

CS6630 Realistic Image Synthesis

Differentiable rendering

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Luan et al. EGSR 2021





(a) Reference images



(b) Optimized surface



(c) Optimization result

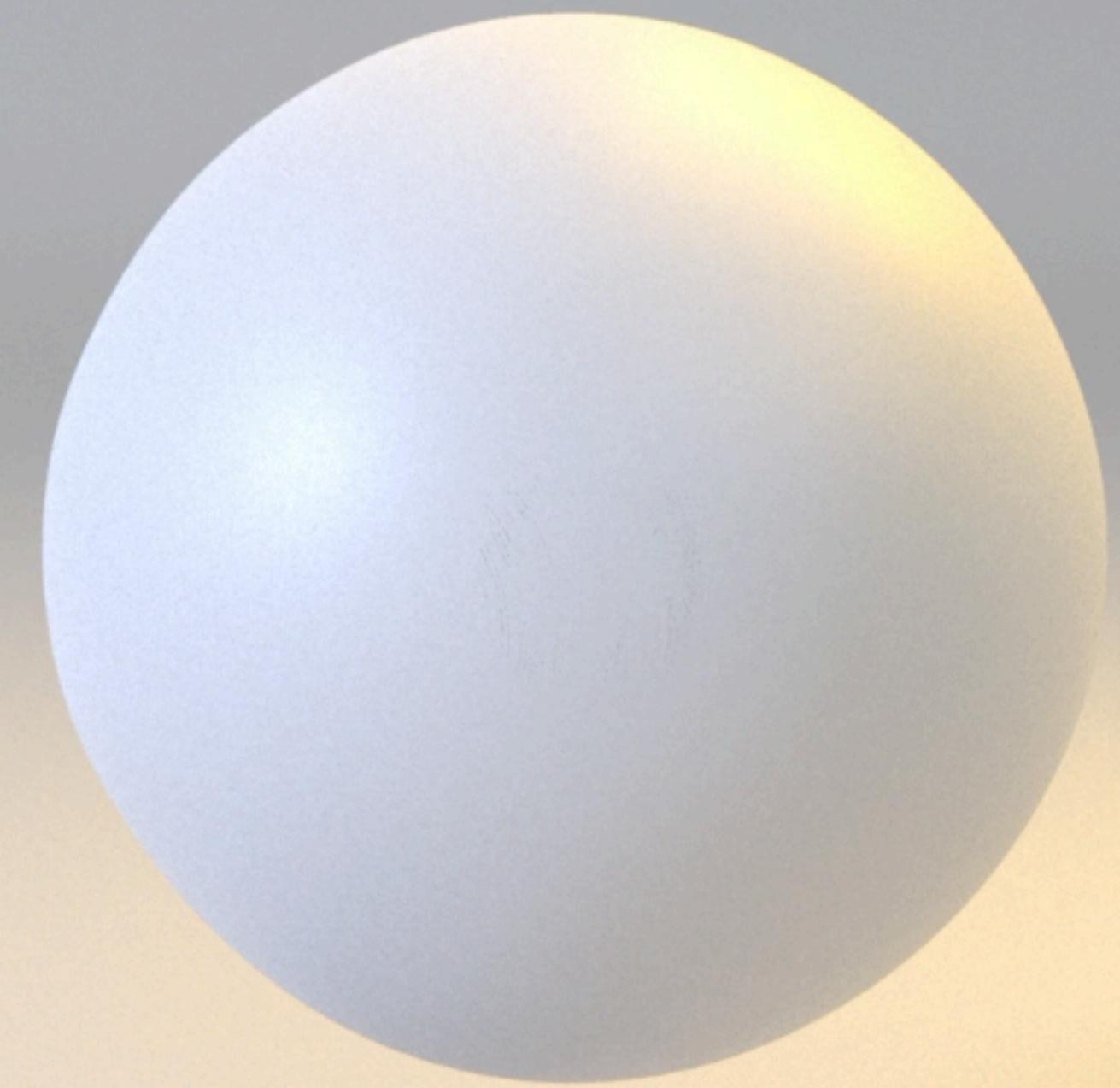


(d) Ground truth



Optimization

Optimizing shape, albedo
& roughness



Iteration 0

Differentiable rendering overview

Computing derivatives

- finite differences
- symbolic differentiation
- automatic differentiation
- reverse mode AD

Differentiating integrals

- Continuous case
- Accounting for discontinuities

Tzu-Mao Li et al.

- explicit edge sampling
- forward path tracing

Nimier-David et al.

- reparameterization
- forward path tracing

Cheng Zhang et al.

- path space formulation
- explicit edge sampling