Fundamental Research Paper DOI: 10.53681/c1514225187514391s.35.290

INNOVATIVE GRAPHIC DESIGN FOR WEBSITES: COMBINING ARTIFICIAL INTELLIGENCE AND PARAMETRIC DESIGN

Diseño Gráfico Innovador Para Sitios Web: Combinando Inteligencia Artificial y Diseño Paramétrico

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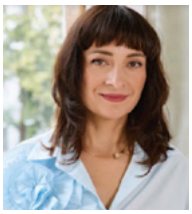

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ABSTRACT

The innovative technologies are used to provide the latest approach to creating graphic design projects. The aim of the study is to determine the impact of artificial intelligence (AI) and parametric design on innovative graphic design.
The aim was achieved by employing SWOT analysis, Thurstone Scale, calculations of eligibility criterion, influence coefficient, root mean square error (RMSE).
The research established that creating a website requires taking into account important parameters of graphic design. The set parameters are colour range (τ=1.18), texture (τ=1.15), geometric shapes (τ=1.21), abstract drawings (τ=1.20), visual communications (τ=0.90). The authors found that Designs.ai (2.5) and Adobe Sensei (2.23) may be the most effective AI applications for creating graphic design on a website. The applications have advantages because they facilitate the creation of individual design projects and are characterized by the possibility of using various innovative tools. The SWOT analysis established that the combination of AI and parametric design has a positive effect on the creation of graphic content for the website. The positive impact is associated primarily with the use of an automated approach (21%), the creation of individualized content (22%). The practical significance of the research consists in choosing the most favourable AI technologies for creating graphic design for the website. Research prospects may be identifying approaches to creating graphic design for a website and developing visual learning material.

KEYWORDS

Sound Postcard; Musical Creation; Graphic Score; Collaborative Learning.

RESUMEN

Las tecnologías innovadoras se utilizan para proporcionar el enfoque más novedoso a la creación de proyectos de diseño gráfico. El objetivo del estudio es determinar el impacto de la inteligencia artificial (IA) y el diseño paramétrico en el diseño gráfico innovador.
El objetivo se alcanzó empleando el análisis DAFO, la escala de Thurstone, cálculos de criterio de elegibilidad, coeficiente de influencia, error cuadrático medio (RMSE).
La investigación estableció que la creación de un sitio web requiere tener en cuenta parámetros importantes del diseño gráfico. Los parámetros establecidos son la gama cromática (τ=1,18), la textura (τ=1,15), las formas geométricas (τ=1,21), los dibujos abstractos (τ=1,20) y la comunicación visual (τ=0,90). Los autores descubrieron que Designs.ai (2.5) y Adobe Sensei (2.23) pueden ser las aplicaciones de IA más eficaces para crear diseños gráficos en un sitio web. Las aplicaciones presentan ventajas porque facilitan la creación de proyectos de diseño individuales y se caracterizan por la posibilidad de utilizar diversas herramientas innovadoras. El análisis DAFO estableció que la combinación de IA y diseño paramétrico tiene un efecto positivo en la creación de contenidos gráficos para el sitio web. El impacto positivo se asocia principalmente con el uso de un enfoque automatizado (21%), la creación de contenidos individualizados (22%). La importancia práctica de la investigación consiste en elegir las tecnologías de IA más favorables para crear el diseño gráfico del sitio web. Las perspectivas de la investigación pueden ser la identificación de enfoques para crear el diseño gráfico de un sitio web y la elaboración de material didáctico visual.

PALABRAS CLAVE

Postal Sonora; Creación Musical; Partitura Gráfica; Aprendizaje Colaborativo.

Data de submissão:
08/07/2024
Data de aceitação:
05/05/2025

1. INTRODUCTION

The current prevalence of graphic objects is associated with the search for effective approaches to presenting information that can be found on various layouts, websites, blueprints, etc. It is possible to achieve higher quality in the creation of visual materials with the help of AI (Birhan, 2024). Based on clearly adjusted parameters, AI enables determining the necessary patterns and creating visual objects. Therefore, the search for the most effective models for creating a graphic design of a website is a relevant issue.

