This two weeks progress.

Documents: Finished Related Work and started Implementation sections.

Code: I investigated more on the possible sampling patterns that are used in the models, as well as reasoning on the formula for efficiently integrating the equations.

At the end I came up with this formula:

$$L(\mathbf{x}_o, \vec{\omega}_o) = \frac{A_{circle}}{k} \sum_{i=1}^{k} S_i(\mathbf{x}_i, \mathbf{x}_o, \vec{\omega}_i, \vec{\omega}_o) \, (n_i \cdot \vec{\omega}_i) \, F_t(n_i, \vec{\omega}_i)$$

where A_{circle} is the area of the circle in world space. I used the following two sampling patterns, an uniform one and an exponential one. Both are generated using Hammersmith points, the second is modified by converting the points to polar coordinates and then applying the following formula to the radius:

$$r^* = \frac{e^{\sigma r} - 1}{e^{\sigma} - 1};$$

We used $\sigma = 2$ for all tests. We tested different radiuses in texture space with both the exponential and uniform pattern.

(a) Uniform   **(b)** Exponential   **(c)** Reference
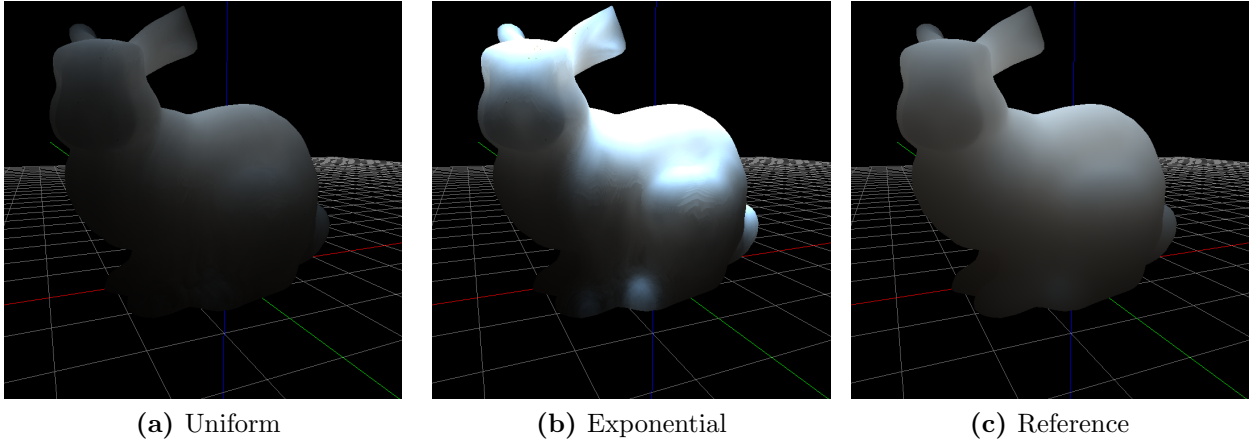
Figure 1: Difference between sampling patterns vs. reference. Jensen dipole, $r = 0.3$, 300 samples.

