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Demonstration of light reflection for rendering realistic trees image

Light in nature is known to behave following the law of reflection. Light ray hits surface with a different orientation and reflects in accordance with the rules of physics. For rendering realistic image, it is difficult to calculate the light reflection of complex foliage, such as trees, the reflection of this natural complexity needs to be adapted to particular rendering situations. In this research, we provide the demonstration to students to understand the light reflection in nature, light calculation in computer graphics and how to apply to render realistic trees. We divided the reflection into 2 types to demonstration: reflection of smooth surfaces, known as specular reflection, and reflection of rough surfaces, known as diffuse reflection. To assess the students understanding results, we assign the assessment to the students to render realistic trees, create tree models of leaves based on the tree shapes and leaf forms. Dividing the surface for normal direction of light reflection is calculated in 4 types: randomly, circle, half circle and following the bush shapes, using the specular reflection to calculate brightness. Then, apply the light reflection value to render realistic trees. When comparing the rendering results, it is found that understanding the different of diffuse reflection, specular reflection, reflection formular, reflection value and surface normal direction can make the most realistic rendering results.

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