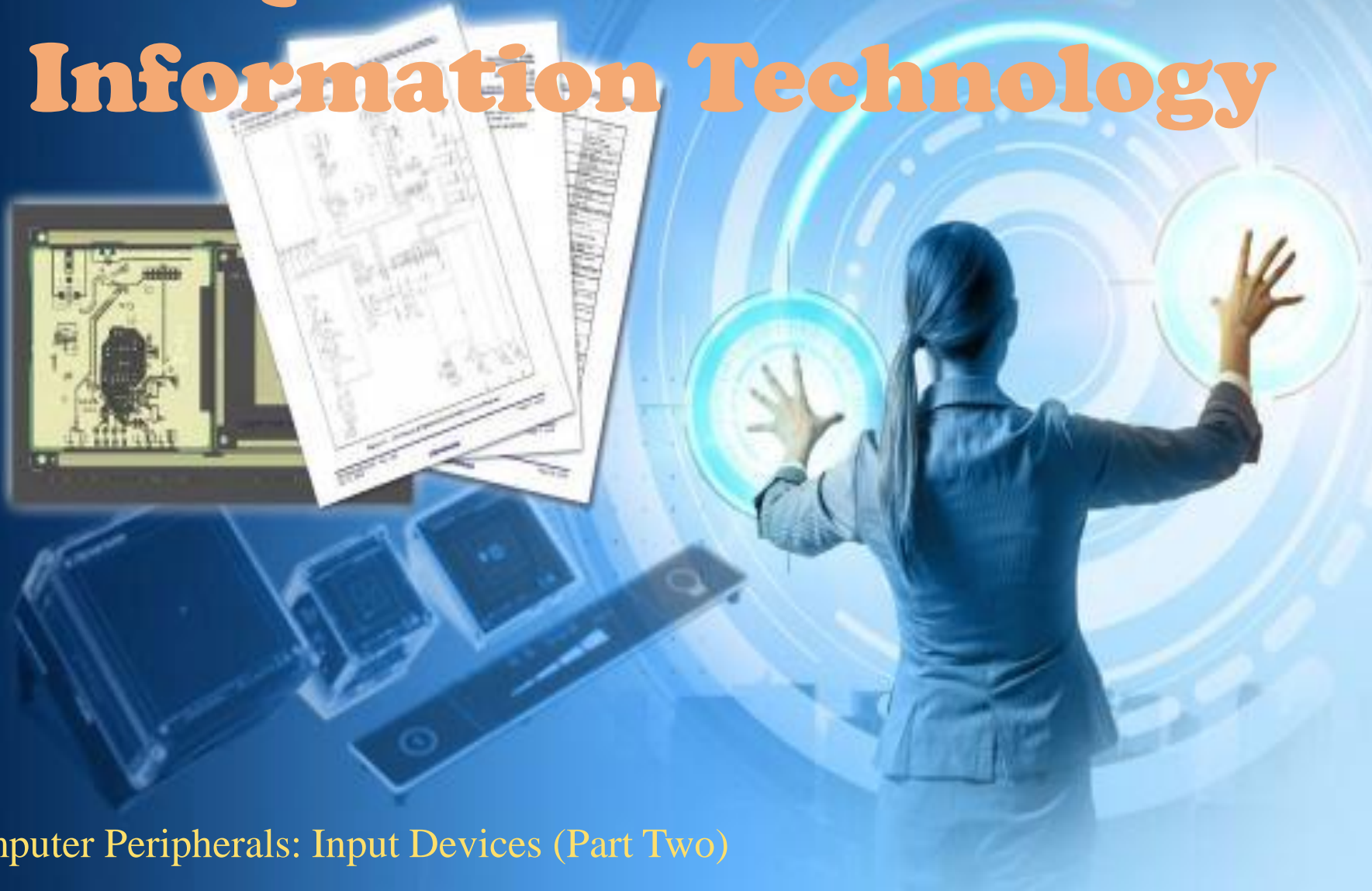# Lecture 7
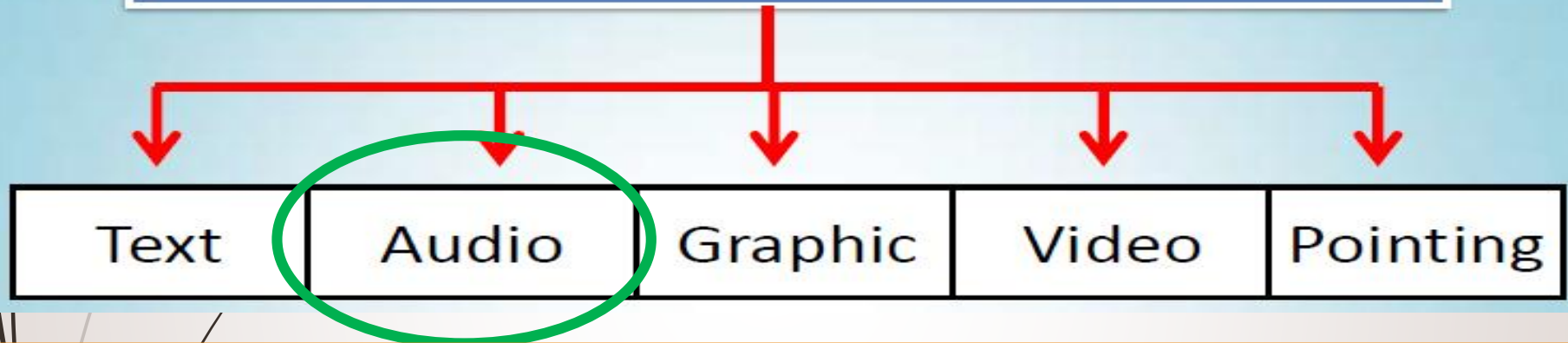
Computer and Information Technology