(a) Uniform   **(b)** Exponential   **(c)** Reference
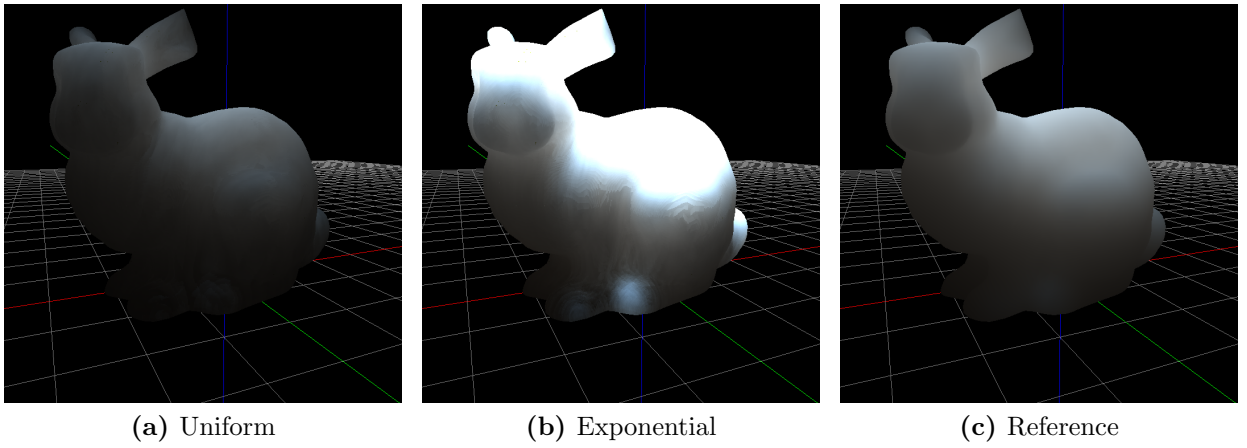
Figure 2: Difference between sampling patterns vs. reference. Jensen dipole, $r = 0.5$, 300 samples.

In the implementation with directional dipole, there are still some artifacts, that need investigation.

(a) Uniform (b) Exponential
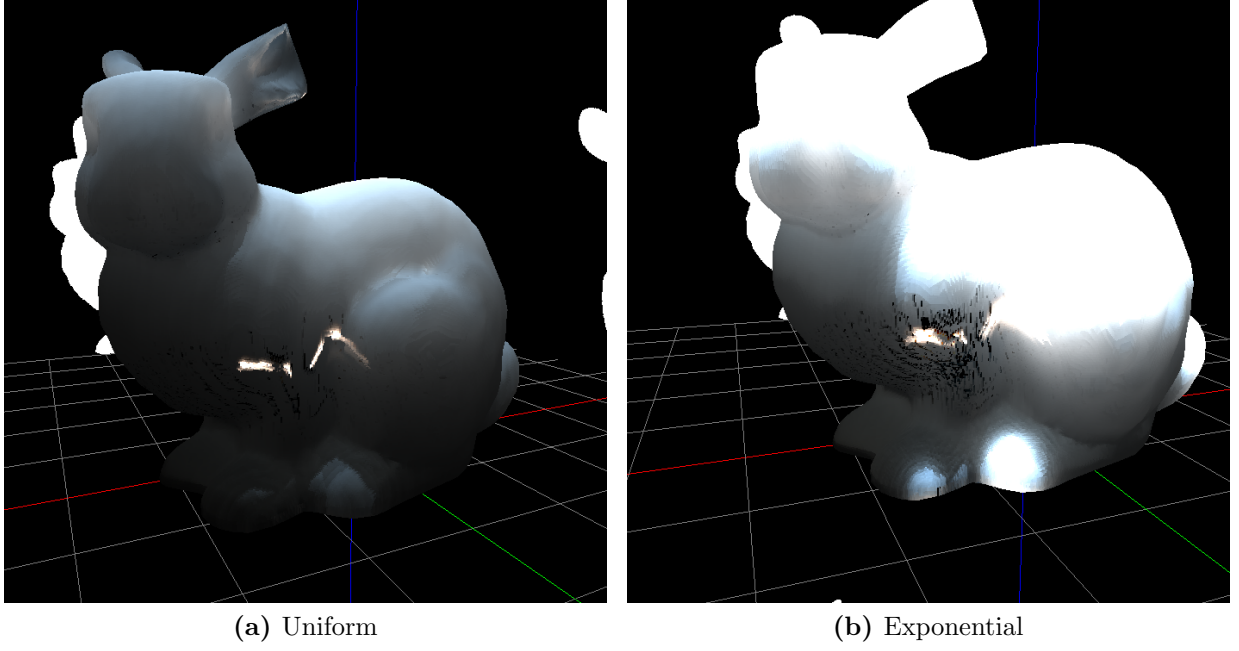
Figure 3: Difference between sampling patterns. Directional dipole, $r = 0.5$, 1000 samples.