Walk-in Slide: AU 2014 Social Media Feed

1. Click on the link below, this will open your web browser

http://aucache.autodesk.com/social/visualization.html

2. Use “Extended Display” to project the website on screen if you plan to work on your computer. Use “Duplicate” to display same image on screen and computer.

Shading and Texturing Workflow

Neil Blevins

Artist, Soulburn Studios

Class summary

In this class, I'll show of my pipeline for shading and texturing environments, props, organic and hard surface models—everything from 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.

Class summary

The class covers shaders and pattern creation / placement, from procedurals and hand-painted textures to photo manipulation.

Class summary

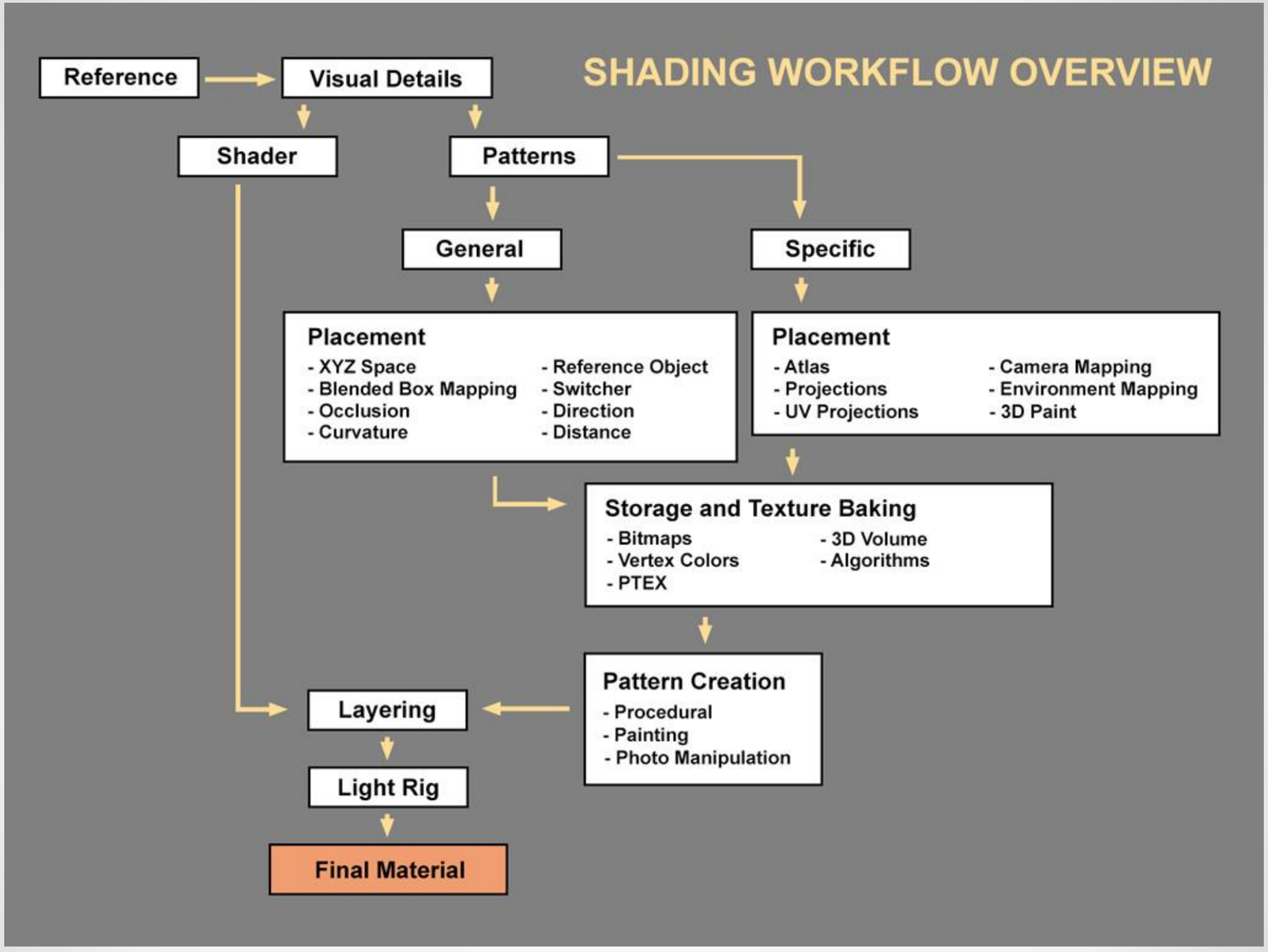
The class will primarily use Autodesk® 3ds Max®, Chaos Group's V-Ray®, and Adobe® Photoshop, but the principles discussed here can be applied to your 3d app, paint application and renderer of choice.

