

# CS580

Programming Assignment #2

Due: 11:59pm on May.-20 (Mon.)

**Objective:** Understand impacts of adaptive sampling and get to know more about pbrt

**Developing environment:** Windows OS is recommended; you can use it linux or other OS

**Requirements:**

- 1) Given a user specified ray budget (e.g., 10K sample counts), distribute those ray samples over pixels of the view space according to an adaptive or error metric. A simple metric would be variance metric.
- 2) Compare its visual quality and runtime performance with a simple uniform sampling.
- 3) Measure MSE between your result and a reference that is generated by a high number of sample counts. Do the same thing for a result generated by the uniform sampling in the same sample count.
- 4) Also, measure and compare the runtime cost of your method against that of uniform sampling
- 5) Which method is better? Explain why you think so. Explain your adaptive metric.



Uniform sampling  
(64 samples per pixel)

Adaptive sampling

Reference

**Deliveries:**

- 1) Source codes that you wrote or modified
- 2) A document summarizing your final rendering images (those of adaptive sampling and uniform sampling) with their rendering time and MSE. The document should explain the adaptive metric that you used
- 3) Send them to TA

**Policies:**

- 1) Everyone must turn in their own assignment. You can collaborate with others, but any work that you turn in should be your own