



# COMPUTER SYSTEMS & PROGRAMMING

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## Computer Monitor

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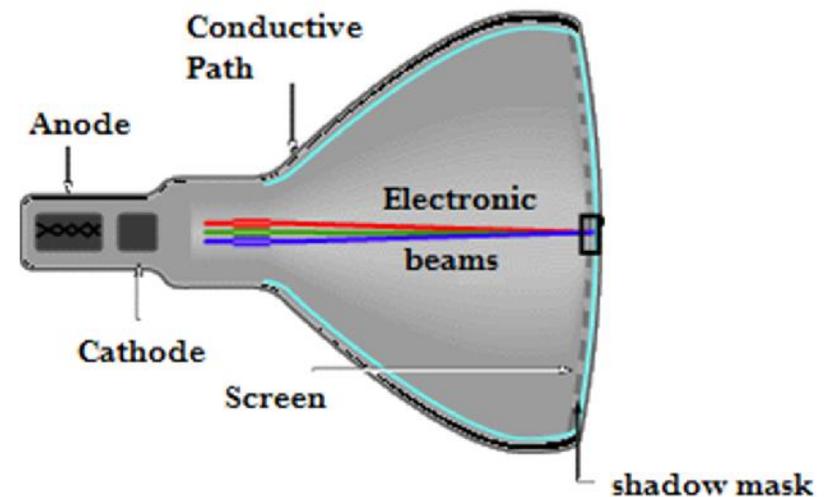
# Introduction

- Electronically representation of output of system in visual form
- Initially introduced in late 1960s
- Idea was taken from Televisions
- Visual representation is performed by means of pixel
- Pixel are addressed by means of resolution or aspect ratio
- Side of display screen is considered diagonally
- Color bit depth
  - Monochromic: 2 colors (1-bit)
  - VGA: 256 colors (8-bit)
  - SVGA: 16777216 colors (16-bit)
  - True color: 4294967296 colors (32-bit)
- Interfaces
  - VGA (Video Graphics adapter) – analog output
  - DVI (Digital Video Interface) – Digital Output
  - HDMI (High Definition Multimedia Interface) – Digital output of audio and video
- Types
  - CRT (Cathode Ray Tube)
  - LCD (Liquid Crystal Display)
  - LED (Light Emitting Diode)



# CRT Monitors

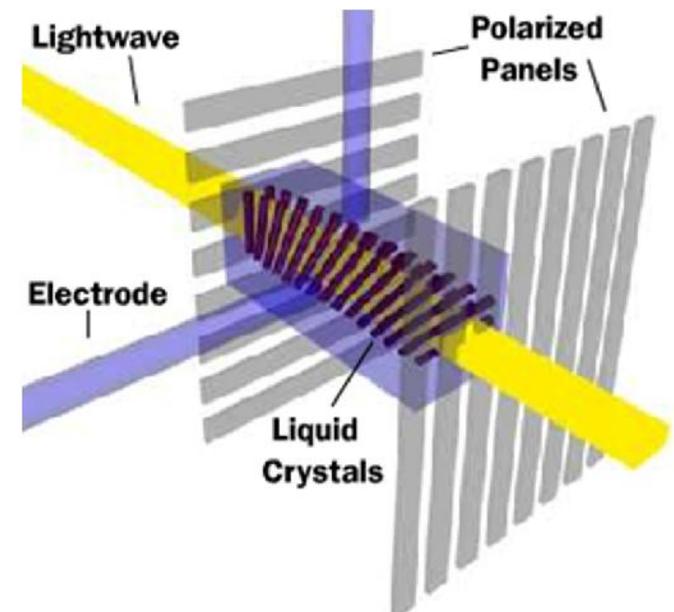
- Initially introduced in 1954
- Uses phosphorous coated screen
- Phosphorous dots glows when electron beam is applied
- Cathode a fulminate material inside a vacuum tube
- The cathode is heated by providing high power where electrons are attracted towards anode
- The Anode takes exited electrons which are pushed towards screen to complete circuit
- Different laser beams of different power produces different colors





# LCD Monitors

- Based on blocking light
- Made of two polarized glass filled with liquid crystal material
- Light is passed from 1<sup>st</sup> to 2<sup>nd</sup> glass
- Small amount of current is produced to select particular pixel
- The current is produced by thin-film transistor layer (TFT)
- It allows some charges to be applied on particular part of screen with support of charged capacitors
- Current changes the alignment of crystals
- The proper alignment allows to pass specific amount of light hence producing different colors for a particular pixel
- Better Contrast, resolution and positioning





# LED Monitors

- Made of Many small LEDs connected in grid form
- These LEDs are also known as OLEDs (Organic LED)
- Organic material glow as LED with specific color
- Several organic material layers are used to display different color combinations
- By changing the amount of electron emitted using TFT layer, different colors are produced
- Advantages:
  - Thinner
  - Less power consumption
  - More brightness
  - More resolution
  - Large field of view



# Questions

