IMGD 1001:
The Game Art Pipeline

Robert W. Lindeman
Associate Professor
Interactive Media & Game Development
Department of Computer Science
Worcester Polytechnic Institute
gogo@wpi.edu

Introduction

- "The computer artist is modern-day alchemist"
  (*Creating the Art of the Game*, by Matthew Omernick)
  - Turn polygons and pixels into wondrous worlds
- Sources of inspiration
  - Playing games!
    - How can make fun game if not having fun yourself?
  - The real world
    - The real world is always more interesting than anything we can make up

Introduction: Remember the Constraints

- Year 2098, Macrosoft will release FunStation 3000, 14 million terabytes of RAM, quantum-holographic drive with near infinite storage, processors at the speed of light
  - Game developers complain not fast enough
- Game artists must be creative *inside confines of technology*
  - All disciplines: engineering, design, sound
  - But often constraints biggest on artist

Based on Ed Wood, *Creating the Art of the Game*, by Matthew Omernick

Outline

- The art pipeline
- Concept art
- 2D Art
  - Animation
  - Tiles
- 3D Art
  - Modeling
  - Texturing
  - Lighting

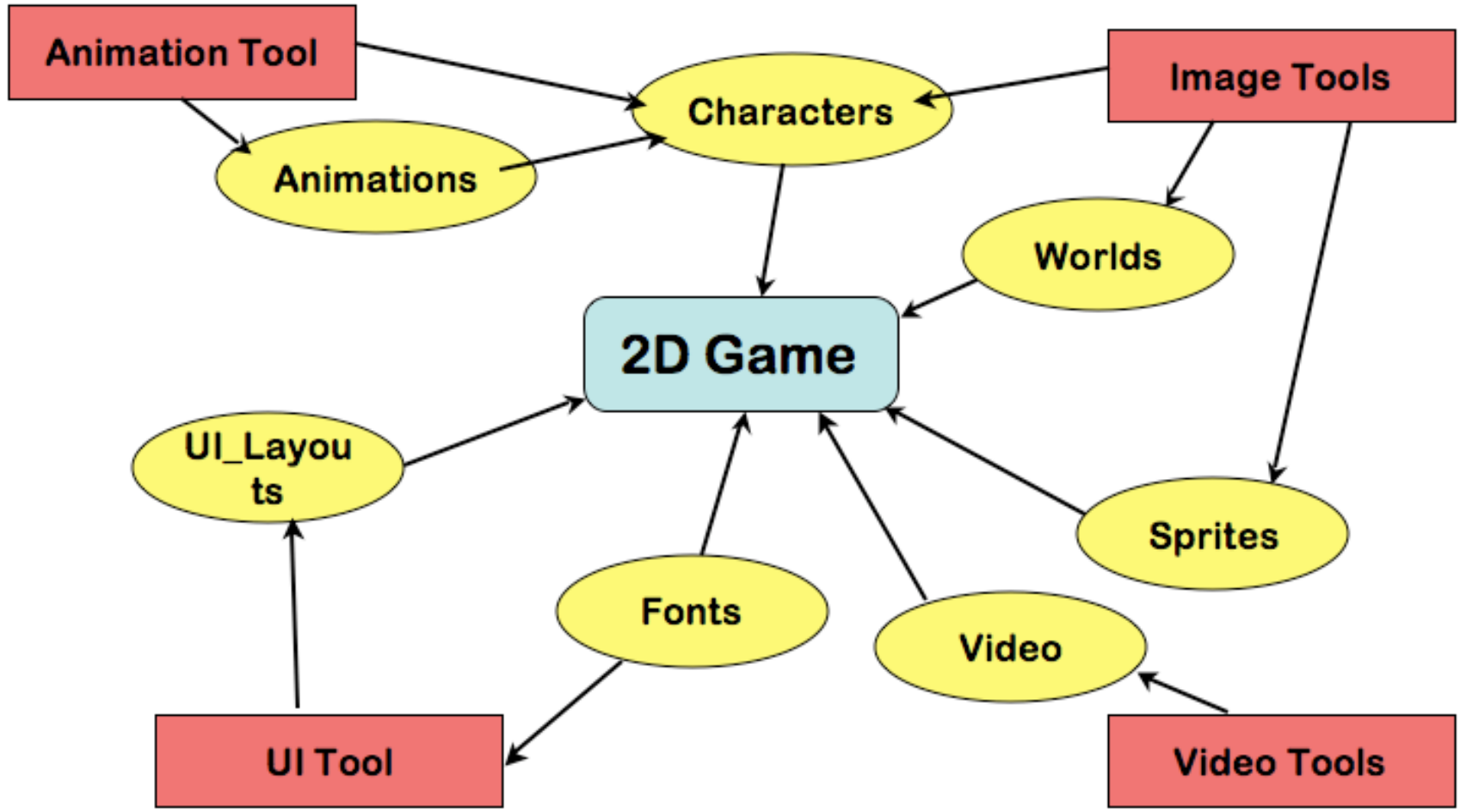
What's a Pipeline?

