AUTODESK UNIVERSITY 2014

Shading and Texturing A Photoreal Robot

Neil Blevins – Soulburn Studios

VI4948

In this intermediary class I will build upon the theory presented in my class, Shading And Texturing Workflow, with a practical example that involves shading and texturing a high-resolution photoreal robot. The techniques presented can be used to texture any high-resolution hard-surface object, whether for visual effects, animated films, video game cinematics, or even architectural work. We will focus on how to efficiently shade thousands of individual objects without having to spend a lot of time UV shading everything. Blended box maps, projection paint, curvature maps, occlusion maps, and the building of a library of materials are just some of the topic that we will cover. I will use 3ds Max software, Chaos Group's V-Ray rendering engine, and Adobe Photoshop for this example, but you can apply the principals discussed to the 3D app, paint application, and renderer of your choice.

Learning Objectives

At the end of this class, you will be able to:

- Learn how to shade and texture hard-surface objects
- Gain a better understanding of procedural shading and paint
- Learn how to quickly texture many objects
- Learn how to apply dirt and grime

About the Speaker

Neil Blevins began his career in traditional painting and drawing before getting into 3D graphics while living in his home country of Canada. After getting a BFA in design art, Neil moved to Los Angeles where he worked for Blur Studio, creating graphics for video games, commercials, and television, as well as for feature and ride films. For the last 12 years Neil has worked as a digital artist for Pixar Animation Studios in San Francisco. In his spare time he makes science-fiction 3D/2D hybrid artwork, he authors tools, and he writes art-related lessons and tutorials for his website.

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3A Bertie Robot: Traditional Texturing

My Digital Shading Pipeline in many ways is similar to how one would go about Shading / Texture Painting a real world model.


