**Worksheet 6 – Theory**

**Part 2:**

**Explain the effect of the different filtering modes and their influence on texture magnification and minification issues.**

The texture filtering operation also performs the texture magnification of minification. Therefore, the texture is being mapped into a primitive image that is larger or smaller than itself. Magnification of a texture can result in many pixels being mapped to a single texel and the result can have a chunky appearance. Minification of a texture means that one single pixel is mapped to many texels.

Three methods of texture filtering are used: **NEAREST**, **LINEAR**, and **MipMap**. The first two are used both on minification and magnification; MipMap can be used only on minification.

**NEAREST** option implies that each texture coordinate will choose the closest value of the texel, meaning black or white.

**LINEAR** option requires more computation and uses a weighted average of a group of texels, neighbors of the point sample. The object resulting is blurrier than the one obtained by using nearest filtering.

A **MipMap** is a sequence of textures, each of which is a progressively lower resolution representation of the same image. In our case, a more blurred image is produced. Also, mipmapping is known for improving the quality of rendered textures at the expense of using more memory.

**Part 3:**

**Choose a filtering option that betters these minification issues without too much blurring of the texture. Explain your choice.**

Just by looking carefully at the result on the screen, we can notice that using NEAREST and LINEAR methods cause the apparition of a lot of noise on the object. To solve this problem, I propose using mipmapping for improving the quality of rendered textures. When changing the dropdown to MipMap, the image gets subtly blurred, aliasing disappears, and it becomes considerably improved.