Shading and Texturing Environments, Props, and Robots

Neil Blevins

Artist, Soulburn Studios

Shading and Texturing Environments, Props, and Robots

In this class, I'll show of my pipeline for shading and texturing environments, props, and hard surface characters—everything from organic plant life to buildings and hard surface robots. These techniques can be used to texture any high resolution object, whether for VFX and animated films, videogame cinematics, or even architectural work.

The class covers shaders and pattern creation / placement, from procedurals and hand-painted textures to photo manipulation. Focus is on efficiently shading thousands of individual objects without the need to spend a lot of time UV mapping everything.

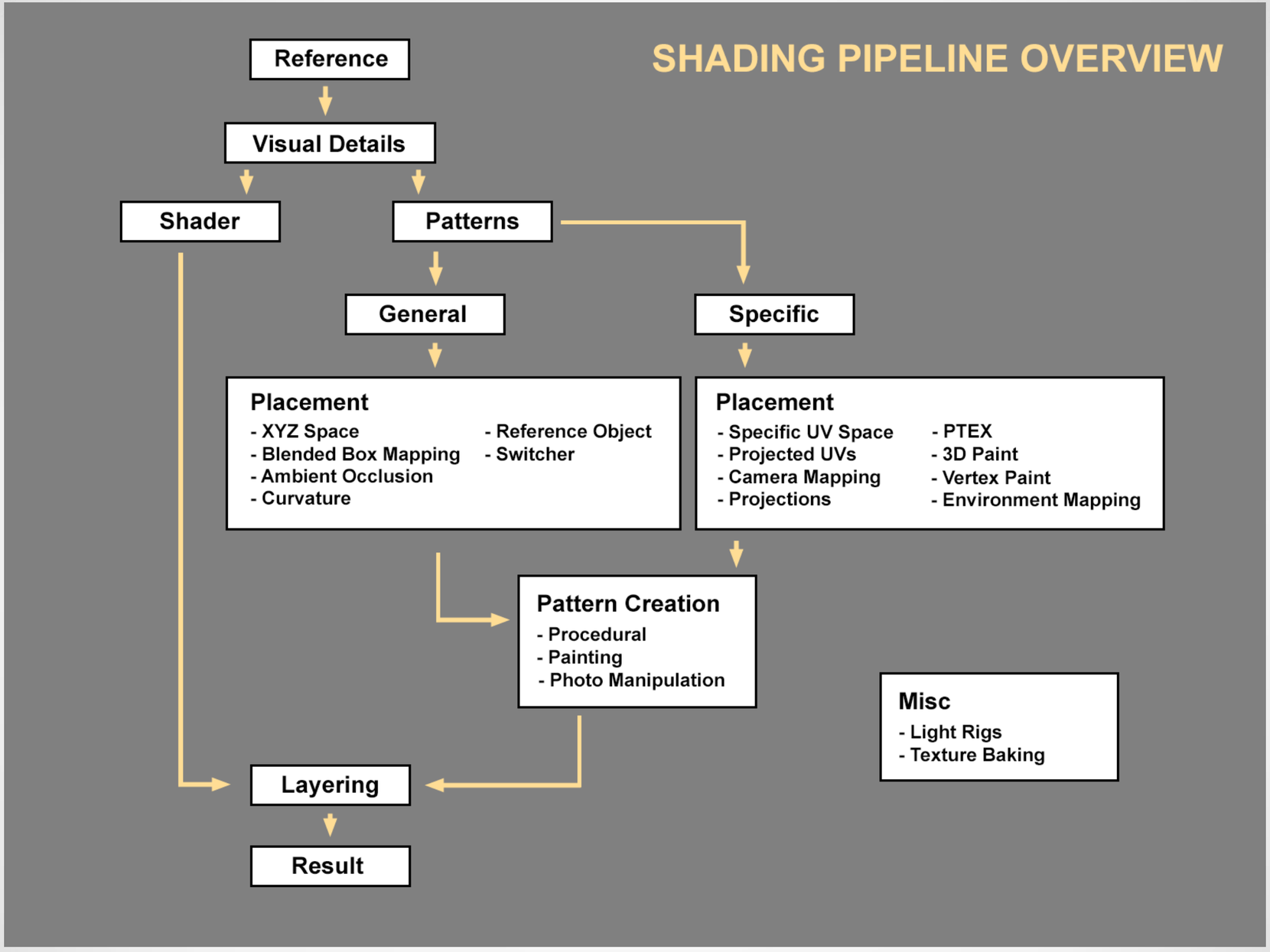
The class will use Autodesk® 3ds Max®, Autodesk® Mudbox®, Chaos Group's V-Ray®, and Adobe® Photoshop, but the principles discussed here can be applied to your 3d app, paint application and renderer of choice.

