

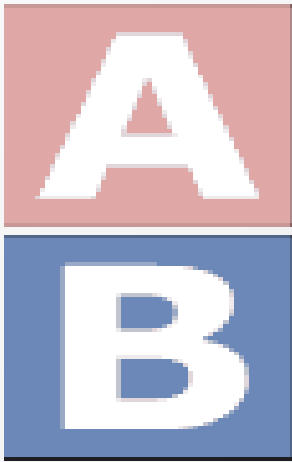


Pengenalan Produksi & Distribusi (Digital) Video

Mata Kuliah
Teknologi Informasi dan Multimedia
Dosen: Avinanta Tarigan

Analog Video

Original
film frame



Video field
(first)



Video field
(second)



Resulting
video frame



- Film: motion picture (high quality)
- Video: scanning a frame (row-wise) convert to electrical info
- Interlacing:
 - ♦ Odd : scanning pada baris ganjil - kemudian genap
 - ♦ Even: sebaliknya
- Progressive Scan vs Interlacing
- Informasi: RGB Spectrum (chrominance) & Luminance (+ Carrier dalam channel + Sync)
- Composite Video vs Separated Video

Analog Video

- NTSC (National Television System Committee)
 - ♦ 4:3 aspect ratio
 - ♦ 525 scan lines
 - ♦ 30 fps
- PAL (Phase Alternating Line) Eropa Barat, China, India, dll
 - ♦ 4:3 aspect ratio
 - ♦ 625 scan lines
 - ♦ 25 fps
- Video Editing & Production harus menggunakan linear-editing system
- Mahal dan memerlukan keahlian khusus

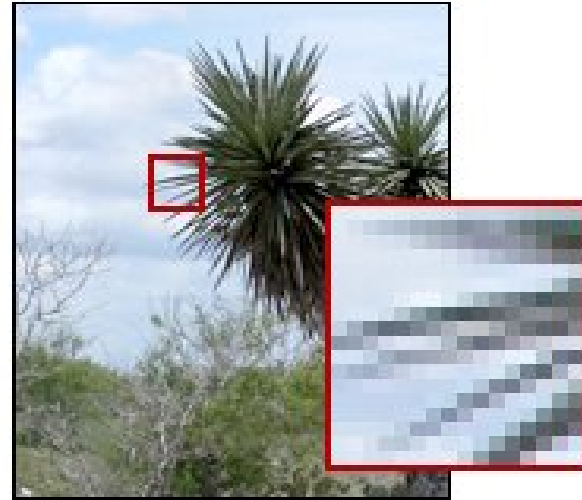
Format	Samples per line
VHS	240
S-VHS	400-425
Betamax	500
Standard 8 mm	300
Hi-8 mm	425

- SECAM (Systeme Electronique Couleur Avec Memoire)
 - ♦ 4:3 aspect
 - ♦ 625 scan lines
 - ♦ 25 fps



Digital Video

- Konsep:
 - ♦ Pixel dalam gambar
 - ✓ *Koordinat + Warna*
 - ✓ *8-bit (256 warna)*
 - ✓ *16-bit (65355 warna)*
 - ✓ *24-bit 16.7 juta*
 - ✓ *32-bit true-colors*
 - ♦ Frame
 - ✓ *Set of Pixel forming a picture*
 - ✓ *Sebuah snapshot dalam video / film*
 - ♦ Video:
 - ✓ *Sequence of Frame*
- Disimpan dalam bentuk:
 - ♦ RAW Data
 - ♦ Compressed



