Equations representing the Ward BRDF:

$$\text{normalize}(\vec{u}) = \frac{\vec{u}}{\sqrt{\vec{u} \cdot \vec{u}}} \tag{1}$$

1. Half vector:

$$\vec{H} = \text{normalize}(\vec{\omega_i} + \vec{\omega_o}) \tag{2}$$

2. Tangent vector:

$$\vec{X} = \text{normalize}(0, \vec{1}, 0 \times \vec{n}) \tag{3}$$

3. Bitangent vector:

$$\vec{Y} = \text{normalize}(\vec{n} \times \vec{X}) \tag{4}$$

4. Roughness parameters:

$$\alpha_x = 0.4 \tag{5}$$

$$\alpha_y = 0.2 \tag{6}$$

5. Exponent calculation:

$$\text{exponent} = -\frac{\frac{\vec{H} \cdot \vec{X}}{\alpha_x}^2 + \frac{\vec{H} \cdot \vec{Y}}{\alpha_y}^2}{(\vec{H} \cdot \vec{n})^2} \tag{7}$$

6. Specular term: 7. And Exponent:

$$\text{spec} = \frac{1}{4 * \pi * \alpha_x * \alpha_y * \sqrt{(\vec{\omega_i} \cdot \vec{n}) * (\vec{\omega_o} \cdot \vec{n})}} \cdot \exp{(\text{exponent})} \tag{8}$$

8. Color parameters

$$\vec{C_s} = 1, \vec{1}, 1 \tag{9}$$

$$\vec{C_d} = 1, \vec{1}, 1 \tag{10}$$

9. Final BRDF:

$$f = \frac{\vec{C_d}}{\pi} + \vec{C_s} \cdot \text{spec} \tag{11}$$