

Art 384: Introduction to 3D Animation

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Lecture 6

Schedule

- Roll
- animation
- Animation and physics
- 3-pass animation

Review

- Animation according to Neal
 - Why not? It's just another angle for crits
 - All that timing and squash & stretch stuff still works.

Breaking Down Animation

- Animation = Acting + Physics
 - Cartesian Dualism -- Mind/Body
- Acting = Focus + Breathing + Psychology
- Physics = ??



Acting=Focus+Breathing+ Backstory

- Focus = where the eyes point
- Breathing = small motions to maintain the illusion of life
- Backstory = the character's origins

Focus

- Eye direction is the main visual indicator of a character's thoughts
- A character thinks sees thing at a time, does one thing at a time, has one goal at a time
- Focus changes at finite speeds
 - it takes time to move your eyes
 - it takes time to think
 - reacting is thinking

Breathing

- You are always in motion
 - heart, lungs, guts, poor balance
 - constant motion is realistic
- John Lassiter: Avoid motionlessness in CG : petrification
- A good actor is acting even when the attention is not on them
 - direction of attention to center
 - ancillary character development

Backstory

- What characters see, other than their surroundings
- Great source of surprising reactions
- Has to be depicted somehow, or it's just inexplicable

Acting with just a head

- <http://www.youtube.com/watch?v=Kd43Cosmy88>

Critiquing acting

- Does the person really look like they're in the situation depicted?
- Reaction timing wrong?
- Emotional actions appropriate?

The role of convention

- It has a role
- There's a visual language to puppetry that is well-known-- learn it, use it.
- The surprise jump back
- The amazed head shake
- The twirly unserious faint
- Suggestions?

Physics for Artists

- Newton's 3 laws of motion
 - Inertia
 - Force = Mass * acceleration
 - Action and reaction

Inertia, you're familiar with

- Things in motion continue in motion
- Things at rest stay put

$$F = M * A?$$

- Start with position
- Velocity is change in position per second
- Acceleration is change in velocity per second

$F=ma$, second slide

- The bigger the object, the harder you have to push
- The bigger the push, the faster it accelerates
- Gravity and bricks!
- Making things look small, or big, or fluffy

Action and Reaction

- You can't push something without it pushing back
- Central to martial arts, jumping, basketball, bowling

3-pass animation

- First pass: establish positions throughout scene
 - NO details: rotation, deformation
 - With Moe & Joe, it's just position
- Second pass: Secondary animation
 - Elbows bend, heads turn
- Third pass: everything else

Let's do one

- Fire up Moe and Joe
- Joe is watching football.
- Moe wants to play Legos, something