Computer Peripherals: Input Devices (Part Two)

Input Type = Audio Device = Microphone

TYPE OF INPUT DEVICES

Text | Audio | Graphic | Video | Pointing

Microphone is an input device that is used to collect sound as an analog signal. The computer then converts it to its digital form by sampling. These type of microphones often connect via 3.5mm audio port through sound capturing device. Another variety of microphone is found in consumer market that readily provides converted digital sound via USB interface and requires no capturing device.

Input Type = Audio Device = Microphone

Uses
- Used to input sound/music
- Can be used for voice commanding
- Can be used for voice recognition and security
- Can be used for dictation, writing notes

Input Type = Audio Device = Midi Keyboard

Midi Keyboards are used with computers which have midi sound controller. In combination with software, a computer system then provides top notch musical instrument supports, music synthesizing, recording and editing option.

Input Type = Graphic Device = Digital Camera

TYPE OF INPUT DEVICES

Text	Audio	Graphic	Video	Pointing
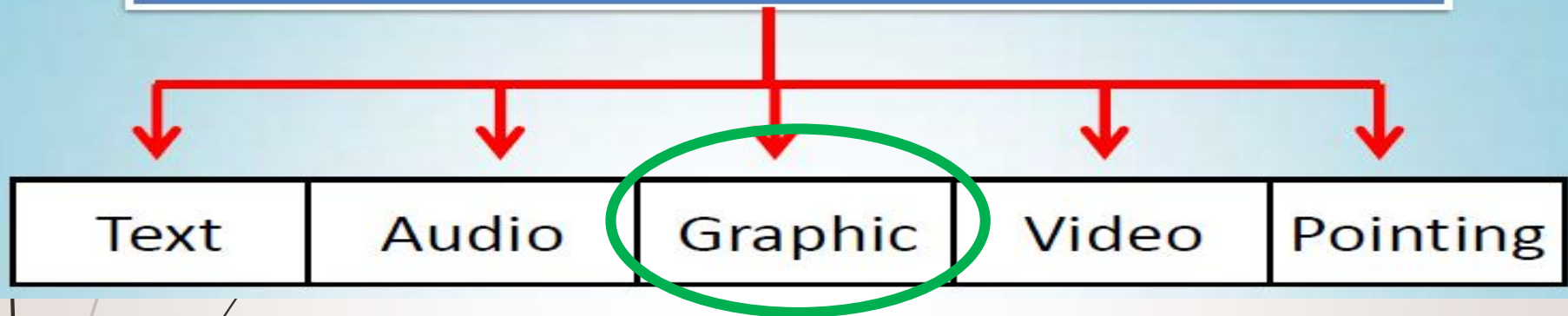
Computers can work with images in various image formats (i.e. BMP, JPEG, PNG, GIF, etc.) and these digital pictures are combination of pixel or picture elements. Quality of these pictures are determined by the resolution and color depth of these pictures.