The possibilities of graphic design can be expanded with the help of a parametric approach, which is related to working with geometric objects using interactive technologies (Dargan et al., 2023). The field of application of parametric design is not limited to the creation of architectural objects, engineering, it can also be used as digital software (Kong et al., 2024). The combination of AI and parametric design enables creating more individual objects, focusing on your own thinking and interactive capabilities. AI helps to improve the design efficiency the author's projects, as well as to create non-standard projects (Issa & Isaias, 2022; Kivijärvi & Pärnänen, 2021). Parametric design is one of the most relevant approaches to creating design, as it involves the use of variable parameters. The use of this approach when developing websites provides greater opportunities in combining complex elements and forms. On the basis of parametric design, it is possible to use non-linear forms that affect the originality of the overall design (Macdonald, 2023). In this way, three-dimensional objects can be created for websites that attract the users' attention. This improves the quality of information perception for websites for services or the transfer of educational content (Murchie & Diomede, 2020). This affects the provision of the latest forms of information presentation, combining visual and textual materials. The use of interactive graphic design during the creation of a website affects the flexibility of work and increased speed. It also affects the preservation of the appropriate format when creating a web page (Brown et al., 2024).

Graphic design should be associated with a harmonious combination of colour scheme, design layout, additional elements. The interactive approaches area used for automatic adaptation of the sizes of graphic objects in accordance with the website and its orientation (Zhang & Hwang, 2023). The quality of created graphic objects can also be preserved with the help of AI, which will allow adequate perception of information on desktop or mobile devices. The created graphic objects should be related to the loading speed, which enable an easy perception of the information. The aesthetics and functionals of the website can be combined with the help of interactive approaches that allow to ensure user requirements (Semerádová & Weinlich, 2020). The preparation of high-quality objects will attract the users' attention due to the focus on professionalism and reliability.

The designer plays a vital role in creating graphic designs, as he ensures the creation of appropriate strategies and conceptual ideas for design (Issa & Isaias, 2022). The designer also controls the project's quality and adjusts the necessary details. Thus, the designer controls the integrity of the created project, which corresponds to a certain brand, typography, colour scheme, etc. The designer ensures compliance with the logical sequence in the creation of projects, which affects the reflection of their uniqueness (Brown et al., 2024).

The conducted research of information gave grounds to determine that interactive technologies are used for the implementation of graphic design. However, the search for approaches to the implementation of modelling approaches with the help of AI in the educational process is not sufficiently studied. The aim of the work is to study the features of innovative graphic design as a result of the combination of AI and parametric design.

The objectives of the study were to:

- Determine the parameters of graphic design that ensure the possibility of perceiving information on the website;
- Identify AI applications that have a positive impact on the creation of graphic design for the perception of information on the website;

- Determine the advantages and disadvantages of the combination of AI and parametric design using SWOT analysis;
- Determine the most important criteria for the positive impact of AI on the creation of parametric design.

2. LITERATURE REVIEW

Finding creative solutions for graphic design is common enough when creating video games. The combined use of the Map-Elites evolutionary algorithm and software models enables creating high-quality visual effects for video games. This approach is used to fulfil creative tasks and significantly reduce the time it takes to create a professional design (Chueca et al., 2024). The importance of web design components is the dissemination of information, the development of social networks, and e-commerce. Therefore, the created websites should be aimed at supporting user activity due to the display of high-quality graphic content. The implementation of graphic design is possible thanks to the well-thought-out organization and structuring of information (Vu et al., 2021). Computer graphics expands the possibilities of graphic design, as it expands the range of current directions. It also contributes to the complexity of parametric designs, the creation of new projects in a multimedia environment. This is determined by the possibility of computer graphics to automatically influence the creation of new forms and create more complex designs (Mamurova et al., 2023). Interactive design helps to improve the quality of advertising due to the use of modern technological achievements. The creation of the design should be accompanied by thematic and content analysis, which will allow to select the necessary criteria. Interactive design promotes teamwork, which is reflected in the quality of project management. It also promotes creativity, which results in the creation of modern graphic design (Opoku et al., 2020).