- *In the pipeline*
  - *Informal*. in the process of being developed, provided, or completed; in the works; under way. (Random House)
- For our purposes
  - The sequence of operations required to move art assets from concept to the finished product
- The Art pipeline
  - 2D: Concept, Creation, Conversion
  - 3D: Concept, Creation (modeling, texturing, lighting), Conversion
  - Asset management

Types of 2D Art

- These are created with tools:
  - User Interface (UI)
  - Sprites, tiles, and other pixel art
  - Type and fonts
- These need a pipeline:
  - Character art
  - Scenery / worlds
  - Characters
  - Animation
  - Video

2D Asset Creation

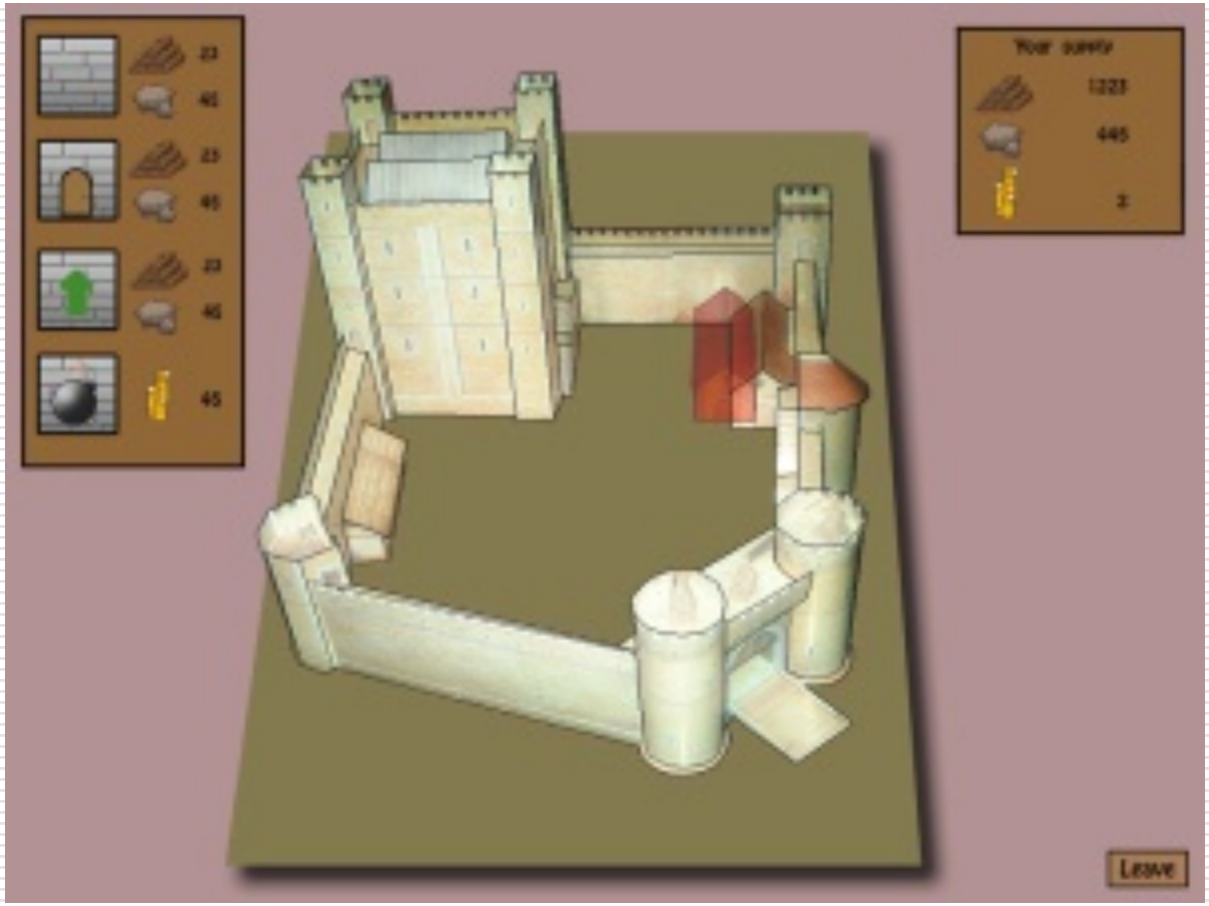


2D Pipeline (1 of 3): Concept

- Sketches
  - Napkin-style
  - Detailed design treatments
  - Prototypes

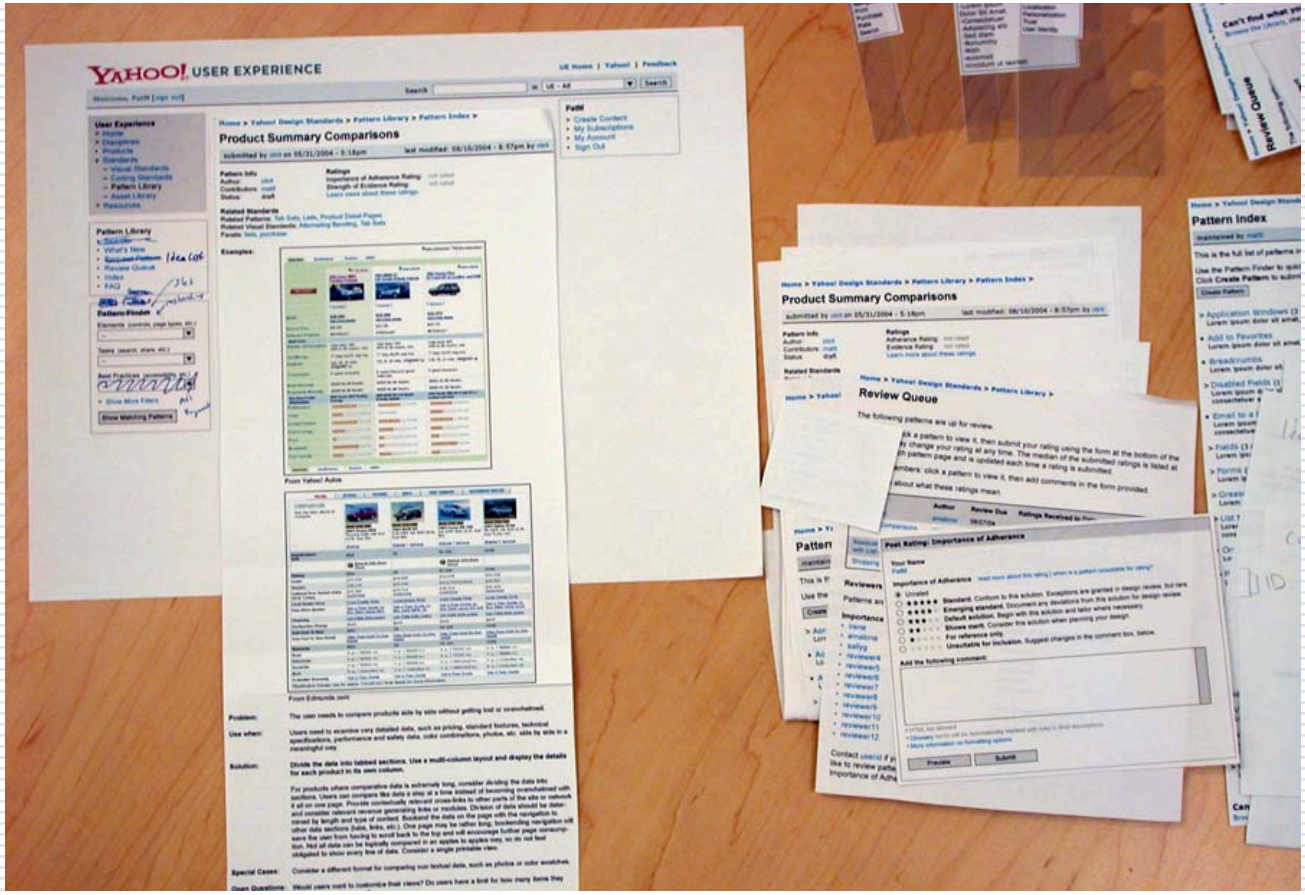
"Napkin-style" Concept Art

2D UI Prototype



designersnotebook.com

Paper UI Prototype

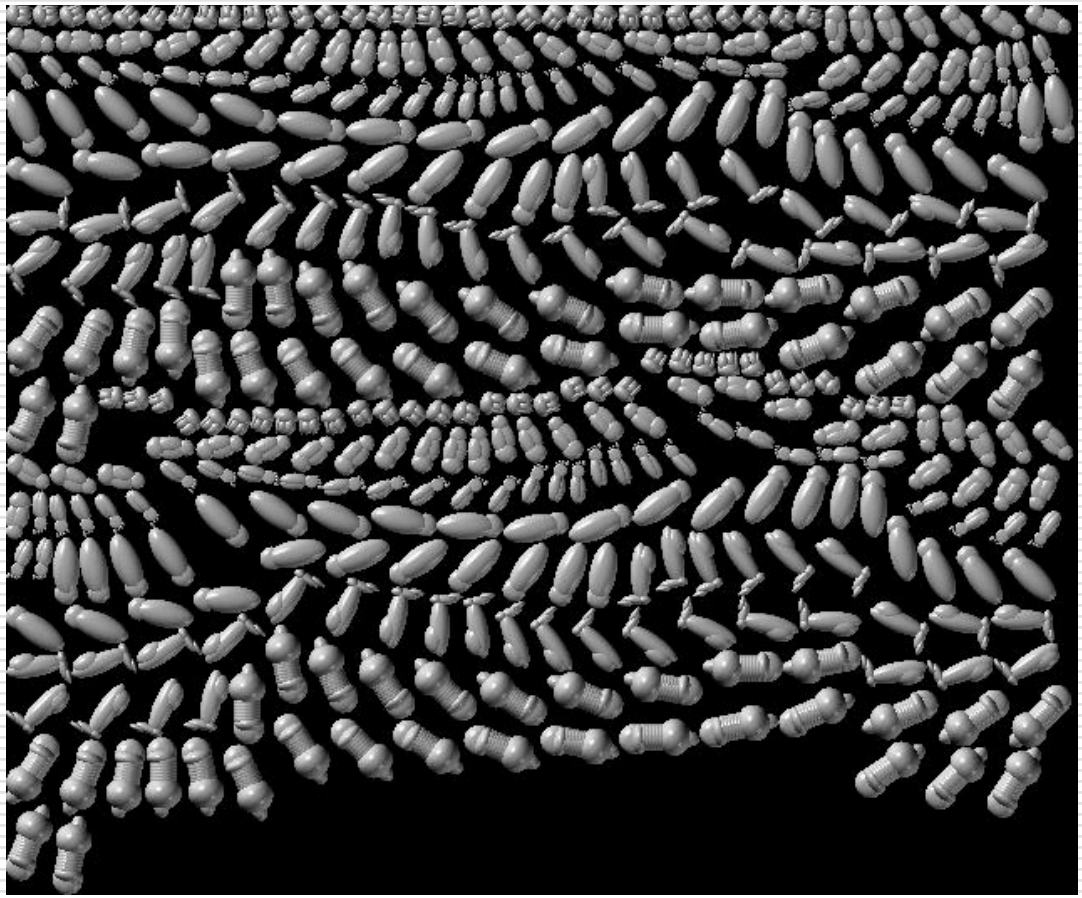


boxesandarrows.com

2D Pipeline (2 of 3): Creation

- Commercial / third party tools:
  - Photoshop, The Gimp, sprite editors, HTML/ browsers, Flash...
- Homegrown tools
  - Specialized animation systems
  - Tools that simulate key game features (UI layout tool, etc.)
  - The game engine

