

Multi-times Monte Carlo Rendering for Inter-reflection Reconstruction

Tengjie Zhu* Zhuo Chen* Jingnan Gao Yichao Yan[†] Xiaokang Yang



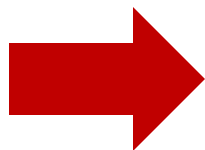
SHANGHAI JIAO TONG
UNIVERSITY

* Equal Contribution † Corresponding Author

Motivation



Inverse
Rendering

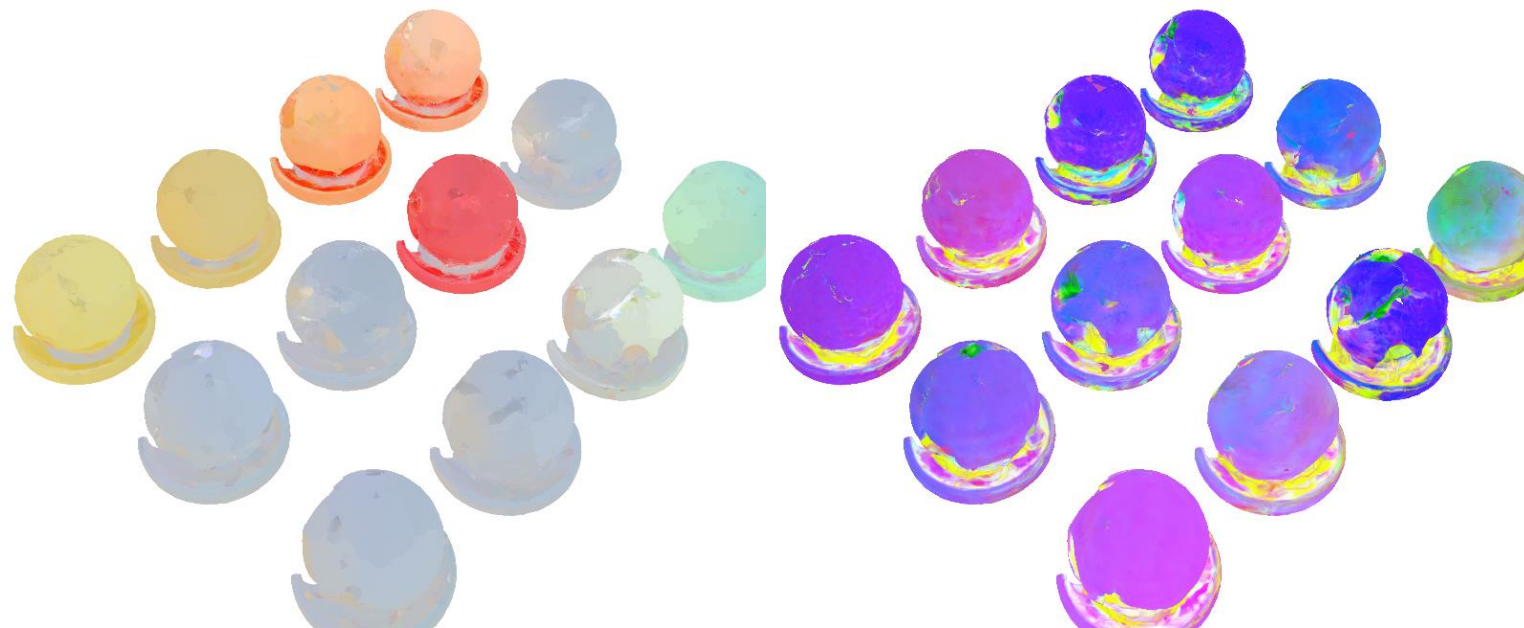


Mesh / \mathbf{k}_d / \mathbf{k}_{orm} / \mathbf{n}