Learning Objectives

At the end of this class, you will:

- Understand a process / workflow by which you can effectively shade / texture almost any object.
- Understand how to use my Dirty Rusty Decaled Painted Worn Metal Shader to quickly shade Hard Surface Objects (Including using Blended Box Maps and Blended Cubic Projection).
- Explore other methods of pattern creation and placement that are more appropriate for Organic Objects

Shading Pipeline Overview


SHADING PIPELINE OVERVIEW
Reference
Visual Details
Shader
Patterns
General
Specific
Placement
- XYZ Space
- Blended Box Mapping
- Ambient Occlusion
- Curvature
- Reference Object
- Switcher
Placement
- Specific UV Space
- Projected UVs
- Camera Mapping
- Projections
- PTEX
- 3D Paint
- Vertex Paint
- Environment Mapping
Pattern Creation
- Procedural
- Painting
- Photo Manipulation
Misc
- Light Rigs
- Texture Baking
Layering
Result

Shading Pipeline Overview

Reference: Probably the most important thing you can do to make your project successful, even for objects that don’t exist in real life. Sometimes we get so excited making an object in 3d that we don’t stop to first think about and observe the thing we are going to make. Spend the time to get good reference!

Shading Pipeline Overview

Visual Details: Pick the 5 to 10 things that make this object look the way it looks and write them down. Example Rock:

- Rough Surface (Not Shiny)
- Cracks
- Large Crinkly Bump, Smaller Grainy Bump
- Grey / Yellow Color
- Spotty Color Pattern

Shading Pipeline Overview

Which Visual Details Are Shaders: A Surface Shader is a set of equations used to determine the appearance of a surface and how it responds to light.

Shading Pipeline Overview

Which Visual Details Are Patterns: Some properties of your list are patterns, or more commonly referred to as maps.

Shading Pipeline Overview

General Patterns are non-specific, stuff that pretty much covers your entire object. Example: Paint strokes on a fire hydrant

Specific Patterns are patterns that appear in only very specific spots on the object. Example: The drip of rust coming from the plug on the fire hydrant.

Shading Pipeline Overview

General Pattern Placement:

- XYZ Space
- Blended Box Mapping
- Ambient Occlusion
- Curvature
- Reference Object
- Switcher

Shading Pipeline Overview

Specific Pattern Placement:

- Specific UV Space (Unwrapping)
- Projected UVs
- Camera Mapping
- Projections
- PTEX
- 3d Paint
- Vertex Paint
- Environment Mapping

Shading Pipeline Overview

General and Specific Pattern Creation:

- Procedural
- Painting
- Photo Manipulation

Shading Pipeline Overview

Layering Shaders and Patterns To Make Materials:

- Layering Materials
- Layering Patterns
- Layering In Paint Program

Shading Pipeline Overview

Light Rigs: Show your work in a Neutral Lighting Setup so color can be decided on, and use the same rig for everything to introduce consistency.

Shading Pipeline Overview

Texture Baking: Used to speed up renders, or to transfer one placement method to another.
Example: Bake a procedural using XYZ Space into a texture map using PTEX so you can paint directly on top of the procedural.

