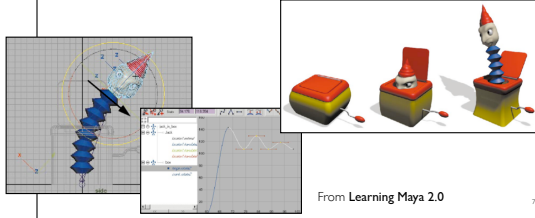


Key-framing (manual)

7

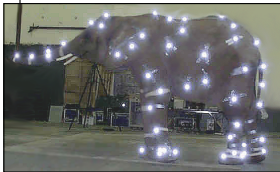
- Requires a highly skilled user
- Poorly suited for interactive applications
- High quality / high expense
- Limited applicability



Motion Capture (recorded)

8

- Markers/sensors placed on subject
- Time-consuming clean-up
- Reasonable quality / reasonable price
- Manipulation algorithms an active research area



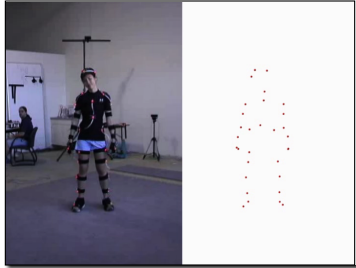
MotionAnalysis / Performance Capture Studio



Okan Arıkan

Model Construction

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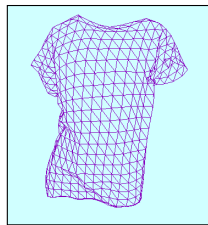
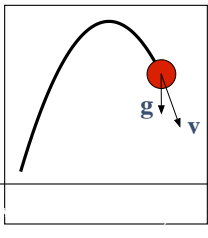
Kirk, O'Brien, Forsyth, CVPR 2005

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Simulation

12

- Generate motion of objects using numerical simulation methods



12

	What to do with animations?
	<ul style="list-style-type: none">• Video tape• Digital video• Print it on yellow sticky notes <p style="text-align: right;">15</p>

15

	NTSC Standard
	<ul style="list-style-type: none">• Used by DVD, DV, and VHS• 720x486 resolution (sort of)• 1.33 aspect ratio• Limited color range• 30 frames per second (sort of 29.97)• Interlaced video• Overscan regions <p style="text-align: right;">16</p>

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Digital Video

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- Wide range of file formats
 - QuickTime
 - MS Audio/Visual Interleaved (AVI)
 - DV Stream
 - Bunch 'o images
- Some formats accommodate different CODECS
 - Quicktime: Cinepak, DV, Sorenson, DivX, etc.
 - AVI: Cinepak, Indeo, DV, MPEG4, etc.
- Some formats imply a given CODEC
 - MPEG
 - DV Streams

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Digital Video

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- Nearly all CODECS are lossy
 - Parameter setting important
 - Different type of video work with different CODECS
 - Compressors not all equally smart
 - Compression artifacts are cumulative in a very bad way
- Playback issues
 - Bandwidth and CPU limitations
 - Hardware acceleration
 - Missing CODECS (avoid MS CODECS and formats)

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Editing

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- Old way:
 - Multiple expensive tape decks
 - Slow
 - Difficult
 - Error prone
- New way:
 - Non-linear editing software
 - Premiere, Final Cut Pro, others...
 - Beware compressed solutions
 - May take a long time for final encoding

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Interactive Animation

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- Video Games

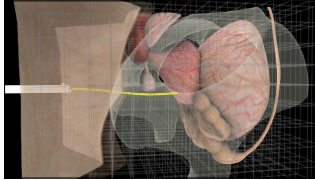


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Interactive Animation

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- "Serious" Games



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Motion Blur

22

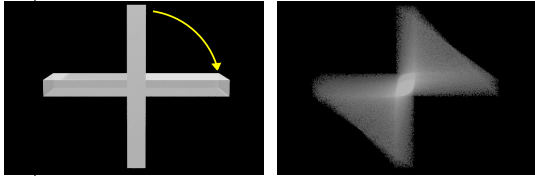
- Fast moving things look blurry
 - Human eye
 - Finite exposure time in cameras
- Without blur: strobing and aliasing
- Blur over part of frame interval
 - Measured in degrees (0..360)
 - 30 tends to often look good

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Motion Blur

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- Easy to do in a sampling framework
- Interpolation is an issue

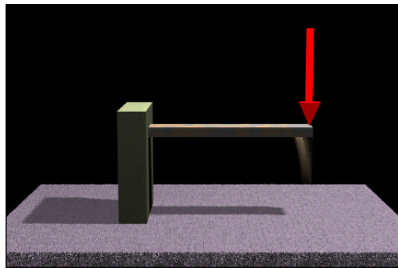


23

Motion Blur

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- Velocity based blur often works poorly



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