Resolution is the number of pixels present in a picture, often described by two numbers. A 4000x3000 resolution picture has 4000 pixels from its left to right and 3000 pixels from top to bottom and a total of 12 million pixels in total and has 4:3 aspect ratio.

Input Type = Graphic Device = Digital Camera

Color depth is often mentioned as bit depth. It is eithervthe number of bits used to define each pixel (bit per pixel or bpp) or the number of bits used define any of the three (RGB) components of a single pixel (bits per pixel component or bppc). The higher the color depth, the "more real" it looks. And higher the resolution pictures can be enlarged more and can be printed on large medium.

Digital cameras captures images and stores them in readily readable digital formats. These pictures are stored in memory cards and can be imported to a computer via USB, Wi-Fi or Bluetooth.

Input Type = Graphic Device = Image Scanner

A flatbed scanner can scan plain paper, picture, sizeable books, fabrics or anything that fits under its lid. It is slow and manual but most common in offices.

Sheet-fed scanners are fast and scans only plain papers from its feed tray in auto. Most scanners interface with computers via USB and/or Ethernet port. Wireless models are not so uncommon.

Input Type = Graphic Device = Image Scanner

High speed document scanner, capable of scanning 600 pages per minute in 600dpi. Can store up to 2500 pages in its tray and after scanning can transfer data via USB or LAN at 1GBps

DPI or Dot Per Inch

For scanners, dpi is a very important parameter that sets the resolution of the digital image output. For example, if a document or hard copy image is 12 inch long and 8 inch wide, then if we scan it in 100dpi, the digital output image will be of 1200 pixel long and 800 pixel wide and its resolution will be shown as 1200x800
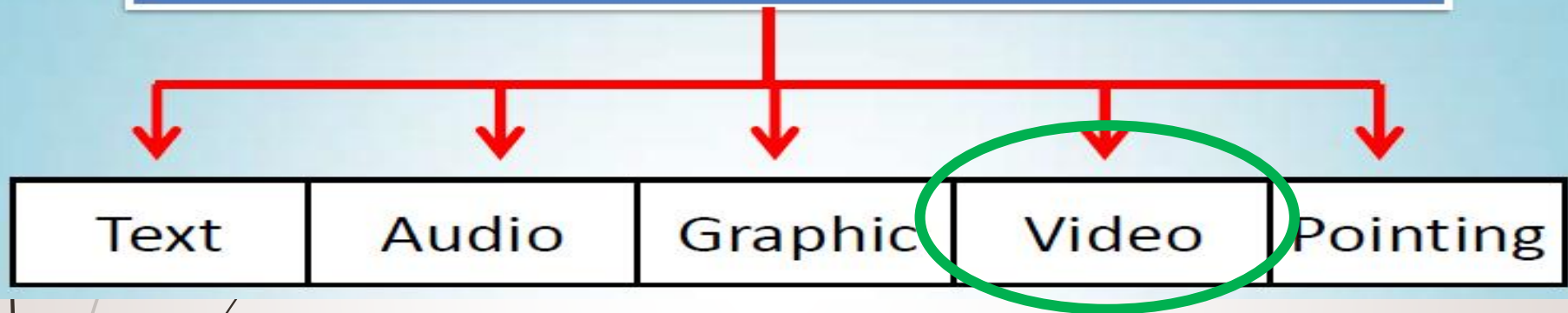
DPI also plays a role during image printing and we will discuss it in another lecture

