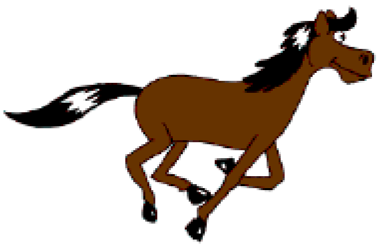
Video

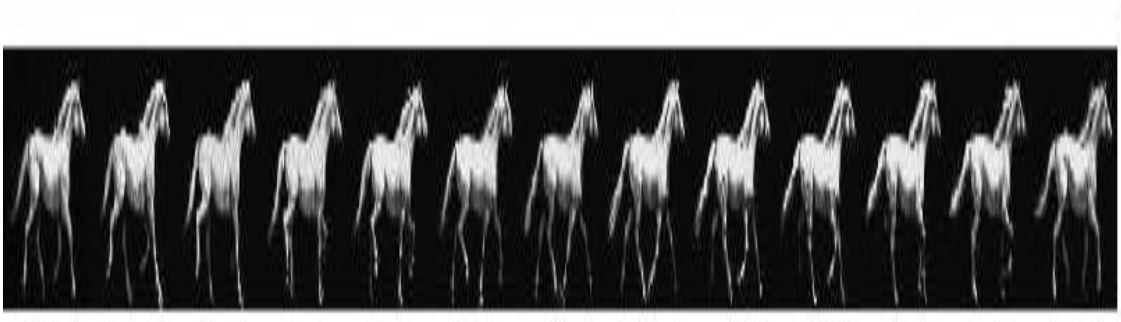
Video Visual Effect of Motion

The visual effect of motion is due to biological phenomenon of Persistence of vision where an object seen by the human eye remains mapped on the eye's retina for a brief time after viewing (approximately

25 ms).



Due to this phenomena of our vision system, a discrete sequence of individual pictures can be perceived as a continuous sequence.



Types Of Video Signals

Video signals can be organized in three different ways: Component video, Composite video,and S-video.

Component Video

Higher-end video systems, such as for studios, make use of three separate video signals for the red, green, and blue image planes. This is referred to as *componellt video.* This kind of system has three wires (and connectors) connecting the camera or other devices to a TV or monitor.

Color signals are not restricted to always being RGB separations. Instead, as we saw in. Chapter 4 on color models for images and video, we can form three signals via a luminance chrominance transformation of the RGB signals - for example, YIQ or YUV. In contrast, most computer systems use component video, with separate signals for R, G, and B signals. For any color separation scheme, component video gives the best color reproduction, since there is no "crosstalk" between the three different channels, unlike composite video or S-video. Component video, however, requires more bandwidth and good synchronization of the three components.

Composite Video

In *composite video*, color ("chrominance") and intensity ("luminance") signals are mixedinto a *single* carrier wave. Chrominance is a composite of two color components *(I* andQ, or *U* and *V).* This is the type of signat'used by broadcast color TVs; it is downward compatible with black-and-white TV.

In NTSC TV, for example [1], [and *Q* are combined into a chroma signal, and a color subcanier then puts the chroma signal at the higher frequency end of the channel shared with the luminance signal. The chrominance and luminance components can be separated at the receiver end, and the two color components can be further recovered.

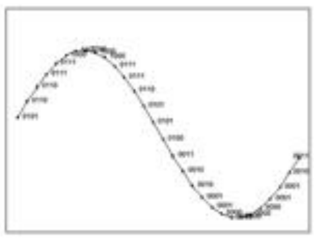
When connecting to TVs or VCRs, composite video uses only one wire (and hence one connector, such as a'BNe connector at each end of a coaxial cable or an RCA plug at each end of an ordinary wire), and video color signals are mixed, not sent separately. The audiosignal is another addition to this one signal. Since color information is mixed and both color and intensity are wrapped into the same signal, some interference between the luminance and chrominance signals is inevitable.

S-Video

As a compromise, *S-video* (separated video, or super-video, e.g" in S-VHS) uses two wires: one for luminance and another for a composite chrominance signal. As a result, there is less crosstalk between the color information and the crucial gray-scale information. The reason for placing luminance into its own part of the signal is that black-and-white information is cLUcial for visual perception. As noted in the previous chapter, humans are able to differentiate spatial resolution in grayscale images much better than for the color part of color images (as opposed to the "black-and-white" part). Therefore, color information sent can be much less accurate than intensity information. We can see only fairly large blobs of color, so it makes sense to send less color detail.

Analogue Video

Video information that is stored using television video signals, film, videotape or other non-computer media. Each frame is represented by a fluctuating voltage signal known as an analogue wave form or composite video.



Composite analogue video has all the video components: brightness, colour and synchronization. Then combined into one signal for delivery, Example : traditional television but the problems: colour blending, low clarity, high generation lost, difficult to edit.

Types of color video signals

Video signals can be organized in three different ways: Component video, Composite video, and S-video.

i- Component Video (3 wires)

One way of maintaining signal clarity is by separating the components of a video signal so that they do not interfere with each other. Component video: Higher-end video systems make use of three separate

video signals for the red, green, and blue image planes. Each color channel is sent as a separate video signal.

(a) Most computer systems use Component Video, with separate signals

for R, G, and B signals.

(b) For any color separation scheme, Component Video gives the best

color reproduction since there is no "crosstalk" between the three channels.

(c) This is not the case for S-Video or Composite Video, discussed next.

Component video, however, requires more bandwidth and good synchronization of the three components.

Composite Video- (1 wires)

In contrast to component video, all video information, chrominance and luminance are mixed together into a single carrier wave.

a) Chrominance is a composition of two color components.

b) The chrominance and luminance components can be separated at the

receiver end and then the two color components can be further recovered.

c) When connecting to TVs Composite Video uses only one wire and video color signals are mixed, not sent separately. The audio and sync signals are additions to this one signal. This mixing causes interference between the luminance and chrominance signals.

Dot-Crawl is a defect that results from crosstalk due to the intermodulation of the chrominance and luminance components of the signal, where Dot-crawl affects the edges of color and manifests itself as moving dots of colour along these edges. Dot-Crawl can be eliminated by using an S-Video, or component video connection. Like component video, composite-video cables do not carry audio and are often paired with audio cables. This is the type of signal used by broadcast color TVs.

ii- Separate Video (S-Video)

S-Video: e.g., in S-VHS uses two wires, one for luminance and another for a composite chrominance signal.

• As a result, there is less crosstalk between the color information and the crucial gray-scale information.

• The reason for placing luminance into its own part of the signal is that black-and-white information is most crucial for visual perception.

– In fact, humans are able to differentiate spatial resolution in grayscale images with a much higher acuity than for the color part of color images.

– As a result, we can send less accurate color information than must be sent for intensity information — we can only see fairly large blobs of color, so it makes sense to send less color detail.

It does not carry audio on the same cable. The infamous dot crawl is eliminated.