

COMPUTER GRAPHICS AND DESIGN SCIENCE AND ITS APPLICATIONS

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Abstract. *It is important to use advanced and modern teaching methods and implement new pedagogical technologies to master the science of computer graphics and design. Textbooks, educational and methodical manuals, lecture texts, standards, handouts, electronic materials, presentations, video lessons, virtual stands and advanced pedagogical technologies are used in mastering the subject. A variety of graphics in the field of computer graphics and design science creation of objects, results of experiments in the form of text, images and raster graphics graphic applications necessary for processing, as well as creating illustrations great attention is paid to the use of graphic editors.*

Keywords: *computer graphics and design science, illustration.*

In computer graphics and design science, great attention is paid to the use of necessary graphic application programs for creating various graphic objects, processing experimental results in the form of text, images and raster graphics, as well as graphic editors for creating illustrations.

Computer graphics and design is widely used in various fields: in medicine to create the images of body parts, in architecture to create models and drawings, and in advertising and in marketing to create design of product and creative promotion.

Computer graphics and design is indispensable part of companies, entertainment, mainstream media, cultural image, and branding. It enables people to turn their ideas into high-quality pictures.

Fields that Computer graphics apply are the following :

- Design - banners, background pictures, opening pages, websites and others ;
- Animation and play industry - videos , fantastic universe and heroes ;
- Print and advertising - from booklets pulling to huge 3D projections ;
- Film industry - special effects ;
- Industry - 3D modeling ;
- Architecture – visualization of projects and creating renders;
- Painting – digital pictures ;
- Medicine - education simulators, for example, creating implants and prosthesis such as Dental VirTeaSy.

● Education and culture - simulations and extended reality projects, for example, Google Arts & Culture.

In the graphics some upcoming tendencies are the following:

- Minimalism: Minimal elements and subtle color schemes with simplified and clean designs are remaining famous.
- Dark mode: alternative visual style and the eye strain reducing interfaces.
- Three dimensional (3D) typography: creating visual designs based on text and using dynamic typography.

- Abstract and *surreal* art: creating designs that are against traditional views and contain abstract shapes.

- Motion graphics: adding visual animations and dynamic elements in order to showcase valuable experiences.

Graphics are also a key component of video games, as they contribute to creating immersive and visually appealing experiences for players. High-quality graphics, including realistic three-dimensional (3D) models, textures, lighting effects, and animations, are essential to creating a visually stunning game environment. Graphics engines and rendering technologies are used to create vibrant characters, detailed landscapes, and visually impressive special effects that enhance the overall gaming experience.

Graphics play an important role in data visualization by presenting complex data sets in a visually appealing and understandable way. Charts, graphs, and infographics can be used to transform data into intuitive visuals that make it easier to understand and analyze. Graphics help identify patterns, trends, and correlations within data, allowing users to make informed decisions based on the information presented. Whether it's a line chart, pie chart, or interactive data visualization, graphics increase the presence and impact of data-driven storytelling.

Graphics (Greek. *graphike*, *grapho* - I write, draw) is a type of visual art. Based on painting and drawing. are visual images or designs on the surface, such as a wall, screen, paper, or stone, to convey information. Images created by a computer are called computer graphics. The term "graphics" was originally used to mean the art of letters and calligraphy. At the end of the 19th century and the beginning of the 20th century, graphics acquired a new meaning, with the development of the printing industry and the emergence of photomechanics, and became a type of fine art.

One of the main areas used in graphics is the book, and the development of the art of calligraphy and book-making, which arose in the Middle Ages, developed as an art form of writing and decorating manuscript books. After that, miniature art developed, and various schools were created. Today, the world's largest museums hold attractively decorated manuscript book samples.

In graphics two the main element are distinguished :

A graphic image is a set of drawings, understood by their interconnections. Explication is a collection of information that reveals the meaning of a graphic image.

Graphics *explication* can have three types of appearance: geometric, ideographic and personalized.

- Ideographic *explication* - explains the meaning of conventional signs - figurative, linear, background, etc. These conditional symbols have a specific meaning to graphic elements.

- Geometric *explication* - coordinate axes, grid, scales. With their help, geometric figures acquire geometric properties, because with the help of these tools, the properties of geometric surfaces are used.

- Customized *explication* - titles, explanations. These explanations show how graphics occupy a place in the whole complex of this field of knowledge, and from the point of view of language it is the most necessary element of graphics, because without it graphics would have no meaning. Graphic images are photographs, drawings, diagrams and other graphic images included in or attached to the manuscript of the work. The manuscript must identify the author or creator of each Graphic. "Third Party Graphics" are graphics authored or created by a person other

than the author(s). The author(s) will not sell, assign or transfer the copyright of the graphic images of others to the publisher.

As applied to computers, graphics term usually displayed on a computer, stored, created or edited Applies to 2D digital images.

Design is user needs the process of creating an attractive and functional object that satisfies. Design web design, divided into several fields such as graphic design and industrial design.

- Web design - creates a visual interface for websites
- Graphic design - advertising materials, logos, branding, etc creates.
- Industrial design - cars, furniture and is engaged in creating objects such as electronics.

Computer graphics and design are widely used in various fields. In medicine used to create images of body parts. In architecture used to create models and drawings. Product in advertising and marketing design, used to create creative advertising.

Computer graphics and design companies, entertainment, public is an integral part of media, cultural image and branding. This enabling people to express their ideas and turn them into quality images will give. The scope of application of computer graphics and design is very wide. First of all, the visuals and design of this area are noteworthy. In graphic design size, shape, color texture, composition, copy and fonts are important is important. Completing the given task in existing graphic programs and necessary working with shapes, fonts and their sizes to achieve results, having an idea of color models and textures when coloring them, knowledge of composition, rendering of an image on a computer screen, and related to perform actions requires the user to know a certain level of geometrical knowledge requires.

Everything around us is graphic data using a computer carried out: books, magazines, packaging, wallpaper, posters, guides, websites, apps and others. Mostly by hand processed graphics computer combined according to the graphics. An image with ink for this is drawn, then it is digitized. It is combined into a layout and processed. This integration converts a hand-drawn image into a computer graphic.

Illustration as a means of visual addition to the text appeared a long time ago. Even in ancient Egypt, scribes placed images on papyri for the clarity of the text, in addition to the contents of hymns and incantations. Illustrations are also found in European handwritten books from various periods (from Antiquity to the Middle Ages). The book of Oriental (China, Japan, Persia) miniatures of that period contains many images, such as hunting themes, battle scenes, and everyday scenes.

An illustration is an image (drawing, photograph) to explain the text of a work of art, technical documentation or scientific work. Visual images help the reader to deeply feel the atmosphere and understand the main essence of the book. Illustrations are widely used not only in the book industry, but also in advertising and mass media.

Illustrators have a variety of tools to bring their creative ideas to life in a painting. There are all types, styles and methods of illustration to bring ideas to life.

Illustration (lat. *illustratio* — illumination, visual representation) is a field of visual art related to the figurative interpretation of a literary work (book, magazine, newspaper). In addition to the text, it serves to illuminate and complete its content. The first manuscripts appeared in the era of books. Initially, manuscripts were decorated with miniatures, book publishing and the emergence of woodblock printing made graphics the leading field of illustration.

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