The first stage of graphic design should be the creation of a layout model, which can be implemented using Generative Adversarial Networks. The problems in layout development may arise when determining the location, size of individual elements, aspect ratio, etc. This problem can be solved with the help of an interactive GAN layout, which automates the necessary elements. It can also synthesize graphic layouts characterized by various input data, while preserving their originality and creativity (Li et al., 2021). Creativity and innovation should be ensured for online learning, which can be conveyed with the help of graphic objects. The Canva programme is used for creating complex algorithms for learning, focusing on different designs. The instructions affect the organization of processes, design methods, colour selection (Anwar, 2021). Internet technologies facilitate the development of design for virtual communication, which is based on multifaceted analysis. Multimedia elements in graphic design convey higher quality factors that will be perceived by consumers. Interactive technologies contribute to the development of graphic images, generalization of text, colour selection. So, visual information is conveyed more intelligently, opening up new opportunities for artistic design (Liu, 2021).

Graphic design facilitates virtual communication and creates attractive designs. The created interactive designs differ in their uniqueness and the number of pixels. Quantitative and qualitative experimental studies have shown the greatest effectiveness of projected layouts in influencing the understanding of visual materials (Lee et al., 2020). Graphic and communication design should focus on professional trends that are aimed at globalization. Interactive technologies in graphic design combine complex models to create non-standard objects. They are used to create images that include the smallest details, focusing on the set tasks (Cezzar, 2020). Icons are a separate element of interactive graphic design that complement the main project. Their use contributes to the optimization of the graphic design, improves the efficiency of information presentation. They ensure the implementation of programmed ideas and affects the redistribution of information for better visual perception (Rossi & Palmirani, 2020).

The conducted literature review found that the study of the creation of interactive graphic design for a website is not a common issue. More often, the works describe the features of creating graphic design for industrial facilities. The interactivity of graphic design is described in a general way, which excludes the presentation of specific AI technologies, and affects the gaps in existing research.

3. METHODOLOGY

3.1. Research design

The first stage of the research provided for determining the elements of parametric analysis, which must be taken into account during the website development. The elements were created depending on the possibility of improving the visual content itself, which is based on graphic design. The authors intended to establish the most influential element.
At the second stage of the research, the authors analysed AI technologies that have an impact on the creation of graphic objects for the website. The authors considered interactive technologies that affect different functions (creating illustrative material of different levels of complexity, diversifying the colour range, the possibility of creating videos, etc.). The effectiveness of interactive technologies was determined with the help of respondents.
The third stage of the research involved determining the advantages and disadvantages of the combination of AI and parametric design. The results were obtained through the use of SWOT analysis. The SWOT analysis is also intended to identify possible threats and weaknesses.

3.2. Sampling

The study involved 154 respondents who had experience working with graphic design specifically for creating websites. The respondents were selected by submitted applications among students of the 5th years who were developing professional skills in this direction. Students' applications for participation were submitted online using electronic mailboxes. The selection of respondents involved the preliminary development of graphic objects in accordance with various specified criteria. This approach was aimed at respondents' understanding of graphic design features that needed to be paid attention to during the research. A total of 178 applications were submitted from possible respondents, but some of them did not meet the specified criteria. Respondents participated in the second phase of the study, which involved identifying the most influential interactive technologies for creating website graphic design.

3.3. Methods

The elements that are necessary for creating a graphic design for the site were determined experimentally. The process involved the analysis of the website parameters that affect the quality of graphic design. The selection of elements was related to the determination of their positive and negative impact. The impact of established individual elements on the quality of the parametric analysis was determined based on the calculations of the criterion of belonging (Billard & Moran, 2022). This criterion allows not only to establish more significant indicators, but also to additionally calculate the standardized deviation. Errors were made in the calculations if the value of a separate calculation exceeds 3.

$$\tau = \frac{x_i - \bar{x}}{\sigma_x}, \quad (1)$$

x_i – conditional value of a separate parameter;
$\bar{x}$ – the difference between the most influential element and the evaluated parameter;
σ_x – mean square deviation.

The most influential AI technologies for the creation of parametric design were determined in a practical way. A total of 25 different applications were used to create graphic design elements for the website. The most effective interactive tools were presented in the work results. Furthermore, the methods of synthesis and deduction were used to determine positive and negative functions of AI technologies. This stage of the study involved respondents creating graphic objects for the website. The Thurstone Scale was used to determine more influential technologies according to the respondents. The selection of effective technologies involved the creation of graphic objects for the website by the respondents. As a result of this approach, students determined the most effective functions of AI technologies. The data were collected from students using electronic mailboxes. The collected data were grouped to calculate the percentage ratio, which contributed to the calculations of the impact factor.

$$\psi = \frac{c-d}{n-1}, \quad (2)$$

c – conditional evaluation of the effectiveness of a particular AI-based application;
d – the difference between the most influential AI-based application and the application under study;
n – the number of AI-based applications that were analysed in the study.

