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Lost in translation. Pilot research on the problem of translating human thoughts into the language of the machine

Abstract

The article presents the conduct of a pilot study carried out at the Institute of Architecture of the Lodz University of Technology in the summer of 2024. The subject of the research that architecture students took part in was to trace the process of creating architectural concepts using the generative image model Midjourney by individuals with no previous exposure to AI tool-assisted design, for whom English – read by a tool capable of converting a string of keywords into an image – is not their native language.

The authors' goal was to capture difficulties arising from translation errors and lack of script literacy. The precisely defined architectural design problem was carried out by the participants of the study by selecting from among the images generated in the version 6.0 model on the basis of the prompts they had previously prepared.

The results indicate the challenges arising from the need to translate thoughts into a language fully understandable by the machine. The title of the article, referring to a movie *Lost in translation* directed by Sofia Coppola, highlights the fleeting essence of the problem: words are only a certain signaller of meaning, which often fails in the full depiction of thought.

Key words: artificial intelligence, AI architecture, Midjourney, AI for Higher Education

Introduction

The use of artificial intelligence (AI)-assisted tools has sparked the need for the development of a new user skill, which is the ability to communicate the expectations of a required result through properly entered key words (prompts). While this communication is intuitive to some extent, creating sets of prompts to produce precise, compliant results still requires experience (Allen et al. 2023). This fact confirms the existence of certain difficulties in communicating human thoughts in a way that can be properly interpreted by a machine. However, at the same time, the increasing scope of implementation of the new technology being a catalyst for the transformation of all branches of science, art and industry leads us to reflect on

the validity of the views of Charles Petzold, who in his 2000 publication *Code: The Hidden Language of Computer Hardware and Software* stated that [...] *just as Latin was for centuries the common language of scholars, so the language of computers has become the common language of our modernity* (Petzold 2000)¹. The neural networks of most of the available generative scripts were trained on databases in English. Although some generative models are now available in more language options, English remains the dominant language for AI communication and development.

In a pilot study conducted as an extension of the research on the potential of usage of the Midjourney tool in the future design practice of an architect (Jaruga-Rozdolska 2022), an attempt was made to identify the scale of potential difficulties in communicating a precisely defined

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¹ Interestingly, similar predictions were made as early as 1993 in a New York Times article that discussed the evolution of programming languages, predicting that languages used for coding could eventually become a universal form of communication (Markoff 1993).

design task using keywords by individuals who had no previous experience with AI-assisted scripts. Architecture students from the Faculty of Construction, Architecture, and Environmental Engineering at Lodz University of Technology took part in the study². The article presents the first of a series of planned research, which is the starting point for establishing new standards for the education performance evaluation among students and an attempt to adapt the current study program to the dynamically changing requirements that the modern labour market will impose on graduates. This is particularly important at the stage of just forming regulations regarding the implementation of new technologies.

The title of the article, with reference to Sofia Coppola's film work (Coppola 2003), points to the ephemeral essence of the problem: a word is only a certain signaller of meaning, which often fails in the full depiction of thought. An additional level of difficulty is the necessity for translation – Midjourney's script reads the keywords solely in English, which is not the mother tongue for the survey participants.

Thus, multiple translations are evident here: human thoughts into words, then those into English, and then a sequence of keywords into an image. Although the script uses a model that allows natural language interpretation (NLP), it interprets the keyword sequence according to the learned context of its meaning. The outcome depends thus on three variables: the ability to describe an architectural concept with words, the proficiency in finding their equivalents in a foreign language, and the degree of training of the model's neural network capable of reading them against the overall meaning.

State of research

The literature on the applications of generative artificial intelligence and its integration into architectural design is undergoing extraordinary growth in recent years. Evidence in this regard is the March 2024 review article *Generative AI for Architectural Design: A Literature Review* (Li et al. 2025). Among other topics, it contains both background information on the principles of generative AI and a review of the recent literature on the subject, citing 191 items on the topic published between 2018 and 2024. According to an article, its authors state that a clear trend of increasing research indicates a growing inclination among the architectural design community to use generative artificial intelligence. Such interest is reflected both in mainstream architecture and design portals such as Dezeen (Wiles 2022), ArchDaily (Valencia 2023) and Designboom (Bhatia 2022; Petridou 2022), as well as in the books that are being written on the subject (Leach 2022; Bernstein 2022; Husam, Ahmed 2023) and surveys by a respected institution – including the Royal Institute of British Architects, which issued a report on architects' use of AI in 2024 (RIBA 2024)³.

² Studies in this field are conducted in Polish.