Robot: Traditional Texture Painting

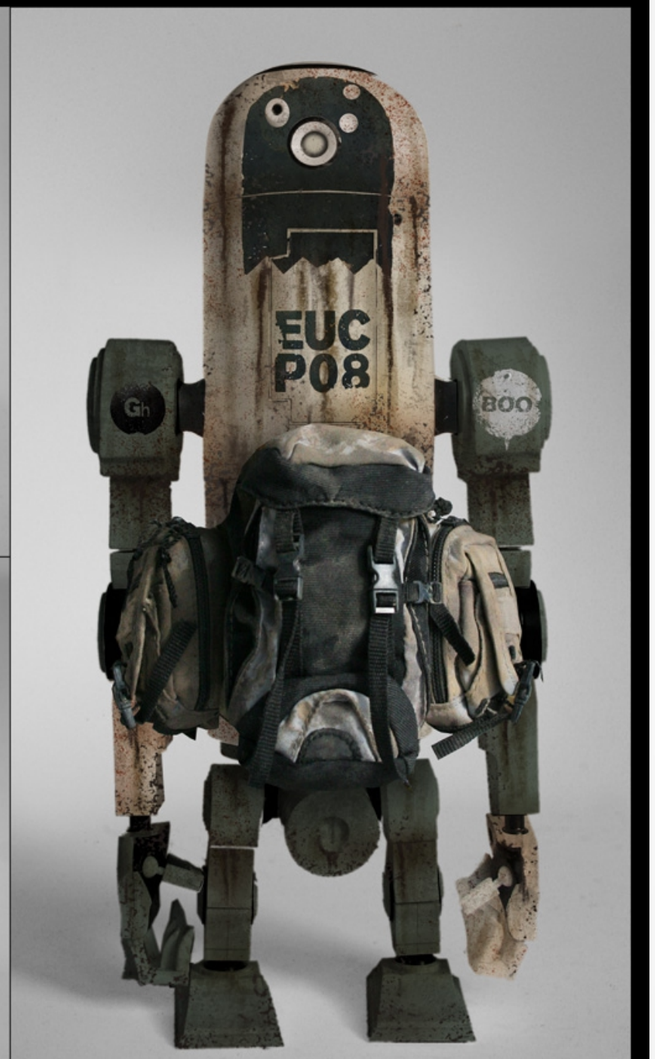

EUC
P08

Robot: Traditional Texture Painting

The Digital Shading Pipeline I outlined in many ways is similar to how one would go about “Shading / Texture Painting” a real world model.

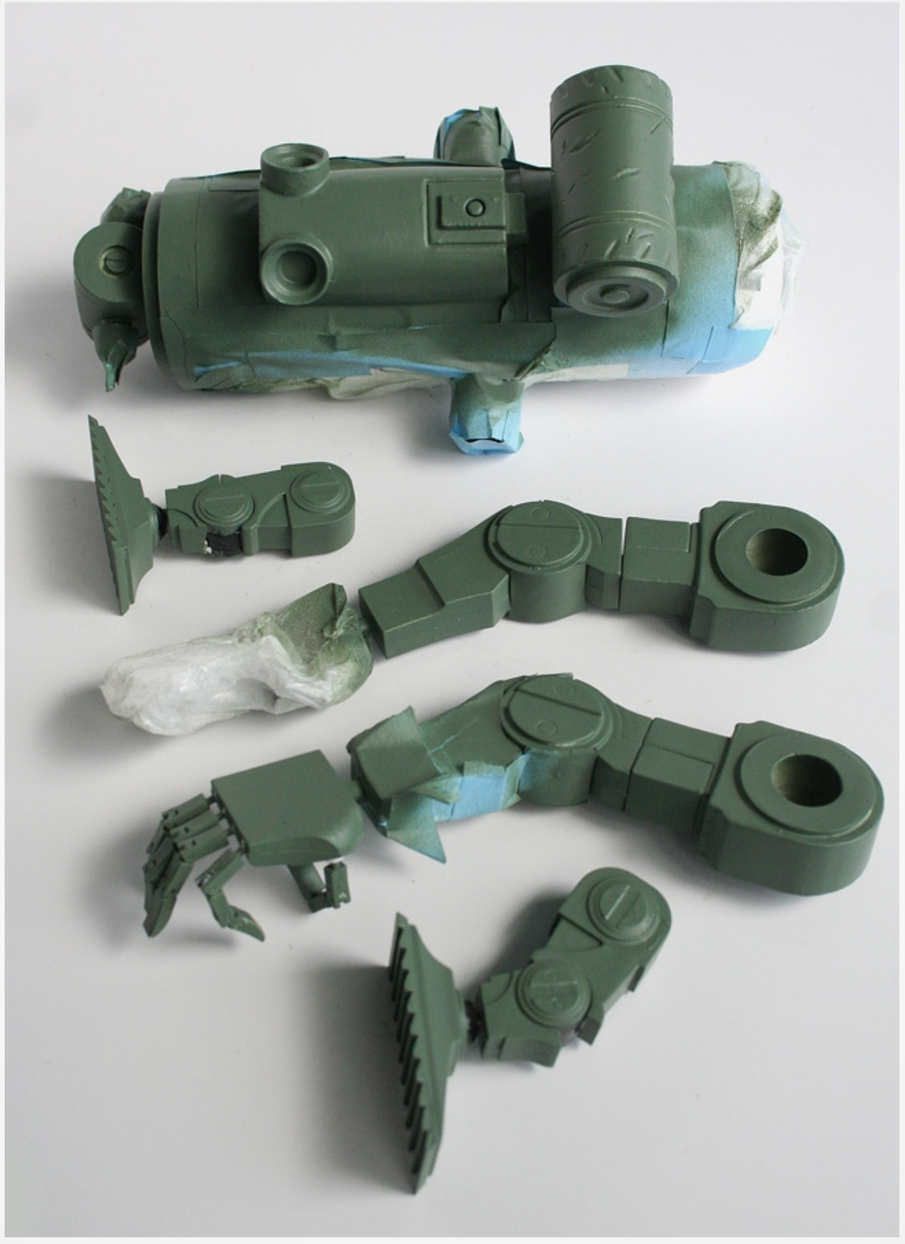

86
ВШ

BERTIE MK3 MODE A GHOST HUNTER CUSTOM CONCEPT



Bertie and Ghost Hunter Colorway designed by Ashley Wood
Colorway Application Concept by Neil Blevins 2012

