Virtualna okruženja

Laboratorijske vježbe 1

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Exercise 1

To make this exercise I have decided to use the Direct X/version HSL.

Changes that I have made:

Retrieval of the normal from normal texture

float3 n = normalize(tex2D(normalMap,IN.texCoord)*2 +float3(-1,-1,-1));

Saving semi-vector h:

float3 l = normalize(IN.lightDir);
float3 v = normalize(IN.viewDir);
float3 h = normalize(IN.lightDir + IN.viewDir);

Calculating the reflection factor simplified formula of reflection
float nSpecL = pow(dot(n, h),material.shininess);

Calculating the overall color of the light based on Material factors and Light components (ambient, specular and diffuse)
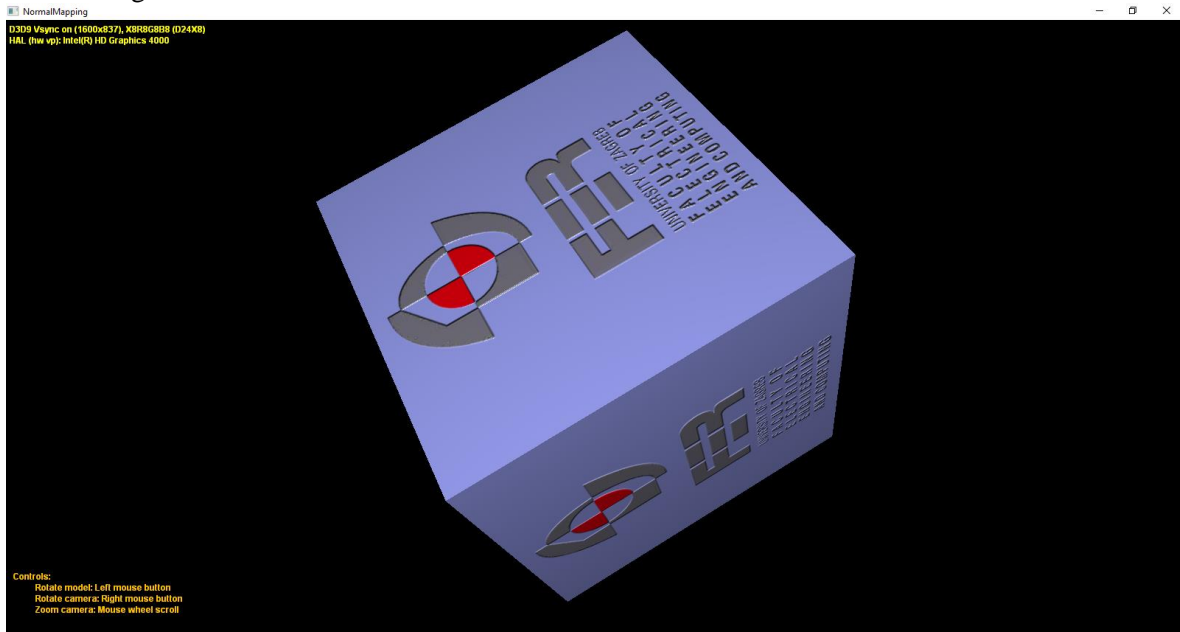
float4 color = (material.ambient * light.ambient) +(material.specular * light.specular * nSpecL) +
                (material.diffuse * light.diffuse * nDotL);

With all this added we have those changes:

Before changes:
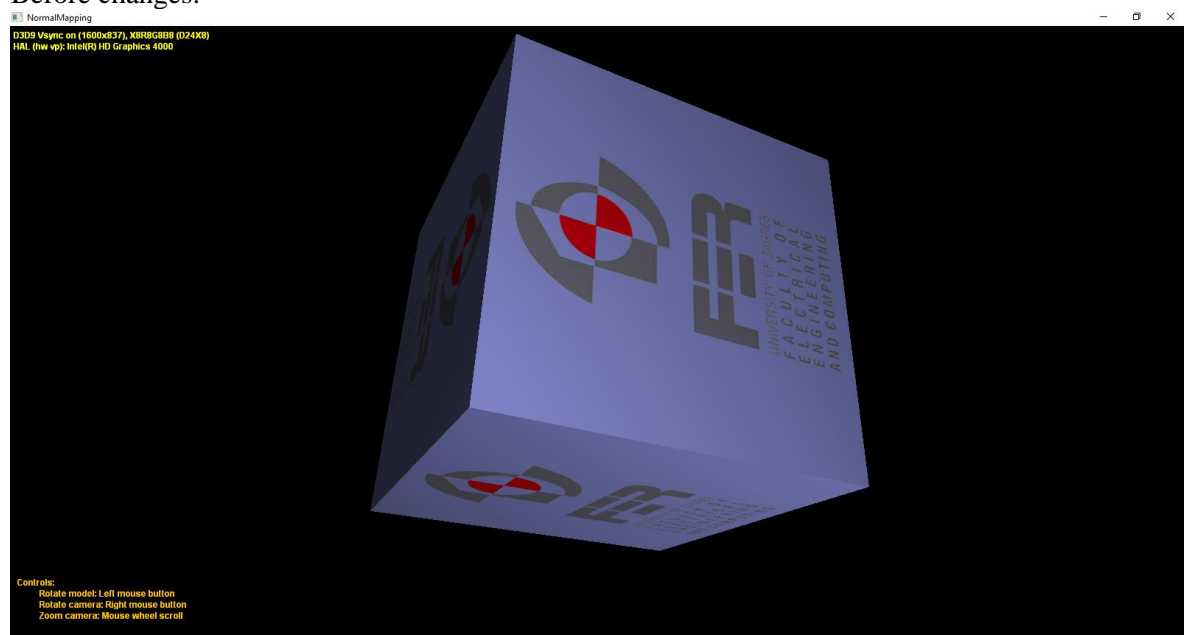
After changes:

Exercise 2

To make this exercise I also decided to use the Direct X/version HSL.

To perform the home transformation viewPosLight vector we make this change:

float4 transVPL = ((IN.viewPosLight / IN.viewPosLight.w) + float4(1,1,1,1))/2;
transVPL.y = 1.0 - transVPL.y;

Also we have to fix the reading fate of folders shadow

float shadowDepth =tex2D(shadowMap, float2(transVPL.x, transVPL.y)).x;

If the current fragment has a greater distance than a fragment of shadow folder, then the current fragment is the shade. Therefore to fix that:

float factor = 1.0;

if(shadowDepth < (IN.viewPosLight.z/xMaxDepth - 0.01)){
factor = 0.0;
}

Finally we should add the diffuse illumination of light:

color =(light.ambient + factor * light.diffuse * nDotL) * material;

Whit this changes now we have those results:

Before picture:

After picture:

There is another question to answer and is:

Why do the shadows look like a cubes¿

This is due to the fact is low resolution and there is no interpolation of values.