³ Answering the question, How do you generally assess your knowledge of artificial intelligence? 9% of respondents said they had none, 51% said they had basic knowledge, 32% described their knowledge as practical, only 6% had advanced knowledge, and 2% considered

It shows that knowledge on AI and its use in architecture remains at an early stage. Research on generative AI, particularly Midjourney, deals with aspects ranging from technical (Ploennings, Berger 2023), educational, aesthetic (Radhakrishnan 2023), cultural (Sukkar et al. 2024; Tanugraha 2023; Kamaoğlu 2023) or ethical (Paraman, Anamalah 2023), and even relating to case applications (Mousavi, Dinçer 2024). Papers concerning communication between the user and AI (Stanusch 2023; Allen et al. 2023; Mayers 2024; Zierock, Jungblut 2024), including prompt writing, as well as those dealing with the application of AI in education, including research conducted with students as future users of generative tools (Tsidylo, Sendra 2023), were relevant to the issues raised in the article.

Purpose of the research

The article presents the course of a pilot study conducted in early summer 2024 at the Institute of Architecture of the Lodz University of Technology. The initial study was intended to establish the scope of the research with the participation of a larger number of students, scheduled for the last quarter of the same year.

Thus, both the pilot study and the subsequent follow-up research are aimed at determining and implementing the most efficient and productive way to alter the standards for educating future architects, adequate to the transformation catalysed by the technological boom tied to the development of artificial intelligence. Another focus of the study was to monitor user-script communication. Significantly, English was not the first language for the survey participants. Therefore, the study touches on the important problem of communicating thoughts sufficiently to achieve the expected results, identifying errors in communication due to both a lack of experience working with generative image models and the need to translate key words into English.

Methods

Fourteen students of the master's degree program in architecture pursued at the Institute of Architecture at the Technical University of Lodz participated in the survey. The participants were asked to prepare individual sets of keywords referring to architectural form in any context. The task included a hint: try to imagine or recall in your memory a building, thereafter describing it with words, including in the descriptive language relating directly to the architectural form (function of the building, materials used, style, scale, form and dominant colour) and those containing suggestions about the context in which the building will be presented (environment, time of day, perspective). No minimum or maximum number of words used was required. The prompts prepared by the students were then used to prepare the architectural visualization in the Midjourney version 6.0.

themselves an authority on the subject. To the question, how often is artificial intelligence used in the projects you are currently working on? 2% said in any, 4% said in most, 15% said in some projects, 20% said they do it occasionally, and 59% said they have never used it (RIBA 2024).