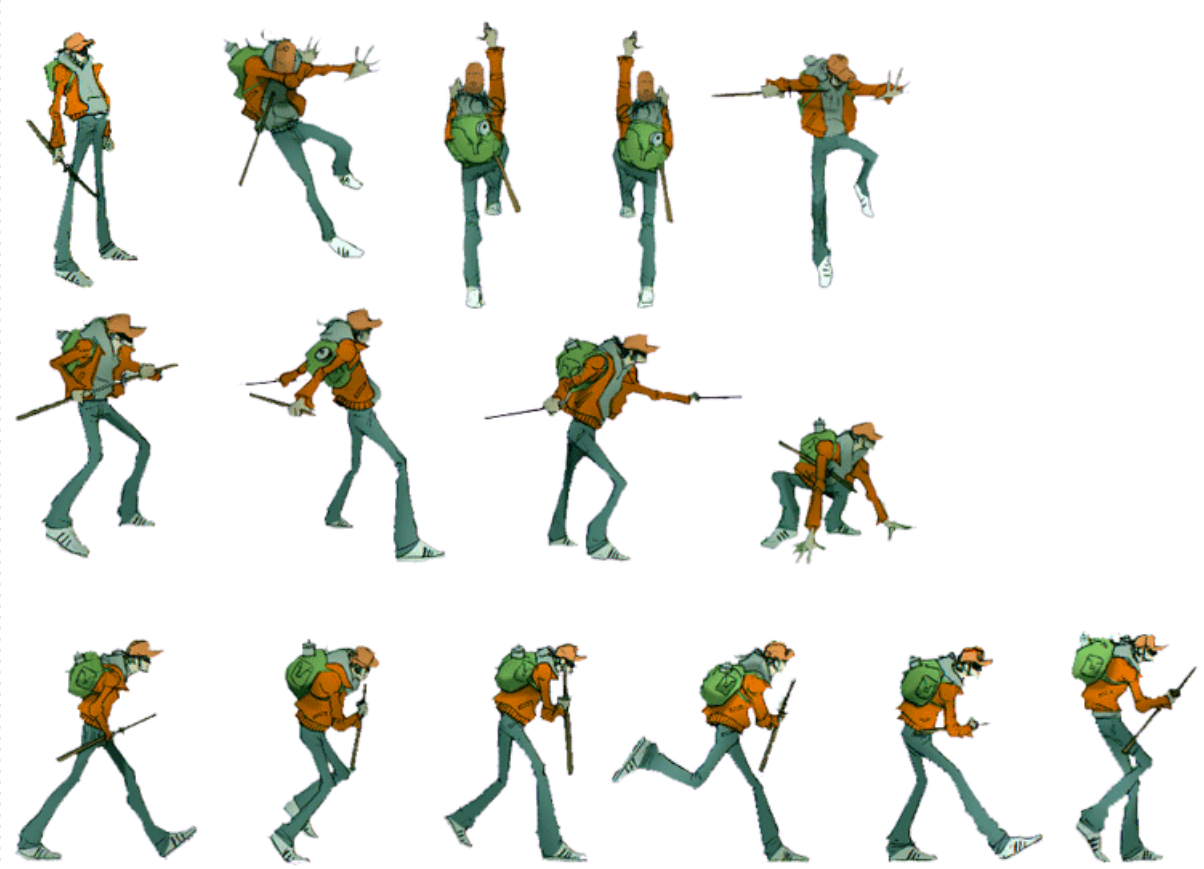
Assets for 2D Animation (1 of 3)



eberlein.org/euphoria

Assets for 2D Animation (2 of 3)

Assets for 2D Animation (3 of 3)