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BERTIE MK3 MODE A GHOST HUNTER
CUSTOM CONCEPT
EUC P08
BOO
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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
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FOR PLASTICS
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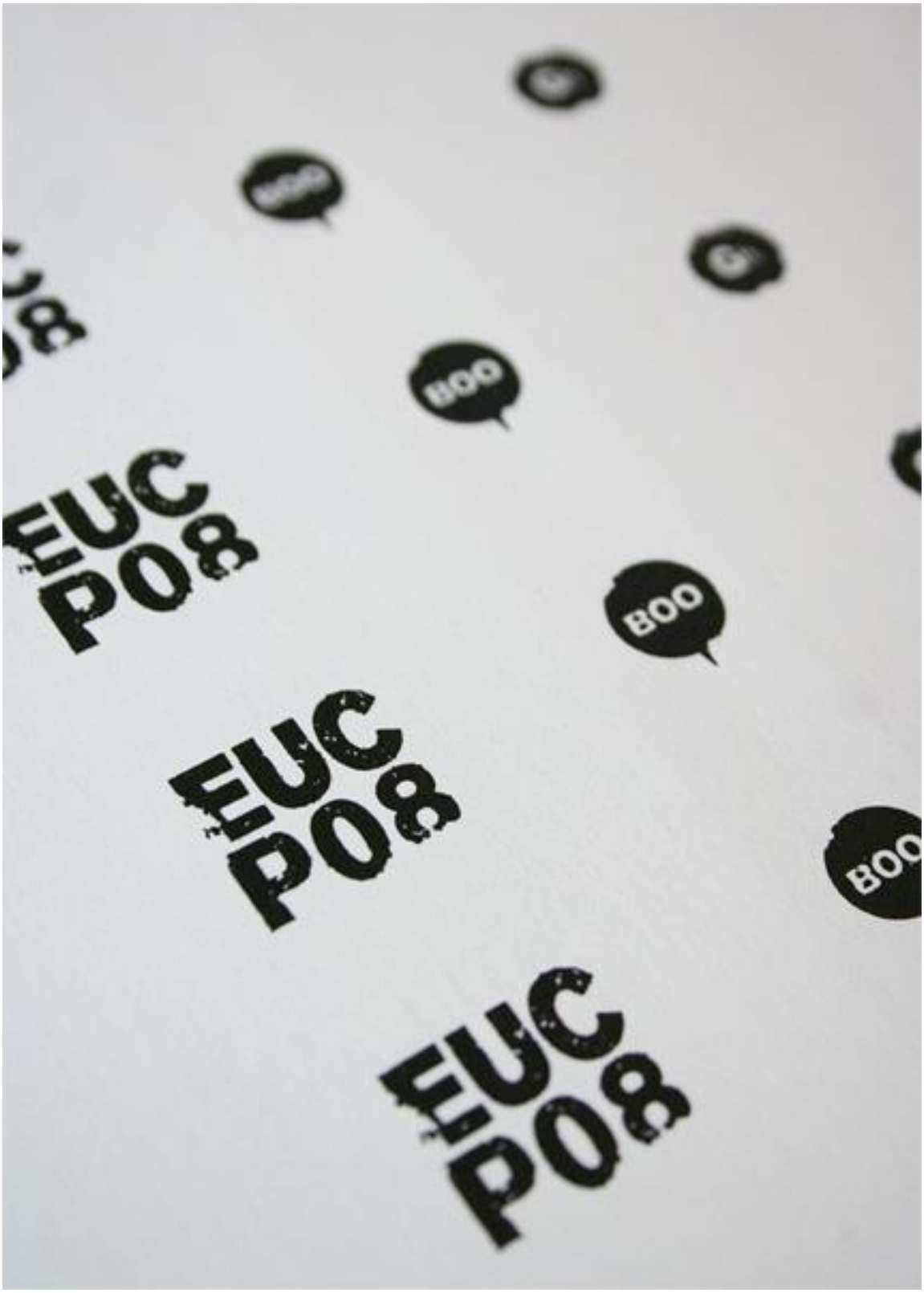
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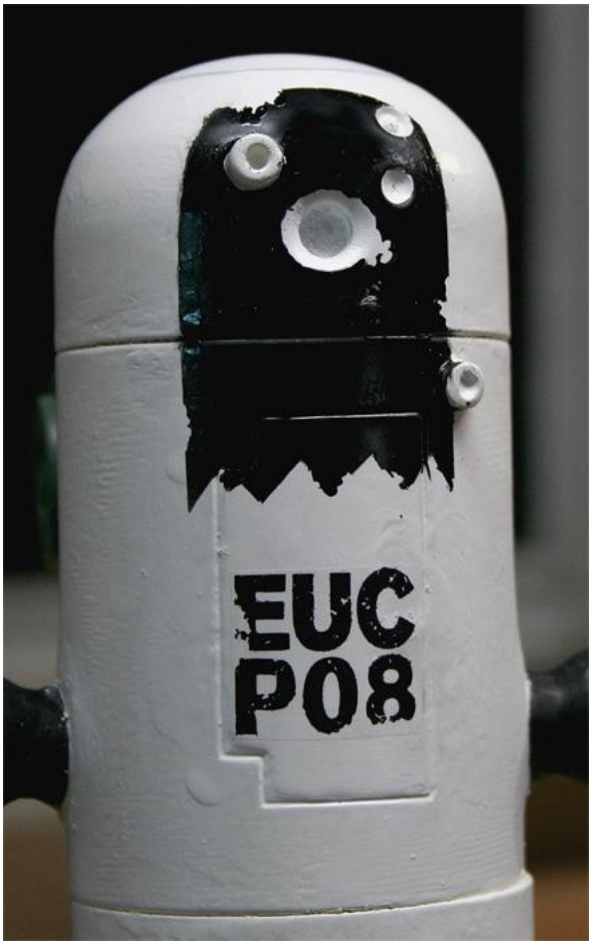