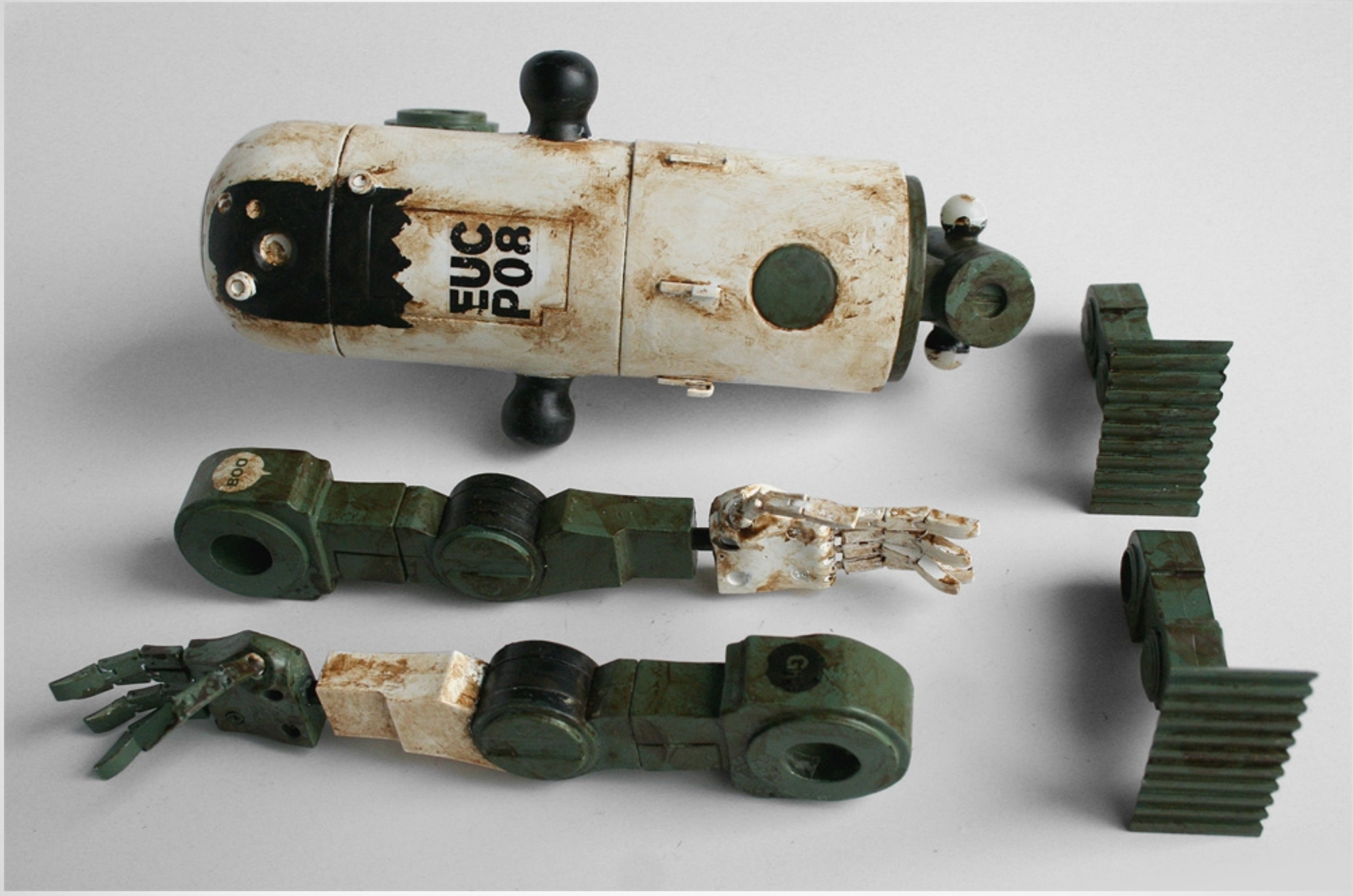

3/4 in x 60 yds
1.9 cm x 55 m
ART
ARTIST TAPE
RUBAN POUR ARTISTES
CINTA PARA ARTISTAS
AA20134
www.Art-Alternatives.com
TAMIYA COLOR
FOR PLASTICS
Tamiya Spray Paint
WARNING: EXTREMELY FLAMMABLE LIQUID AND VAPORS
100 ml NET VOLUME
X-ACTO