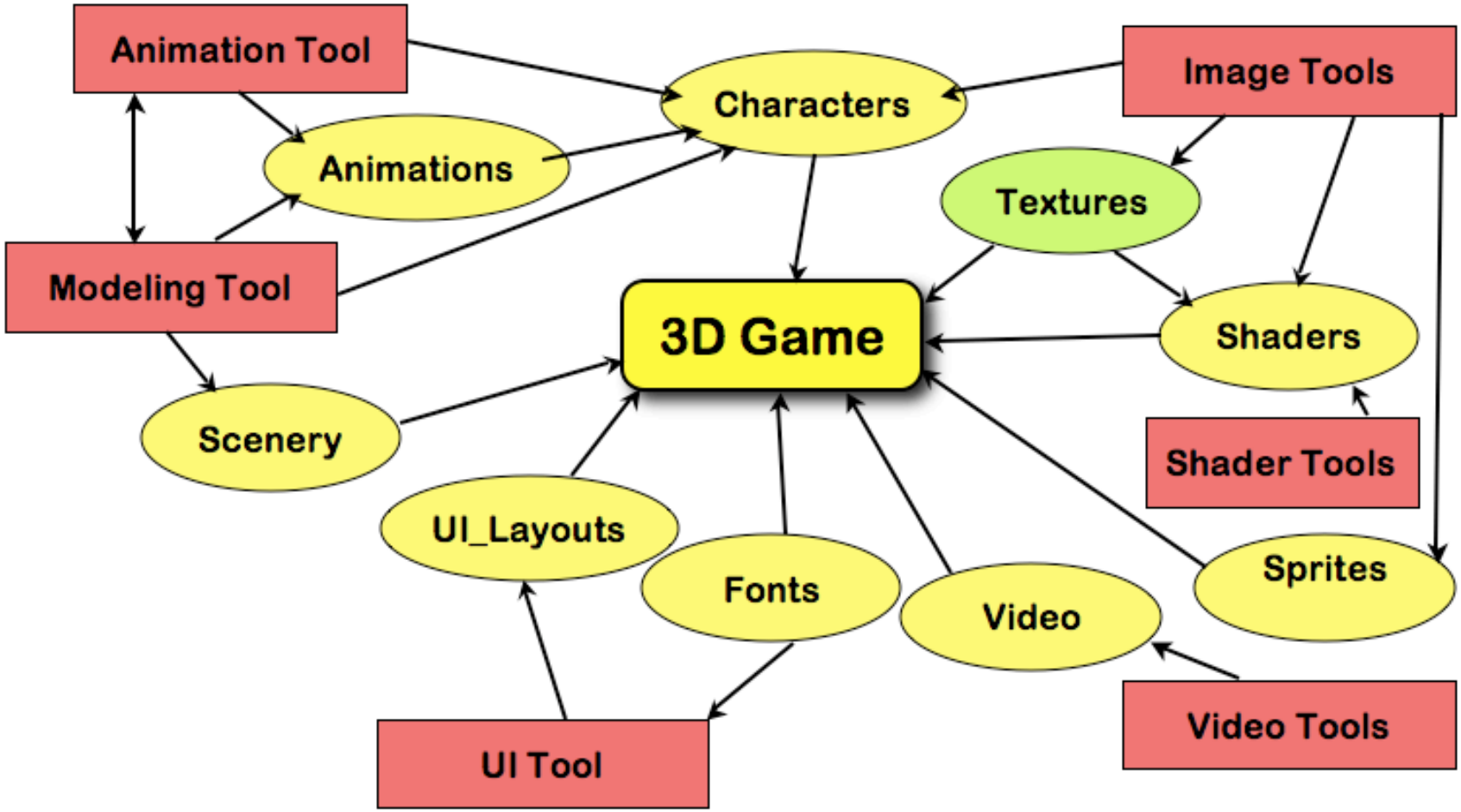


aniway.com

2D Pipeline (3 of 3): Conversion

- Putting the assets into the final form
  - File type conversion
    - PSD to TGA / JPG, for example
    - Compression
    - Collection (zip files, pak files, etc.)
  - Testing in the game
  - Debug / fix

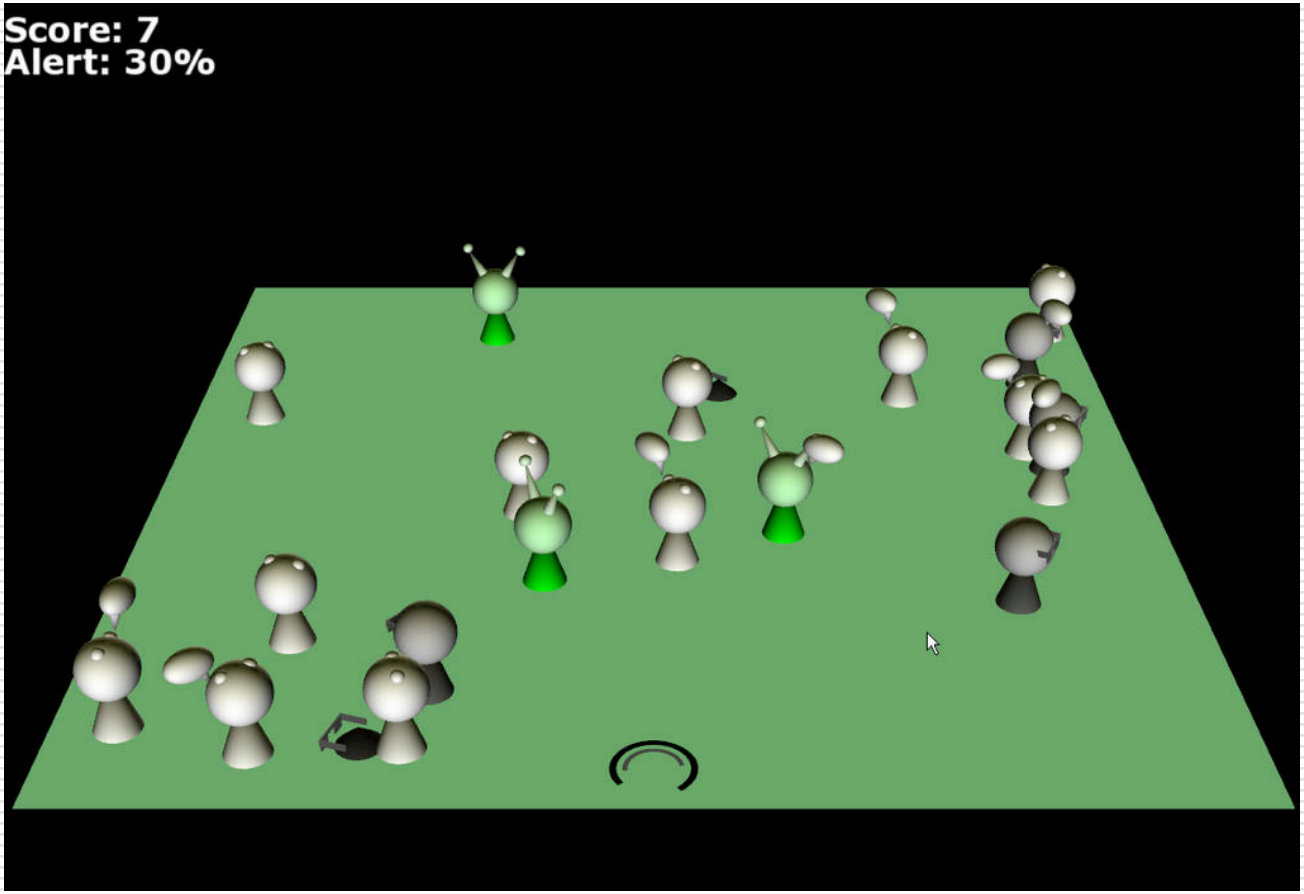
3D Asset Creation



3D Pipeline (1 of 4): Concept

- Sketches
  - *Napkin-style*
  - *Detailed design treatments*
  - *Prototypes*
  - Maquettes
  - Animation sketches / flipbooks
  - Mockup models
  - Texture mockups
  - Architectural layout

