

CS488 Graphics Lecture 2 - Overview of Display Devices

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CRT (Cathode Ray Tube) based on Television technology

- beam of electrons(cathode rays) emitted by an electron gun passes through focusing and deflecting systems that direct the beam toward specific positions on a phosphor-coated screen.
- Color CRT Monitors use a combination of phosphors that emit different colors
 - Shadow Color Method: Three phosphor color dots at each pixel location (RGB)
 - Three electron guns; one for each color dot
 - Triangle alignment

Terminology

- Persistence: How long the point on the screen continues to emit light after the CRT beam is removed
 - Question: for displaying highly complex static pictures/images, should we use a high or a low persistence phosphor.
 - Answer: If static/highly complex then we have high persistence, images that are moving/changing we want low persistence.
- Resolution: maximum number of points (pixel = picture elements) that can be displayed without overlap. If we have two pixels that are very close together and the distance D of the amplitude wave is larger than the distance between the two pixels, the pixels appear to be the same color. this distance D is usually the distance from the center (highest amplitude) to the point at 60% of the amplitude
- Frame Buffer: Stores the picture(image) definition. It holds the set of intensity values for all screen points (pixels)

- Stored intensity values are retrieved from the frame buffer and painted one row (scan line) at a time.

Flat Panels

- Plasma Panel (Gas discharge). Filling the region between two glass plates with a mixture of gasses that usually includes neon ("Glowing Plasma")
- Separation between pixels provided by the electrical field of the conductors.

Liquid Crystal Display (LCD)

- Produces a picture passing polarized light from the surroundings or from an internal light source through a liquid-crystal material that can be aligned to either block or emit light.

Organic Light Emitting Diode (OLED)

- LCD's are non-emissive (They are illuminated with a back light)
- OLED are emissive (They produce their own light)
- OLED: Excellent response time, fair lifetime
- LCD: Excellent lifetime, fair response time

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Three main areas in graphics: Modeling, rendering, animation
Finished Chapter 2 in the course notes