Motivation

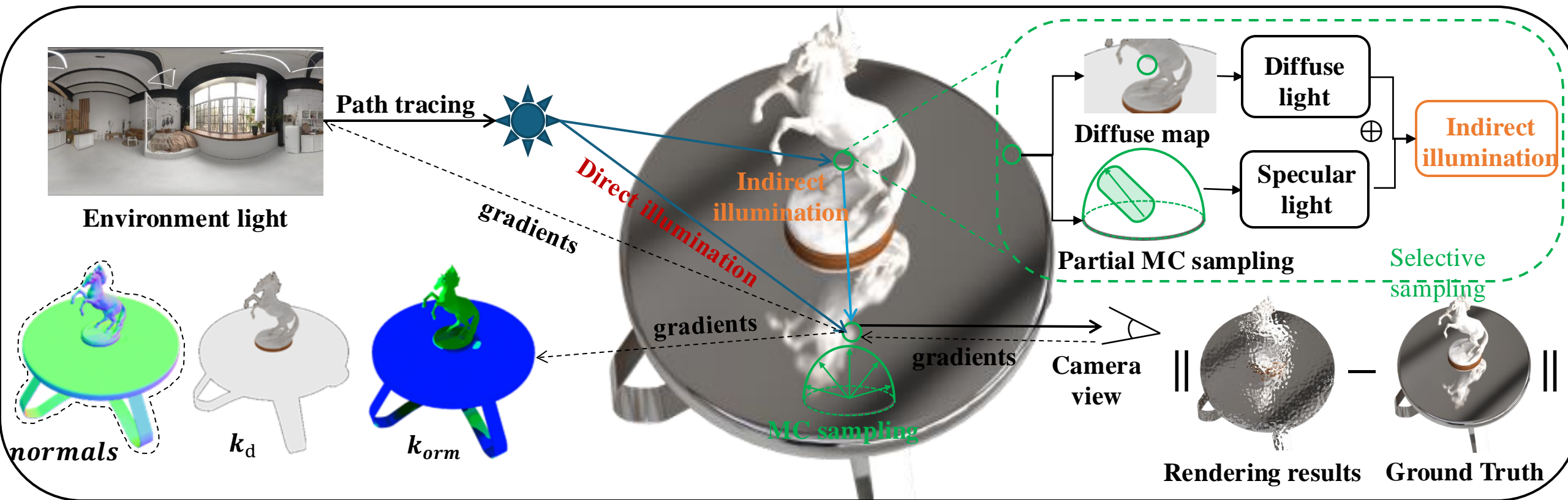


Mesh / \mathbf{k}_d / \mathbf{k}_{orm} / \mathbf{n}



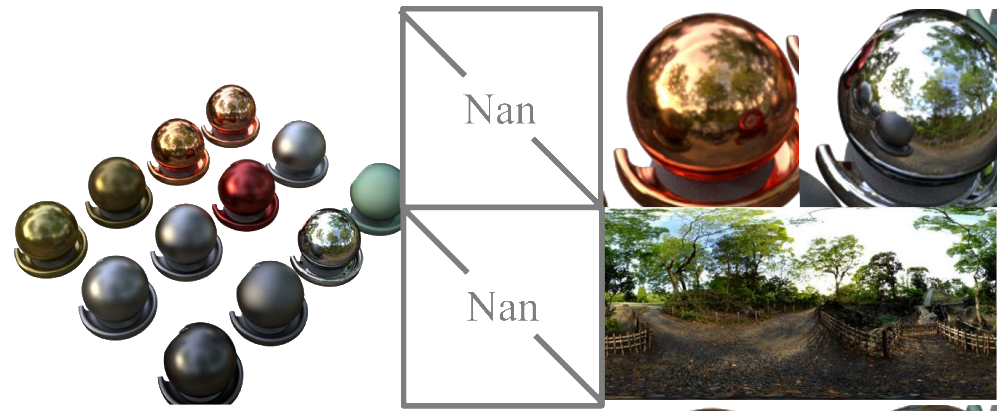
Ambiguous Material Decomposition

Method Overview



Comparison

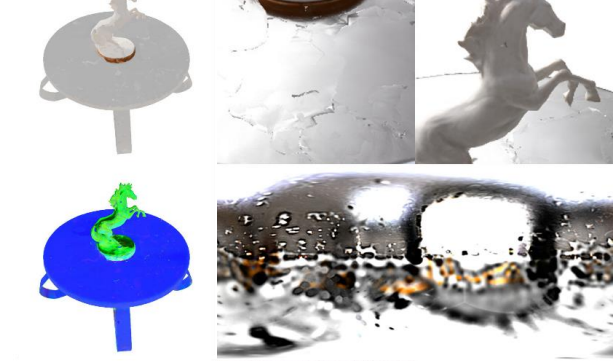
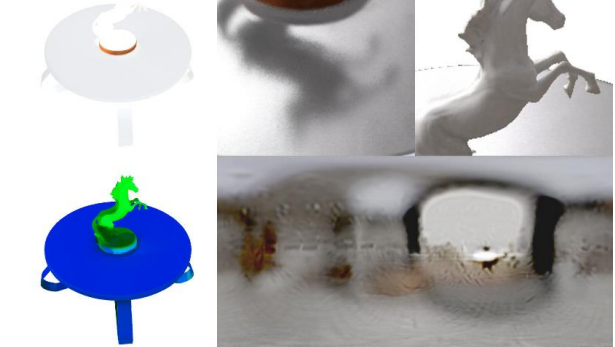
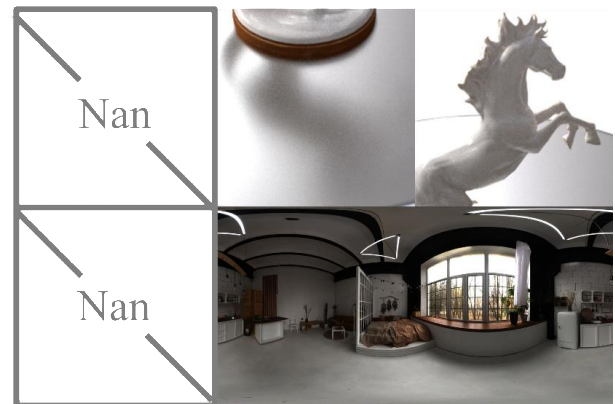
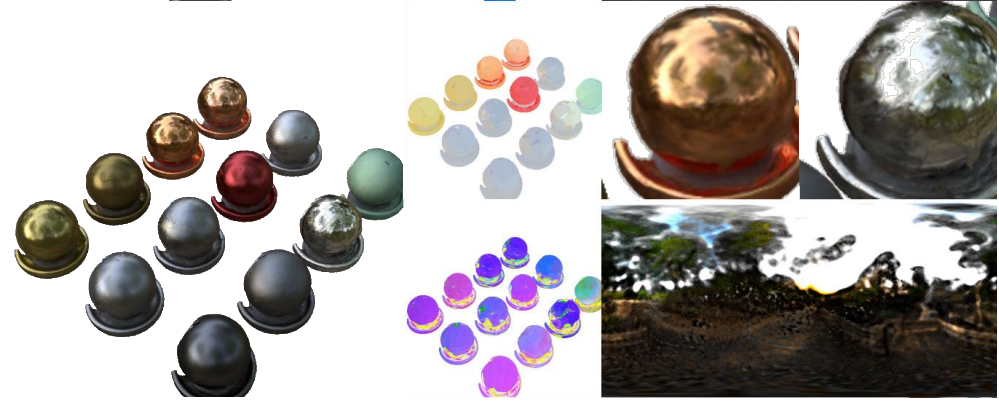
Ground Truth