Input Type = Video
Device = Digital Video Camera

TYPE OF INPUT DEVICES

| Text | Audio | Graphic | Video | Pointing |

Computers are used for generating videos called CGI (computer Generated Imagery) and can work with live action videos. To capture videos in digital formats, digital video cameras are used. Digital videos are electronic representation of moving images encoded in digital binary form. With softwares like Premier, Houdini, LightWave 3D, Blender, 3D Studio Max, etc., captured live action videos then can be altered to produce realistic effects, animations and CGI

Input Type = Video
Device = Digital Video Camera

Red's Weapon 8K VV was announced to be used to shoot Guardian's of the Galaxy Vol. 2
This camera can shoot at 60 fps at 8K Full Format (8192 × 4320) and priced at $54.5K (body only)

Digital cameras comes with various parameters and specifications. For amateur works, we mostly consider the resolution and the frame per second (fps) its format provides.
Now a days, video cameras are used for vlogging, making infomercials, documentaries, etc.

Input Type = Video Device = Web Cam

Webcams are economy digital video camera small enough to be attached on top of computer monitors. Most webcams don't have any storage facility and hence captured video are directly recorded on to computer's secondary storage device. They are used to capture low resolution compressed video intended for live streaming or video conferencing or for any where in the web.

# Input Type = Video
Device = IP Camera

IP camera or Internet Protocol cameras are one kind of video camera capable of receiving control commands and can transmit both still image and video over internet or any network. They can stream live, can be programmed to be motion activated or can store image and video in its own memory card that can be accessed via IP network from any remote location.

IP cameras can also be wired with DVR for storing its recordings. These cameras are now a must have item for surveillance.

TYPE OF INPUT DEVICES

Text	Audio	Graphic	Video	Pointing
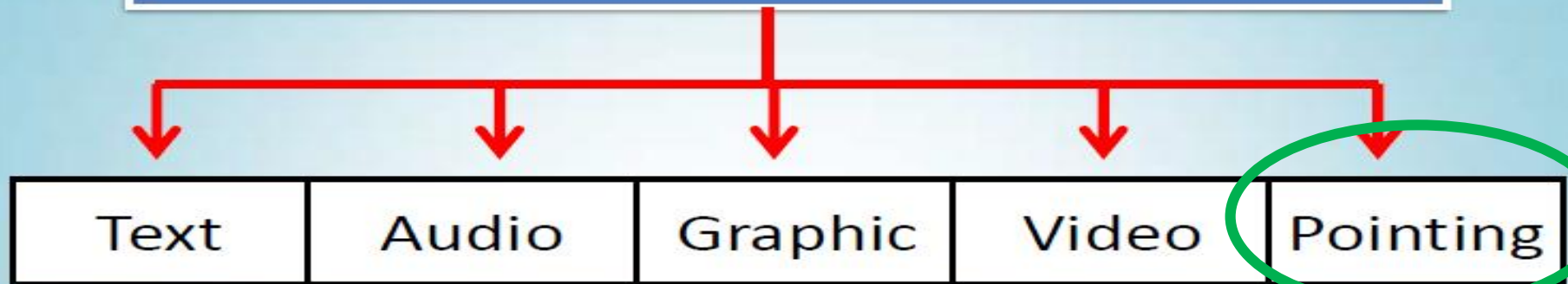
Mouse is the most popular pointing device. It is a very famous cursor-control device having a small palm size box with a motion tracking system consisting of a LASER diode and a sensor at its base, which senses the movement of the mouse and sends corresponding signals to the CPU when the mouse is moved or any of its buttons are pressed. Generally, it has two buttons called the left and the right button and a wheel is present between the buttons. A mouse can be used to control the position of the cursor on the screen in GUI OS.