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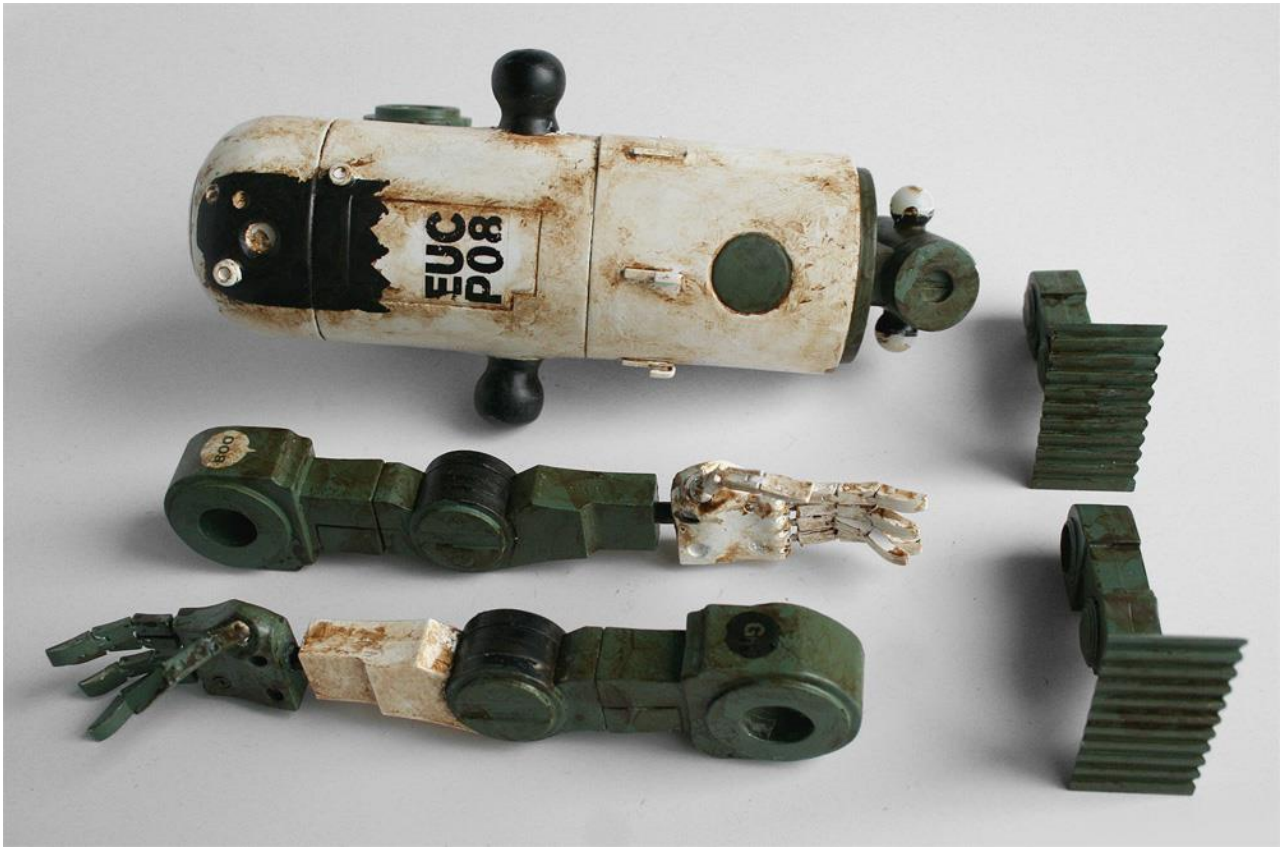
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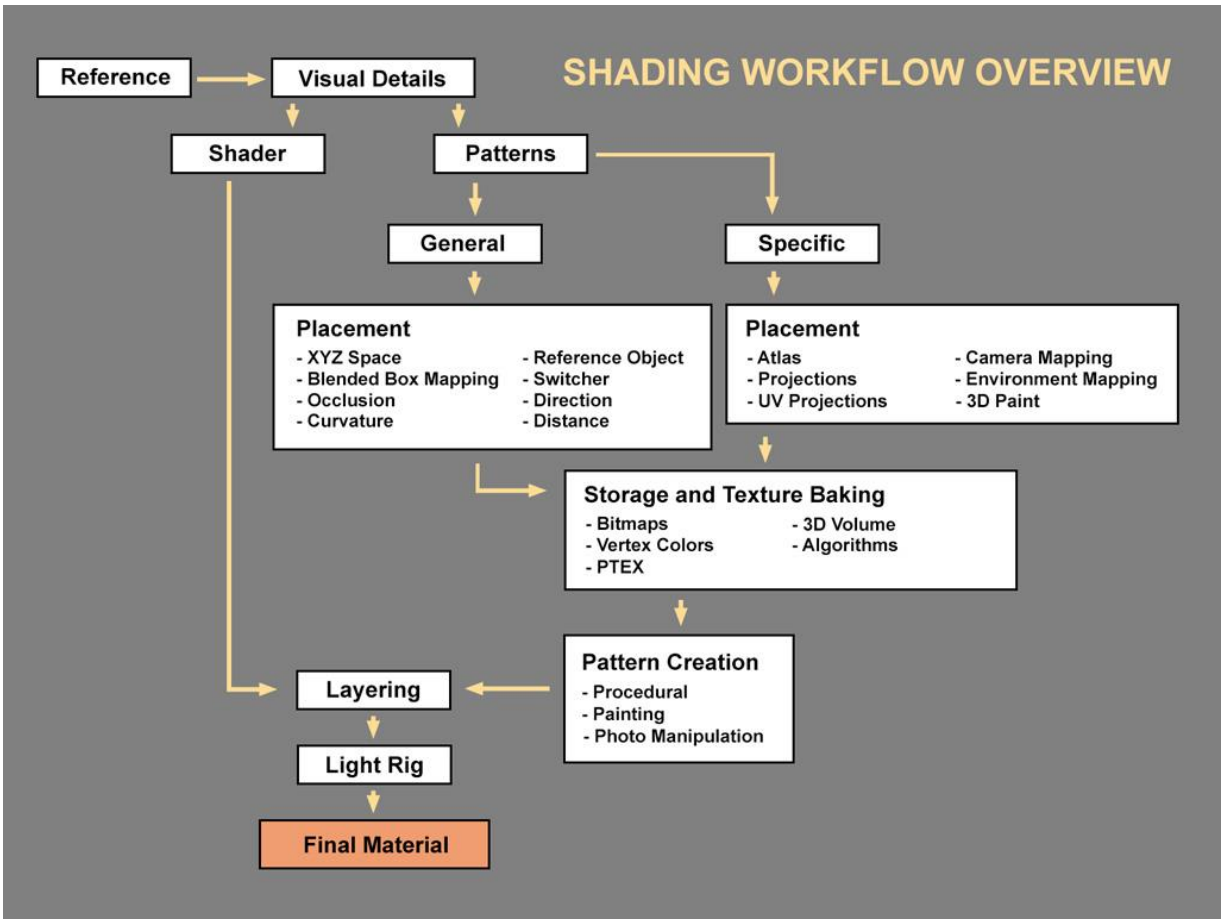
Shading Pipeline Overview