Key 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 all of the different methods for placing patterns on a surface
- Understand all of the different methods for creating those patterns.
- Understand all of the different methods for storing these patterns.
- How to use these patterns inside Shaders to create your final materials.

Shading Pipeline Overview


SHADING WORKFLOW OVERVIEW
Reference
Visual Details
Shader
Patterns
General
Specific
Placement
- XYZ Space
- Blended Box Mapping
- Occlusion
- Curvature
- Reference Object
- Switcher
- Direction
- Distance
Placement
- Atlas
- Projections
- UV Projections
- Camera Mapping
- Environment Mapping
- 3D Paint
Storage and Texture Baking
- Bitmaps
- Vertex Colors
- PTEX
- 3D Volume
- Algorithms
Pattern Creation
- Procedural
- Painting
- Photo Manipulation
Layering
Light Rig
Final Material

1) Gather 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!

2) Identifying 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

3) Splitting Visual Details Into Shaders And Patterns

A Surface Shader is a set of equations used to determine the appearance of a surface and how it responds to light. A Shader is combined with Maps (Patterns) to form a Material. Sometimes your material is refereed to as a "shader", but for clarity sake, I will only refer to the Illumination portion of your material as a shader.

3) Splitting Visual Details Into Shaders And Patterns

Now lets look at your Visual Detail List, what on the list is part of the shader? Example, Hydrant (3 shaders):

- Paint Shader
- Metal Shader
- Rust Shader

3) Splitting Visual Details Into Shaders And Patterns

Look at your Visual Detail List, what on the list are patterns? Example, Hydrant (8 patterns):

- Paint requires several colors, has a paintbrush bump pattern, a pattern to change how reflective the surface is, and the paint is worn off to reveal the metal in a specific pattern (4 patterns).
- Metal has some slight blemishes in color (1 pattern)
- Rust has a specific color, specific bump, and then is placed on the surface of the hydrant in a specific pattern (3 patterns).

4) Shaders

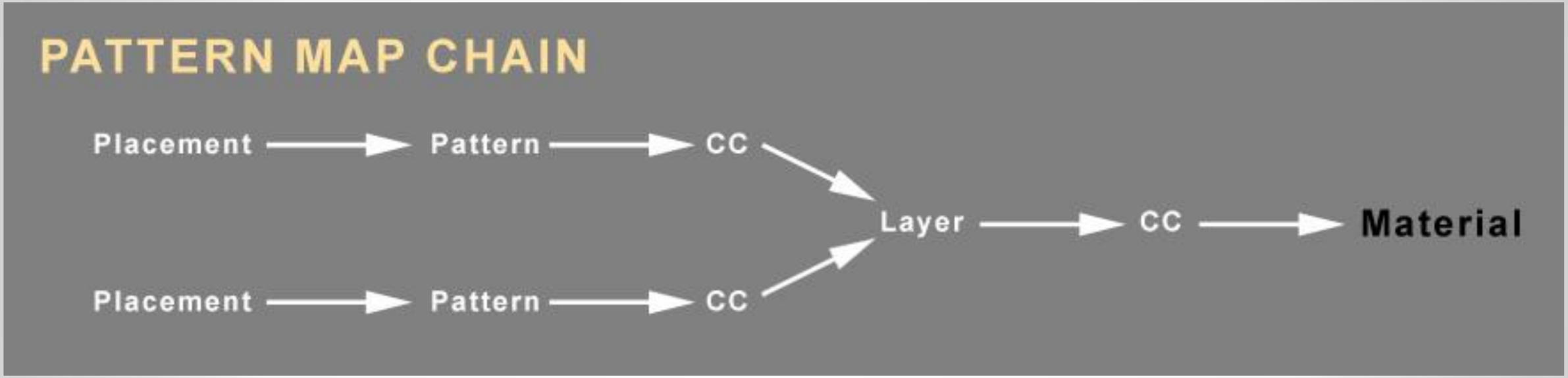
A Surface Shader is a set of equations used to determine the appearance of a surface and how it responds to light.