Input Type = Pointing Device = Mouse

Apple PCs have made this pointing device popular among the consumers. Early mouse had only one button and had a heavy rubber coated ball underneath it. Moving the mouse on a surface made the ball roll which then spun two cross shaft. The spin of these shafts were translated into cursor movement.
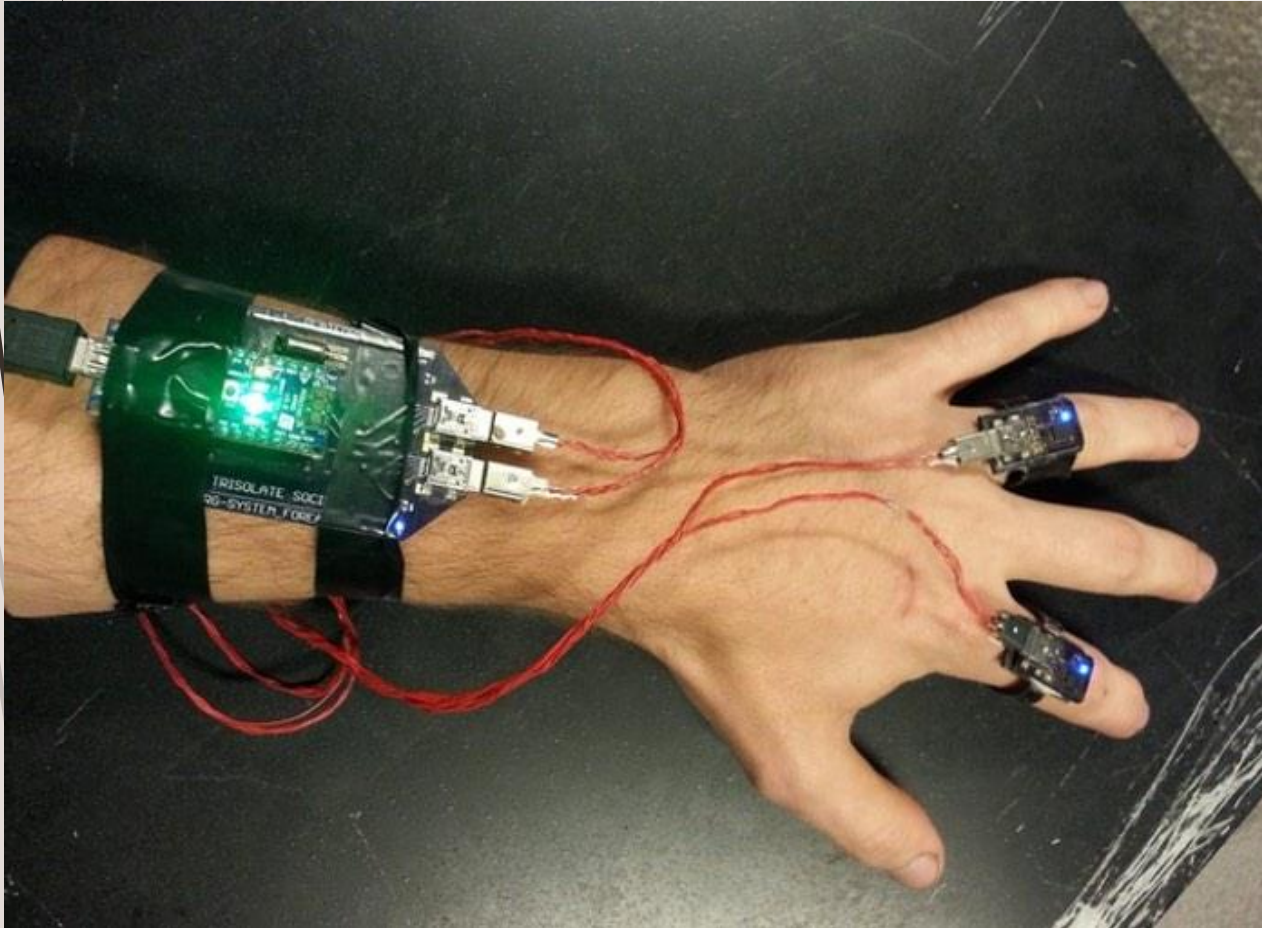
Input Type = Pointing Device = Mouse

Wireless Vertical Mouse with Ergonomic Design

Mouse with a Track Ball

Input Type = Pointing Device = Mouse

An amateur project to transform a regular laser mouse into a motion sensing "anywhere to use" mouse.