A SWOT analysis was used to determine the positive and negative specifics of AI for creating graphic design. Conducting a SWOT analysis involves focusing on well-founded information that contributes to the identification of positive and negative factors. The external and internal factors that have an impact on the analysed object are taken into account during the SWOT analysis. The significance of individual parameters was additionally established when determining the positive impact. The significance of the parameters was presented as a percentage.

3.4. Data analysis

The mean squared error (MSE) was calculated for statistical analysis (Swanzy-Impraim et al., 2023). Statistical analysis influences the more thorough confirmation of the numerical indicators that provide the development of the "Results" section. Statistical calculations were carried out when determining the elements that have an impact on the professionalism of the creation of graphic objects. The root mean square error (RMSE) was used to compare the effectiveness of AI technologies. The final calculated results, at the significance level (α) of 0.01, will be correct if the obtained values are less than the tabulated values.

$$S_r = \frac{1-R^c}{\sqrt{n-1}}, \quad (3)$$

R^c – multiple correlation indicator, which depends on the obtained numerical values;
n – the number of indicators for calculation.

4. RESULTS

Creating a website requires a combination of harmonious approaches that affect the perception of information and its professionalism. Therefore, the authors identified elements of parametric design that have the greatest impact on the perception of information on the website. The results were obtained using the calculations of the criterion of belonging (Fig. 1).