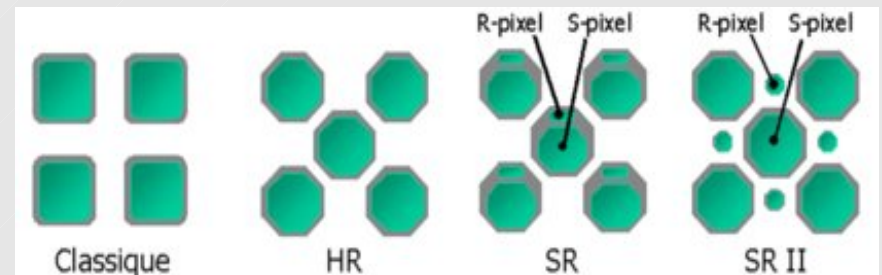
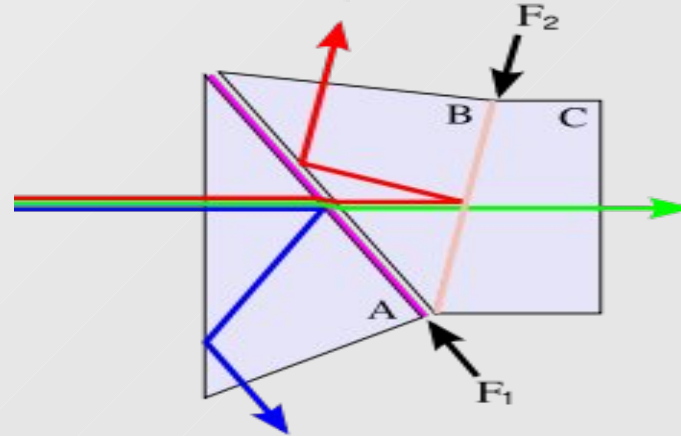
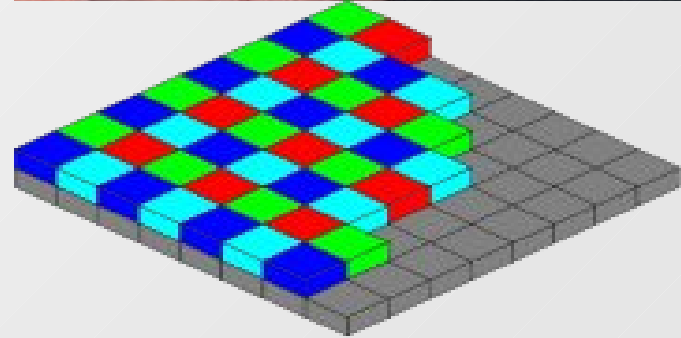
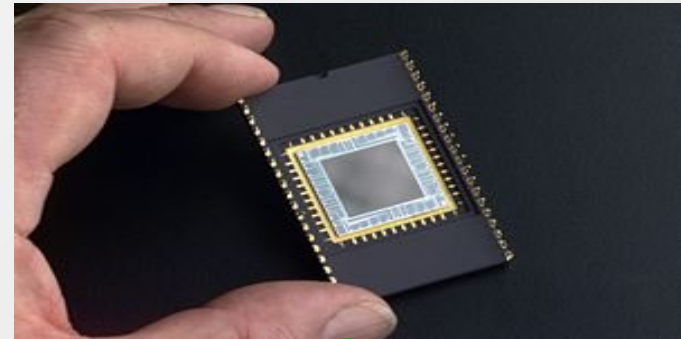
Camcorder

- Analog
 - ♦ Low-Band:
 - ✓ *Appx 3 MHz bw*
 - ✓ *250 lines (333x480)*
 - ✓ *Betamax ('75)*
 - ✓ *VHS, VHS-C (76,82)*
 - ✓ *Video8 (85)*
 - ♦ High-Band:
 - ✓ *Appx 5 MHz bw*
 - ✓ *420 lines (550x480)*
 - ✓ *S-VHS (87)*
 - ✓ *S-VHS-C (87)*
 - ✓ *Hi8 (88)*
- Digital
 - ♦ Digital Codec
 - ✓ *MidiDV*
 - ✓ *Digital8 (Hi8 tapes)*
 - ♦ MPEG2 Based
 - ✓ *MicroMV*
 - ✓ *DVD*
 - ✓ *HDV (HDTV)*
 - ♦ Digital Tapeless (Harddisk)
 - ✓ *MPEG-2*
 - ✓ *H.264*



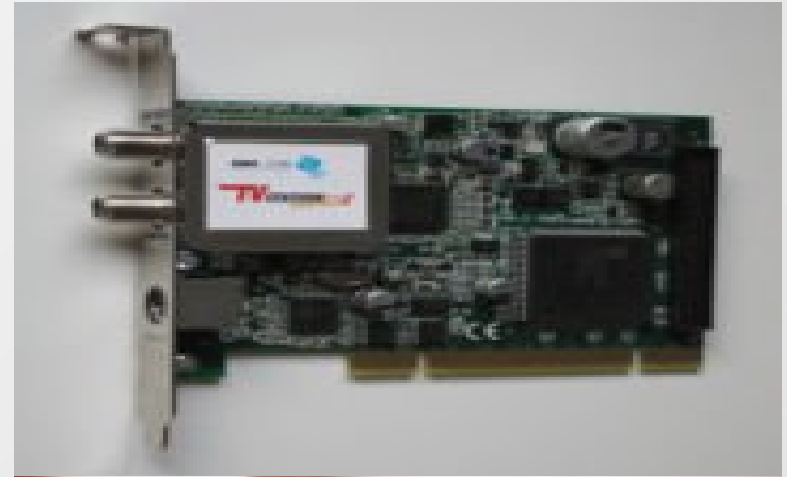
Camcoder (2)

- CCD
 - ♦ Charge-Coupled Device
 - ♦ Array of Photoelectric Sensor - Capacitor
 - ♦ Charge amplifier untuk merubah ke tegangan
- 3CCD
 - ♦ Menggunakan prisma untuk memecah R,G,B
 - ♦ Masing2 warna ditangkap oleh 1 CCD
- Super CCD
 - ♦ Proprietary Fuji (1999)
 - ♦ Menempatkan CCD berukuran kecil diantara array utama