Input Type = Pointing Device = Wearable Mouse

Mycestro wearable mouse can be used from up to 30 feet away. It is a gyro motion sensing pointing device that can replace your mouse and play smart role during presentations.
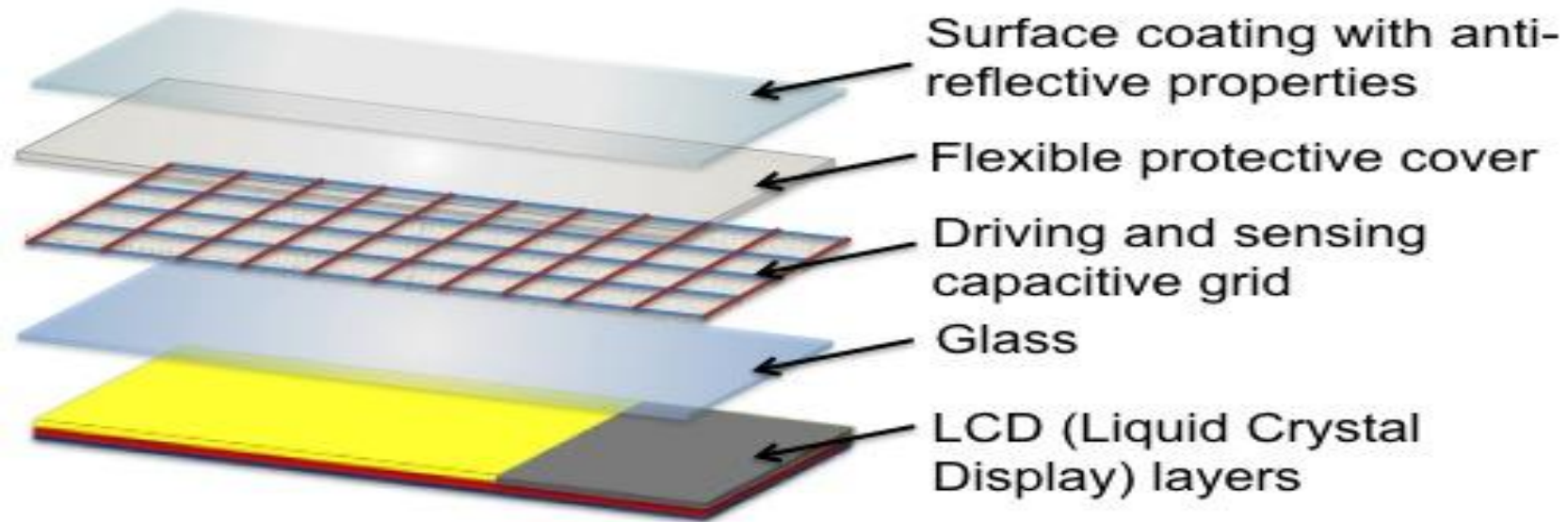
It is a motion sensing device that can track the motion of user's two hands and all ten fingers simultaneously. It is not just a pointing device. It is very useful for CAD designers, gamers, musicians and graphics designers.

Surface coating with anti-reflective properties

Flexible protective cover

Driving and sensing capacitive grid

Glass

LCD (Liquid Crystal Display) layers

Touch screen is the soul of any portable smart device that uses GUI OS. Use of any additional pointing device will ruin the portability of these devices. So a touch sensitive transparent sensor is placed on top of the display. This sensor can register any touch made anywhere on its surface and delivers the message to the CPU which then animates the point on the display right below the sensor where the touch contact was made.

Input Type = Pointing Device = Drawing Tablet

Drawing tablets are used for drawing images that can be directly generated in a computer. It is often used with photo editing and drawing softwares like Photoshop, Corel Painter, AutoDesk Sketchbook, etc.

This is an essential input device for sketch artists, painters or any artist who draws pictures.