Ours

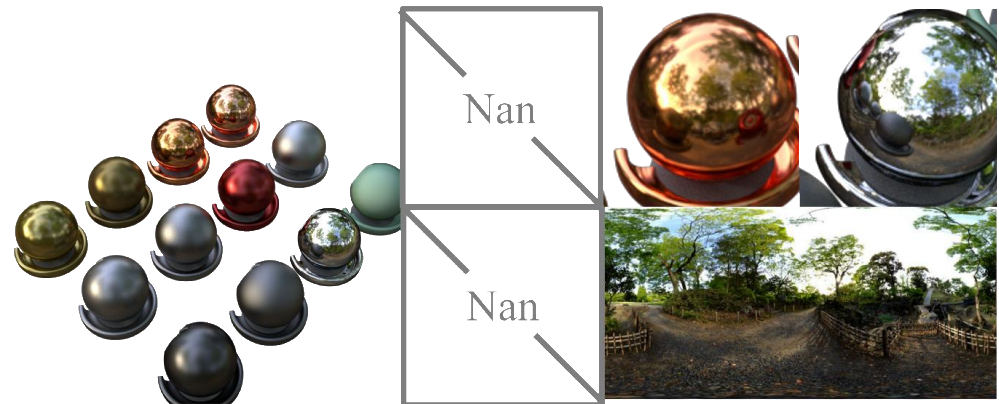


Nvdiffric



Comparison

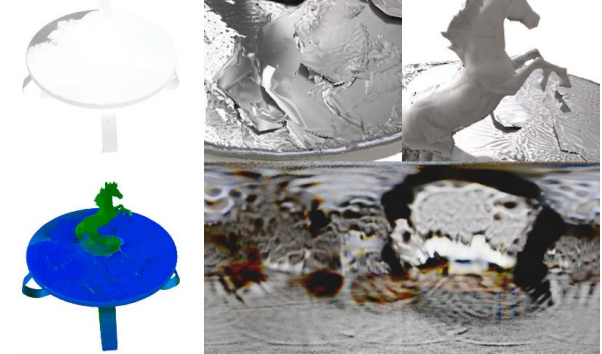
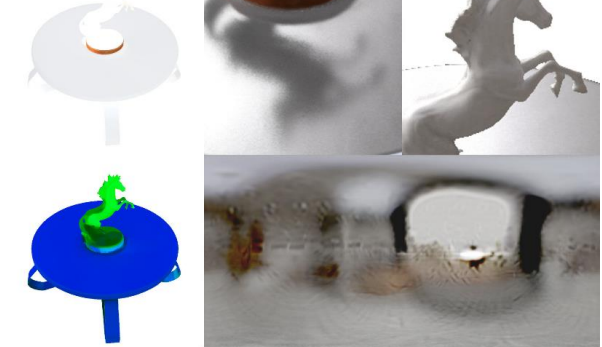
Ground Truth



