Introduction :

What is Computer Graphics ?

Computer graphics is commonly seen as a computer science branch that deals with the computerized image fusion theory and technology. As simple as a triangle outline, a computer-generated image may represent a scene. The computer has become a powerful tool for producing images quickly and economically.
When a computer is used to create images, the same process is followed as creating images manually. The process's primary computational steps give a boost to several important computer graphics areas. Also on computers, the term computer graphics covers almost everything. Here in the computer graphics program's classroom, we think of computer graphics as drawing images on machines, often known as **rendering**. The images can be photos, sketches, animations, or pictures of items imagined. Or they may be pictures, we cannot see directly, like internal body parts. We have put a great deal of our time to develop how computer images can replicate real-world scenes. We want objects on computers not only to look more real, but also their colors to be more realistic and how different materials appear. We can call it "real synthesis of the image."

The term computer graphics has been used to define "almost everything on the computer, including text or
sound." Generally, the term computer graphics refer to the following things:
- Computer representation and manipulation of image data.
- Various technologies for creating and manipulating images.
- Computer graphics study is a sub-field of computer science that studies methods for digitally incorporating and manipulating visual content.

The next area of computer graphics that deals with the placement of a triangle is called **transformation**.
Here we can use matrices to get the mapping of a triangle in image space. We can also set up the
transformation matrix to control the location and orientation of the displayed image.

Applications of Computer Graphics

Computer graphics is the part of computer science that studies methods for manipulating visual content although computer graphics deals with 3D graphics, 2D graphics, and image processing. It also deals with the creation, manipulation, and storage of different types of images and objects. There are some of the applications of computer graphics are described below.:

- Computer Art: Using computer graphics we can create fine and commercial art which includes animation packages, and paint packages. These packages provide facilities for designing object shapes and specifying object motion. Cartoon drawings, paintings, and logo designs can also be done.
- Computer-Aided automobiles Drawing: Designing buildings, automobiles, and aircraft is done with the help of computer-aided drawing, this helps in providing minute details to the drawing and producing more accurate and sharp drawings with better specifications.
- Presentation Graphics: For the preparation of reports or summarizing the financial, statistical, mathematical, scientific, and economic data for research reports, and managerial reports, moreover creation of bar graphs, pie charts, and time charts, can be done using the tools present in computer graphics.
- Entertainment: Computer graphics find a major part of its utility in the movie industry and game industry. Used for creating motion pictures, music videos, television shows, and cartoon animation films. In the game industry where focus and interactivity are the key players, computer graphics help in efficiently providing such features.
- Education: Computer-generated models are extremely useful for teaching huge number of concepts and fundamentals in an easy-to-understand and learn manner. Using computer graphics many educational models can be created through which more interest can be generated among the students regarding the subject.
- Training: Specialized systems for training like simulators can be used for training the candidates in a way that can be grasped in a short span of time with better understanding. The creation of training modules using computer graphics is

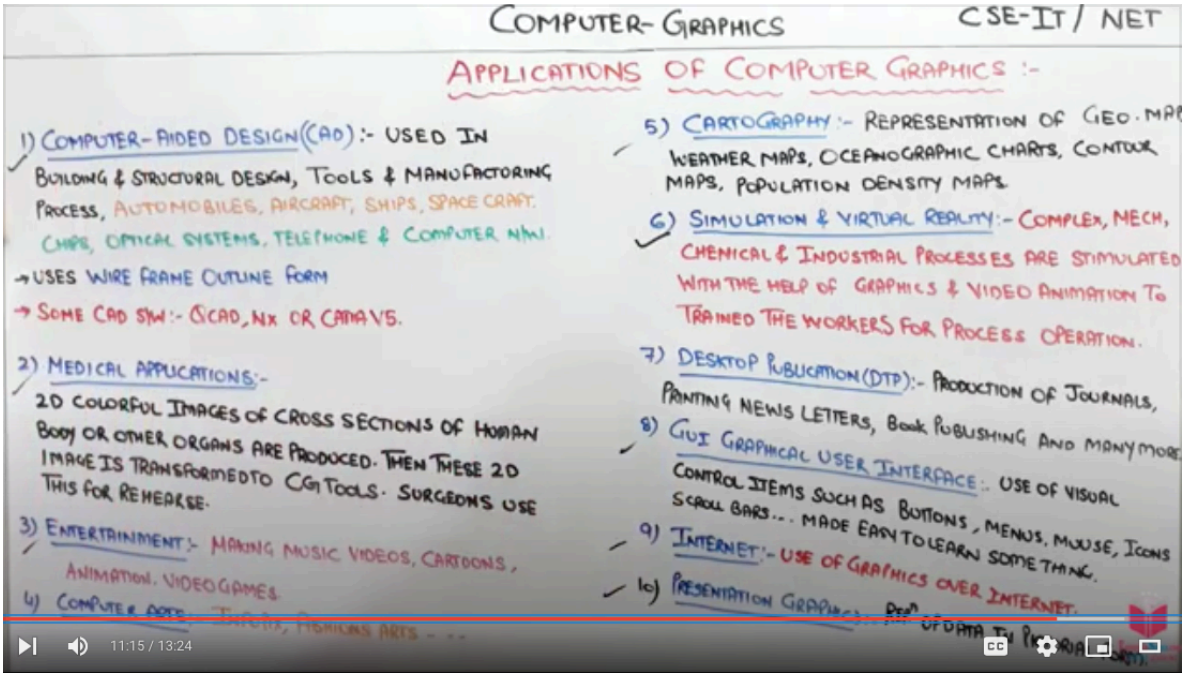
simple and very useful.

