Oregon State University

Project #3B: Displacement Mapping, Bump Mapping, and Lighting

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1 Description

1.1 Set up

GLSL and glman are used to create a curtain with pleats and bumps in the project #3B.

1.2 Program Description

In this project, the program is designed to make a curtain with pleats and noise. In the .glib file, uA, uP, $uNoiseAmp$ and $uNoiseFreq$ are for Displacement and Bump mapping. They are determined like:

$$uA \ < 0.01\ 0.1\ 1.0 >$$
$$uP \ < 0.1\ 0.5\ 1.0 >$$
$$uNoiseAmp \ < 0.\ 0.1\ 1.0 >$$
$$uNoiseFreq \ < 1.\ 1.\ 10. >$$

The vertex shader setting is as same as project #3A. In the .frag file, on the other hand, the noise texture and the given function, vec3 PerturbNormal2 (float angx, float angy, vec3 n), is needed for bump-mapping. Unlike previous project, noise texture is based on the vec4, not vec3. So, the codes would be:

$$vec4\ nvx = texture(Noise3, uNoiseFreq * vMC);$$
$$float\ angx = nvx.r + nvx.g + nvx.b + nvx.a - 2.; // -1.to + 1.$$
$$angx* = uNoiseAmp;$$

$$vec4\ nvy = texture(Noise3, uNoiseFreq * vec3(vMC.xy, vMC.z + 0.5));$$
$$float\ angy = nvy.r + nvy.g + nvy.b + nvy.a - 2.; // -1.to + 1.$$
$$angy * = uNoiseAmp;$$

Then, the PerturbNormal2 function is used to perturb the normal and be normalized:

$$vec3\ n = PerturbNormal2(angx,\ angy,\ vN)$$
$$vec3Normal = normalize(gl_NormalMatrix * n)$$

1.3 URL

Video Link(bitly): `https://bit.ly/3CzYKQy`

Video Link(original):
`https://oregonstate.zoom.us/rec/share/3CRn-Cf8wYgygWRTZ-XiQak0ylb_kbXh860j_RVAc_gXZqeloVcnPcBYDKK-6Y4VaxgeAwF?startTime=1738380174000`

1.4 Test Result

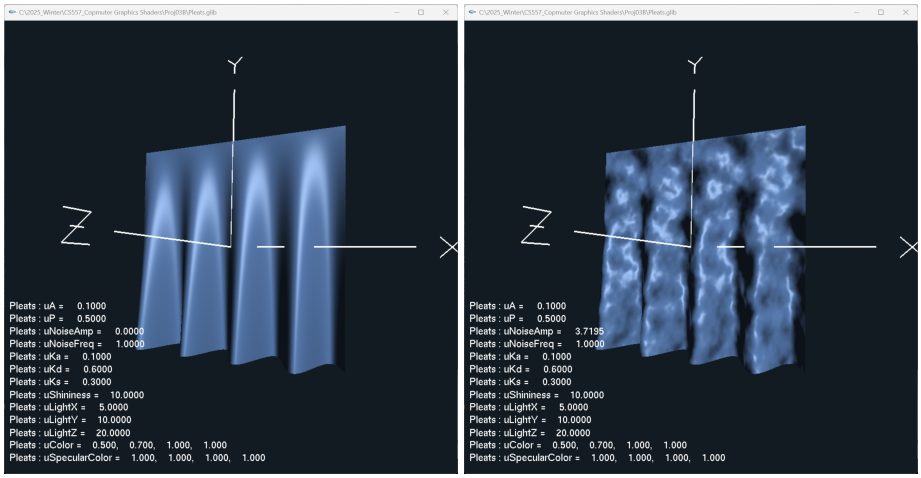

Figure 1: Original(left) and increase uNoiseAmp(right)

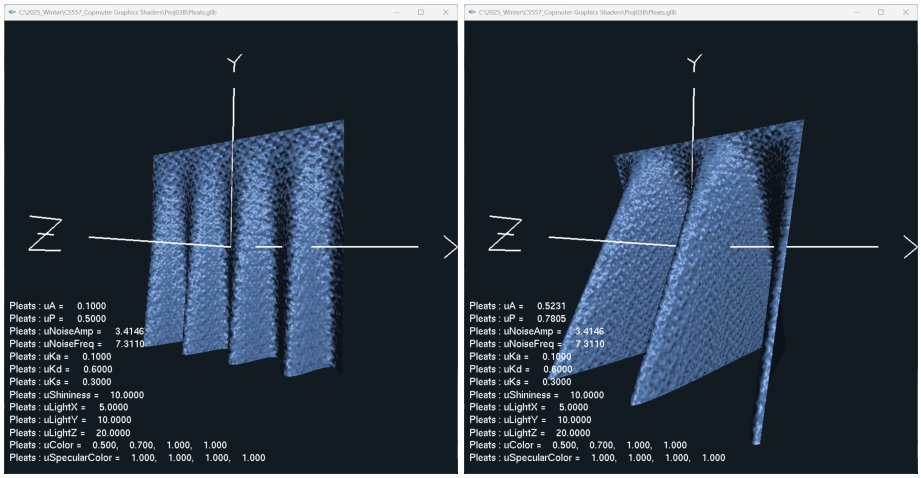

Figure 2: increase uNoiseFreq (left) and uA, uP (right)