Ours

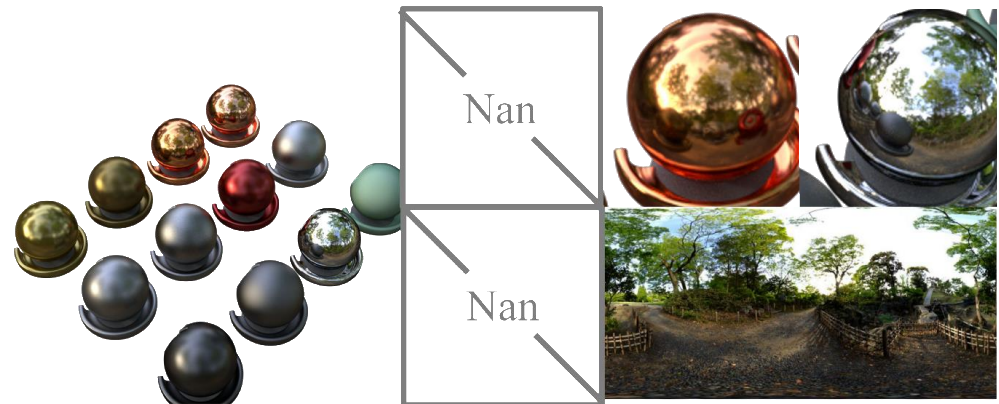


Nvdiffrmc

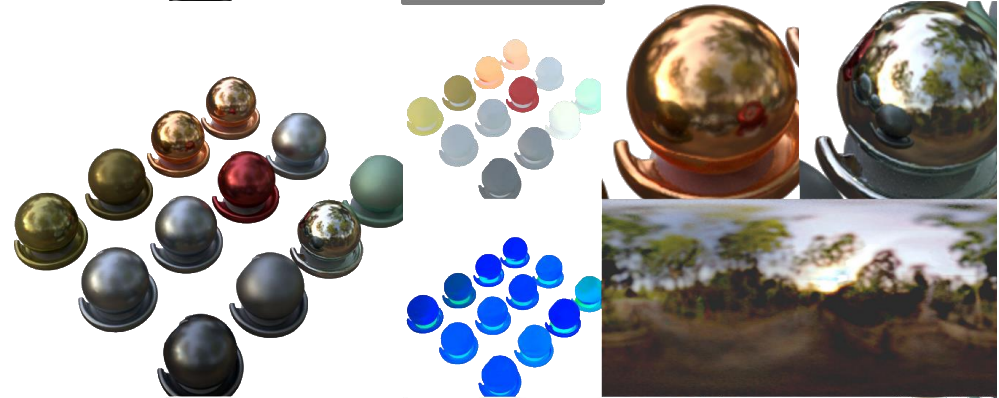


Comparison

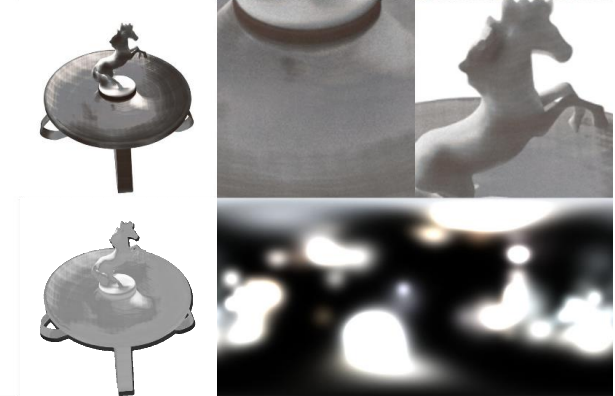
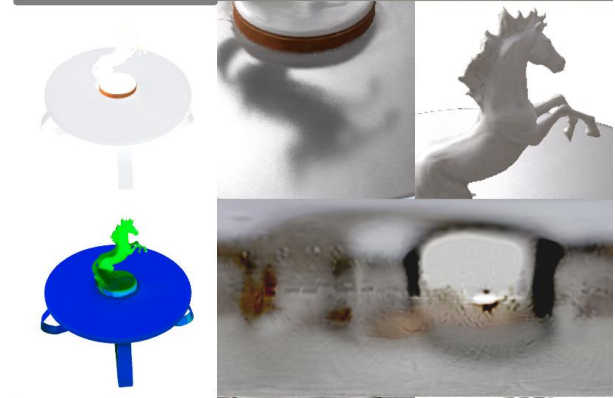
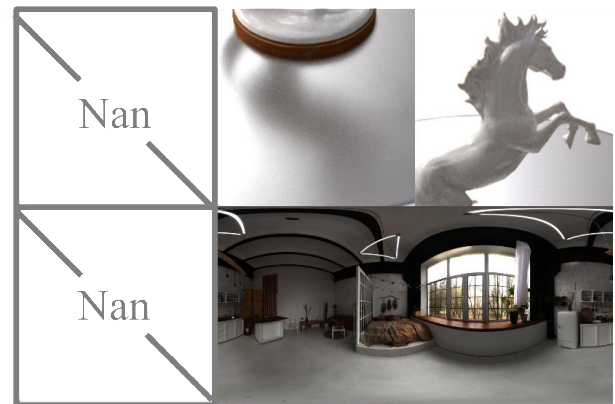
