Multiple Importance Sampling
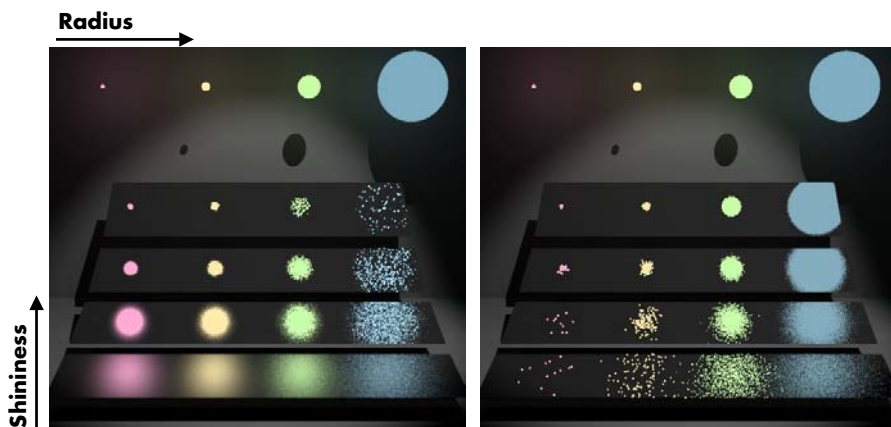

Multiple Importance Sampling

Reflection of a circular light source by a rough surface

Radius →

Shininess ↑

Sampling the light source   **Sampling the BRDF**

$$\int f(x)g(x)\,dx$$

Multiple Importance Sampling

Two sampling techniques

$$X_{1,i} \sim p_1(x) \qquad X_{2,i} \sim p_2(x)$$

$$Y_{1,i} = \frac{f(X_{1,i})}{p_1(X_{1,i})} \qquad Y_{2,i} = \frac{f(X_{2,i})}{p_2(X_{2,i})}$$

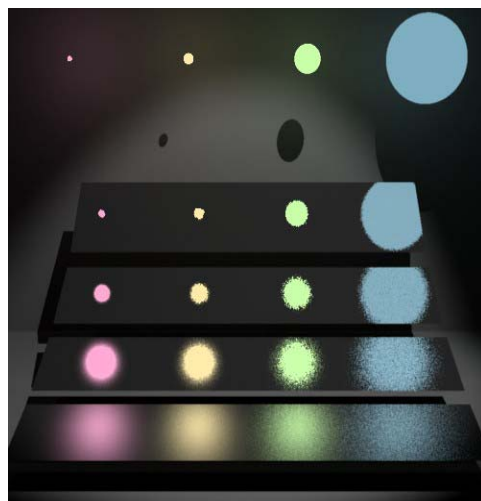**Form weighted combination of samples**

$$Y_i = w_1 Y_{1,i} + w_2 Y_{2,i}$$

The balance heuristic

$$w_i(x) = \frac{p_i(x)}{p_1(x) + p_2(x)} \Rightarrow p(x) = w_1(x)p_1(x) + w_2(x)p_2(x)$$

Multiple Importance Sampling

Source: Veach and Guibas