

Perception Animation

Overview

Animation: Can It Facilitate?

- Animation vs. static graphics
- benefits and failures of animation
- congruence principle
- apprehension principle

Principles of Traditional Animation Applied to Computer Animation,

- 11 principles of animation

Recources

Animation: Can It Facilitate?

Barbara Tversky, Julie Morrison, Mireille Betrancourt,
International Journal of Human Computer Studies
57:4, pp 247-262, 2002.

Principles of Traditional Animation Applied to Computer Animation,
John Lasseter,
Proceedings of SIGGRAPH 87, Computer Graphics,
21(4), pp. 35-44, July 1987.

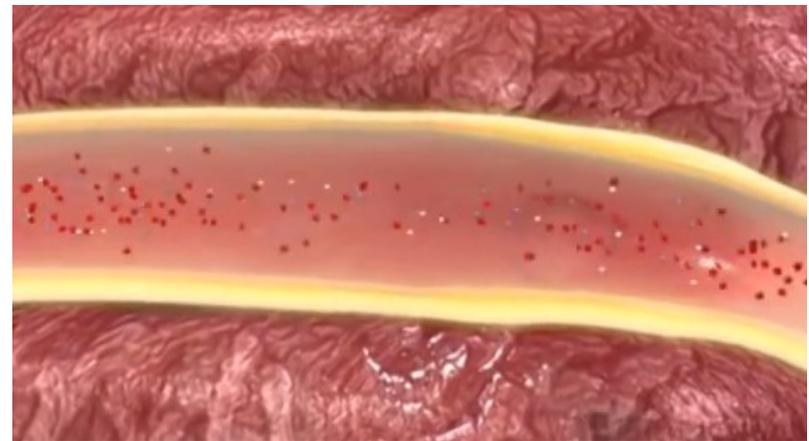
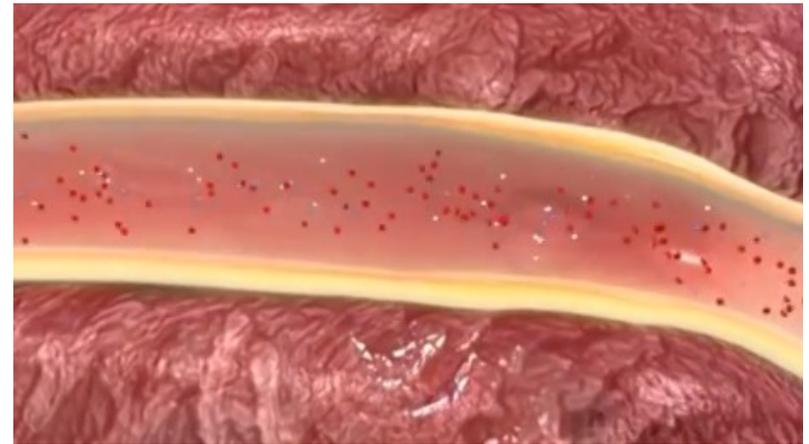
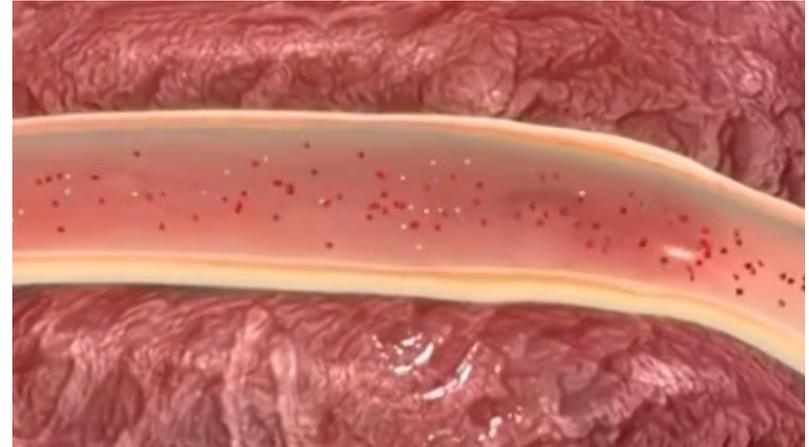
When will animation
be *effective*?