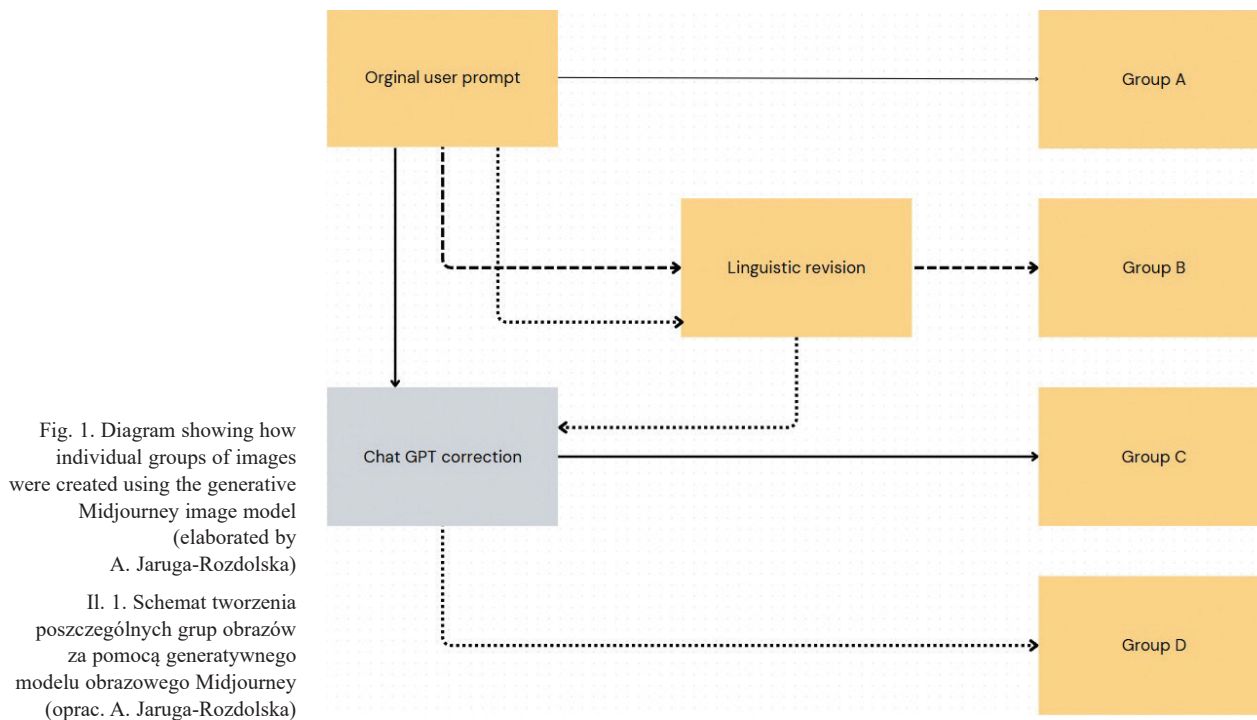


Fig. 1. Diagram showing how individual groups of images were created using the generative Midjourney image model (elaborated by A. Jaruga-Rozdolska)

Il. 1. Schemat tworzenia poszczególnych grup obrazów za pomocą generatywnego modelu obrazowego Midjourney (oprac. A. Jaruga-Rozdolska)

First four images – marked A in the form – were generated on the basis of the original prompt prepared by each of the study participants. Afterwards, the prompt was edited, correcting any grammatical and linguistic errors that might cause it to be misinterpreted by the script – the images generated on the basis of the prompt revised in this way constituted the group of images marked with the letter B. Further, bearing in mind that the authors of the keyword sequences have no experience in working with a similar tool, a kind of bridge in the communication between the human and the tool was created: both the original and the corrected set of prompts were entered into the generative text model – ChatGPT version 4.0. The word sequences expanded in such a manner⁴ contributed to the generation of successive sets of images, marked successively with the letter C for the original prompt corrected by the generative text model, and with the letter D for the previously linguistically corrected prompt expanded by ChatGPT (Fig. 1). While not without drawbacks⁵, the decision was made under the assumption that translating the human thought transcript into script-generated text could improve the quality of the resulting images, especially when the user is an individual with no prior experience in writing prompts and for whom English is not a native language. The keyword sequences generated using the generative text model were significantly longer and more descriptive (Fig. 2).

All sixteen images (four corresponding to each prompt) were then placed in each of fourteen individually prepared questionnaires – each participant in the study evaluated

solely the images generated from their own set of keywords. Participants were asked to evaluate the aesthetic and content quality⁶ of each image. They further made a selection of the best and worst visuals in each category⁷. In the final question, participants were asked to identify the visualization they would most like to use as inspiration for a full architectural concept⁸.

Results

During the conducted study, a total of 224 images were generated. The selected sets of four images are shown below, representing as follows: the visualizations generated for each group in alphabetical order along with the initial prompt prepared by the survey participant (Figs. 3, 4), examples of pairs of the best and worst rated images (Fig. 5), and the visualizations that participants indicated they would be most likely to use as the impetus for an architectural design (Fig. 6).

The survey results in percentage form showed the following:

1. Participants most often pointed to images in group C (original prompt expanded using ChatGPT's generative text model version 4.0) as the aesthetically best images – they accounted for 32.14% of all answers given. In the same category, the second most frequently selected images were those from group D (the language-corrected prompt

⁴ The form of the query: please provide a Midjourney prompt to generate... – in the place of an ellipsis, the original and revised set of keywords were inserted sequentially.

⁵ The generative image model should interpret the keyword sequence without requiring external scripts to improve the user prompt.

⁶ Defined as compliance with the original set of keywords.

⁷ Shown in a tabular summary in the following sections of the article as BEST E for the aesthetically best visualization, WORST E for the lowest rated visualization in this category, and BEST M and WORST M similarly for the substantive evaluation of the images.

⁸ According to a tabular summary in the following sections of the article, defined by the INSPO acronym.

ORIGINAL PROMPT, GROUP A

MUSEUM OF JAPANESE CULTURE, GLASS, CONCRETE AND WOOD, MODERN, DAYLIGHT, JAPANESE GARDENS ARE NEARBY

CORRECTED PROMPT, GROUP B:

MUSEUM OF JAPANESE CULTURE, ELEVATION MADE OUT OF GLASS, CONCRETE AND WOOD IN MODERN STYLE, DAYLIGHT, SURROUNDED BY JAPANESE GARDEN

AI PROMPT BASED ON ORIGINAL PROMPT, GROUP C:

