



IMGD 1001: 2D Art



Outline

- The Pipeline
- Concept Art
- 2D Art (next)
 - Animation, Tiles
- 3D Art
 - Modeling, Texturing, Lighting

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Animation

- Animation → produces the illusion of movement
- Display a series of frames with small differences between them
- Done in rapid succession, eye blends to get motion
- Unit is Frames Per Second (fps). For video:
 - 24-30 fps: full-motion (Game Maker does 30)
 - 15 fps: full-motion approximation
 - 7 fps: choppy
 - 3 fps: very choppy
 - Less than 3 fps: slide show
 → (2D Sprites can get away with about ½ the above)
- To do successfully, need to keenly observe, focus on differences in movement
 - Apply basic principles (next)

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Key Frames

- Images at extremes in movement
 - Most noticeable to observer
 - Ex: for flight wings up and wings down
 - Ex: for walking, right leg forward, leg together
- The more the better?
 - Smoother, yes
 - But more time to develop (tradeoffs)
 - And more prone to errors, "bugs" that interfere with the animation



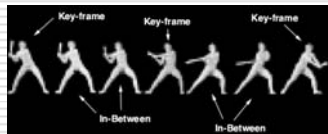
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In-Between Frames

- Generated to get smooth motion between key-frames
 - Can be tedious and time consuming to make
 - Most software allows duplication



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Frame Animation Guidelines

Object	Minimum # of Frames	Maximum #
4-legged animal running	4	16
Animal biting	2	5
Crawling	2	12
Explosions	5	16
Falling	3	5
Flying	2	12
Jumping	2	10
Kicking	2	6
Punching	2	6
Rotating/spinning	4	16
Running	2	12
Swinging (an object)	2	8
Throwing (an object)	2	6
Vehicle flying	2	4
Vehicle moving	2	8
Walking	2	12

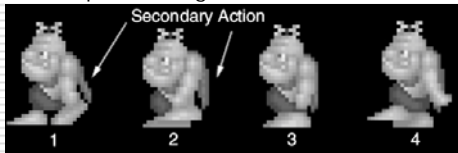
Faster motion needs fewer drawings. Slower motion needs more drawings.
(See GameMaker tutorial shooter for examples of Enemy Planes, Explosions)

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Secondary Actions

- Animation part that does not lead movement, but follows it
 - Add extra dimension of reality
 - Ex: Hair moving in wind
 - Ex: Cape billowing backward



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Steps in Creating Animation Sequences (1 of 3)

- Conceptualize – have vision (in mind or on paper) of what animation will look like
- Decide on object behavior
 1. Animated once (no looping)
 2. Animated continuously (using cycles)
 - 2nd choice means must make last key frame blend with first
- Choose an image size – will contain and constrain object
 - Test and experiment briefly to have plenty of room
- Design key-frames - drawing the motion extremes
 - Use simple shapes to represent main actions
 - Ex: stick figures or basic shapes (circles, squares)

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Steps in Creating Animation Sequences (2 of 3)

- Estimate the in-betweens
 - Think of how many you will need to complete the sequence smoothly
 - Be conservative. Easier to add additional transition frames than to remove them
- Apply secondary enhancements
 - Embellish to look convincing and enticing
 - Exaggeration

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Steps in Creating Animation Sequences (3 of 3)

- Test each movement
 - Can be done with 'copy' and 'undo' in tool
 - Others have animation rendering (ex- Game Maker)
 - Look for flaws (movement, discolored pixels ...)
- Repeat
 - Repeat for all animations

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Primitives

- Used in many games
- If you know these, you can apply primitive rules out of the box:
 - Cylindrical primitive
 - Rotational primitive
 - Disintegration primitive
 - Color flash primitive
 - Scissors primitive
 - Growing primitive
 - Shrinking primitive
 - Minor primitives (used less often)
 - (See Chapter 9 of Feldman)

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Tiles

- Needed for common backgrounds
 - Too hard to make every pixel different!
- Exploration games (especially outdoors) make heavy use of these
 - Grass, trees, water, sand
- Start with a grass tile to warm up

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Grass is Green

- Use a basic green square
- But this looks unnatural
 - Like flat, shiny metal
- No illusion of movement

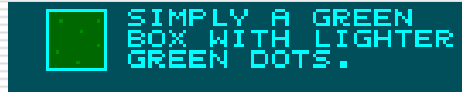


← Simply a Green Box

(Ex: bkg_grass0)

Grass has Variation

- Can do a lot with simple enhancement of color shades



(Ex: bkg_grass1)

Make Variation More Random

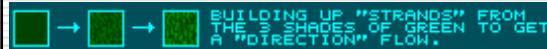
- Can use the "spray" tool



(Ex: bkg_grass2)

Make Look Random but with Control

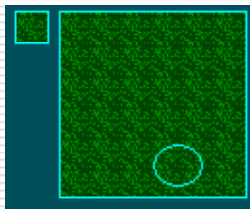
- Draw by hand for more control
 - 4 pixel line strokes



(Ex: bkg_grass3)

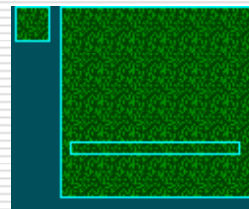
The "Grid" (1 of 3)

- Looks too much like tiles
- "Large" blank is problem, so remove



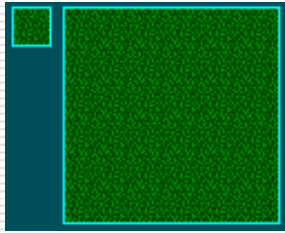
The "Grid" (2 of 3)

- Still, some "lines" are visible when repeated
- Break up with more color



The "Grid" (3 of 3)

- Much better!



(Ex: bkg_grass4)

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Don't Try This at Home

- Don't use same texture for all, else not much better than just colors



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When the Rubber hits the Road?

- Beware of the seams where different types of tiles meet!



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Group Exercise

- Break into groups
- Think of a (simple) animation (sprite) needed for your game
- Make key frames
- Make in-betweens
- Try it out!
 - Sketch on paper (grids for pixels)
 - Flip-book
- Feedback from group

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