Assignment 5: Normal Mapped Bunny

In this assignment you'll perform normal mapping. Normal mapping is a technique useful for producing bumps, dents, roughness, or wrinkles on the surface of an object without deforming the surface geometry. The underlying surface is actually smooth, but is made to appear rough by varying the normal vectors using a texture called the normal map. Thus normal vectors are encoded into the RGB information of the normal map where the red channel contains the x-coordinate, the green channel contains the y, and the blue channel contains the z coordinate of normal vector. The texture values in normal map are used as normals while computing illumination model to create fake bumps on smooth surface.

In the following figure, the upper left corner shows the base color texture used as the diffuse reflectivity in illumination model whereas the bottom left normal map texture has been used to produce fake dents on the surface of the bunny model;
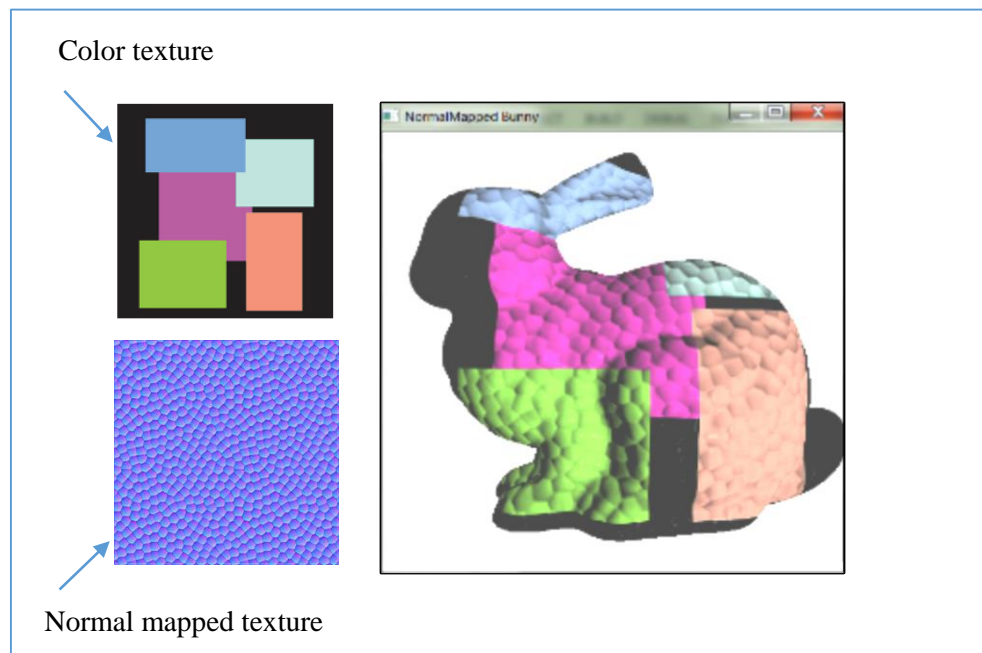

Figure 1: Normal Mapping

In order to implement normal mapping, you need to evaluate the reflection model in tangent space. You need to define a transformation from camera coordinate system to tangent space. You'll find the lecture note on "Normal Mapping" helpful to guide you along the implementation. Use the attached images for color texture and normal map texture as shown in Figure 1.

Submission:

Submit the assignment in a zipped file via canvas. Name the file as Firstname_Lastname_5_CSCD471.zip. Deadline is Wednesday, February 19, 11:59 pm.

This assignment carries a weightage of 20% of this course.