Incomparable Content

<i>Animation</i>	Movement Transformation Change over time	Can show fine structures
<i>Static graphic</i>		Detailed information Comparisons Can't show fine structures

Fine structure of a vein

- Hard to see direction of the blood flow
- Hard to see behavior of the blood cells
- Can't show the microsteps



Incomparable Procedures

Kieras (1992)
„Star Trek Phaser Bank“

- Students who learned from the animated graphic performed better
- Animation may be facilitating execution of the task rather than understanding of the concept



http://de.memory-alpha.org/wiki/Phaserbank?file=Enterprise_feuert_Phaser.jpg

Failures of animation to benefit

Online Help system „Hypercard“

Students with the animation completed the training task better but they completed the testing task more slowly

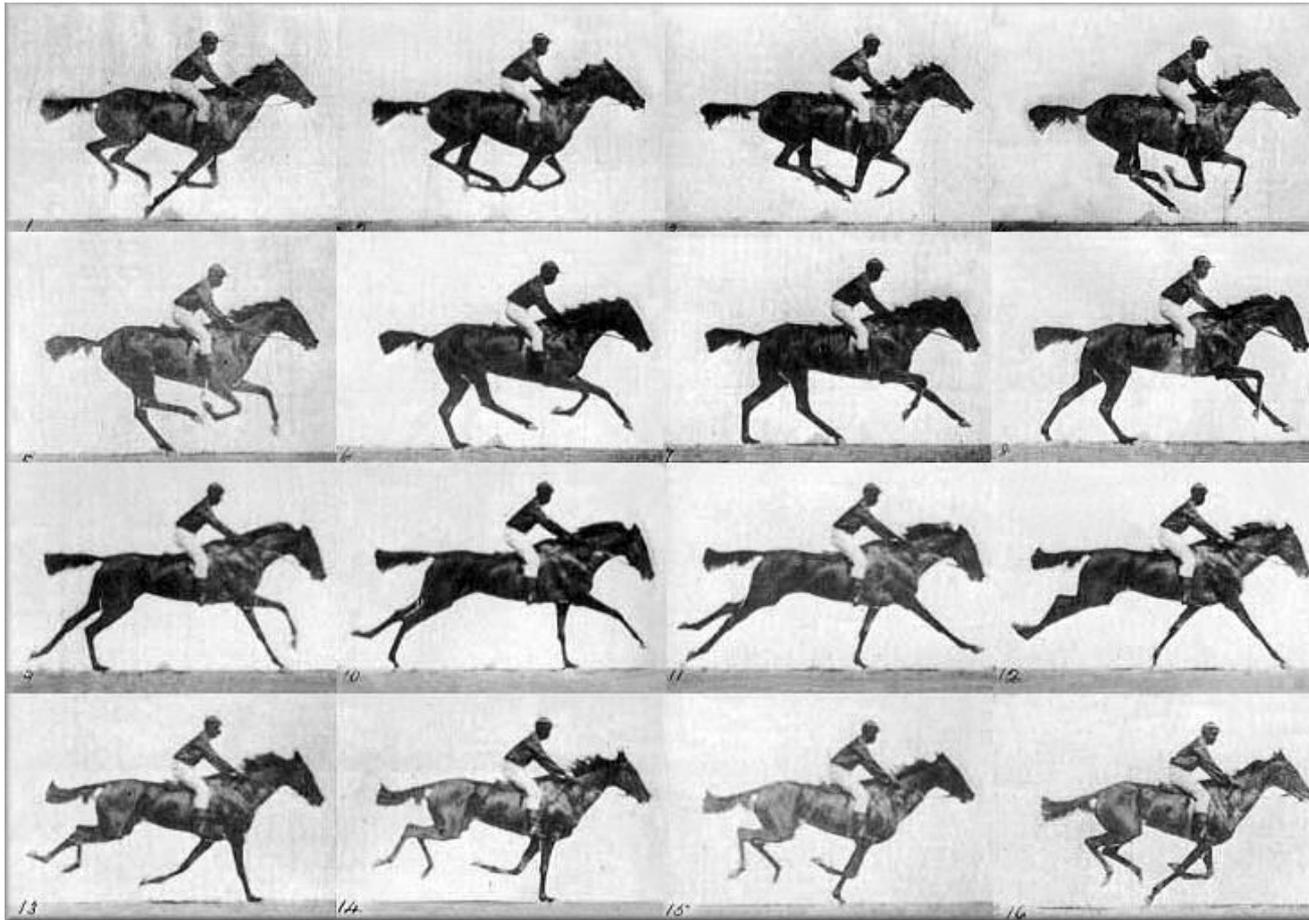


After a week, performance of students who had studied the text improved



Performance of students with animation declined

Why do animations fail?



