Principles of Animation / Production Pipeline

CMPT 466
Computer Animation
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Reading

- Chapters 1 of Parents book
- Course 1 at SIGGRAPH 94, “Animation Tricks”.
- The Animator's Workbook, White, Tony, Watson-Guptill, 1988
Principles of Animation - Physics

- Squash & stretch
  - objects have rigidity/mass
- timing
  - character of object/physics
  - heavy object moves slowly
- secondary actions
  - supply (physically based) reaction to main action
- slow in & slow out; arcs
  - model inertia, friction, viscosity
  - bouncing ball example

Principles of Animation - Aesthetic Actions

- Exaggeration
- Appeal
  - make it enjoyable to watch
- Follow through/Overlapping action
  - actions flow into another
Principles of Animation - Presentation of Actions

- **Anticipation**
  - upcoming action is set up

- **Staging**
  - present an action so it is not missed by the audience

Principles of Animation - Production Technique

- **Straight ahead**
  - develop motion continually
  - principal of physically based animation

- **Pose to pose**
  - identify key-frames and interpolate
  - typical in conventual animation
Production Pipeline

• Production
  – entire animation
• Sequence
  – major episode; associated w/ staging area
• Shot
  – continuous camera recording
• Frame
  – single recorded image

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Production Pipeline

• Preliminary story / script
• storyboard
  – model sheet (character details)
  – exposure sheet (camera details)
  – route sheet (scene details)
• animatic / story reel
  – key frames
  – in-betweening

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CA production

- Model
- Shading
- Layout
- Lighting
- Motion
- Camera

Digital Video

- Digital storage of film
- Digital Television (DTV)
- Digital Video (DV)
- Digital Non-Linear Editing
RGB vs. NTSC

- Composite video
- Component video
- Alpha channel

RGB

red

green

blue

sync
Codecs

- Symmetric - equal time for comp & decomp
- Lossy v. lossless
- Interframe v. intraframe compression

Codecs

- Runlength Encoding
- Vector Quantization
- Fractal Compression
- Digital Cosine Transform
- Wavelet Compression
Codecs

- Quicktime
- Movies for Windows
- Sorensen
- DivX

Editing

- Splicing physical medium
- Electronic Editing
- Non-Linear Editing
Electronic Editing

Source Deck 1

Source Deck 2

Editing System

Character Generator

Special Effects Generator

Target Editing

Non-Linear Editing

Source 1

Source 2

Computer Editing System

Video Board

Output Video