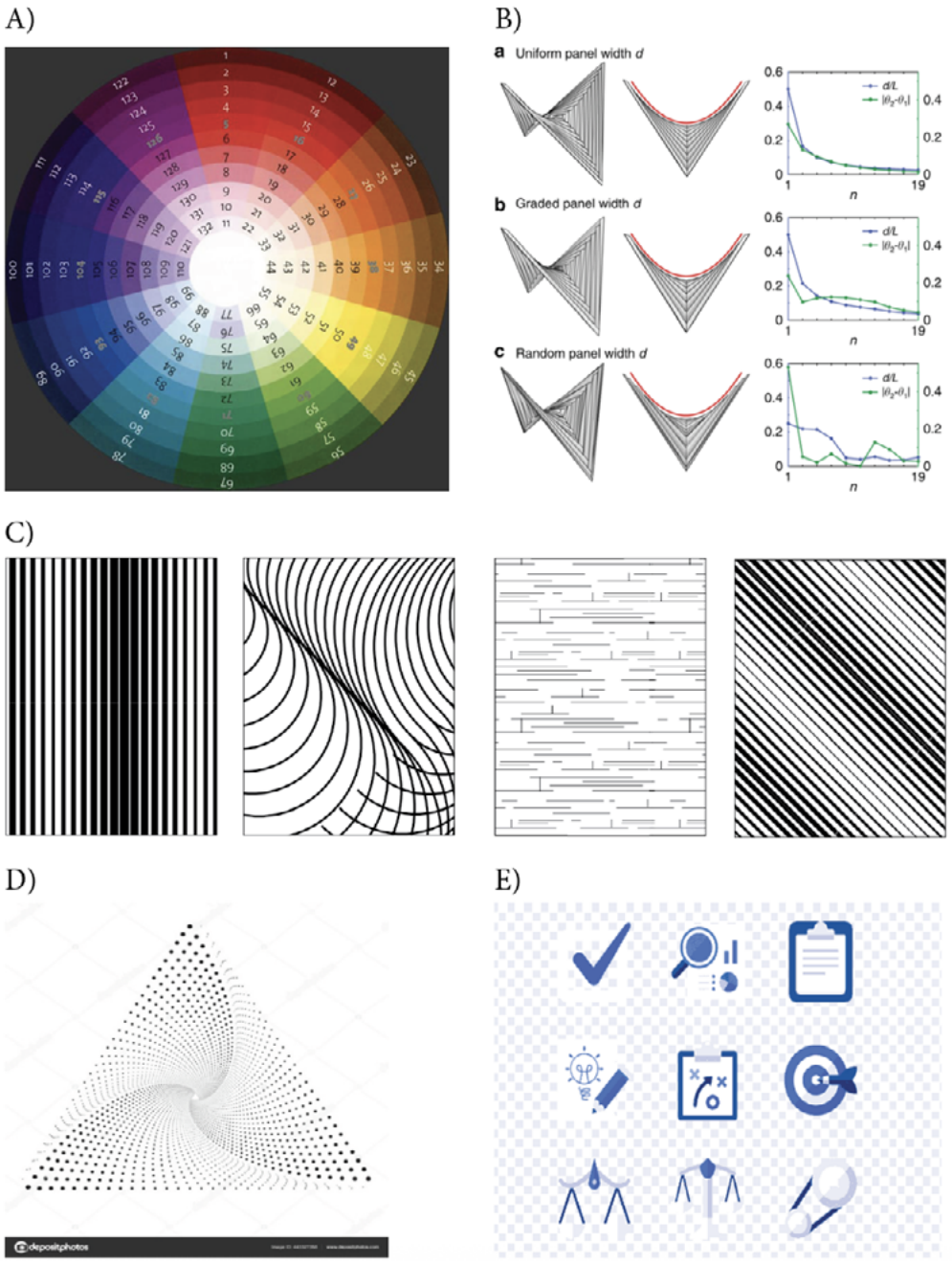

Fig. 1
The elements of parametric design that influence the creation of graphic objects for the website: A) colour spectrum (τ=1.18); B) geometric shapes (τ=1.21); C) texture (τ=1.15); D) abstract drawings / shapes (τ=1.20); E) visual communications (icons) (τ=0.9); = 0.557.

The colour spectrum during the creation of a parametric design has one of the most important values, which is associated with easier perception of information. The colour spectrum makes it possible to emphasize the individuality of the website, the qualitative perception of the project. When creating a design, it is necessary to select colours according to functionality and hierarchy. The colour makes it possible to create appropriate contrasts. The choice of colour spectrum should be related to the definition of the format of the website, graphic forms that will be harmoniously combined with each other. The selection of chromatic colours should affect the comfort of perception. The texture of the graphic object contributes to providing depth and spaciousness, provides visual perception. The texture in graphic design is also responsible for the combination of points with each other, which contributes to the realistic perception of the object, the creation of the necessary shades. The realism of the image is also formed on the basis of additional relief, colouring. Texture in 3D graphics can contribute to the transparency of drawings, mirroring elements. Overlaying textures helps to create a new design for a better perception.
Geometric shapes in parametric make it possible to achieve the desired results due to variations

in lines, circles or other geometric shapes. They enable making organic or sharp transitions in the corresponding object. The use of complex geometric shapes contributes to the creation of extraordinary projects, which diversifies the website's constructivism. This affects creative freedom, the ability to ensure photorealistic perception. The creation of software projects on their basis is more effective. *Abstract drawings / shapes* contribute to the creation of non-standard visual effects. So, the stylization of graphic objects is more relevant, which corresponds to modern standards. Abstract drawings and shapes make it possible to emphasize specific information. *Visual communications* (icons) can also be realized through graphic design. Their use helps to increase the functionality of a particular website, while forming a competent composition of visual design. Visual communication has the effect of not only improving the design, but also provides functional solutions, for example, due to the transition to another page of the website.

During the research, the authors identified innovative technologies that can be used to create a website. However, the focus was on the ability to create graphic objects. The most influential technologies were chosen with the help of respondents (Fig. 2).

Fig. 2
AI-based applications that can be used to create graphic designs, = 0,823.