http://commons.wikimedia.org/wiki/File:Muybridge_race_horse_gallop.jpg

Two principles for successful animated graphics

Congruence Principle

Natural correspondence between change over time, the core of animation and the essential conceptual information.

Apprehension Principle

Animations must be slow enough to perceive movements, changes and timing

Principles of
Traditional animation
applied to
3D computer animation

1. Squash & Stretch

„Defining the rigidity and mass of an object by distorting its shape during an action.“

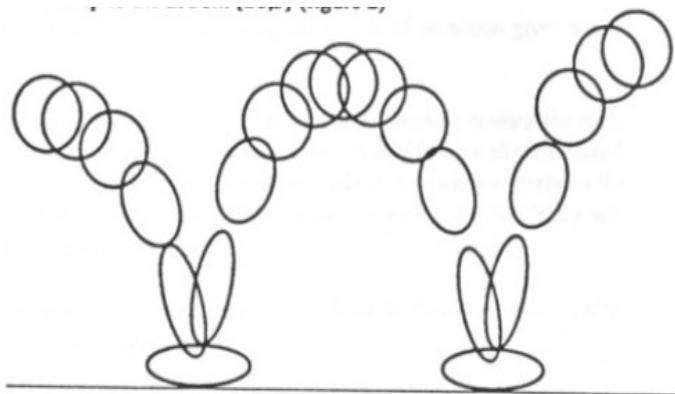


FIGURE 2. Squash & stretch in bouncing ball.

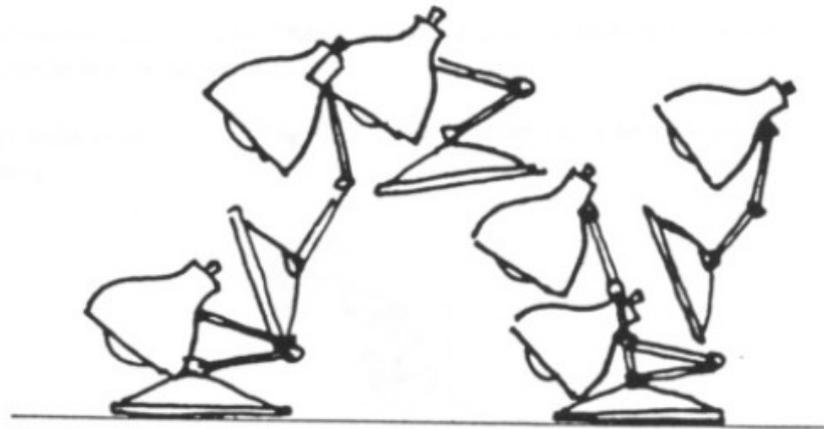
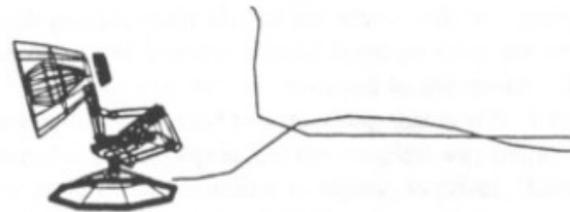
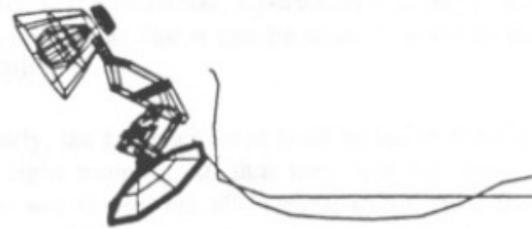


FIGURE 3. Squash & stretch in Luxo Jr.'s hop.

