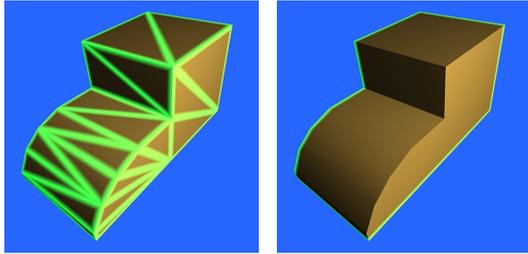


LESSON – THE WIREFRAME TEXTURE

INTRODUCTION

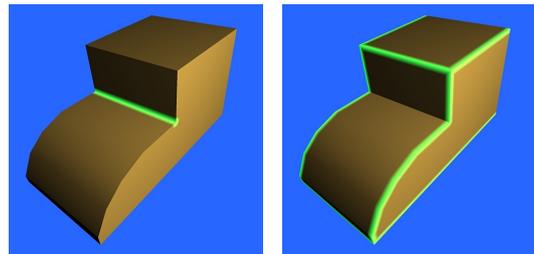
The **wireframe** texture is a special procedural texture that can be used inside Kerkythea material editor for various purposes. In most cases, it is applied in the diffuse or ambient components of a material to highlight edges, or it can be even used in the context of an alpha map to produce special edge effects.



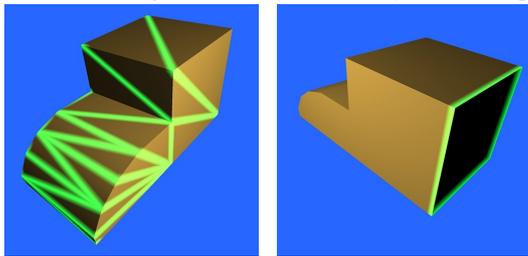
As an introduction to this special texture, it is important to understand the various edge types in a mesh. In the first figure on the left, we can see a simple object, where the wireframe texture has been applied in all edges as a greenish ambient term. Thus, we see all the edges highlighted with green color besides the standard brown diffuse

color of the object. On the second figure on the left, we see another render where the wireframe texture has been applied only to the **silhouette** edges of the object. The silhouette edges are viewer dependent edges and they are the edges where the viewer can “see” only one of the faces incident at the edge.

The edges of an object can be divided as well in **hard** and **soft** edges. The hard edges are the ones that glue faces with a quite big difference in their orientation. Usually, faces that have 30 or more degrees difference in their normal vectors, are considered to be incident at a hard edge. Hard edges can be further subdivided in



inner and **outer** edges, the former being the ones where the incident faces “look” at each other (first figure on the right) while the latter are the ones where the faces “look” away from each other (second figure on the right).

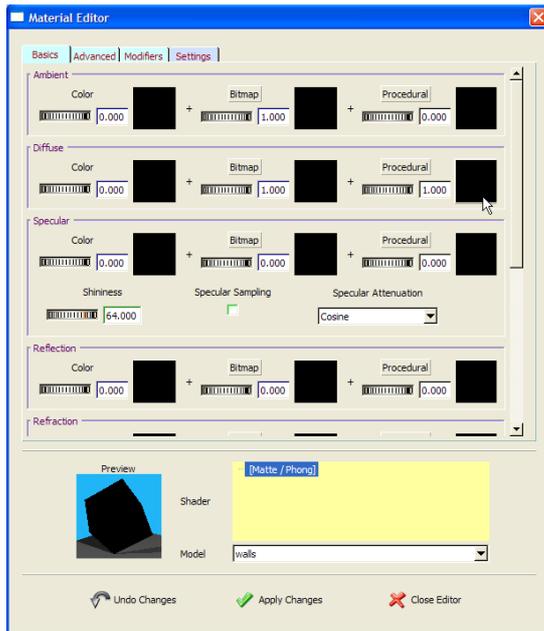


If an edge is not a hard edge, it is considered to be a **soft** one (first figure on the left). In general, a correctly modelled object will have all edges with exactly 2 faces incident at them and the whole object will be closed (i.e. without holes). In some special cases, there can be edges with only

one face incident (i.e. the object being hollow) and we can mark these as well with the wireframe texture. In the object on these pictures, one face has been removed from the back and we can highlight the produced **open** edges (second figure on the left).