Input Type = Pointing Device = Drawing Tablet

Drawing tablet with its own display that projects a copy of the main display of the computer for ease of use.
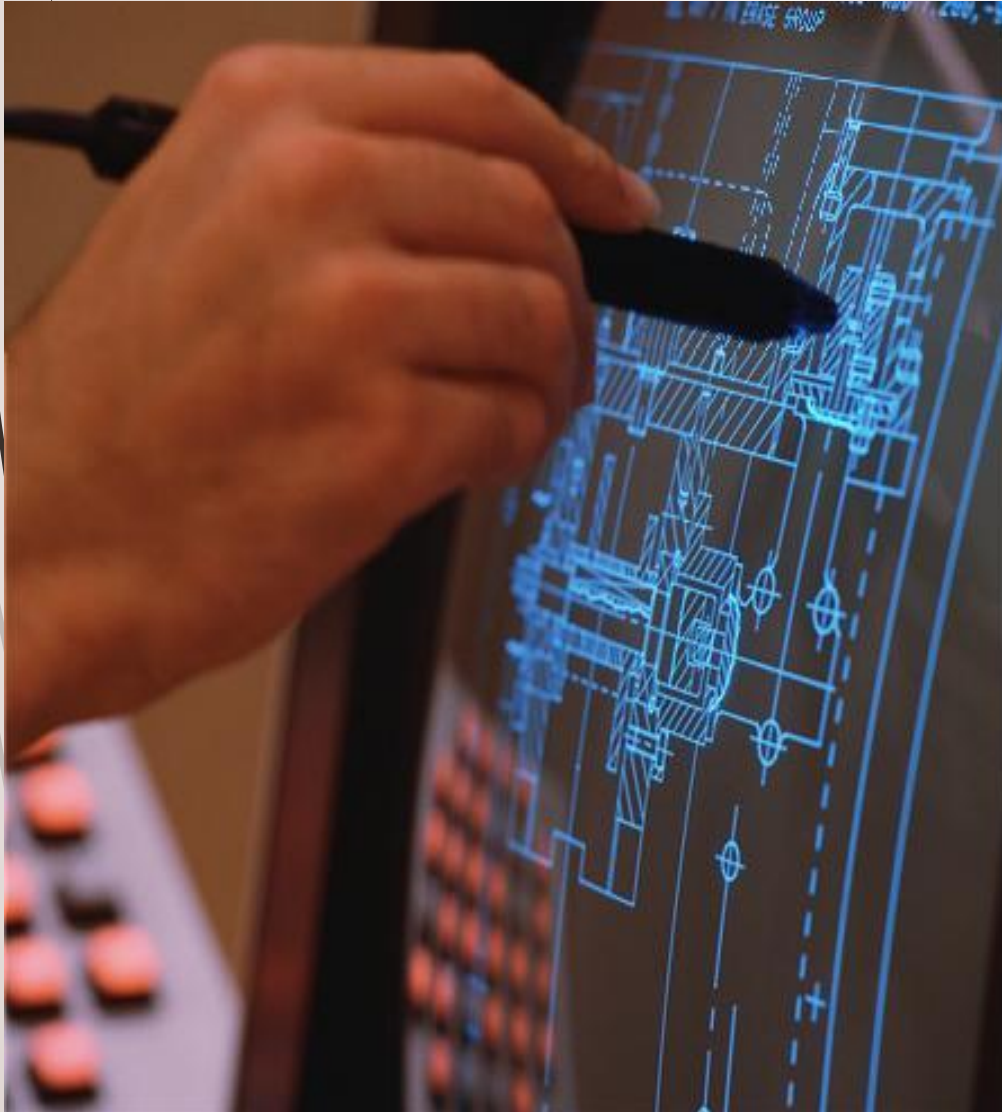
Input Type = Pointing Device = Gamepad and Joystick

Input Type = Pointing Device = Light pen

Light pen is an input device in the form of a light-sensitive wand used with a computer's display. It allows the user to point to displayed objects or draw on the screen in a similar way to a touchscreen but with greater positional accuracy. Light pen has a miniature camera like sensor on its tip which collects emissions from pixels it is pointed to. In this way it can tell where it is pointed.

Stay Home, Stay Safe Always put on a mask when you are in public!