

Reaction Report II: An Adaptive Parameterization for Efficient Material Acquisition and Rendering

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Identify one idea in the paper that you feel is a major contribution or a major limitation, explain it, and discuss why it is important

The authors proposed the first adaptive BRDF parameterization method that can do multi tasks from acquisition, storage and rendering as a end-to-end pipeline. I think the most important contribution is the efficient data acquisition since the system was able to capture characteristics of many different materials with interesting spectral behavior (multiple types of iridescent, opalescent, and color-changing paints). Furthermore, unlike the previous works which used on a fixed set of samples that covers the 4D domain of the BRDF, the authors used an adaptive approach to put measurement samples to the correspondence locations (Monte-Carlo sampling computed using retro-reflection). This approach decreases the computational cost thus allows them to build a big BRDF database with high precision, low cost and easy to extend.

Describe one idea of yours that builds on the paper and expand on that idea as much as possible

I think one direction do extend this idea is to simulate the BRDF of unknown materials. Given in the current database, the authors have different materials and theirs characteristics, I think it is possible to simulate the BRDF of a new material that has the similar properties with some of the existent ones. A self-supervised learning pipeline could support such idea. This simulation is crucial, first it could provide a BRDF baseline database for new materials, it even can pass the current limit on layered materials. More important, there is the possibility of reverse-engineering to find and create the new material that BRDF is well understood to use for specific purposes. For example, we can create new type of composite materials such as plastic but with some additional components that make data acquisition become easier.