SETUP AND PARAMETERIZATION

Well, that was all regarding the classification of the mesh edges in the context of the wireframe texture. The parameters of the texture inside Kerkythea correspond to the description in the previous section.

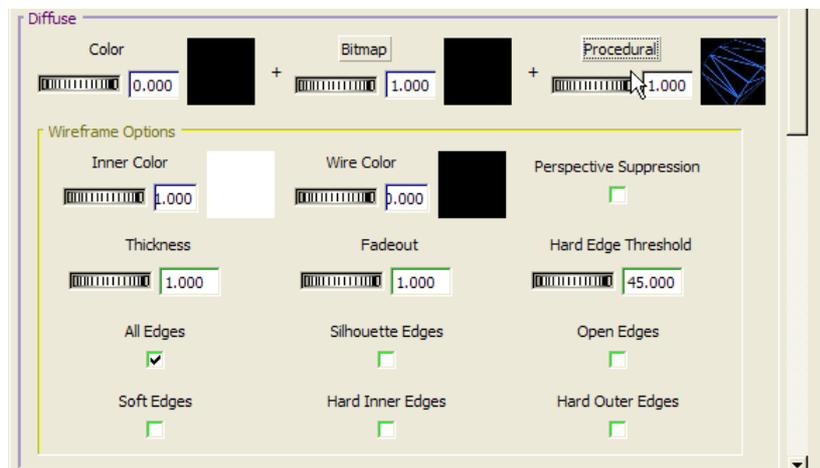


When using a texture like the wireframe one, it is convenient to use a material editor scene with a mesh object. Thus, after opening the material editor, select the **Settings** tab, press the **Material Editor Scene** button and select the cube scene. With this way, the effect of the wireframe texture is evident on the mesh edges on the preview (see figure on the left).

Assuming that we are editing a material, the first thing to do is to press the procedural icon image. This will bring up the procedural texture selection dialog. Then, select the wireframe texture and press ok. Observe that the texture is now drawn in the icon.

Afterwards, we can click on the **Procedural** button right next to the icon.

This will expand material editor with the options for the wireframe texture (see figure on the right). All the parameters of the texture can now be changed. If we want to hide again the options, just press on the **Procedural** button once more.



Now, we can analyze the parameters of the texture one by one. The **Inner** and **Wire Color** refers to the color of the faces and edges respectively. By default, they are white and black correspondingly, which means that the mesh will be white with black edges. **Perspective Suppression** refers to whether the distance to the edges will be taken into account – if checked, the thickness of the edges will be the same regardless of the distance making the wireframe looking “more isometric”. **Thickness** refers to how thick the edge will be and **Fadeout** refers to the transition distance between the inner and wire color. It is logical to have fadeout distance similar to thickness for smoother results. The rest of the parameters refer to everything that has been told in the previous section. The user can select exactly which edges are going to be viewed with the wire color – the rest will be assigned the inner color. The **Hard Edge Threshold** corresponds to the angle (in degrees) that separates the soft from the hard edges.

In the next sections, we are going to see some examples of using the texture. It is easier to follow them by opening the accompanying scene `WireframeExample.xml` and apply instructions step by step. All materials in the applications are contained in the material library `WireframeMaterials.kml` for the more advanced reader.

APPLICATION I – ADDING WIREFRAME

APPLICATION II – WIREFRAME RENDERING

APPLICATION III – MIXING WIREFRAME AND SOLID RENDERING

APPLICATION IV – DUST MATERIAL