Important Aspects of Computer Graphics in Teaching Students in Architecture and Design

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Abstract: *The main purpose of this study guide is to provide short answers to the main a range of questions about the principles, formats and programs of computer graphicshelfand helping to know students master the discipline.*

Keywords: *computer graphics, AutoCAD, Web-design, architecture, design, Multimedia.*

Introduction

In order to improve the quality of education in the educational system of our country, the requirements for the use of new innovative information technologies will further activate the activity of learning. For the same purpose, to further improve the effectiveness of the reforms carried out in the Republic of Uzbekistan, to further improve the continuous education system for the development of education and science, to equip it with modern innovative and computer technologies and teaching methods for the comprehensive and rapid development of the state and society. through strengthening their material and technical base.

For this purpose, computer graphics is getting deeper and deeper into all spheres of human activity. The level of imaging, the quality has reached such a level that many people do not notice that it was created with the help of a computer. Naturally, the computer is widely used in architecture, design and mechanical engineering, where the main carrier of information is images.

The modern level of computer technology software makes it possible to move from traditional, manual methods to new information technologies, that is, designing using computers. In communication with the computer, it is possible to create from the simplest primitives to complex construction documents. The main purpose of this tutorial is to provide students with short answers and a series of questions related to computer graphics principles, formats, and programs to help students master the discipline.

Many books have been written about computer graphics, they are studied, but highly specialized areas or applied issues, such as low-level programming of video adapters or the operation of graphics packages, at the same time, there is often a lack of information for students. But with a general introductory plan that

allows you to navigate the rapidly expanding field of computer graphics, these materials are intended to at least partially fill this gap.

Computer graphics is a science related to the use of computing technology to create graphic images, their display using various tools and their manipulation. The following conclusion follows from the definition - a computer (digital) means that a picture created with a computer program can be named.

Initially, the programmers learned to get drawings in this mode, symbols such as symbolic printing (stars, dots, crosses, letters, etc.), mosaic-like patterns were obtained. Graphs of functions, images of liquid and gas flows, images of electric and magnetic fields, etc. were printed in this way. Symbolically, print programmers were able to create images and even works of art. In the unique computer center, the walls are not decorated, but Einstein portraits, La Gioconda (Monaliza) reproductions and others even managed to create a "color image in the machine". Later, special devices or equipment (plotters) were created that draw on paper for graphics. With the help of such a device, graphic images are applied to a sheet of paper with an ink pen: graphics, diagrams, technical drawings, etc. But a real revolution in computer graphics occurred with the appearance of graphic displays. In graphic display, pictures, pictures in a paper-like form are pencils, paints, drawing tools, and now there are devices that make posters, panels, posters and other things in strong color.

The connection between the traditional system and computer graphics, on the one hand, determines the use of copying technology, on the other hand, you can think of more about the appearance of the term "graphics" in connection with the work. One interpretation of this can be taken as "computer artist". The word "graphics" means "drawing with lines", and all computer graphics programs are mainly divided into two types: vector (drawing lines) and raster (image as points), that is, whatever At first glance, a computer-generated image seems to be inherently complex, each of which is related to a type of graphics. A real revolution in the production of visual products occurred with the advent of the computer at the same time as the technology was changing.

Types of computer graphics. Although there are many classes of computer graphics software, there are only three types of computer graphics. These are raster graphics, vector graphics and fractal graphics. The principles of their formation differ from images on a monitor screen or printed on paper. Another classification also applies, which is Two-dimensional graphics - a two-dimensional image, that is, depicted on a plane. One of the foundations of computer graphics, including three-dimensional (3D) graphics.

Three-dimensional (3D) graphics - special programs for creating with the help of a computer, a spatial model, which contains simple and complex geometric shapes, giving this model textures, colors, levels of transparency and opacity, giving it and in virtual space, conditional camera movement of sources in this space light and, finally, consists in the correct organization of the built scene. used to create computer games, advertising, etc.

Fields of application of computer graphics. Modern applications of computer graphics are very diverse. Let's consider the main areas of computer graphics application.

Scientific graphics - this direction appeared first. Meeting - visualization (visualization) of objects of scientific research, graphic processing of calculation results, implementation of calculations are their results.

