

2D Animation in Games - A Primer

Tyriq Plummer
Main Guy, FourbitFriday

Who's This Chump?

- Tyriq Plummer
 - He makes games
 - And also art
 - Hello.



CATAACOMB RIDS



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Some Considerations...

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 - Use the right tools for the job.
 - 2D animation does not like lots of fiddly details.
 - 2D animation is not fast.
 - Listen to your artists

Some Considerations...

- Animation isn't *just* “Make Thing Look Good”
 - Animation is *Communication*
 - Communication takes even greater precedence in games
(Because not knowing what's going on kind of sucks)

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- Motion can be a separate aspect of visual appeal
 - Any style of art can move well
 - Any style of art can move poorly



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Animation Terms

- Keyframes
- In-Betweens
- Spacing
- Smears and Multiples

Principles of Animation

• There are 12 of them

- Squash + Stretch
- Anticipation
- Staging
- Straight-ahead vs Pose-to-Pose
- Follow-through + Overlapping Action
- Slow In + Slow Out
- Arcs
- Secondary Action
- Timing
- Exaggeration
- Solid drawing
- Appeal



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• There are 7 of them that we care about

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Squash + Stretch

- Deformation along an axis
 - A quick way to give static things life and character.



Anticipation

- The warning sign...the hesitation...
 - How and how much an action is prefaced, foreshadowed.
 - Can be unwieldy on player-characters, when reflex is demanded.
 - An invaluable tool for communicating what's *about* to happen, and why.



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Timing

- The rhythm of motion
- Where the focus hangs; where it rushes by
 - How long an action takes, and where the beats are.
 - The distance from one frame another measured through time.



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Ease in, Ease out

- “Inertia: It exists”
 - Things take time to start
 - Things take time to stop
- Sometimes handled by...actual game logic.



A Brief Interlude

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Arcs

- Things like to move in curves
- Is it a pendulum, or a spring?
 - Things tend to move in arcs
 - And when they don't it's because they're either physically unbounded or moving directly towards/away from a constraint (rather than obliquely to one).



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Follow-Through, Overlapping Action

- That which follows; the aftermath



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 - Grounds motion with a physicality
 - Make Thing Look Good



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Exaggeration

- Communicate impact and add expressiveness by pushing the other Principles to extremes

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- Communicate impact and add expressiveness by pushing the other Principles to extremes
 - Squash and stretch? Crush and spaghettify!
 - Anticipation? Anxiety!
 - Arcs? Orbits!
 - Follow-through? Dogged pursuit!

Common Mistakes



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Common Mistakes

- Too Many Frames

- “Smooth” is not equivalent to “Good”
- Snappy is a fine way to be
- Consider how much you actually need to effectively communicate the action.

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Common Mistakes

• Misuse of Smears

- Despite the name, smears are a means of clarifying motion
- They do not inherently communicate 'speed'
- Fill in visual information that would otherwise be difficult to track
- When used when unneeded they can actually make things feel slower and less impactful.



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Common Mistakes

•Overanimating

- Animations should match the behavior on screen
- Remember: Animation is communication
 - Consider that a lot of repetitively moving bits can be fatiguing to watch for hours at a time
 - Consider which on-screen elements are most important and needing of a player's attention
 - Consider the contrast of states between each other
 - Lotta things to consider.

Common Mistakes

•Thinking You Know Things

- You don't know things, and that's fine
- Things exist and you can look at them
- Use references. Make your own references. By moving
- Act out your animations. Get props.

Common Mistakes

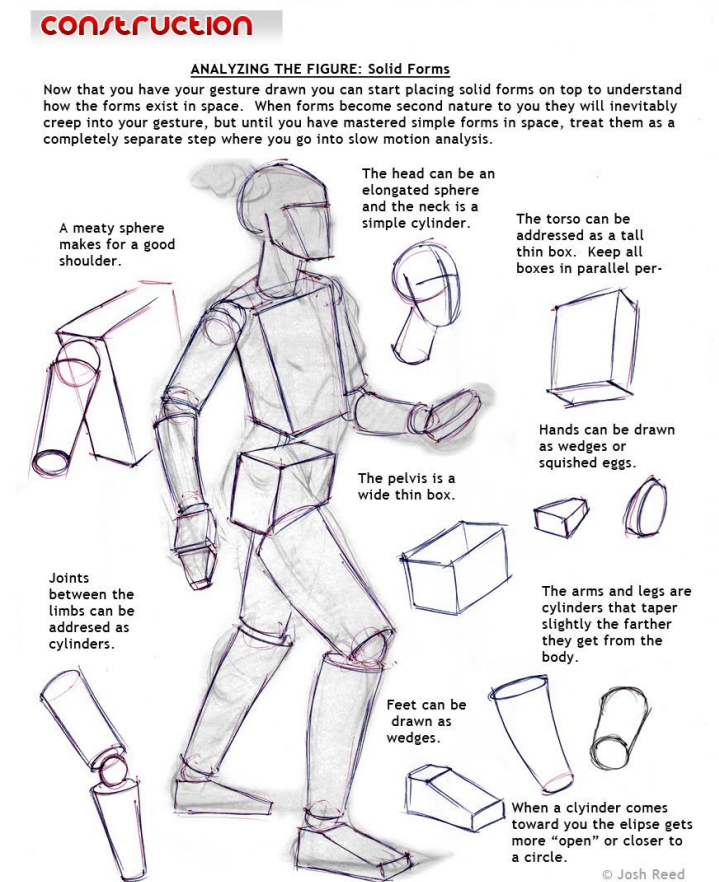
- Being Too Precious With Your Work
 - You drew a good frame. Good job! Now do it again!
 - It can often (but not always) be faster and better looking to completely redraw frames than trying to finagle the One Good Frame you've drawn into a complete animation.
 - Also, you will get better faster!