Uizard is one of the interactive programmes that provides the ability to create graphic objects. The programme helps to work with geometric shapes, lines, points, providing a

three-dimensional perception of a visual image. The programme contributes to the creation of the main logo, provides the opportunity to develop additional elements for visual communication. The ready-made templates makes it easier to work in the programme, but it takes a lot of time to create a quality product. The programme functions provide for the digitization of the created drawings, which requires the involvement of designers and developers in the search for an idea that will later be digitized for the website. With the help of the Uizard application, it is possible to ensure the original creation of design projects, which is limited to copyright materials. Therefore, to create a project using an application, it is necessary to provide the development of the author's idea, which will be implemented using artificial intelligence. Uizard creates a visual identity through the available tools, corresponding to the appropriate brand. The graphical application Adobe Sensei offers more advantages than Uizard, which is explained by a simple interface and a variety of interactive tools. The advantages of the interactive application are related to the possibility of creating not only graphic objects, but also working with colours. The graphic application enables using vector and raster images for work. It also provides work with textual information that is directly related to a visual one. The creation of small details ensures the increased quality of visual material for the website. However, paid access shall be provided to get the advanced version. The Adobe Sensei application is entirely AI-based, which provides the ability to automate the creation of designs. At the same time, an individual approach is used, which affects the overall creativity. The Adobe Sensei application is associated with a more creative approach to creating website designs. Based on artificial intelligence, it provides a unique design based on the specified style. Visual identity is formed automatically. The application can be used as an auxiliary designer tool without copyright infringement. The SketchUp application facilitates the creation of three-dimensional models, which provides the ability to develop parametric design. The advantages of SketchUp are related to the ability to provide teamwork, creating high-quality graphic models. The interactive application SketchUp I used to ensure simplicity and clarity of forms, which contributes to the creation of clear objects. However, the creation of 3D objects requires the active participation of designers, as the use of ready-made models is quite limited. The originality of the designs created using the SketchUp application is not high enough, since it focuses more on te mplate approaches. The authorship of the created projects entirely belongs to the developer, since the author is fully responsible for the created projects, which excludes an automated approach. Therefore, the visual identity of the created design depends on the developed project and the possibility of its implementation using the SketchUp application. *Blender* is one of the best interactive applications for creating graphic objects. It enables working not only with three-dimensional models, but also with textures, colour spectrum. Visual modelling combines several drawings that are connected to each other using nodes. Blender is used to create animations of various levels of complexity. This approach affects visual lightness and provides high-quality spatiality. Using AI technology, Designs.ai has one of the most compelling approaches to graphic design. Broad functions affect the possibility of creating a parametric design, developing logos or videos. The Blender application is not limited to formulaic approaches, which allows you to create original projects based on various 3D-pidkhodiv and animations. It also creates a visual identity based on the flexibility of methods used to display the desired style. Thus, the authorship remains with the designer based on the unique visual code created. The Designs.ai application makes it possible to create advertisements that can be harmoniously combined on the website with the main information. AI facilitates the automated creation of individual design projects that will correspond to the main design of the website. A large number of graphics, colours, fonts affects the achievement of a professional level of created graphic objects. This ensures the creation of original content based on artificial intelligence tools. It also contributes to the creation of a high level of visual identity correspondence in accordance with the specified brand. The authorship of the created project is divided between the designer and artificial intelligence. The *Khroma* application is also Ai-based, but its use in graphic design is primarily related to colour selection. The application facilitates the creation of an individual colour

scheme that will be most clearly related to the website style. But Khroma cannot be used to create full-fledged parametric models. The originality of the Khroma application is limited since it involves targeting selected colours and fonts. Thus, the designer entirely owns the projects created. High-quality visual identity can be achieved by choosing an individual approach to the creation of the project while maintaining a unique style.
During the study, the authors determined the impact of combining AI and parametric design to provide innovative graphic design for the website. The results were determined on the basis of a SWOT analysis. Furthermore, the significance of the positive impact was determined depending on the set indicators (Tab. 1, Fig. 3).

Positive impact (strengths)	Negative impact (weaknesses)
- Creation of personalized content - Automated approach - Creation of clear graphic objects - A harmonious combination of graphic object elements (design, shapes, colours, etc.) - Searching for new ideas for graphic design	- Lack of digital skills, which ensures the creation of low-quality content
Opportunities	**Threats**
- The ability to predict new trends - Increasing the professional level - Continuous improvement of graphic objects as a result of improvement of interactive applications	- The creation of a graphic object will not contribute to effective placement on a web page because of the selection of inappropriate interactive tools

Tab. 1
Determining the advantages and disadvantages of AI for creating parametric design based on SWOT analysis.