For more info please visit [How Do I Shade / Texture Stuff?: Shading Workflow Overview]

Inc The Robot: Digital Texturing

How a model like this is textured depends on the sort of job you need to do. If you're doing 3d concept design, the most common method these days is transferring your model to keyshot, applying some simple materials and lights, then bringing it into photoshop to paint the dirt and grime and details. Which is fine, but if you need to change angles or render out further angles, you now have to repaint that dirt.

If you're now on the production side producing the final asset, the most common workflow is to uv all of your objects, then bring them into a 3d paint program and manually paint all the pieces. Plenty of difficulties with this technique, first, if you want to change a major thing like the texture you're using for your metal, this is more complex because you have a different texture on every piece of your model.

Second, you have to UV every single piece, and that takes a lot of time. Despite the fact we all hate UVing stuff, we have in fact become so addicted to UVs that we have convinced ourselves that there must be no other way. I have friends in the visual effects industry who are texturing robots, and they are frequently given 2-3 months for the task. Now there's lots of reasons it takes so long, including client approvals, revisions, etc. But I believe another reason is because of UVing.

And as the complexity of these robots grow, its taking longer and longer, and that's partly because the more objects you have, the more uving you have to do. My techniques, since they're uv independent, require almost no extra time, so whether your object has 500 objects or 50,000, it's the surface size, and how close you're going to get to the model that increases texturing time, not number of objects.

And it involves painting and texturing in 3d, so if you're doing 3d concept art, you can move your model around without repainting, and its really fast to do which is necessary when doing concept work.

Robot Stats:

- 1617 Objects
- Faces: 15 million smoothed, 926,000 unsmoothed

Shading And Texturing The Hand

Preparing Your Mesh:

- **Turn On Turbosmooth:** Using SubdivAutomator

Preparing Your Mesh:

- **Reset Xform:** Select your objects and use the Reset Xform utility to reset their xform. Remember, if you have objects linked to other objects, Reset Xform won't do its job properly. So make sure you Reset Xform before linking any objects together. And also check to make sure the normals of the objects don 't get inversed when you reset their xform. You can xView in the viewport to check the direction of the face normals.
- **Convert To Editable Poly:** This step isn't necessary, but is helpful to clean up your mesh before texturing. Also guarantees better results from the Bake Curvature step.
- **Blended Box Map:** Run the Soulburn Script blendedBoxMapMaker, uncheck "Create Map?", make sure "3 Sided UVW Mapping Method" is selected, and hit Do.
- **Blended Cube Projection:** Run SoulburnScript blendedCubeProjectionMaker, uncheck "Create Map?", make sure "6 Sided CameraMapGemini Method" is selected, and hit Do. Also remember to render templates to paint on, 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 SoulburnScript 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. If your mesh looks too white after running the script, try increasing the High Angles and decreasing the Low Angles in the script so that a larger area of the mesh becomes black (this will be necessary for very detailed smooth meshes).

- **Material Modifier:** Apply a Material modifier to your objects with a value of 1.
- **Apply Material**: Apply Your Material Using SAL.

Using The Material:

- remove decal and worn steel 2
- change paint color
- adjust edge of paint (Using texmap Preview)
- paint front wear (Using BlendedCubeProjection)
- apply rust to metal

- paint rust map (Using BlendedCubeProjection)
- paint dirt map (Using BlendedCubeProjection)
- turn on dust

And here is the final hand for the robot for the "Inc" visual development book project, and you can see it's very similar to the example I just did for you guys. While the hand is about 200 pieces, the entire robot was about 1700, and it took only a few nights to do all the texturing to hold up at this level of detail.

Obviously it could have been faster if I didn't need to get this close to it, the technique really is the same regardless of whether you're painting a final production model or painting a fast concept, the only difference Is how much time you spend massaging the details.

While this technique is already fast, it can be made faster with new tools, a curvature shader, triplanar mapping, grouping nodes, etc so please help me put pressure on the 3d and rendering application developers to shift more dev time to improving this workflow, so that we can all have kickass texturing in way less time and can go home at night to our families.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Neil Blevins 2009

Further Reading

- How Do I Shade / Texture Stuff?: Shading Workflow Overview
- Blended Box Mapping
- Worn Edges Using A Distorted Vertex Map
- Blended Cube Projection
- Layering Materials
- Weathering A Model: Extracting A Pattern From A Photograph
- Weathering A Model: It's All About Erasing The Dirt