2. Timing

„Spacing actions to define the weight and size of objects and the personality of characters“



3. Anticipation

„The preparation of an Action“

- Catch the audience eye, prepare them for the next movement
- lead them to expect it before it accures



4. Staging

„Presentating an idea so that is unmistakably clear“

- important that only one idea is seen by the audience at a time
- object of interest should contrast from the rest of the scene

5. Follow Through and Overlapping Action

„The termination of an action and establishing its relationship to the next action“

- action should never brought to a complete stop before starting another action
- actions should overlap

6. Straight Ahead Action and Pose-to-Pose Action

„The two contrasting approaches to the creation of movement“

- **Straight ahead**: creating pose after pose, frame after frame
- **Pose-to-Pose**: defining and sketching the key poses first

7. Slow In and Out

„The spacing of the inbetween frames to achieve subtlety of timing and movement“

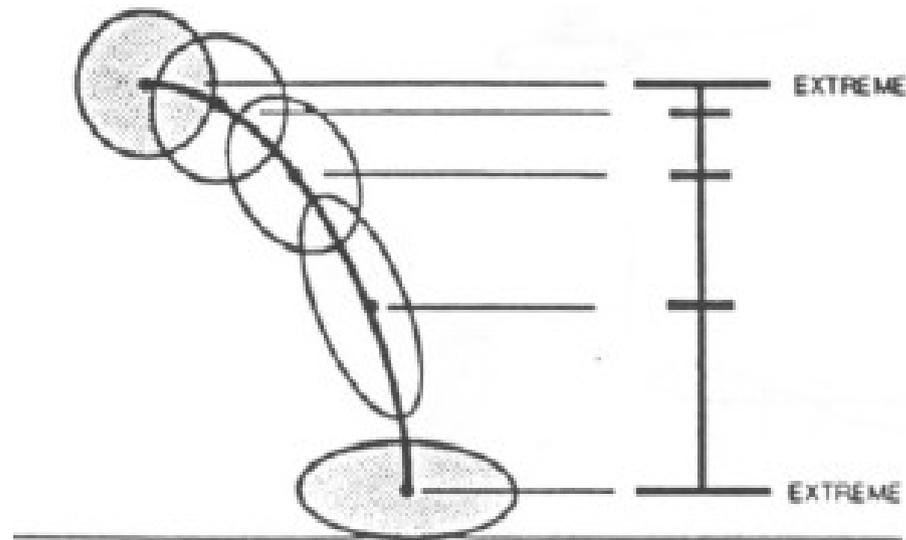
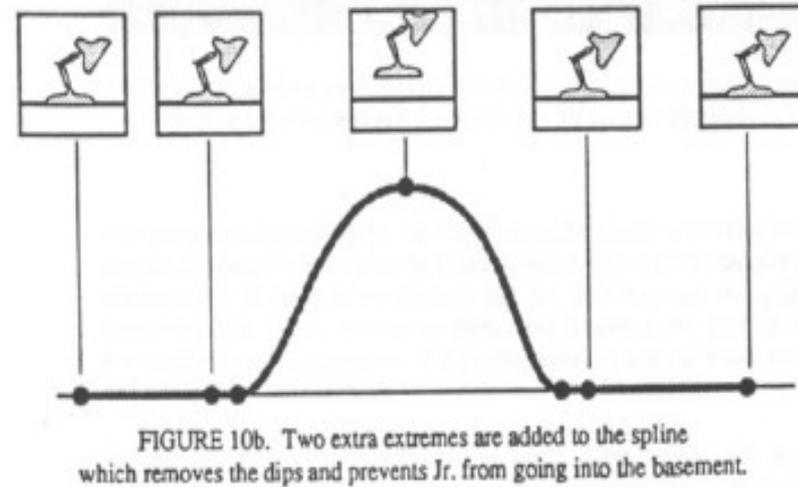
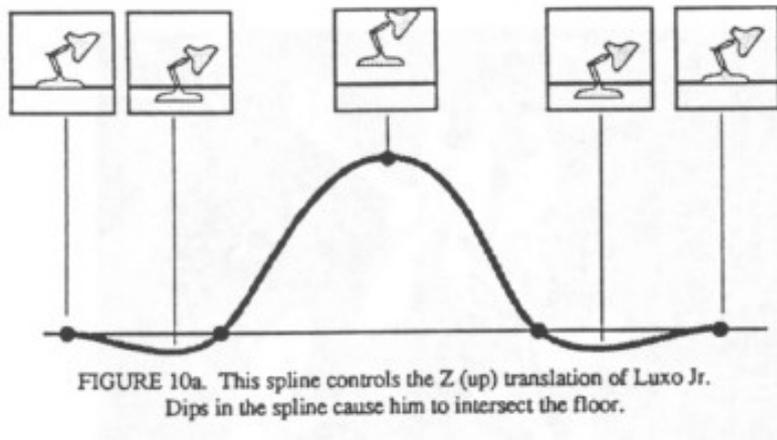


FIGURE 9. Timing chart for ball bounce.