STEP INTO A REALM OF SERENE BEAUTY AT THE MODERN MUSEUM OF JAPANESE CULTURE, WHERE THE SPIRIT OF ZEN PERMEATES THE CONTEMPORARY ARCHITECTURE. ILLUMINATED BY GENTLE DAYLIGHT, THE MUSEUM'S SLEEK FACADE, CRAFTED FROM A HARMONIOUS BLEND OF GLASS, CONCRETE, AND WOOD, EXUDES A SENSE OF TRANQUILITY AND BALANCE. FOCUS YOUR LENS ON THE INTRICATE ARCHITECTURAL DETAILS THAT EVOKE THE ESSENCE OF ZEN. FROM THE CLEAN LINES OF THE GLASS PANELS TO THE NATURAL TEXTURES OF THE WOODEN ACCENTS, EVERY ELEMENT IS CAREFULLY CURATED TO CREATE A SPACE OF HARMONY AND SIMPLICITY. ADJACENT TO THE MUSEUM, A LUSH JAPANESE GARDEN UNFOLDS, ITS METICULOUSLY MANICURED LANDSCAPES OFFERING A TRANQUIL OASIS THAT COMPLEMENTS THE CULTURAL EXPERIENCE. LET THE VERDANT FOLIAGE AND SERENE WATER FEATURES FRAME THE MUSEUM, INVITING VISITORS TO IMMERSE THEMSELVES IN THE TIMELESS BEAUTY OF NATURE. IN THIS SCENE, CELEBRATE THE ZEN-INSPIRED DESIGN OF THE MUSEUM OF JAPANESE CULTURE, WHERE MODERN ARCHITECTURE AND ANCIENT TRADITIONS CONVERGE TO INSPIRE CONTEMPLATION AND INNER PEACE. INVITE VIEWERS TO EMBARK ON A JOURNEY OF DISCOVERY, WHERE THE PATH TO ENLIGHTENMENT IS PAVED WITH BEAUTY AND TRANQUILITY.

AI PROMPT BASED ON CORRECTED PROMPT, GROUP D:

ENTER A REALM WHERE TRADITION MEETS INNOVATION AT THE MODERN JAPANESE CULTURAL MUSEUM, A BEACON OF ARCHITECTURAL BRILLIANCE AMIDST THE DAYLIGHT. THE MUSEUM'S FACADE, CRAFTED FROM A SEAMLESS BLEND OF GLASS, CONCRETE, AND WOOD, EXUDES CONTEMPORARY ELEGANCE WHILE PAYING HOMAGE TO JAPANESE HERITAGE. FOCUS YOUR LENS ON THE STRIKING ELEVATION OF THE MUSEUM, WHERE SLEEK GLASS PANELS REFLECT THE SURROUNDING DAYLIGHT, JUXTAPOSED AGAINST THE SOLID PRESENCE OF CONCRETE AND THE WARMTH OF NATURAL WOOD ACCENTS. EACH ELEMENT CONTRIBUTES TO THE MUSEUM'S MODERN AESTHETIC WHILE HONORING THE TIMELESS PRINCIPLES OF JAPANESE DESIGN. NEARBY, JAPANESE GARDENS BECKON, OFFERING A TRANQUIL OASIS THAT HARMONIZES WITH THE MUSEUM'S CULTURAL SIGNIFICANCE. LET THE VERDANT FOLIAGE AND METICULOUSLY SCULPTED LANDSCAPES FRAME THE MUSEUM, INVITING VIEWERS TO EXPERIENCE THE INTERCONNECTEDNESS OF NATURE AND ART. IN THIS SCENE, CELEBRATE THE EXQUISITE FUSION OF PAST AND PRESENT EMBODIED BY THE MODERN JAPANESE CULTURAL MUSEUM. INVITE VIEWERS TO IMMERSE THEMSELVES IN THE BEAUTY AND SERENITY OF JAPANESE CULTURE, WHERE ARCHITECTURAL MASTERY AND NATURAL SPLENDOR CONVERGE TO INSPIRE AWE AND CONTEMPLATION.

Fig. 2. An example of the transformation of the original prompt (elaborated by A. Jaruga-Rozdolska)

II. 2. Przykład transformacji oryginalnego promptu (oprac. A. Jaruga-Rozdolska)



Fig. 3. A set of images generated from the keyword sequence:

Modern university building in the shape of the letter "X", vertical. Colourful glazing, contemporary architecture, as high as the Eiffel tower. Located in Paris, historical surroundings. Sunny weather; some zeppelins flying high selected consecutively from the images of groups A, B, C and D (elaborated by A. Jaruga-Rozdolska; images generated using Midjourney based on phrases provided by the study participant)