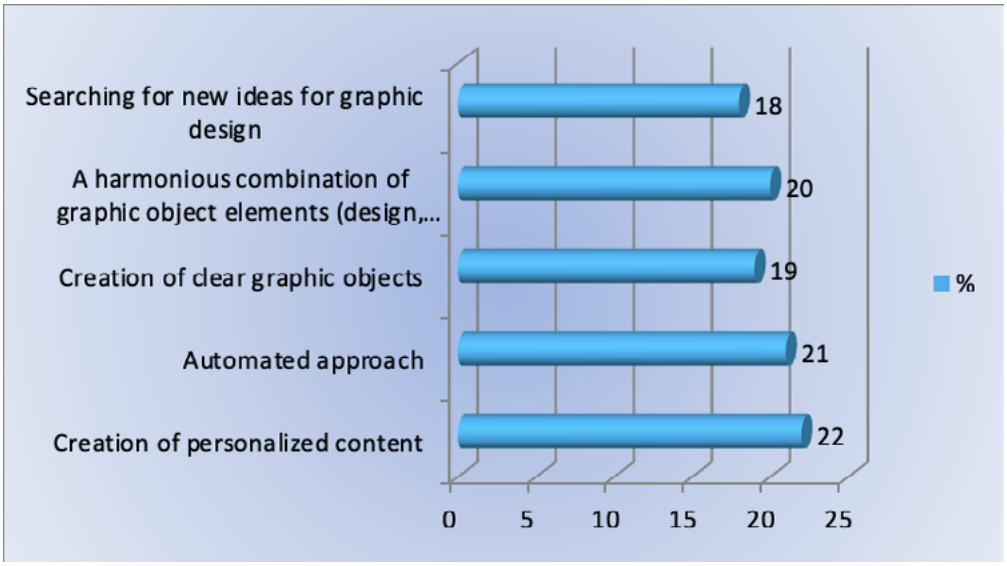

Fig. 3
Positive impact parameters from using AI to create parametric design.

Artificial intelligence contributes to providing a positive influence for the creation of graphic design, which is associated with the possibility of transferring individualized content, an automatic approach to its creation. AI also ensures the transfer of clear images, the search for new ideas, and the harmonious combination of graphic design elements. So, parametric modelling has an impact on ensuring a qualitative approach to the generation of visual elements. AI makes it possible to make creative designs focusing on increasing professionalism. The automation principles make it possible to eliminate monotony, ensuring efficient processing of repetitive elements. On this basis, it is possible to provide high-quality drawing of the background, its alignment, which improves image clarity. AI enables creating more effective designs that correspond to the attraction of readers to the website. The negative impact and possible threats are not significant, which can be minimized by ensuring a thoughtful approach.

5. DISCUSSION

Creating graphic design for software requires finding effective interactive practices. The use of interactive technologies should be based on powerful tools, which expands standard boundaries. This allows for a high level of accuracy and enables the display of complex graphic forms (Hidayah, 2024). Artificial algorithms optimize graphic design options, which can be related to full automation. However, modern generative design tools exclude the human factor, which limits the potential emotional reactions of innovative products. Mixed approaches have a positive impact on the computational and generative design, which affects the advanced development of simulated projects (Demirel et al., 2023). The effectiveness of the presentation of graphics and video materials depends on the ability to use digital technologies for graphic design. This requires working through each element of the design to ensure that the most valuable design is developed, which is focused on the needs of consumers. The combination of graphic design and appropriate context shows a higher quality context (Doan et al., 2024). The elements that influence the development of graphic design were indicated in the published articles. Our work also established the necessary elements of graphic design, but the emphasis was placed on improving the website design. The development of 3D objects should be associated with a detailed analysis of information, focusing on the possibility of using complex and irregular models. Digital technologies ensure the search for necessary bills, points for creating a design. VoxelNet, SECOND, and PointPillars applications enable creating symmetric models while preserving the underlying geometric information (Li et al., 2023). The creation of high-quality graphic design should be based on the development of creative strategic adaptive approaches. When choosing interactive technologies, it is necessary to focus on possible advantages and disadvantages. Interactive technologies should ensure the creation of accurate and efficient objects, which affects the reduction of time and the possibility of developing complex models (Goria, 2022). Computer-aided design facilitates the creation of graphic models, focusing on the preliminary analysis of the project and project documentation. AI expands the possibility of designing and affects the rapid development of complex graphic elements. Interactive modelling allows finding the most innovative solutions, focusing on their optimization (Hunde & Woldeyohannes, (2022). Artificial design systems contribute to the development of the structure of the graphic project, which ensure the quality of information presentation in the educational process. AI systems provide a complete set of tools for computer graphics, focusing on different levels of complexity and various details. This allows for greater accuracy in the creation of graphic projects and to eliminate possible errors (Hemachandran et al., 2022). The reviewed studies indicate the general advantages of AI during the creation of graphic design. In this study, we identified not only advantages, but also possible disadvantages, which was implemented with the help of a SWOT analysis.

