Advanced Image Synthesis

Week 2

Using the skeleton code, compute the integral of

$$\ell_x(\omega) = \cos(\theta) \tag{1}$$

using Monte Carlo Integration.

1. To get acquainted with the inversion method, implement it for the discrete probability distribution function

   $$p(x) = 0.1, 0.2, 0.4, 0.2, 0.1 \tag{2}$$

   using the skeleton code `inversion_method_skeleton.py`.

2. Implement Monte Carlo integration to compute the integral in Eq. 1. Ensure that your samples are uniformly distributed on the sphere. Use `mc_hemisphere_skeleton.py` as a starting point.

3. Study the accuracy and variability of the computations as a function of the number of samples.