BOO
BOO
BOO
BOO


EUC
P08

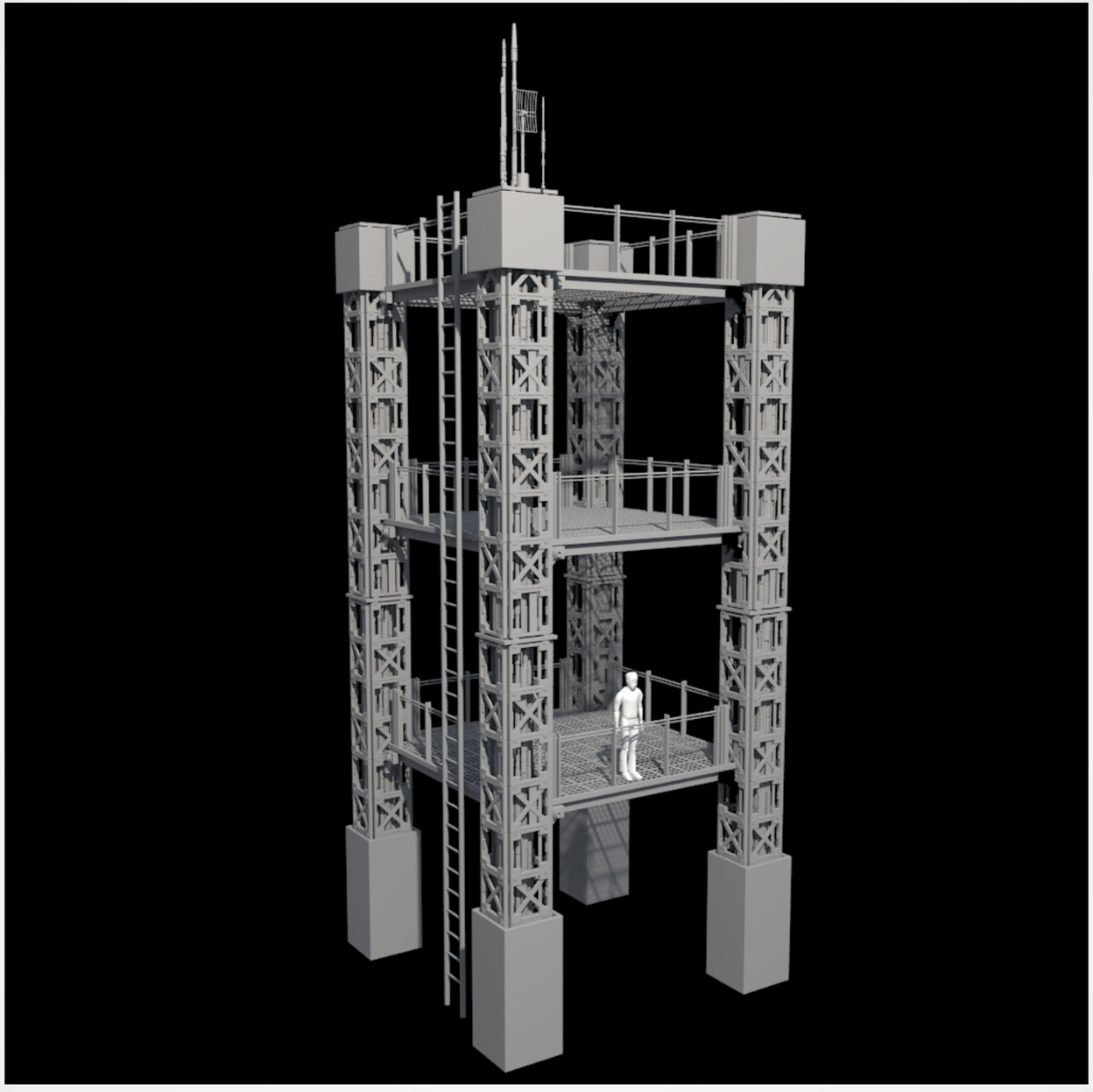

EUC
P08

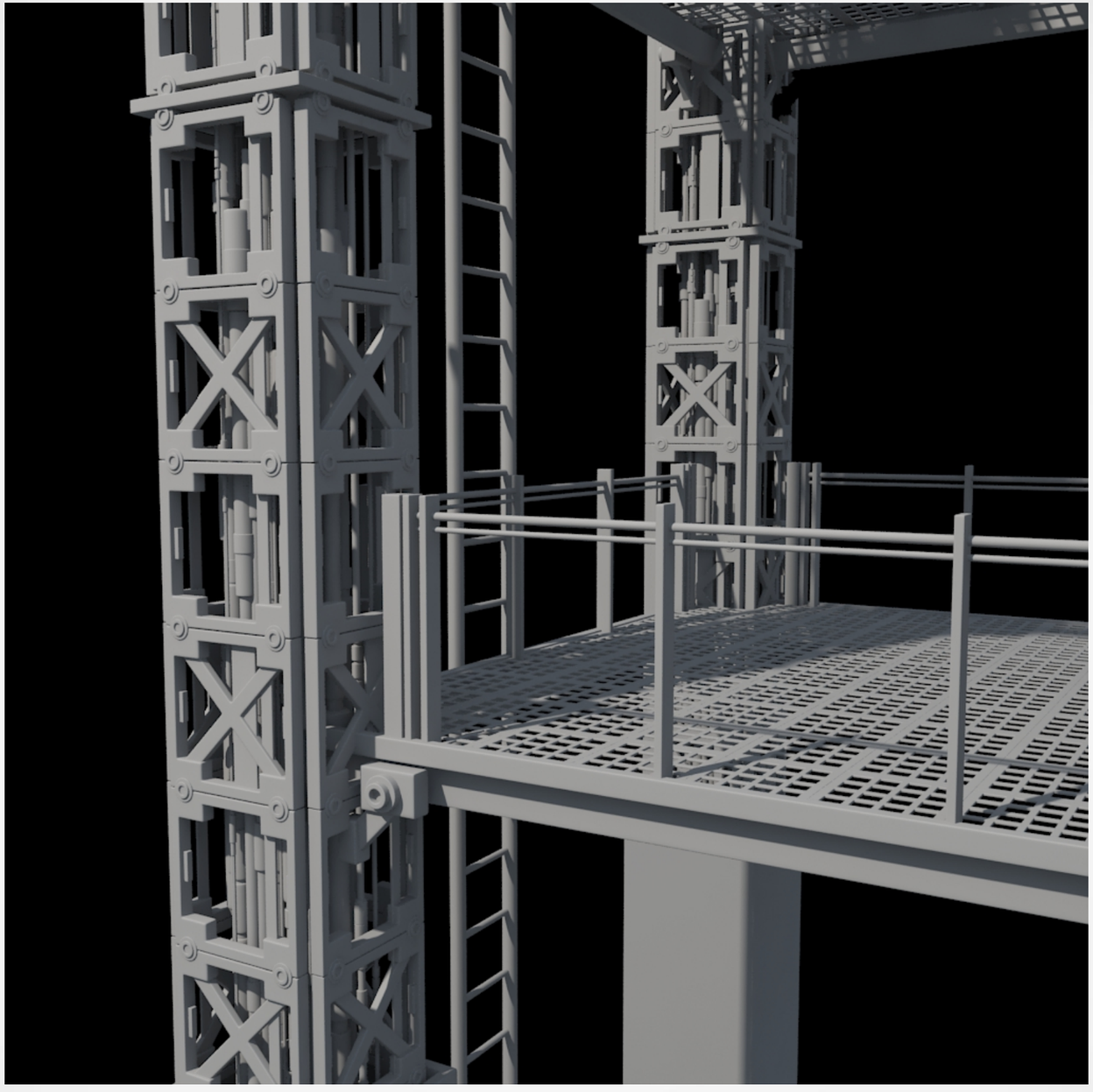

EUC
P08


EUC
P08


EUC
P08

Environment:
Hard Surface Rig Tower





Environment: Hard Surface Rig Tower

Rig Tower Stats:

- 924 Objects
- Faces: 24 million smoothed, 1.5 million unsmoothed

Environment: Hard Surface Rig Tower

This would be a real pain to unwrap and manually paint all the objects, so lets instead use my Dirty Rusty Decaled Painted Worn Metal Material, which uses Blend Box Mapping, Blended Cube Projections and Curvature.

Material will be posted to www.neilblevins.com after the class.

Environment: Hard Surface Rig Tower

Preparing Your Mesh:

- **Reset Xform**: Select your objects and use the Reset Xform utility to reset their xform. I like to them convert all the objects to Editable Polys, but this step isn't necessary.
- **Blended Box Map**: Run the Soulburn Script blendedBoxMapMaker, uncheck "Make Map", make sure "3 Sided UVW Mapping Method" is selected, and hit Apply.
- **Blended Cube Projection**: Run the Soulburn Script blendedCubeProjectionMaker, uncheck "Make Map", make sure "6 Sided CameraMapGemini Method" is selected, and hit Apply.

