

Experimental Analysis of Multiple Scattering BRDF Models Supplemental Material

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1 CSSIM ERROR FOR COSINE WEIGHTED L2 FITTED PARAMETERS

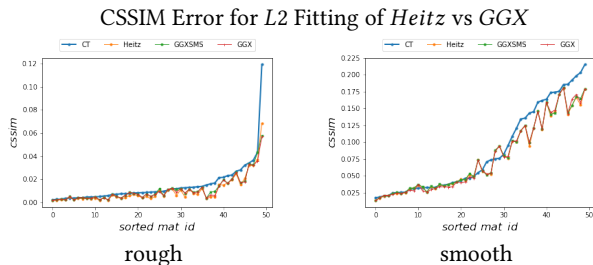


Figure 1: CSSIM errors for the renderings of a sphere under the Eucalyptus Grove light probe over all the MERL materials for the cosine weighted L2 BRDF fits of the different BRDF models.

Figure 1 shows that for the fitted BRDF parameters obtained with the cosine weighted L2 fitting metric, the Heitz model has almost identical visual fidelity as the standard GGX model for the smooth materials (right) and slightly better visual fidelity than the GGX model for the rough materials (left). Even though the L2 error graph in Figure 3 in the main paper (right-top) shows the Heitz model to have worse data fidelity for some smooth materials. The Heitz BRDF model outperforms the GGX model in terms of visual fidelity in both cosine weighted L2 and image based adaptive fitting.

2 GGX AND HEITZ FITTING PARAMETERS

While there is little visible visual difference between the GGX and Heitz fitting for most of the rough materials in the MERL dataset,

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α and specular albedo parameters for GGX and Heitz

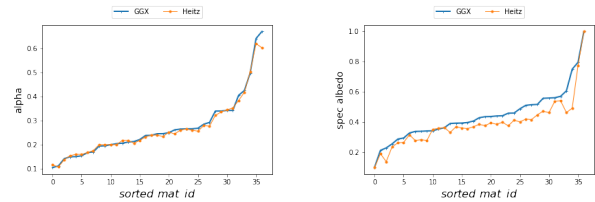


Figure 2: Comparing α and specular albedo parameters computed for the GGX and Heitz BRDF model parameters computed using image based adaptive fitting.

the fitted parameters for the two models differ most in their specular albedo. Figure 2 shows that the specular albedo for the Heitz model is lower than for the GGX model for most of the materials (right) and that α for the Heitz model is slightly lower for some materials (left).

For this comparison, we filtered out 15 rough material whose total albedo is greater than 1 because these BRDF fits are suboptimal for two reasons ¹:

- (1) These BRDF fits have a high visual fitting error; and
- (2) These BRDF fits are not physically plausible and can produce unexpected results in a physically based renderer that requires energy conservation.

¹For the filtered out materials, the Heitz model's specular albedo is also lower than for the GGX model.