Transfer Medium

- Dari Camcoder Analog
 - Membutuhkan TV Card atau Tuner
 - Analog-To-Digital Conv
- Dari Camcoder Digital
 - USB 2.0 (480 Mbps)
 - Firewire - IEEE 1394, 400,800,3200 Mbps
 - USB 3.0 (5Gbps)
- Data yang ditransfer dari camcoder adalah DigitalVideo (DV) format
- Pada beberapa MPEG-2 based camcoder data yang ditransfer adalah MPEG-2 stream
- High-Definition Multimedia Interface (HDMI) 10.2 Gbit/s at 340 Mpixel/s



Non-Linear Video Editing

- Source:
 - ♦ Camcorder (MiniDV, Digital8, DVD, Harddisk)
 - ♦ Digital Video (MPEG)
 - ♦ Picture (JPEG, PNG)
 - ♦ Music (WAV)
 - ♦ Libraries / Templates
- Software:
 - ♦ Pinnacle Studio
 - ♦ Adobe Premiere
 - ♦ Main Actor (Win / Linux)
 - ♦ Kino (Linux)
 - ♦ Photoshop / GIMP (Image Editing)
- Output:
 - ♦ RAW DV
 - ♦ Compressed (MPEG)
 - ♦ VCD, SVCD, DVD
- Tools (OpenSource):
 - ♦ MjpegTools
 - ♦ Lame (MP3)
 - ♦ FFMPEG
- Hardware:
 - ♦ PC / Apple + LCD
 - ♦ High-end Processor (AMD vs Intel)
 - ♦ Super Fast Memory (> 2Gb)
 - ♦ Brutal-Huge Fast Harddisk
 - ✓ > 300 Gb
 - ✓ > 7200 RPM
 - ✓ Video-Ready
 - ♦ DVD-R
 - ♦ Control panel khusus untuk Editing (jika perlu)

Non-Linear Video Editing (2)

The screenshot displays a video editing software interface with the following components:

- Menu Bar:** File, Edit, Timeline, Tools, Windows, Help.
- Browser Panel:** Contains a search bar and a tree view of effects categories: Paint, Special (selected), Standard, Text, Weather, Sources, Transitions, 3D, Dissolve, and Iris. The Special category is expanded to show effects like Aged Film, Flip, Frame, Incognito, Perspective, and Rewind.
- Timeline 1:** Shows a multi-track editing environment with tracks for Video 2 (V2) and Audio 1 (A1). Video tracks contain clips labeled MOV00393.MPG and MOV00396.MPG. The audio track shows a waveform for MOV00393.MPG.
- Effects Panel:** Displays two active effects:
 - FX Audio Source (A1 [00:00:00:00, 00:00:09:00])**: Media file MOV00392.MPG, Master volume 1.00.
 - FX Audio Transition (A1 [00:00:04:00, 00:00:09:00])**: Fade Out: Linear fade out, Fade in: Linear fade in.
- Media Player:** Located at the bottom, showing a video preview window with the text "MainActor 5.5" and a playback timeline from 00:00:00:00 to 00:01:04:02.
- Status Bar:** Shows "Audio Transition : [00:00:04:00, 00:00:09:00] = 00:00:05:00" twice.

Lihat: http://en.wikipedia.org/wiki/Comparison_of_video_editing_software

Kualitas Digital Video & Kompresi

- Compression:
 - ♦ MPEG-1, MPEG-2, MPEG-4
- Encoding / Packaging:
 - ♦ AVI, DivX, ASF, etc.
- Standard:
 - ♦ VCD : MPEG-1, NTSC-352 x 240 at 30 fps | PAL-352 x 288 at 25 fps | Bit rate at 1.15 Mb/sec
 - ♦ SVCD : MPEG-2, NTSC-352 x 480 at 30 fps | PAL-352 x 576 at 25 fps | Bit rate at 2.4 Mb/sec
 - ♦ DVD : MPEG-2, NTSC-704 x 480 at 30 fps | PAL-704 x 576 at 25 fps | Bit rate at 4.8 MB/sec
 - ♦
- Tugas: Coba Cari Encoding & Compress Algorithm yang lain

Distribusi

- Offline:
 - ♦ CD / DVD
- File (AVI, DivX, WMV, MPEG)
- On-line:
 - ♦ IP Based:
 - ♦ MPEG Streaming
 - ♦ WMV Streaming
 - ♦ RealMedia Streaming .rm
- Broadcasting:
 - ♦ DVB-T (Terrestrial), DVB-S (Sattelite), DVB-C (Cable)
 - ♦ Encoding:
 - ✓ Old: MPEG-2
 - ✓ New: H.264/MPEG-4 AVC