- Visualization: Today the need of visualize things have increased drastically, the need of visualization can be seen in many advanced technologies, data visualization helps in finding insights into the data, to check and study the behavior of processes around us we need appropriate visualization which can be achieved through proper usage of computer graphics.
- Image Processing: Various kinds of photographs or images require editing in order to be used in different places. Processing of existing images into refined ones for better interpretation is one of the many applications of computer graphics.
- Machine Drawing: Computer graphics are very frequently used for designing, modifying, and creating various parts of a machine and the whole machine itself, the main reason behind using computer graphics for this purpose is the precision and clarity we get from such drawing is ultimate and extremely desired for the safe manufacturing of machine using these drawings.
- Graphical User Interface: The use of pictures, images, icons, pop-up menus, and graphical objects helps in creating a user-friendly environment where working is easy and pleasant, using computer graphics we can create such an atmosphere where everything can be automated and anyone can get the desired action performed in an easy fashion.

These are some of the applications of computer graphics due to which its popularity has increased to a huge extend and will keep on increasing with the progress in technology.

Example of Computer Graphics Packages:

- LOGO
- COREL DRAW
- AUTO CAD
- 3D STUDIO
- CORE
- GKS (Graphics Kernel System)
- PHIGS
- CAM (Computer Graphics Metafile)
- CGI (Computer Graphics Interface)