II. 3. Zestaw obrazów wygenerowanych na podstawie ciągu słów kluczowych:

Modern university building in the shape of the letter „X”, vertical. Colorful glazing, contemporary architecture, as high as the Eiffel tower. Located in Paris, historical surroundings. Sunny weather; some zeppelins flying high wybranych kolejno spośród obrazów z grup A, B, C i D (oprac. A. Jaruga-Rozdolska; obrazy wygenerowane za pomocą Midjourney na podstawie fraz dostarczonych przez uczestnika badania)

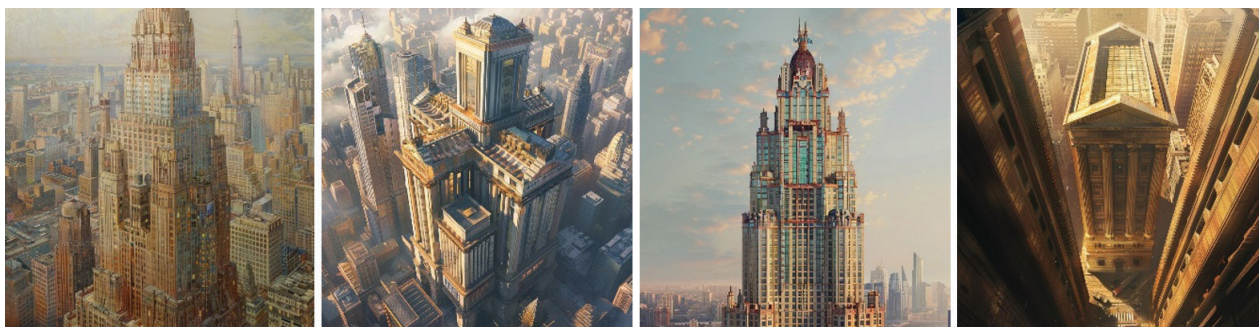


Fig. 4. A set of pictures generated based on the keyword string: *Skyscraper, antique, inspired by ancient Rome; stone/sandstone; natural colours mixed with red, blue and yellow; large city; early sunny morning, summer* selected consecutively from images in groups A, B, C and D (elaborated by A. Jaruga-Rozdolska; images generated using Midjourney based on phrases provided by the study participant)

II. 4. Zestaw obrazów wygenerowanych na podstawie ciągu słów kluczowych: *Skyscraper, antique, inspired by ancient Rome; stone/sandstone; natural colors mixed with red, blue and yellow; large city; early sunny morning, summer* wybranych kolejno spośród obrazów z grup A, B, C i D (oprac. A. Jaruga-Rozdolska; obrazy wygenerowane za pomocą Midjourney na podstawie fraz dostarczonych przez uczestnika badania)



Fig. 5. A set of top and worst rated images generated based on the keyword sequence: *Religious, brick, sheet metal, glass, neo-gothic, mustard yellow, tarnished copper, low and mid-rise buildings, night*, respectively – the best and worst image in terms of aesthetics, and the best and worst image in terms of content (elaborated by A. Jaruga-Rozdolska; images generated using Midjourney based on phrases provided by the study participant)

II. 5. Zestaw najlepiej i najgorzej ocenianych obrazów wygenerowanych na podstawie ciągu słów kluczowych: *Religious, brick, sheet metal, glass, neo-gothic, mustard yellow, tarnished copper, low and mid-rise buildings, night*, kolejno – najlepszy i najgorszy obraz pod względem estetycznym oraz najlepszy i najgorszy obraz pod względem merytorycznym (oprac. A. Jaruga-Rozdolska; obrazy wygenerowane za pomocą Midjourney na podstawie fraz dostarczonych przez uczestnika badania)



Fig. 6. Example of visualizations identified as those with the greatest potential to be used as inspiration for a full architectural concept (elaborated by A. Jaruga-Rozdolska; images generated using Midjourney based on phrases provided by the study participant)

II. 6. Przykład wizualizacji wskazanych jako te o największym potencjale do wykorzystania jako inspiracja do stworzenia pełnej koncepcji architektonicznej (oprac. A. Jaruga-Rozdolska; obrazy wygenerowane za pomocą Midjourney na podstawie fraz dostarczonych przez uczestnika badania)

enhanced using ChatGPT's generative text model version 4.0), indicated by 28.57% of respondents. The least frequent (17.86%) images in this category were indicated as the best in terms of group A (original keyword sets provided by survey participants).

2. Most often, images from group B (32.14%) were indicated as the worst in terms of aesthetics; it was followed by images from group D (28.57%), C (21.43%) and A (17.86%) being selected most frequently.

3. The images in group C ranked best in terms of content (32.14% of responses given); the second most statistically common response was from group B (25%). Images

from groups A and D were indicated the least frequently in this category (21.43%).