Environment: Hard Surface Rig Tower

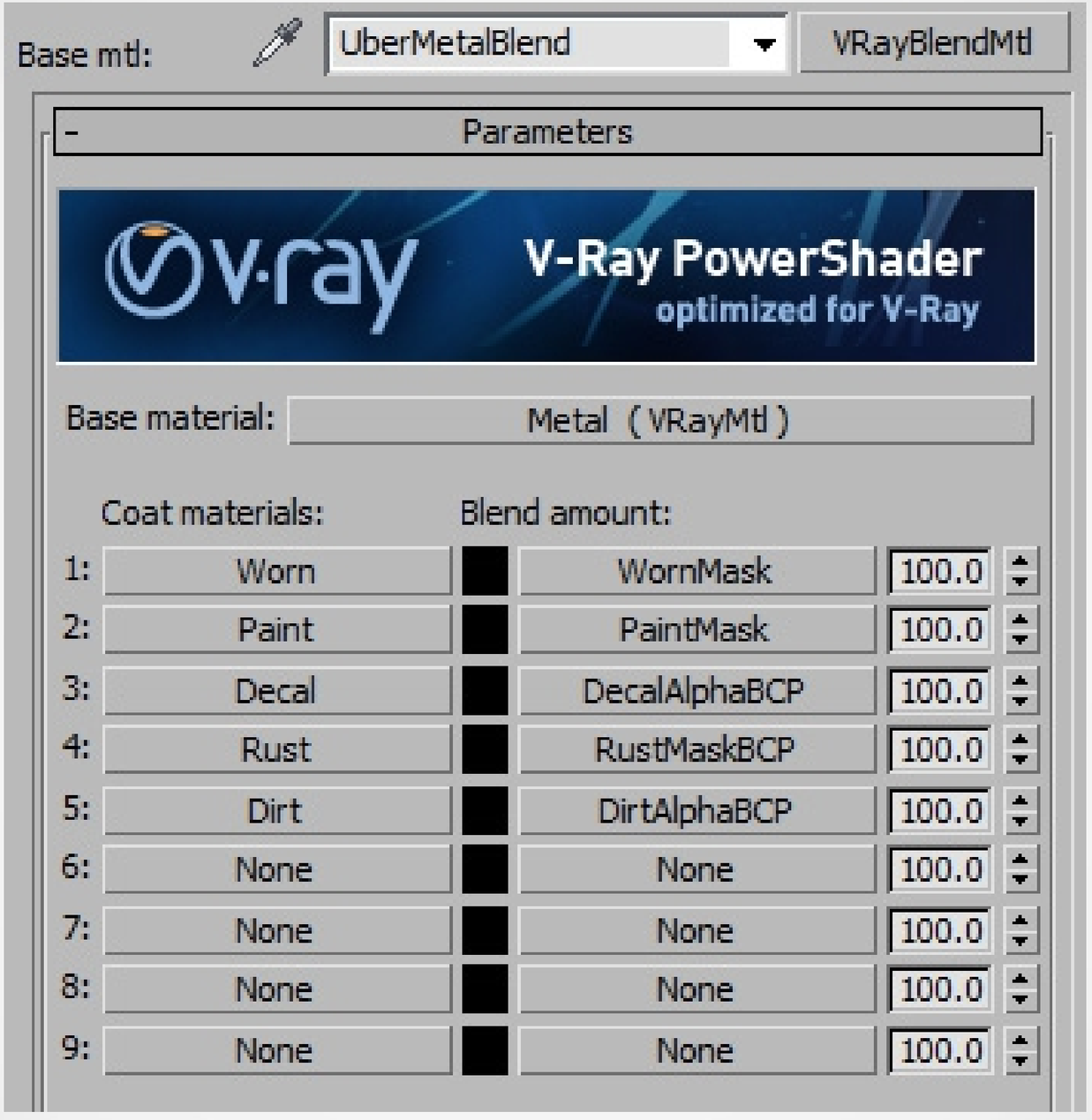
Preparing Your Mesh:

- **Render Templates**: Turn off any lights in your scene so that the camera lights turn on, then with your objects selected, in the modifier stack, choose the CameraMapGemini Modifier, then run the Soulburn Script cameraMapGeminiRenderer, choose an output directory, and hit apply. It will now render out templates to paint on top of.
- **Bake Curvature**: Run the Soulburn Script cornerEdgeToVertexMap, use the default settings and hit Do, this will bake a vertex map to your meshes where the flat areas are white and the edges are black.

Environment: Hard Surface Rig Tower

Preparing Your Mesh:

- **Apply Material Modifier**: Apply a Material modifier to your objects with a value of 1.
- **Apply Material**: Apply the Dirty Rusty Decaled Painted Worn Metal material from my example file to your mesh.


Base mtl:
UberMetalBlend
VRayBlendMtl
Parameters
V-Ray PowerShader
optimized for V-Ray
Base material:
Metal (VRayMtl)
Coat materials:
Blend amount:
1: Worn WornMask 100.0
2: Paint PaintMask 100.0
3: Decal DecalAlphaBCP 100.0
4: Rust RustMaskBCP 100.0
5: Dirt DirtAlphaBCP 100.0
6: None None 100.0
7: None None 100.0
8: None None 100.0
9: None None 100.0

Environment: Hard Surface Rig Tower

Using The Material:

1. Replace the environment map with an appropriate environment map for the scene you're trying to make. Or remove entirely if you want to use only raytraced reflections.
2. Assign Material modifiers to your objects, change their value depending on what color of metal you want: 1 is regular metal, 2 is darker metal, 3 is darkest metal, 4 is gold.
3. Change the noise size and output values of the "Worn" procedural mask to get the results you want.