COMPUTER-GRAPHICS
CSE-IT / NET
APPLICATIONS OF COMPUTER GRAPHICS :-
1) COMPUTER-AIDED DESIGN (CAD) :- USED IN
BUILDING & STRUCTURAL DESIGN, TOOLS & MANUFACTORING
PROCESS, AUTOMOBILES, AIRCRAFT, SHIPS, SPACE CRAFT.
CHIPS, OPTICAL SYSTEMS, TELEPHONE & COMPUTER N/W.
→ USES WIRE FRAME OUTLINE FORM
→ SOME CAD S/W :- QCAD, NX OR CATIA V5.
2) MEDICAL APPLICATIONS :-
2D COLORFUL IMAGES OF CROSS SECTIONS OF HUMAN
BODY OR OTHER ORGANS ARE PRODUCED. THEN THESE 2D
IMAGE IS TRANSFORMED TO CG TOOLS. SURGEONS USE
THIS FOR REHEARSE.
3) ENTERTAINMENT :- MAKING MUSIC VIDEOS, CARTOONS,
ANIMATION, VIDEO GAMES.
5) CARTOGRAPHY :- REPRESENTATION OF GEO. MAP
WEATHER MAPS, OCEANOGRAPHIC CHARTS, CONTOUR
MAPS, POPULATION DENSITY MAPS.
6) SIMULATION & VIRTUAL REALITY :- COMPLEX, MECH,
CHEMICAL & INDUSTRIAL PROCESSES ARE STIMULATED
WITH THE HELP OF GRAPHICS & VIDEO ANIMATION TO
TRAINED THE WORKERS FOR PROCESS OPERATION.
7) DESKTOP PUBLICATION (DTP) :- PRODUCTION OF JOURNALS,
PRINTING NEWS LETTERS, BOOK PUBLISHING AND MANY MORE
8) GUI GRAPHICAL USER INTERFACE :- USE OF VISUAL
CONTROL ITEMS SUCH AS BUTTONS, MENUS, MOUSE, ICONS
SCROLL BARS... MADE EASY TO LEARN SOMETHING.
9) INTERNET :- USE OF GRAPHICS OVER INTERNET.
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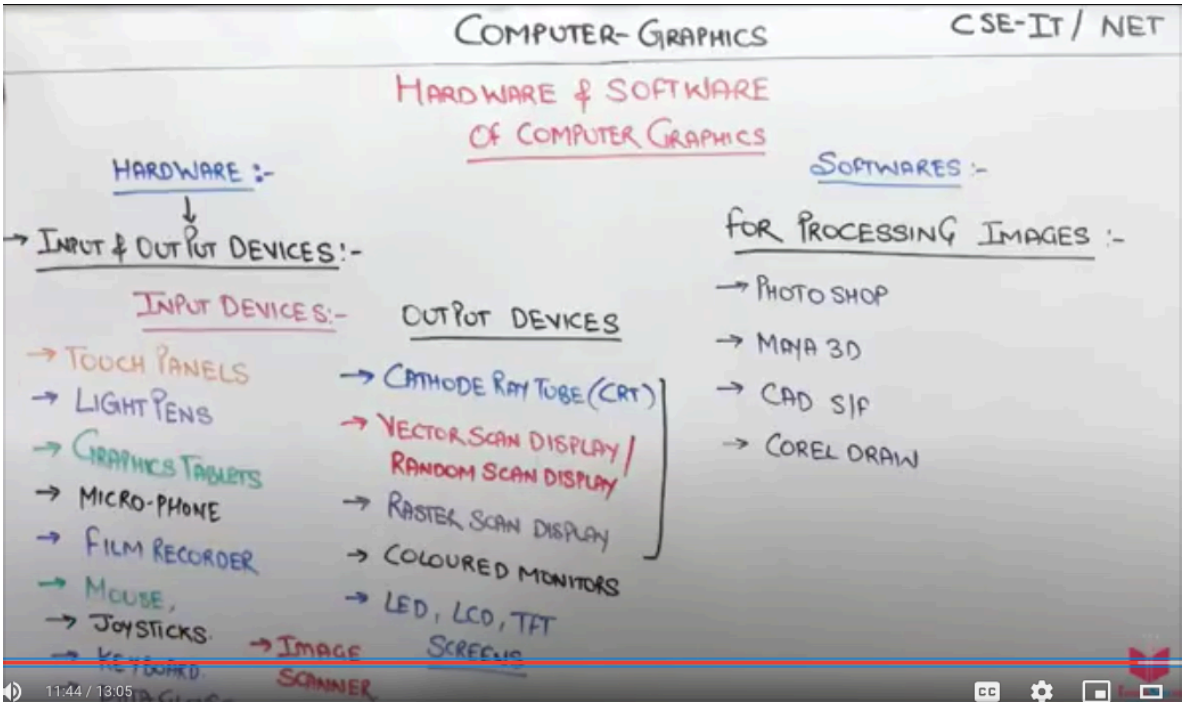
COMPUTER-GRAPHICS
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HARDWARE & SOFTWARE
OF COMPUTER GRAPHICS
HARDWARE :-
→ INPUT & OUTPUT DEVICES :-
INPUT DEVICES :-
→ TOUCH PANELS
→ LIGHT PENS
→ GRAPHICS TABLETS
→ MICRO-PHONE
→ FILM RECORDER
→ MOUSE,
→ JOYSTICKS
→ IMAGE SCANNER
OUTPUT DEVICES
→ CATHODE RAY TUBE (CRT)
→ VECTOR SCAN DISPLAY / RANDOM SCAN DISPLAY
→ RASTER SCAN DISPLAY
→ COLOURED MONITORS
→ LED, LCD, TFT SCREENS
SOFTWARES :-
FOR PROCESSING IMAGES :-
→ PHOTO SHOP
→ MAYA 3D
→ CAD S/F
→ COREL DRAW
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