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Low Polygon Modeling
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Banks, Lester. "What Is Texel Density and How to Keep It Consistent in Maya." Lesterbanks, 12

June 2018, lesterbanks.com/2018/06/texel-density-maya/.

In the 3D industry UV mapping is a key skill set that is critical to have as a modeler or a

texture artist. UV mapping allows for textures to be created for an asset in a way that has no

distortion and equal resolution throughout the model. These aspects of the texture in a model are

extremely important to an asset that is going to be used in any setting and makes UV unwrapping

and layout critical concepts to understand and be able to implement.

UV mapping is a process that unwraps a 3D object and flattening it out onto a 2D plane

so that it is flat with no overlaps. This "flattening" can then be projected back onto a 3D object

with color and texture. While this is a simple concept UV unwrapping can have many small

issues that can lead to problems with distortion and projection on the asset. To unwrap in

Autodesk Maya there are three main tools that are used. The first is a series of projection types

that can be used to create maps of the 3D object to have better maps of UVs. The different types

of projection are used for different types of objects and affect the outcomes heavily. The planar projection is often used for many objects as it can be used for any flat surfaces. However, any curved surfaces need projections for cylinders or other shapes. The second main tool is the 3D cut and sew tool in Maya. This tool can be used to interactively cut the 3D models into separate UV shells that can be used as the foundation of a UV map. Lastly, the unwrap tool flattens a UV shell so that its projection can be better used for texturing. These tools used in series can create the unwrapping of objects.

Following the preliminary unwrapping of objects, the shells of the objects need to have the same texture element (texel) density throughout the map. The texel density of a models UVs can be seen using a basic checkerboard pattern on the assets. The checker pattern allows the density of a texture to be viewed clearly. It is usually best practice to have consistent texel density throughout a model so that the resolution throughout the model is consistent and allows for good textures to be created. To create consistent texel density the UV projections of objects have to be sized correctly so that the projection of the checkerboard shows the same density throughout a model. The checkerboard projection can also show any distortion issues that need to be fixed with the UV unwrap. Once texel density has been completed on an asset the UV maps of each part of an asset can be laid out on the UV plane.

Once the unwrapping process is complete for every part of a model the maps can be laid out on the UV plane. This process of laying out UVs by hand allows for UV space to be optimized so that there is plenty of room to create textures. Large portions of a model that are going to be seen consistently in the end product should have the most space while small parts do not need as much space. Past the considerations for space if objects are symmetrical they can

have UV maps that are the same for both halves. In this case, the UV shells can be stacked to optimize space. Past simply optimizing space placing the UVs in ways that allow edges of similar shapes to be placed next to each other can optimize space. All of these practices can create an ideal UV sheet that has minimal wasted space.

Following the creation of a complete UV map, the model can then be moved into the texturing process in Photoshop, 3D Coat, Substance Painter or another texturing software. The UV process, while tedious, is a significant part of the animation pipeline to create work for major projects.