjourney was able to match the name of the architect with the architectural aesthetic and approach he follows. In the third stage, when the keyword "Endless House" was typed, the compositions of a saddle roof house that holds the meaning of the words "endless" and "house" emerged. However, a crucial point displayed in this stage is that Midjourney (and other selected AI applications) could not match the architectural aesthetic, approach, or form with the project name without the architect's name being given. The fourth and fifth stages, unlike the first three stages, presented a materialized architectural space. In these last two stages, after the architect and the project were clearly defined, AI produced its creation devoid of the consciousness (unconscious) of Surrealism. In other words, by adding the words "architect" and "house" the dreamlike and intellectual context of Surrealism disappeared. The visuals created with the prompt text "Surrealist Architect Frederick Kiesler's Endless House" in the last stage were completely devoid of the ambiguity seen in the first stage. Midjourney's creations in the fourth and fifth stages became constructible representations with a defined topography. In these creations, Midjourney reinforces visual plausibility with the furniture it adds to the layers of the form. This spatial creation offers a visual experience of the curves of a dynamic, fluid, and flexible space.

When Midjourney's outputs are analyzed contextually, it can be seen in the visuals that the context changes and disappears. While the psychoanalyzed background of Surrealism and "Endless House" and the avant-garde cultural context in which it is set are apparent in the topography presented by Midjourney, the images evoke no sensory resonance. Neither Surrealism's ideas of the inner

journey and the uncanny nor the darker narratives and references to the 'Endless House' are included in the reproduction of 'Endless House'. These creations reduce the highly glossy, fluid, and smooth surfaces to forms detached from their historical and cultural context. Representations that reflect the critical depth of Surrealism are lost in the visual reconstructions of AI. AI's "Endless House" is transposed to a timeless universe.

Examining all the stages, it was observed that as the prompt text became more defined, AI clung to reality more and broke away from imaginative and surreal narratives. This five-stage analysis shows how Midjourney AI's vision shifted from the surreal to the real. As can be seen in the analysis in 4.2, where the outputs of OpenAI, Leonardo AI, DALL-E 3, and Midjourney AI are compared, this analysis also shows how big a role the keywords used in the prompt text play, and indicates that explorations can differ based on the data in the database used to train AI applications.

5 Conclusion

During the architectural creation process of his project "Endless House" in 1924-1965, Frederick Kiesler explored imaginary spaces by criticizing the rational approaches of modernism that overlooked sensory architecture and held a place in the unconscious area of Surrealism. The main question of our research was what surrealist architecture can transform into in the speculative fiction of AI. In this scope, the paper analyzed how AI applications interpret Kiesler's surreal topography and his uncertain and unsettling unconscious spaces and discussed the imaginary capacity and exploration processes of AI applications. Surrealist thought allows the conceptualization of phenomena that would be considered impossible or even fantastic in the real world. These phenomena expand the limits of our imagination. Therefore, speculative fiction offers alternatives to existing realities and ways of life. This, in turn, paves the way for critical spatial creations. The compositions obtained through the reproduction of the exemplary "Endless House" by AI applications are not intended to produce a final product, but rather to observe how early examples of speculative spatial creations of AI are unfolding today. Thus, the "Endless House" project was "rebuilt" in 2025, approximately a century later from its origin, through the explorations of AI.

The outputs obtained through the AI applications selected in the research show how small changes to the keywords selected when defining the subject in the prompt text can lead to large transformations in what AI applications create. As can be seen in the multiplied outputs of Midjourney, the generative AI's interpretations and explorations enable the designer to see different spatial possibilities and diversify those. Midjourney AI can also discover the architectural

aesthetic only through a prompt text that includes the architect's name and can present speculative comments on its outputs. The efficient ways of using AI for creations that aim to enhance imagination in the fields of architectural design and studies depend on the database and visuals used to train it. The meanings of the keywords in the prompt and their weight in the database transform the outputs.

Despite the interpretation potential of generative AI discussed above, it has several limitations. It is not sophisticated enough to create detailed and complex images. For example, it is seen that when Frederick Kiesler's "Endless House" narratives and depictions are typed into the prompt, the visuals that reflect Kiesler's ideas are not obtained but rather visuals outside the narrative in the AI's text are shown. Generative AI application that produces synthetic images has not yet reached the limit of its possibilities in the field of design. However, it is apparent that AI will continue to evolve in the future.

Revisiting the long-lasting creation process of Kiesler's "Endless House" from the 20th century, this paper provides various findings about how keywords limit or set creation free through AI in today's world, when the integration of AI into architectural training is under discussion and prompt writing classes are being instructed. In the analysis of these findings, both the possibilities of the vast imaginary world of surreal thought in the field of architectural creation and the process of exploration of AI are discussed. The "hybrid collective" mode of production of designers and AI has the potential to transform traditional modes of production in the field of architectural design. AI-generated speculative fiction can offer alternative paths of the uncertain and undefined world of imagination, with new and different fictions at every step in the "infinite" universe of machine learning's inductive journey.

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