Business graphics is a field intended for computer graphics, which are often used in the work of various institutions to create documents, static summaries - the objects from which these business graphics are created are visual materials. Most often, these charts are considered pie charts and bar charts.

Design graphics - used in the work of design engineers, This type of computer graphics is an integral element of systems design automation (CAD). CAD graphics are used to prepare technical drawings of designed devices. Graphics together with calculations allow you to conduct the search in a visual form. optimal design, the most successful arrangement of parts, are facilities for predicting the consequences of changes. With the help of design graphics, there are images (projections, sections) and spatial, three-dimensional (3D) images that can be in the plane.

Polygraphy (Printing) is the reproduction of textual material and graphic images for several sets of technical means. A specialist working in this field needs to know not only programs layouts and graphic editors, but also publications to understand prepress. "Web-design" - design of web pages. It plays the same role as print design for a website and the layout of a paper publication. Most often, under web design, not only the creation of graphic elements for navigation is understood, but also the design of the site and its structure, that is, the creation of the site.

Multimedia is a field of computer graphics related to the creation of interactive programs (possibility of active influence, content and direction of creation), encyclopedias (dictionary system), support systems, educational programs and is to create interfaces to them.

Desktop publishing systems. The concept of desktop publishing (Desktop Publishing) includes all technical and software aspects of computer graphics. At least three main levels can be distinguished, the presence of which ensures the reliable operation of the system.

➢ The hardware level is a set of material elements - with the help of which devices input, process, store, transmit and output data.

➢ Software level by which information elements (programs and their commands) are a collection managed as text and visual information and technical tools.

➢ User-level software (brainware level) is a collection of high-level creative individuals, professionals and ordinary users, which are the hardware and software levels that unite them, as well as creating creative works.

Hardware level. In turn, it consists of the following components:

➢ Data (information) input devices (input devices) - ensure that any information in various media is transformed into a digital form, which creates conditions for its further development computer processing;

➢ data processing, storage and transfer devices (process, storage and transfer devices) - core of the hardware level;

➢ data output devices (output devices) - devices that ensure the translation of digital information into a form that is understandable and convenient for people.

Input devices

✓ The main feature is the same transformation data (images on "hard media") in another form, in our case digital form.

✓ Such devices include:

✓ "keyboard" (keyboard);

✓ mouse (mouse);

✓ trackball (trackball);

✓ scanner (scanner);

✓ digital camera (digital camera);

✓ graphic tablet (graphics tablet);

✓ digitizer (digitizer) and hokozo.

Devices for processing, storing and transmitting information, in most cases, we are talking about the hardware level of the computer, which is a layered structure. Processing device - processor, video processor.

Information storage devices:

➢ random access memory device (RAM);

➢ video card memory;

➢ magnetic media loader (FDD, HDD);

➢ optical media (CD, DVD, etc.);

➢ magneto-optical means (MO, MOD Drive);

➢ removable discs and mass media (flash drives);

➢ tape drives (for example, mini DV), etc.;

Transmission devices - ports and other components.

Information output devices:

Output devices perform the opposite function of input and provide the conversion of digital information that can be read by human visual vision.

Depending on the visualization method, it can be divided into two main classes:

✓ electronic visualization tools (monitors, projectors);

✓ physical means of output (inkjet, laser and photo printers, drawing, photosystem machines).

Program level. The computer does nothing by itself. The following main classes of any Software can be distinguished:

✓ raster (pixel) graphic editors;

✓ vector graphics editors;

✓ three-dimensional (3D) graphic editors;

✓ fractal graphic programs;

✓ layout programs;

✓ utilities (operating system, utilities, plug-in, plug-in, viewer, converters, browsers, archivers, etc.).

User (custom) level. Aesthetic and artistic components are not part of technical systems. The person sitting in front of the computer is at the user level or is called a user.

In short, in this article, only the theoretical part of "Computer graphics" was considered with questions. In the process of operation, practical packages are studied in the laboratory and in the practical process. Many electronic educational materials intended for use in the educational process have been created, such as electronic textbooks, electronic study guides, educational software tools, etc. They increase efficiency

in education to a certain extent due to the presence of features such as controllability, interactive methods, elements of artificial intelligence, emotional flexibility.

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