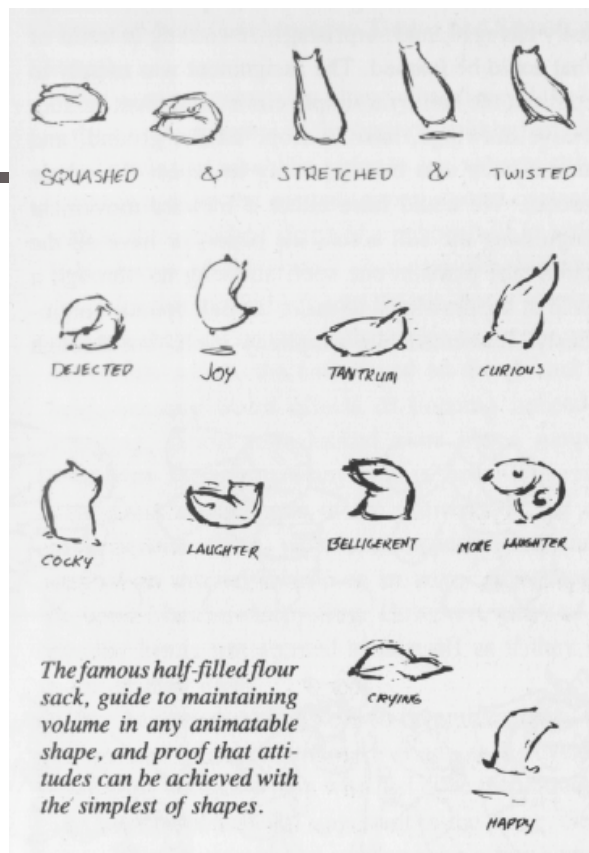

12 Principles of 3D CG Animation

Amy Gooch

CS395: Intro to Animation

Summer 2004



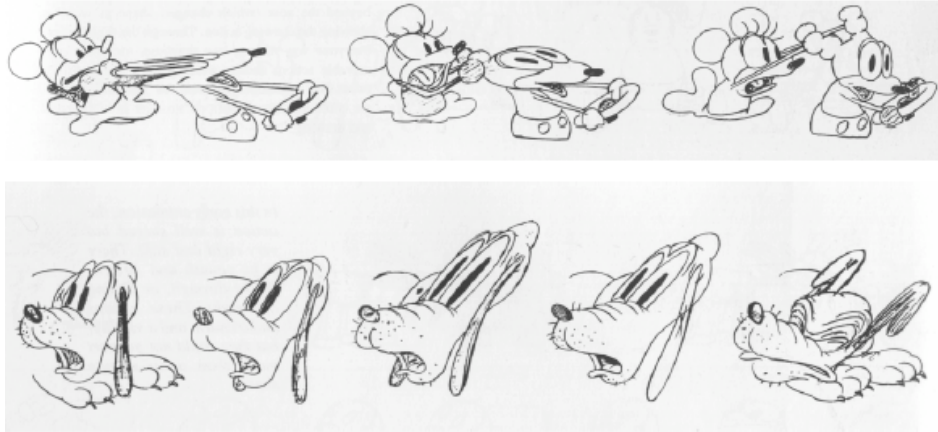
12 Principles of Animation

- Created by Disney Studios in 1930s
 - Snow White (1937)
 - Pinocchio & Fantasia (1940)
 - Dumbo (1941)
 - Bambi (1942)