4. Remarkably, Group A images (generated from unmodified sets of keywords provided by survey participants) were considered as the worst most frequently in terms of compatibility with the original prompt – up to 42.89% of respondents selected this answer. On the other hand, group C images were the least often chosen by students in this category.

5. Group A images were also selected least frequently as those stimulating a full architectural concept. The results of the pilot study and the results in percentage terms are presented in the table (Fig. 7).

STUDENT ID	A/E	A/M	B/E	B/M	C/E	C/M	DE	D/M	BEST E	WORST E	BEST M	WORST M	INSPO
WP.	9 8 7 6	8 7 6 5	5 9 8 8	3 8 7 9	6 5 8 9	4 4 8 8	8 7 7 5	8 8 6 4	D_01	A_04	D_01	A_04	D_01
SREDNIA:	7,5	6,5	7,5	6,75	7	6	6,75	6,5					
A.K.	9 8 8 5	6 8 9 7	7 6 8 9	7 6 8 9	9 10 7 8	9 10 7 8	8 9 10 9	8 9 10 9	D_03	A_04	D_03	A_01	D_03
SREDNIA:	7,5	7,5	7,5	7,5	8,5	8,5	9	9					
PK.	8 9 7 9	1 2 3 3	9 8 6 9	4 4 1 3	6 8 10 6	3 3 3 2	7 7 7 9	4 2 1 1	A_04	B_03	B_01	A_01	D_01
SREDNIA:	8,25	2,25	8	3	7,5	2,75	7,5	2					
JK.	7 4 6 4	5 3 3 2	9 4 8 4	8 3 8 4	8 5 6 9	9 3 3 9	4 3 6 6	3 3 2 3	C_04	B_02	C_04	D_03	C_04
SREDNIA:	5,25	3,25	6,25	5,75	7	6	4,75	2,75					
O.W.	10 8 10 10	8 6 10 9	10 8 6 6	8 5 4 3	7 7 10 9	6 7 10 7	8 7 10 5	6 5 9 3	A_03	D_04	C_03	B_03	A_03
SREDNIA:	9,5	8,25	7,5	5	8,25	7,5	7,5	5,75					
A.F.	6 3 4 5	4 3 7 5	4 4 5 5	1 1 3 3	8 9 7 8	5 7 6 5	4 7 7 6	4 4 4 3	C_02	B_01	C_02	B_01	C_02
SREDNIA:	4,5	4,75	4,5	2	8	5,75	6	3,75					
D.U.	7 4 1 9	6 4 1 9	8 9 8 8	8 7 2 7	1 1 8 10	1 1 8 7	1 1 1 5	1 1 1 1	B_02	C_02	B_02	C_02	B_04
SREDNIA:	5,25	5	8,25	6	5	4,25	2	1					
WK.	5 2 4 5	2 1 2 2	6 7 4 5	3 6 4 3	6 8 4 2	2 8 1 1	3 6 6 5	2 6 3 3	C_02	C_04	C_02	A_02	B_02
SREDNIA:	4	1,75	5,5	4	5	3	5	3,5					
WS.	4 5 8 8	4 4 4 6	4 3 5 3	2 2 5 2	7 5 3 4	3 3 2 2	6 4 7 6	1 1 1 2	C_03	C_03	A_04	C_04	A_04
SREDNIA:	6,25	4,5	3,75	2,75	4,75	2,5	5,75	1,25					
K.D.	6 4 8 7	4 1 6 9	5 8 5 10	3 2 8 2	9 2 7 5	1 3 7 6	5 4 6 5	9 7 6 3	B_04	C_02	A_04	A_02	B_04
SREDNIA:	6,25	5	7	3,75	5,75	4,25	5	6,25					
NJ.	8 9 9 7	4 6 9 7	9 5 10 5	9 8 9 6	5 8 9 9	6 7 9 9	5 7 4 9	7 7 5 8	B_03	C_01	B_03	C_01	B_03
SREDNIA:	8,25	6,5	7,25	8	7,75	7,75	6,25	6,75					
S.K.	7 8 8 10	4 1 1 2	5 4 2 7	3 2 3 8	8 8 8 5	6 8 8 8	9 5 9 9	8 5 8 9	C_04	B_01	C_04	B_04	C_02
SREDNIA:	8,25	2	4,5	4	7,25	7,5	8	7,5					
MJ.	10 8 4 3	7 5 2 1	6 8 3 8	2 5 1 3	4 5 10 5	5 3 6 1	7 2 2 1	2 1 1 1	C_03	C_04	A_01	C_04	C_03
SREDNIA:	6,25	3,75	6,25	2,75	6	3,75	3	1,25					
MD.	8 8 1 7	4 8 1 6	4 8 4 6	3 9 3 7	9 8 9 7	7 7 9 6	7 8 8 6	7 7 8 4	Zerwingtore A_01, Wingtore C_03		Zerwingtore B_02, Wingtore C_03	A_03	B_02
SREDNIA:	6	4,75	5,5	5,5	8,25	7,25	7,25	6,5					