3D UI Prototype

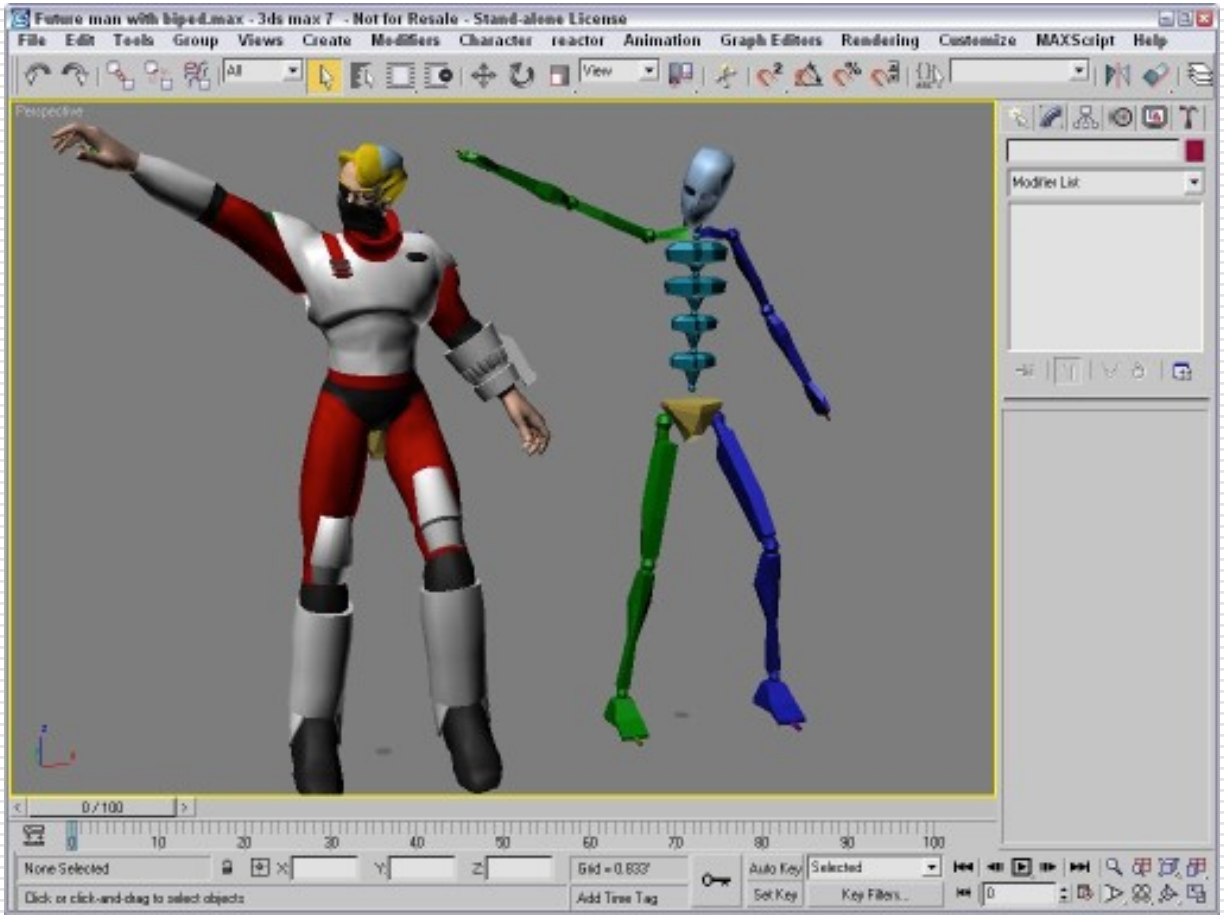


lostgarden.com

3D Pipeline (2 of 4): Creation

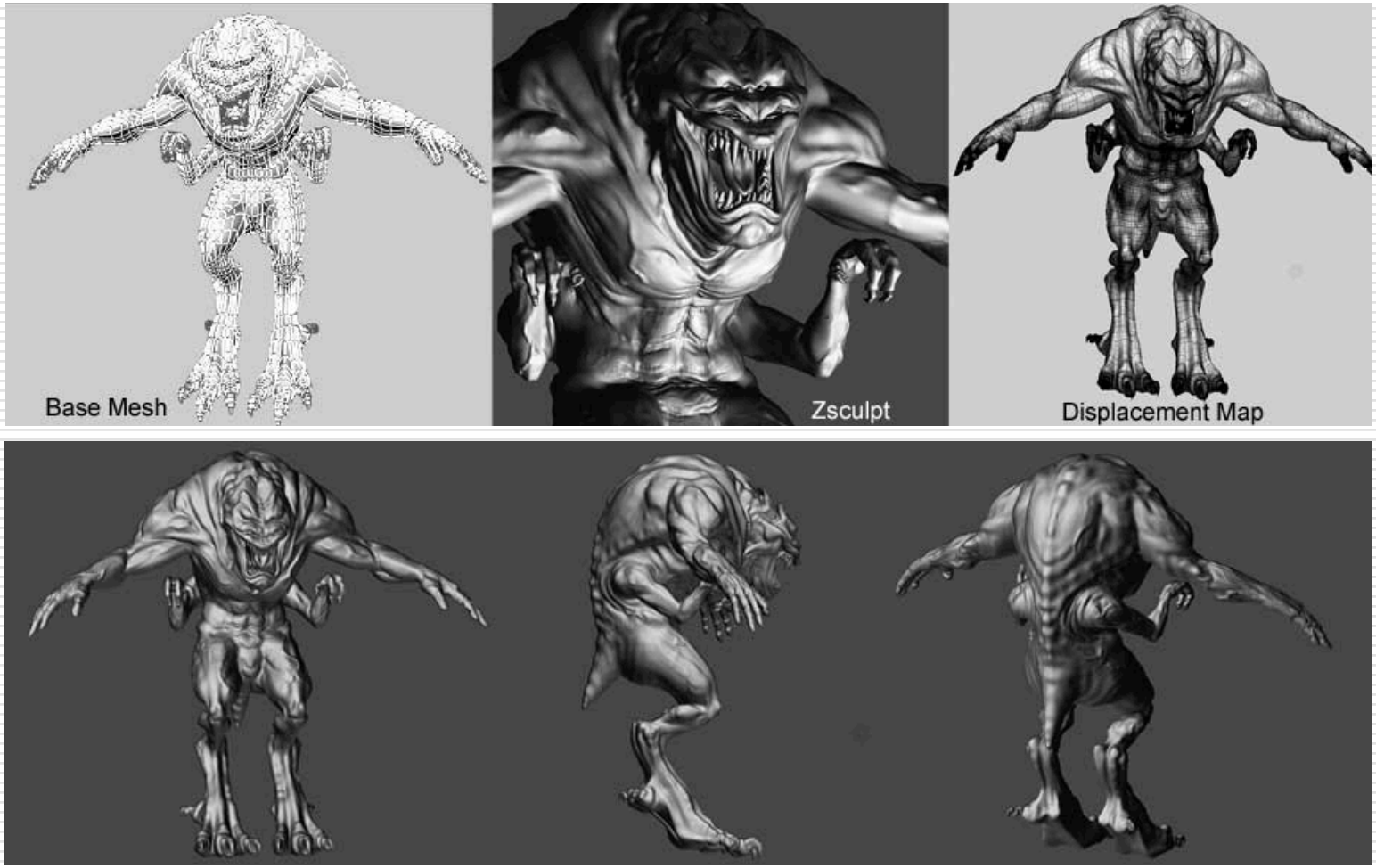
- Commercial / third party tools:
  - *Photoshop, The Gimp, sprite editors, HTML/browsers, Flash...*
  - 3D tools: 3D Studio Max, Maya, Lightwave, Blender, ZBrush
- Homegrown tools
  - Specialized animation systems
  - Tools that simulate key game features (UI layout tool, etc.)
  - The game engine
  - Exporters / plugins