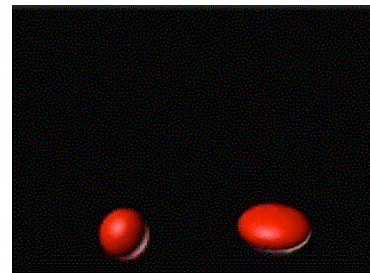
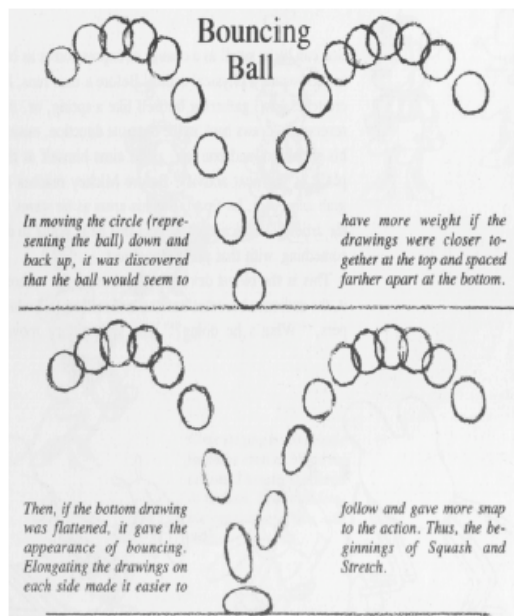
Really about...

- Performance
 - Directing Performance
 - Representing reality
 - Interpreting real world physics
 - Editing sequence of actions

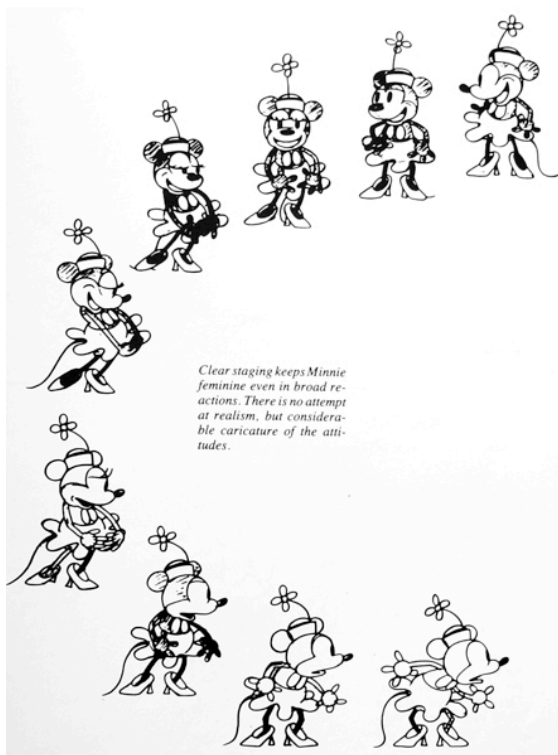
Squash and stretch



Squash and stretch



Anticipation



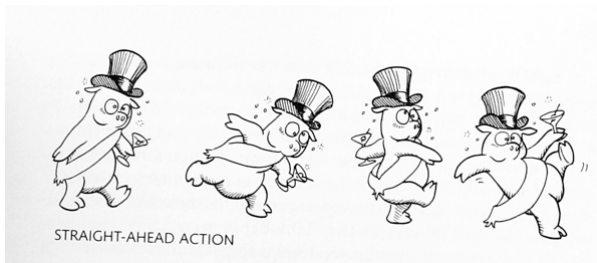
Clear staging keeps Minnie feminine even in broad reactions. There is no attempt at realism, but considerable caricature of the attitudes.

