Graphics Compression

By Timothy Southwick

Why?

- Space
- Hardware limits
- Network limits

General Techniques

- Reduce
- Reuse
- Recycle

Reduce

- Noise
- Excess data
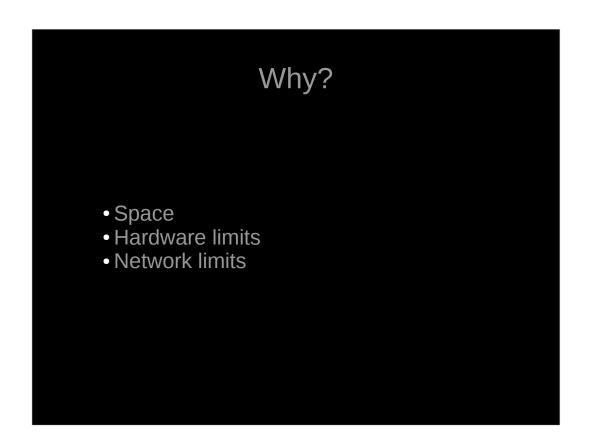
Reuse

- Palettes
- Sprites
- Time

Recycle

- Use existing methods

Questions?

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* graphics compression mainly focusing on older
  hardware
* briefly touch on video compression

Why?

- Space
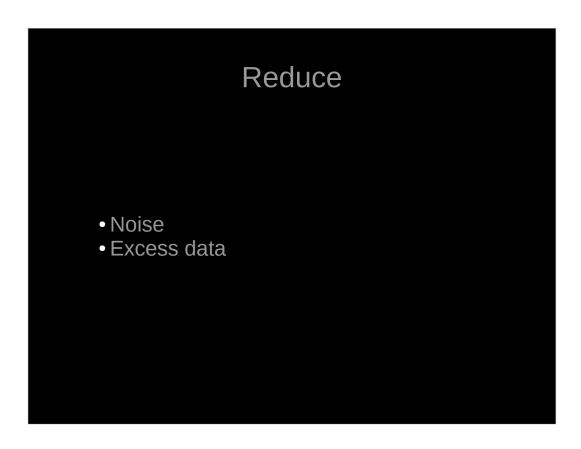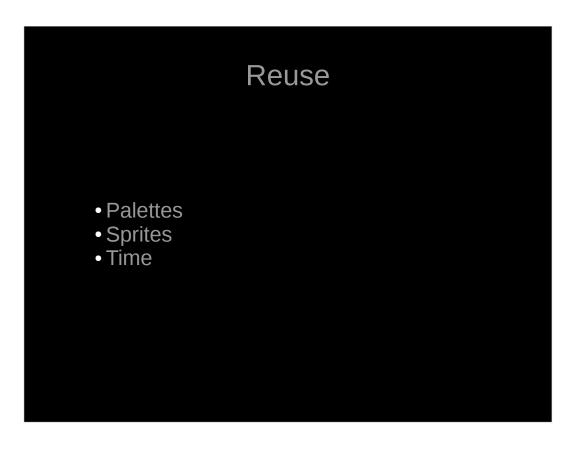- Hardware limits
- Network limits

* space
 - computers/consoles of the 80's couldn't directly store
   every pixel on their screen in full color
 - memory had to contain graphics, sound, and code
* processing power
 - some systems used CPU's to handle graphics
   instead of dedicated hardware, like early Atari
   systems
 - early 3D with wireframe or polygonal graphics
* internet speed
 - modern internet speeds cannot handle 1080p30
   without compression (24bpp,raw image)

General Techniques

- Reduce
- Reuse
- Recycle

* Reduce the data being handled
* Reuse data where possible
* Recycle (bit of a stretch) existing code (code reuse)

Reduce

- Noise
- Excess data

* lower resolution, framerate, bpp
* color cells (grid of color palettes shared within each
   cell)
* creative use of hsync interrupt (visual effects and split
   screen using limited hardware)
* use of 16-bit fixed point values instead of IEEE float
   (SNES mode 7 graphics)
* lower quality models/graphics improve performance
   of distant objects

Reuse

- Palettes
- Sprites
- Time

* color palettes
* sprites/tiles
 - jpeg expands on this by using predefined patterns;
   specify brightness, and discard the noisier ones
   depending on amount and quality settings
* mirroring of symmetrical scenes
* motion
 - better to move a texture in front of the screen instead
   of the pixels on the texture
 - modern video compression compresses by the
   motion of sections of the screen if possible

Recycle

- Use existing methods

* many compression methods exist as libraries or utilities
* compression from some earlier technologies are available as legacy modes (SVGA is backwards compatible with VGA, EGA, and CGA)

Questions?