- Lambert (Simple Diffuse)
- Phong (Highlight)
- Blinn (Highlight, less distortion at glancing angles)
- Oren Nayar (Diffuse for Rough Surfaces)
- Ward Anisotropic (Anisotropic Highlights)
- Cook-Torrance (Metals)
- GGX

5) Patterns

To make a successful material, you generally want at least 3 patterns per material...

- Color
- Bump / Displacement (Disp)
- Specular Amount (Spec)


PATTERN MAP CHAIN
Placement
Pattern
CC
Placement
Pattern
CC
Layer
CC
Material

6) Splitting Patterns Into General And Specific

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.

7) General Patterns

In our Fire Hydrant Example, these are the General Patterns:

- Paint Color
- Paint Bump
- Paint Specularity
- Metal Color
- Rust Color
- Rust Bump

8) Specific Patterns

In our Fire Hydrant Example, these are the Specific Patterns:

- Worn Off Paint Placement
- Rust Placement

9) General Pattern Placement

Patterns can be thought of as having three components, how you place that pattern on your object, how the pattern is stored, and creating the pattern itself.

No one pattern placement method works in all cases, generally a material will need to use several different pattern placement methods.

9) General Pattern Placement

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

10) Specific Pattern Placement

1. Atlas
2. Projections
3. UV Projections
4. Camera Mapping
5. Environment Mapping
6. 3D Paint

11) Pattern Storage And Texture Baking

Once you decide how you want to place your pattern, you have to decide how that pattern will be stored.

11) Pattern Storage And Texture Baking

1. Bitmaps
2. Vertex Colors
3. PTEX
4. 3D Volume
5. Algorithm

11) Pattern Storage And Texture Baking

Texture Baking is the process of converting the storage type from one type to another.

- Algorithm -> Bitmaps: Say you have a procedural in XYZ Space, but you want to edit it in a paint program, you can bake the Procedural pattern into a bitmap
- Algorithm -> Bitmaps: 3dsmax UVWMapping Modifier: XYZ to UVW, bakes procedural patterns using XYZ Space into UVs, good for deforming objects

11) Pattern Storage And Texture Baking

- Algorithm -> Vertex Color: Baking Curvature into Vertex Colors using SoulburnScript CornerEdgeToVertexMap
- Algorithm -> Bitmaps or PTEX: Baking Occlusion into UVs / Bitmaps or PTEX, so the occlusion doesn't change when the object moves / deforms
- Bitmaps / Algorithm -> Bitmaps: Baking Multiple Maps Into Single Map Using UVs (which can speed up renders)
- Baking sculpted details into displacement map or normal map using UVs / Bitmaps or PTEX (common workflow for transferring sculpted models from ZBrush or mudbox to max / maya / xsi)

12) Pattern Creation

General and Specific Pattern Creation:

- Procedural
- Painting
- Photo Manipulation

13) Layering

Now we combine the shaders and patterns to create your final result.

- Layering Materials
- Layering Patterns
- Layering In Paint Program

14) Lighting Rigs

To see the results of your material, I highly recommend you creating a standardized lighting rig to view all your models in.

14) Lighting Rigs

A lighting rig should ideally…

- Show off the local color of the object
- Show off your Reflectivity, Spec and Bump
- Be similar to the rig your lighter will use.
- Be used to show off every model for consistency

Having all 4 things 100% is almost impossible, so you do the best you can to make a compromise lighting rig.

15) Final Material

The final step is taking your layered material, testing it in your lighting rig, and now you have your final material.

My Favorite Techniques

Hard Surface Models:

General Patterns:

- XYZ Space - Algorithm - Procedural
- Blended Box Maps - Bitmaps - Painting / Photo Manip
- Occlusion - Algorithm - Procedural
- Curvature - Vertex Colors - Procedural
- Switcher

My Favorite Techniques

Hard Surface Models:

Specific Patterns:

- Projection - Bitmaps - Painting / Photo Manipulation

My Favorite Techniques

Organic Models:

General Patterns:

- Blended Box Maps - Bitmaps - Painting / Photo Manip
- Switcher

My Favorite Techniques

Organic Models:

Specific Patterns:

- Atlas - Bitmaps - Painting / Photo Manip
- 3D Paint - Bitmaps / PTEX - Painting / Photo Manip

Imagery Of Inc

Shading Pipeline Overview

Thanks!

Session Feedback

- Via the Survey Stations, email or mobile device
- AU 2014 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time

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