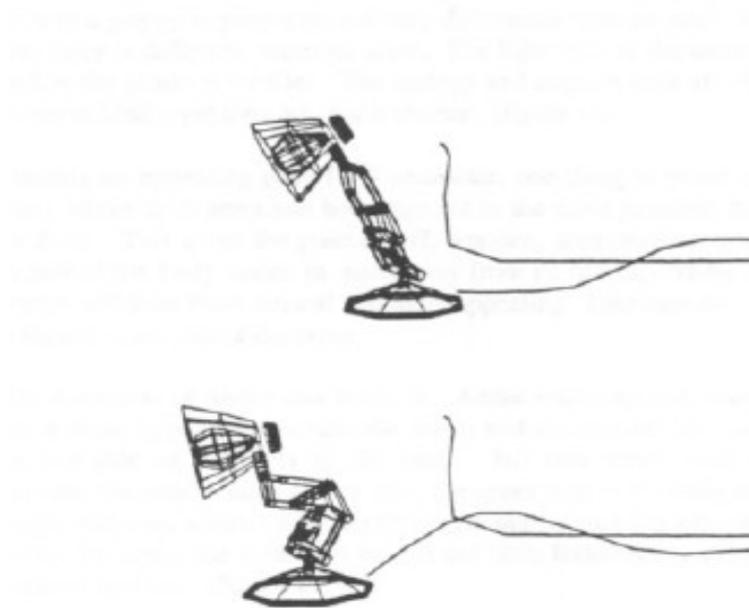
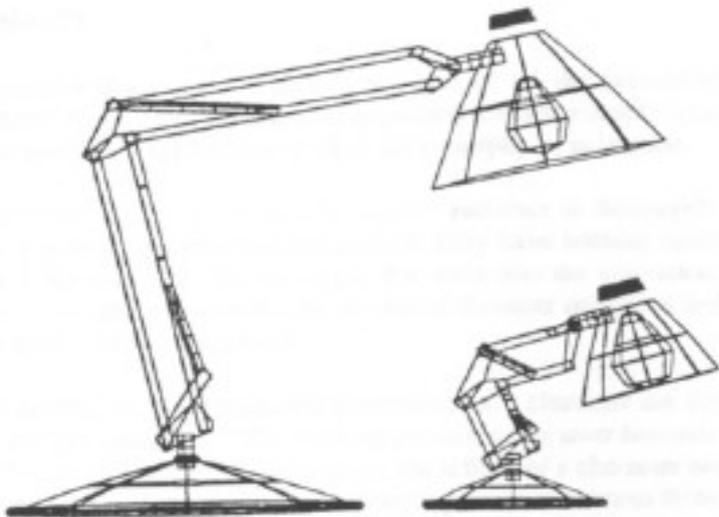
8. Arcs

„The visual path of action for natural movement“



9. Exaggeration

„Accentuating the essence of an idea via the design and the action“



10. Secondary Action

„The action of an object resulting from another action“

For example

- main idea is told by movement, secondary action = facial expression

11. Appeal

„Creating a design or an action that the audience enjoys watching“

- avoid „twins“ (both arms and legs are in the same position)
- each part of the body should vary

Luxor Jr Animation

<http://www.youtube.com/watch?v=6G3O60o5U7w>

Critique

Animation can it Faciliate?

- + good description of the problems
- + different lightning of the topic
- +/- contains a lot of studies where it's hard to make a overall conclusion
- Many textual descriptions and no visual examples

Critique

Principles of Traditional Animation Applied to
Computer Animation,

- + good description, understandable
- + a lot of pictures and examples
- maybe there are newer approaches and more than 11 principles today