Generative design reflects automatic design methods, which enables achieving the creation of parametric design and optimizing new opportunities. AI takes into account possible obstacles, which enables providing creative design solutions. AI determines the necessary

style, graphics, colour, font that will satisfy the users' demand (Jang et al., 2022). The relationship between graphic design and human life is more stable, which is related to the information exchange. Information communication takes place through visualization, which can be implemented using three-dimensional modelling. Modern art design is an innovative approach that improves image quality (Gu et al., 2023). Creating video games requires high-quality and individual graphic design. For this purpose, it is necessary to determine key events, storylines, which diversify the design and determine the smallest details. The AI-based programme SCENECRAFT makes it possible to adapt the design to the player's choice and the author's instructions (Kumaran et al., 2023).

Comparison of published academic articles with our work made it possible to determine the prevalence of methods of preparation for creating graphic design. Our article defined the parameters that must be taken into account when creating a graphic design specifically for the website. The work analysed various AI technologies that contribute to the creation of a parametric design for a website. The paper also determined what advantages and prospects there are for using AI programmes to create graphic design. The criteria were determined using a SWOT analysis.

5.1. Limitations

The research limitations are related to the lack of techniques for creating a specific parametric design when using AI. However, this limitation relates to the pedagogical field, which can be considered in further studies. The authors presented various technologies for the possibility of creating a graphic design. This involved determining their positive or negative impact, which can be used later during the educational process.

5.2. Recommendations

The variety of interactive possibilities can influence the selection of inefficient technologies used to create graphic design. Therefore, the use of AI technologies allows to eliminate possible problems and affects the provision of individuality in design. AI technologies contribute to an improved perception of information, focusing on a unified style in the website creation.

6. CONCLUSIONS

The aim of the study set by the authors was achieved during the conducted research. First of all, the parameters that affect the quality and professionalism during the creation of graphic design for the website were established. It was found that geometric shapes (1,21) make it possible to create quality projects, focusing on the variety of graphic designs. Colour spectrum (1.18) and texture (1.15) are also important, providing the ability to highlight important details. Abstract forms (1.20) and visual communications (0.9) contribute to complementing visual design by emphasizing individual information.

During the research, the authors analysed five different AI-based applications for creating graphic design. The interactive application Designs.ai has been found to have a positive impact on the creation of graphic design for the website, as it provides the most individuality. Adobe Sensei graphic design tools make it possible to combine vector and bitmap images, focusing on working with design and colours. The Blender application provides the ability to combine various drawings with each other. The Wizard application facilitates work with graphic design based on the creation of additional important elements. The Khroma application is less important, as it affects the quality of colour selection, but does not provide work with graphic forms. The SketchUp application is effective for creating three-dimensional models, but it requires the active involvement of designers, which is not related to full automation of the process.

SWOT analysis found that the combination of AI and parametric design has a mostly

positive effect on the creation of graphic material for websites. The positive influence is manifested in automation, the possibility of creating individualized content, the creation of clear graphic objects, the possibility of a harmonious combination of elements of a graphic object, and the search for new ideas.
The practical value of the work is the possibility of using selected AI technologies for building graphic design development skills for websites. Research prospects are aimed at creating different parametric designs using the presented AI applications and determining their quality.

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Reference According to APA Style, 7th edition:
Wei, L., Kolisnyk, O., (2025). Innovative Graphic Design for Websites: Combining Artificial Intelligence and Parametric Design. *Convergências - Revista de Investigação e Ensino das Artes, VOL XVIII* (35), 101-115. https://doi.org/10.53681/c1514225187514391s.35.290