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- Inconsistent size/mass
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 - Measure distances and keep track of them
 - Make rough animations to guide you



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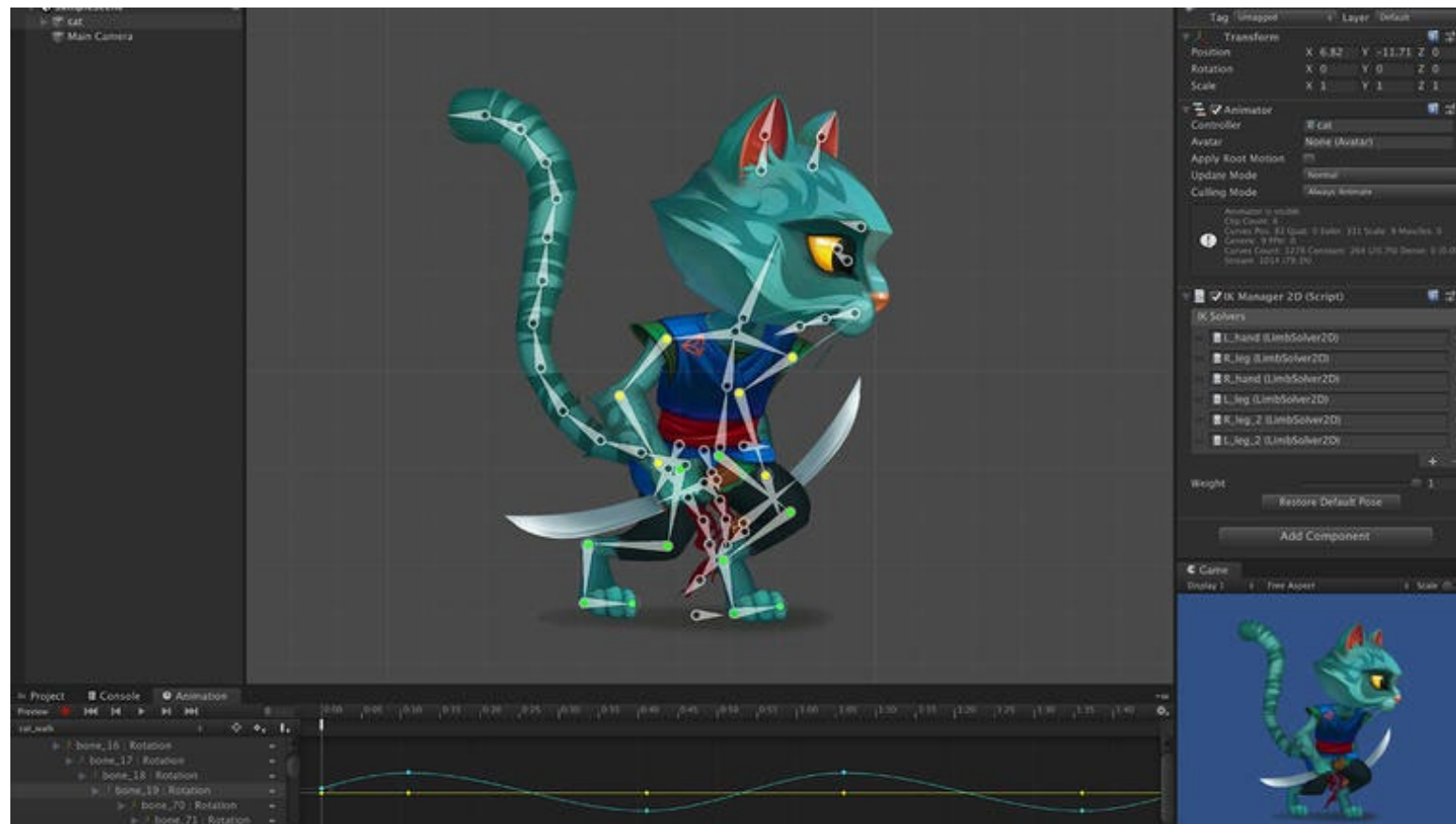
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Some Other Stuff

Skeletal Animation

- Using bones and joints to animate between keyframes
 - Extremely useful for modular/equippable characters
 - Procedurally Animate-able



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 - Hips and shoulders???



Leverage your tools (Engine Stuff)

- You can offload some stuff onto the engine!
 - Transformations like squash + stretch
 - Trailing objects like scarves, tails, hair, etc.
 - Effects like weapon trails and particles
 - Integrating certain effects into the engine rather than baking them into the animation can make actions feel more grounded in the world

A Plea to the Engineers

- Please support variable frame-durations for animations
 - Within an animation, let frames last for arbitrary durations
 - It is very useful and good
 - I've only worked on two projects that had this as part of their workflow (Cadence of Hyrule and Epic Mickey)
 - It made a huge difference.
 - I am sad when I cannot use it
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This has been me, talking

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basically everywhere