3D Studio Max



gamedev.net

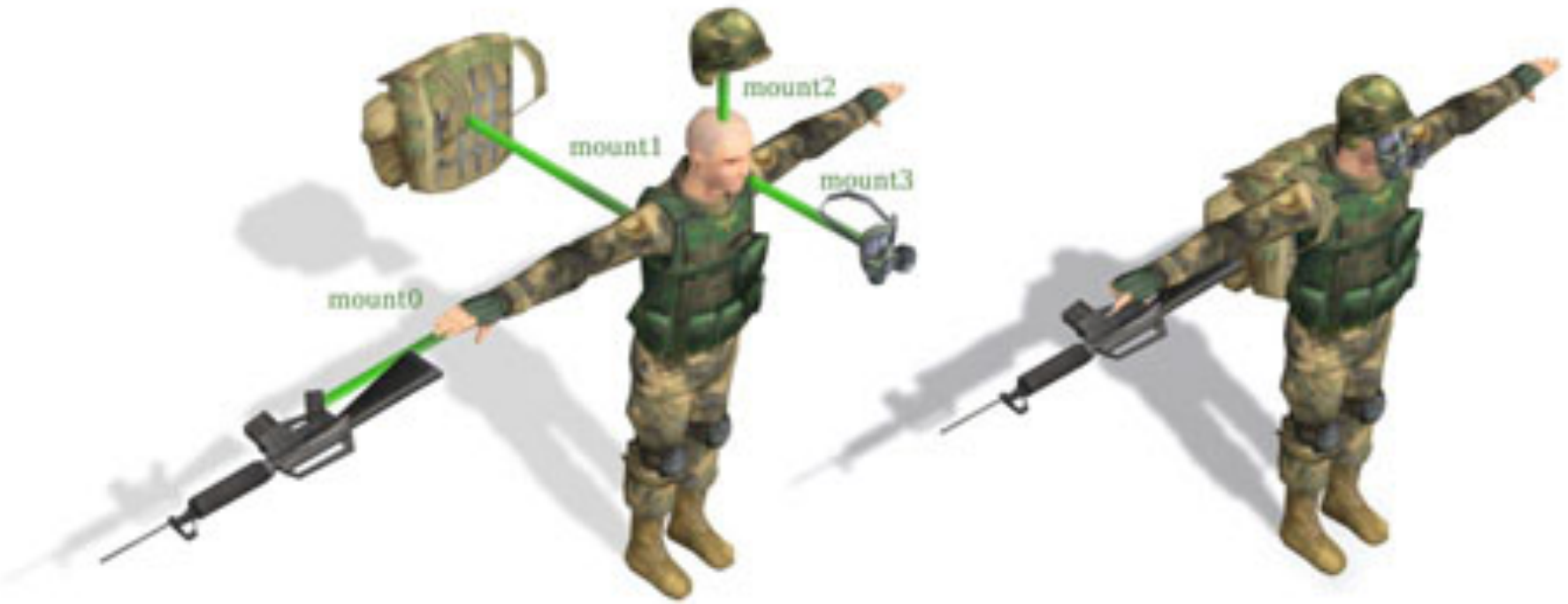
Stages of a Model



3D Pipeline (3 of 4): Texturing

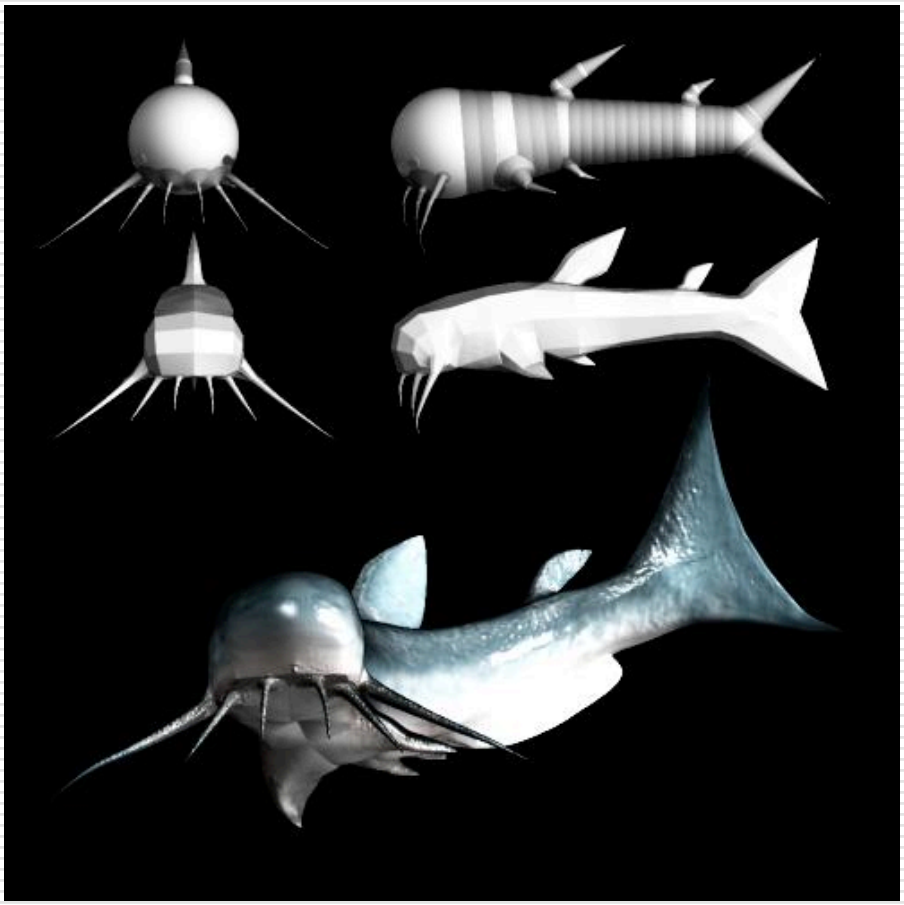
- *Animation systems*
  - *Motion capture*
  - *Third party tools*
  - *Homebuilt tools*
- Texturing systems
- Shaders / surface tools
- Renderers / video systems

Texturing and Accessories



garagegames.com

A Model, Textured

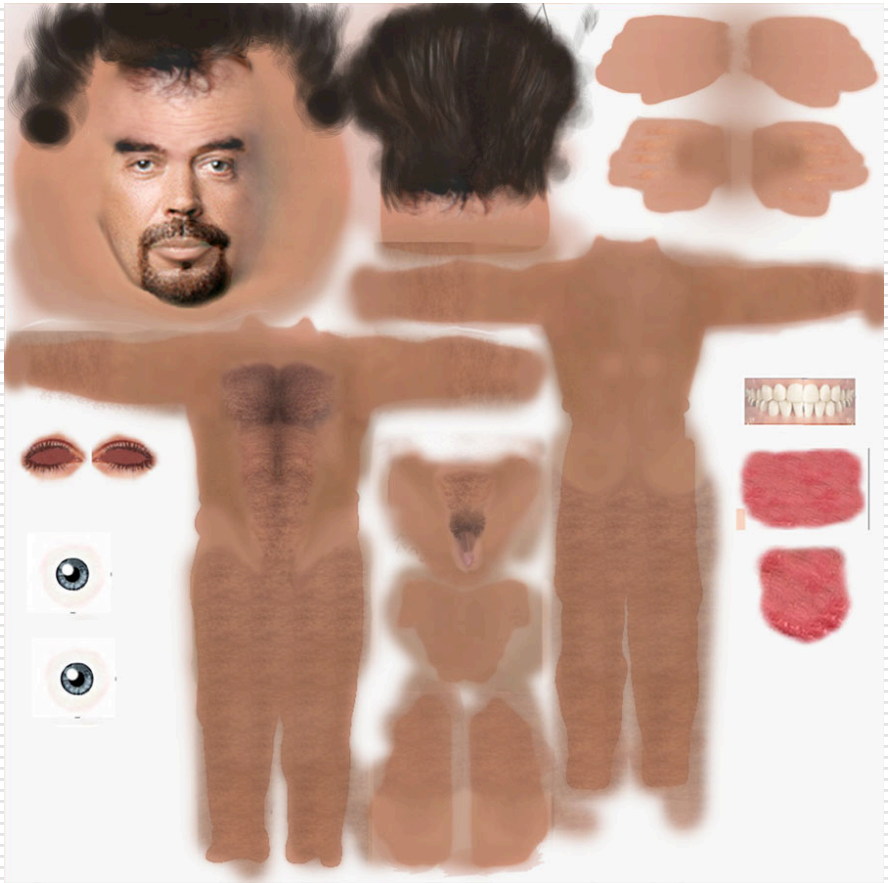


zbrush

Character and a Skin (1 of 2)

secretlair.com

Character and a Skin (2 of 2)



cresswells.com

3D Pipeline (4 of 4): Conversion

- Export from modeling to custom formats
- *Putting the assets into the final form*
  - *File type conversion*
    - *PSD to TGA / JPG, for example*
    - *Compression*
    - *Collection (zip files, pak files, etc.)*
  - *Testing in the game*
  - *Debug / fix*

Asset Management

- How do you share the production process across time, space, and content creators?
  - Source code has many tools -- "solved"
  - Data/Art is harder
    - Not easily merged
    - Dependencies not obvious
    - Relationships complex
  - Some commercial systems are trying
  - Typically a combination of:
    - Homegrown tools
    - Convention and process