Highest score: image aesthetics criterion [%]	Lowest score: image aesthetics criterion [%]	Highest score: keyword sequence matching criterion [%]	Lowest score: keyword sequence matching criterion [%]	Images most frequently selected as most inspiring among others [%]
A = 17.86	A = 17.86	A = 21.43	A = 42.86	A = 14.29
B = 21.43	B = 32.14	B = 25.00	B = 21.43	B = 28.57
C = 32.14	C = 21.43	C = 32.14	C = 7.14	C = 28.57
D = 28.57	D = 28.57	D = 21.43	D = 28.57	D = 28.57

Fig. 7. Tabular representation of the results of the conducted surveys. The highest percentage score in a given category is highlighted in bold (elaborated by A. Jaruga-Rozdolska)

Il. 7. Tabelaryczne przedstawienie wyników przeprowadzonych badań. Pogrubionym pismem wyróżniono najwyższy procentowy wynik w danej kategorii (oprac. A. Jaruga-Rozdolska)



Fig. 8. Images generated on the basis of the prompt: 17th century baroque residence in central Poland based on Wilanów Palace (elaborated by A. Zaguła with the use of Midjourney tool)

Il. 8. Obrazy wygenerowane na podstawie promptu: 17th century baroque residence in central Poland based on Wilanów Palace (oprac. A. Zaguła z użyciem narzędzia Midjourney)

Additional research

To supplement the above pilot research, one of the contributors to the study, Artur Zaguła, conducted his own investigation. It was intended to address not only the language of prompt generation, but also the non-English-speaking cultural area. In order to achieve this, a prompt was written in English giving the command to generate a building based on a well-known example of Polish building culture

– the Wilanów Palace. The first prompt was: Baroque residence in central Poland based on Wilanów Palace; the next prompt specified the construction age: 17th century baroque residence in central Poland based on Wilanów Palace. Both resulted in poor results clearly demonstrating the deficiencies in the Midjourney script’s tutoring of Polish examples of historical architecture (Fig. 8). The next step involved writing a prompt in Polish to see how the script would behave when receiving a request in this language. The prompt



Fig. 9. Images generated from the prompt: *siedemnastowieczna rezydencja w środkowej Polsce oparta na Palacu w Wilanowie* (elaborated by A. Zaguła with the use of Midjourney tool)

II. 9. Obrazy wygenerowane na podstawie promptu: *siedemnastowieczna rezydencja w środkowej Polsce oparta na Palacu w Wilanowie* (oprac. A. Zaguła z użyciem narzędzia Midjourney)



Fig. 10. Images generated based on the prompt: *Aerial view of Wilanów Palace, richly decorated in yellow and green with intricate details, surrounded by lush gardens under clear blue skies, showcasing its grandeur as one of Poland's most iconic landmarks. The palace stands alone against an expansive background, embodying elegance and historical significance, wide shot, ultra realistic photography* (elaborated by A. Zaguła with the use of Midjourney tool)

II. 10. Obrazy wygenerowane na podstawie promptu: *Aerial view of Wilanów Palace, richly decorated in yellow and green with intricate details, surrounded by lush gardens under clear blue skies, showcasing its grandeur as one of Poland's most iconic landmarks. The palace stands alone against an expansive background, embodying elegance and historical significance, wide shot, ultra realistic photography* (oprac. A. Zaguła z użyciem narzędzia Midjourney)

ran as follows: *siedemnastowieczna rezydencja w środkowej Polsce oparta na Palacu w Wilanowie*, and the generated images completely puzzled the researcher (Fig. 9). It demonstrated a complete misunderstanding of the command and proved that being situated outside the English-speaking world, one cannot count on anything even close to the correct results. The final step involved using the describe command for the creation of a prompt from a photograph of the Wilanów Palace⁹ (Fig. 10); four prompts generated had factual errors, in none of which the Wilanów Palace name appeared. However, after corrections made by the researcher, clearly the best results were achieved using such method.