Staging

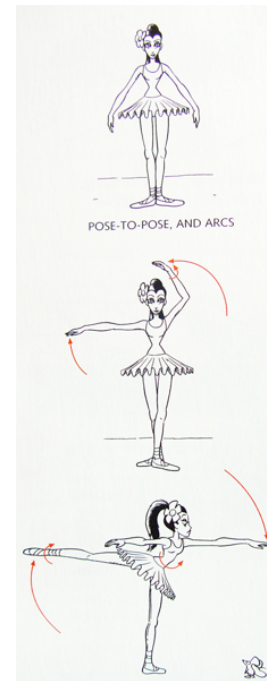


Two Animation Techniques for Action

- Pose-to-Pose
- Straight-ahead

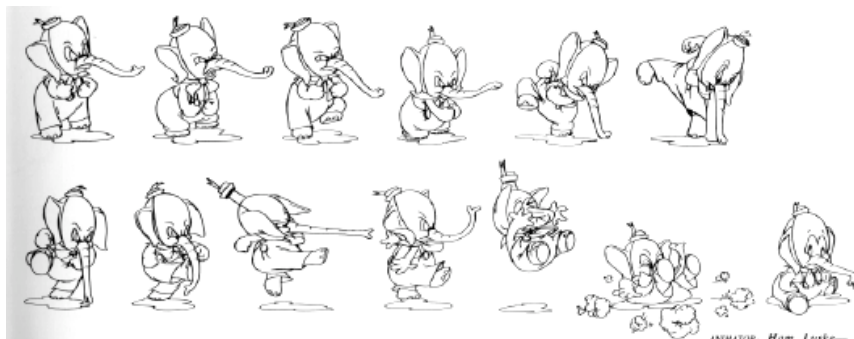


(Also: Ryan by Chris Landreth)

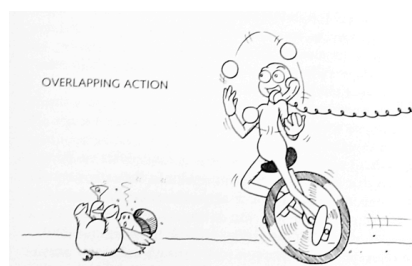


Action, pt 2

Follow-thru Action



Overlapping Action



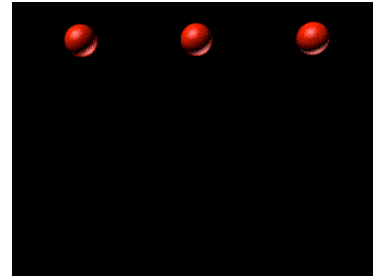
Movement:

Slow-in and Slow-out

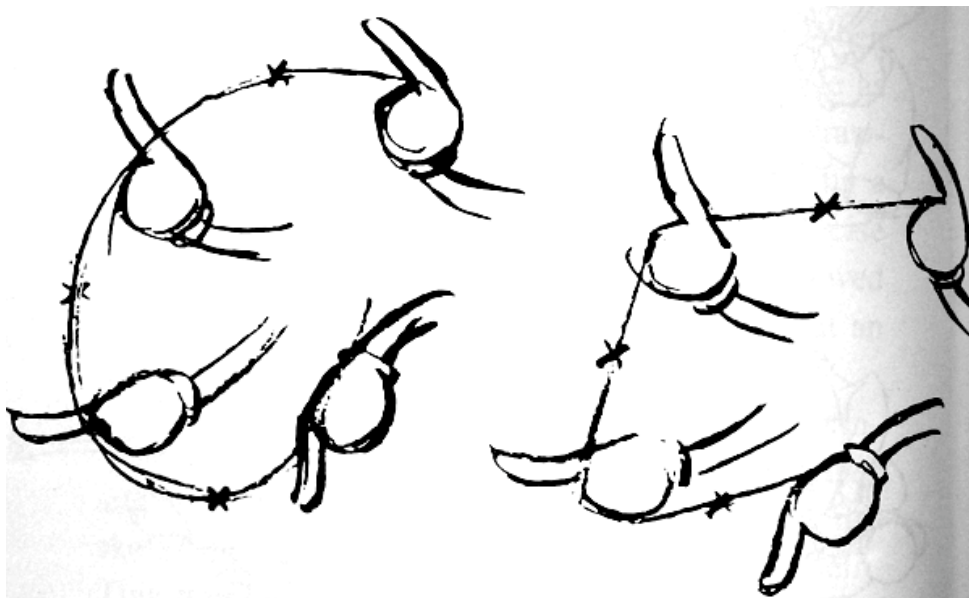
- The ball on the left moves at a constant speed with no squash/stretch.

The ball in the center does slow in and out with a squash/stretch.

The ball on the right moves at a constant speed with squash/stretch.