Environment: Hard Surface Rig Tower

Using The Material:

4. Paint the 6 maps for the "Worn" mask's blended cube projection using the rendered templates. These maps are black and white.
5. Choose a paint color.
6. Change the noise size and output values of the "Paint" procedural mask to get the results you want.
7. Paint the 6 maps for the "Paint" mask's blended cube projection using the rendered templates. These maps are black and white.

Environment: Hard Surface Rig Tower

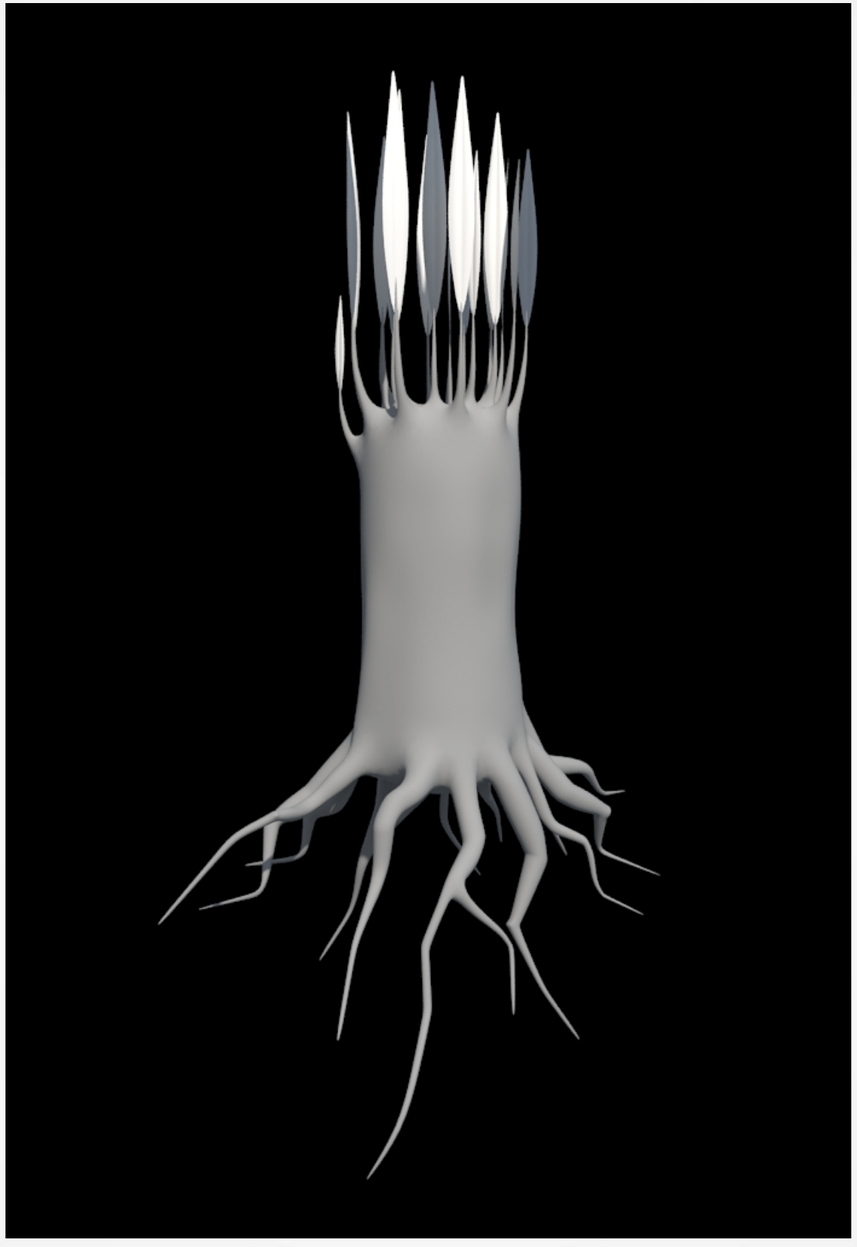
Using The Material:

8. Paint the 6 maps for the "Decal" layer's blended cube projection using the rendered templates. These maps are color on transparent. Plug into both the color and the mask maps of the material.
9. Choose the brightness of the rust.
10. Paint the 6 maps for the "Rust" mask's blended cube projection using the rendered templates. These maps are black and white.
11. Paint the 6 maps for the "Dirt" layer's blended cube projection using the rendered templates. These maps are color on transparent. Plug into both the color and the mask maps of the material.


Neil Blevins 2008


M-176
M-176
M-176
Neil Blevins 2009

Prop:
Organic Alien Tree



Prop: Organic Alien Tree

For Organic Plant, we'll use less General Patterns, and More Specific Patterns. Here's the placement methods we'll use:

- Specific UV Space (Unwrapping)
- PTEX
- 3d Paint

Thanks!