

Radiosity Rendering with WebGL

BY - Utkarsh Agarwal

What is Radiosity?

Radiosity is a rendering technique that considers light as energy and simulates the distribution of energy in a scene.

Because of this nature, we can see different phenomena, like colour bleeding and soft shadows.

Radiosity Equation

$$B_i = E_i + \rho_i \sum_j B_j F_{ij}$$

In Equation, B_i is the Radiosity of patch i , E_i is the emission of patch i , ρ_i is the reflectivity of patch i , B_j is the Radiosity of patch j , and F_{ij} is the form factor between patches i and j . This equation is computed for each patch i

Form Factor

Form factor is the relation between two patches.

If patch i and see patch j then the form factor value between them is 1, else it is 0.

$F_{ij} = 1 = F_{ji}$ \rightarrow i and j can see each other

$F_{ij} = 0$ \rightarrow i and j cant see each other

Ways of calculating

Solving linear equations

In this method, we calculate the form factor and solve for the radiosity equation

This method is fast but complicated

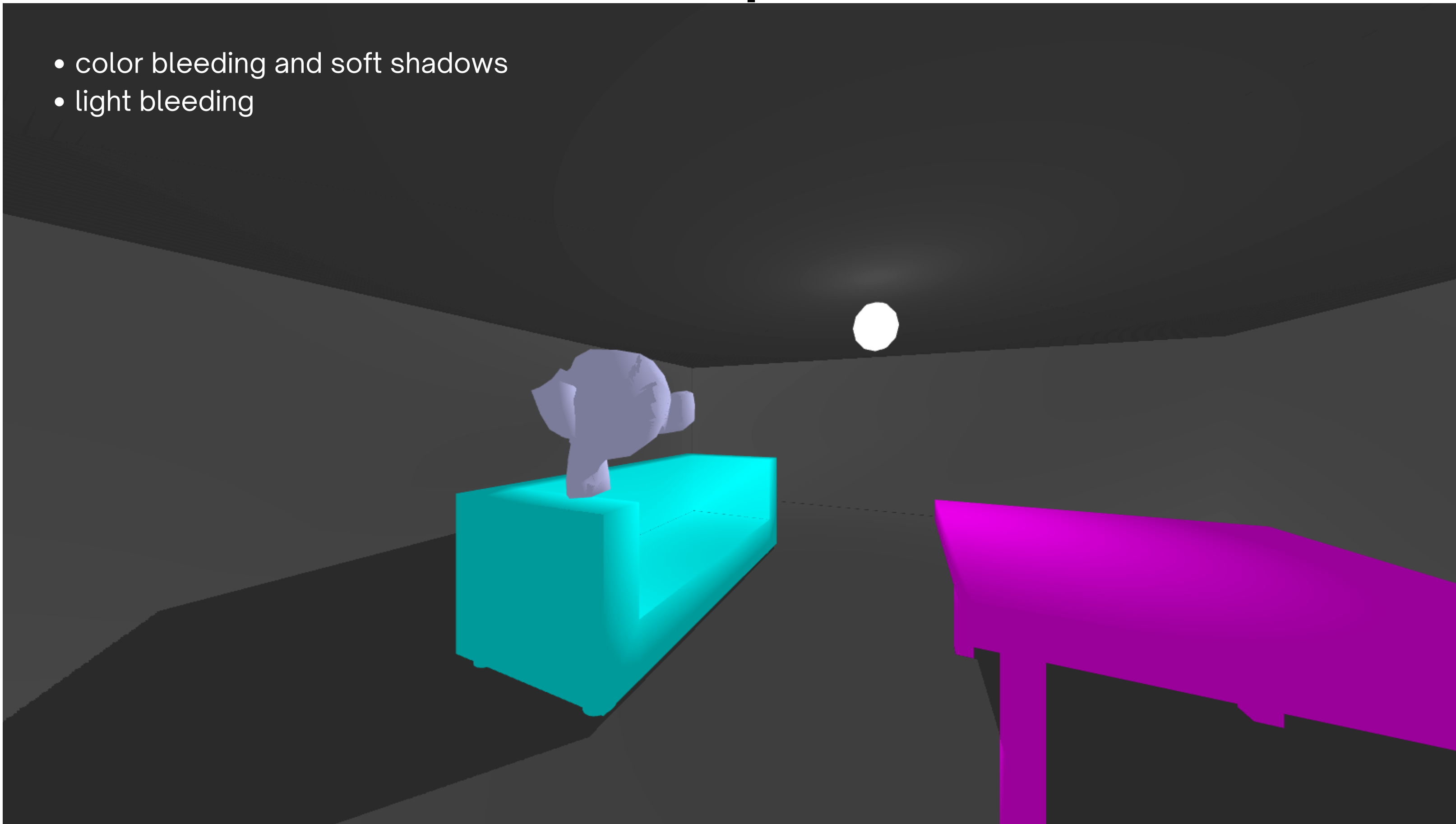
Shooting and gathering

In this method, we gather light to the patches, and set the patch colour accordingly

this method is slow but less complicated

Output

- color bleeding and soft shadows
- light bleeding



Code