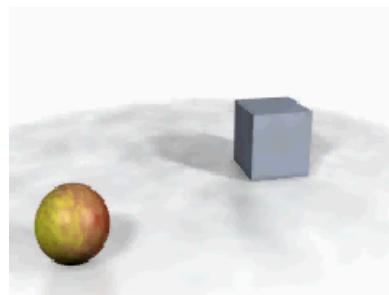
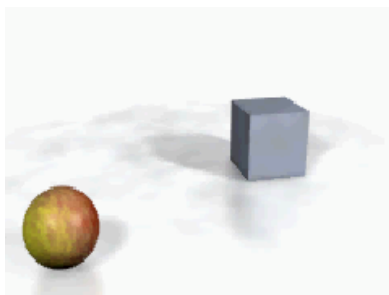
Movement: Arcs



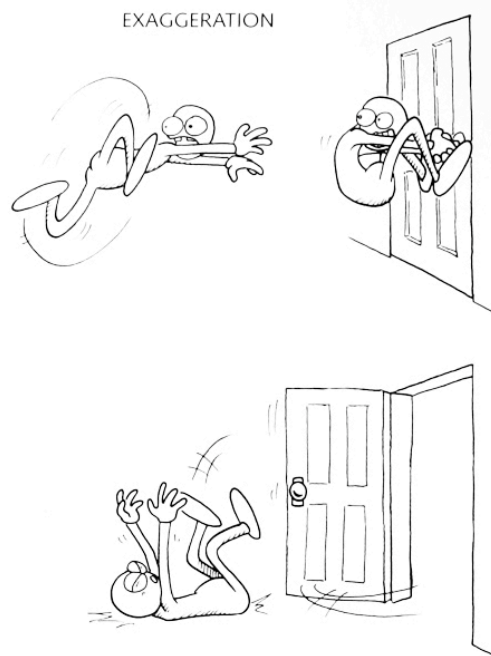
Secondary Action



Timing

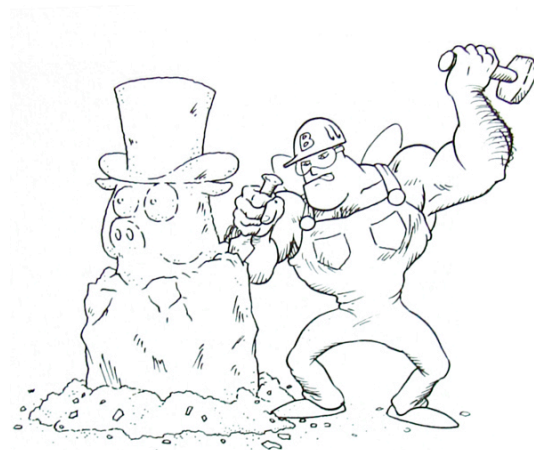


Exaggeration



Solid modeling and rigging

- (solid drawing in 1930s)



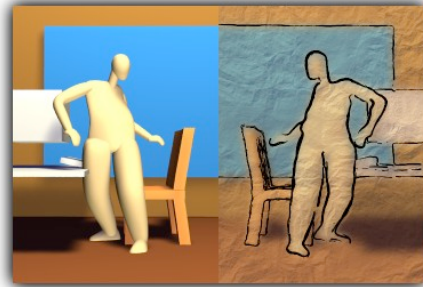
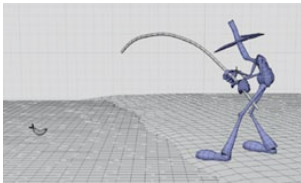
SOLID MODELING AND RIGGING

Character Personality



A few more...

Visual Styling



Blend Motion

- Cartoon physics
- Realistic cartoon
- Realistic human
- Rotoscoping

Cinematography

- Lighting
- Composition
- Squencing

Facial animation

- More subtle controls in CG
- Decide early on level of control

User-controlled animation

- Games allow user intervention
 - Built-in anticipation
 - Branch smoothly between action shots
-

Animation Examples

- Siggraph 2004 DVD

Credits

- http://www.siggraph.org/education/materials/HyperGraph/animation/character_animation/principles/prin_trad_anim.htm
- Kerlow's Book
- Jessica Hodgins's Notes