Conclusions

It must first be stated that when using the Midjourney script to generate images from the field of architecture, extensive and linguistically well-constructed sets of keywords

⁹ Using Midjourney's generative script, the describe module allows the process to be reversed: the user uploads an image of their choice and, based on that image, forces the describe command to generate four options for a textual description of the image. Each of the prompts generated thus can then be used to generate a new set of images.

– prompts – are essential. In addition to subject matter knowledge, it is important to know how to properly construct word prompts and proficiency in working with generative image models. According to the study, additional difficulties may arise from the need to translate the expected outcome into English. The pilot study findings show that images generated from prompts created by non-English-speaking users were evaluated the lowest by the users themselves. Both in terms of aesthetics, consistency with the prompt, and a potential as an inspiration to create a full architectural concept, they received the lowest ratings. Both in terms of aesthetics, consistency with the prompt, and inspiration to create a full architectural concept, those images received the lowest ratings. The second important finding of the study is that the images generated according to the prompt corrected by the generative text model were rated best. Prompts enhanced with chat GPT were much more elaborate; being based not on human linguistic structures, but those developed in the course of artificial intelligence evolution, they produced more appealing results. What this suggests perhaps is that a language tailored to the way machine neural networks read words is a new kind of language that we, as humanity, must begin to learn if we want to communicate with AI, which, given the pace and scope of the changes

unfolding, seems inevitable. Notably, prompt C won all three categories in the respondents' assessment, although as inspiration it received the same score as prompts B and D. The equal frequency of identifying images from groups B, C and D as the most appealing in terms of their use as the basis for a full architectural concept leads to the collateral conclusion that the elimination of linguistic errors should be considered a sufficient correction, and that a good proficiency in English should be considered a necessary skill in working with the Midjourney model. The expanded prompt, achieved through the use of ChatGPT in the process, improved the aesthetics of the whole image, influencing factors such as lighting, context and camera angle, but for respondents with architectural background, the presentation itself appeared to be secondary to the form and aesthetics of the building and the materials used in the design¹⁰. Due to the small number of respondents, the results may not be entirely conclusive, but we made the decision to publish them since research in the use of AI, including image generation in the field of architecture, is critically needed today. Collecting data to accelerate the ability to assess the usefulness and use of AI is the imperative of the present time.

¹⁰ This data was contained in original prompts prepared by the participants.

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Future research

The initial pilot study presented in the article provides a basis for the formulation of strategies for experiment repetition with a greater group of respondents. The analysis of the process of creating an architectural concept using generative image models, on the other hand, forms the basis of a scenario for a summer workshop for students aimed at demonstrating effective selection of words to get the result closest to the intended one.

Recognizing, that students – and, consequently, future architects – will use AI more frequently in the design process, efforts must be made to develop new teaching strategies and criteria for evaluating the projects carried out by students in the course of their education. The curriculum should undergo necessary updates in the face of transformations.

The ongoing technological revolution obliges us as researchers to take responsibility, especially since we are also operating in the field of education. We envision the university as an institution responsible for responding to today's challenges and striving to keep abreast of and strategically respond to the newest advancements.

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Streszczenie

Utracone w tłumaczeniu. Pilotażowe badania nad problemem tłumaczenia ludzkich myśli na język maszyn

W artykule przedstawiono przebieg badań pilotażowych przeprowadzonych w Instytucie Architektury Politechniki Łódzkiej latem 2024 r. Wzięli w nich udział studenci kierunku architektura. Tematem badań było prześledzenie procesu tworzenia koncepcji architektonicznych za pomocą generatywnego modelu obrazowego Midjourney przez osoby niemające wcześniej styczności z projektowaniem wspomaganym narzędziami AI, dla których to osób język angielski – odczytywany przez narzędzie zdolne przetwarzać ciąg słów kluczowych na obraz – nie jest językiem ojczystym. Celem autorów było uchwycenie trudności wynikających z błędów translacyjnych oraz braku umiejętności posługiwania się skryptem. Precyzyjnie określony architektoniczny problem projektowy uczestnicy badania realizowali, wybierając spośród obrazów wygenerowanych w modelu w wersji 6.0 na podstawie uprzednio przygotowanych przez nich promptów. Uzyskane rezultaty wskazują na trudności wynikające z konieczności przełożenia myśli na język w pełni zrozumiały dla *maszyny*. Tytuł artykułu, nawiązujący do filmu *Między słowami* w reżyserii Sofii Coppola, podkreśla ulotną istotę problemu: słowa są jedynie pewnym sygnalizatorem znaczenia, który często zawodzi w pełnym zobrazowaniu myśli.

Słowa kluczowe: sztuczna inteligencja, AI, sztuczna inteligencja w architekturze, Midjourney, AI w szkolnictwie wyższym