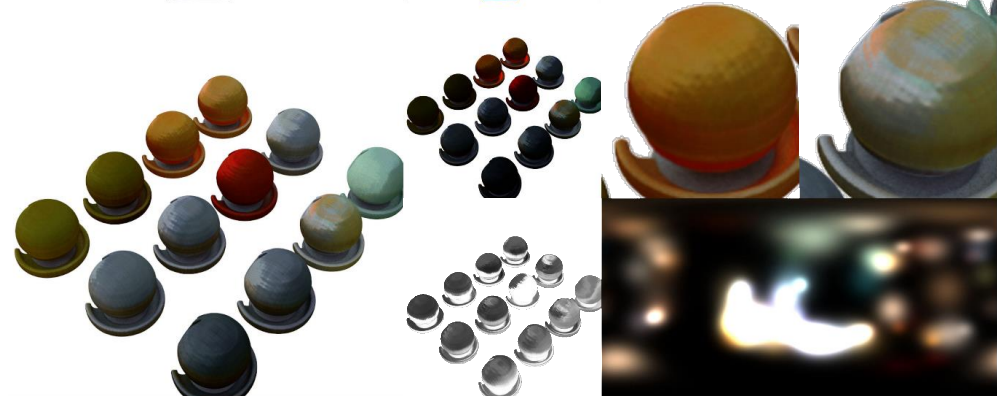
Ground Truth



Ours



Neffi



Comparison



Ours



Ours

Comparison

EnvMap

NeRO

Ours

EnvMap

NeRO

Ours



Relighting and Editing

Relighting

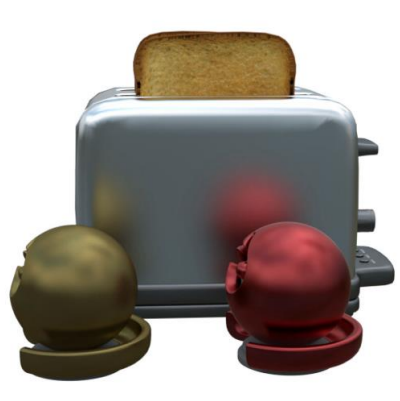


Material Editing

Relighting and Editing



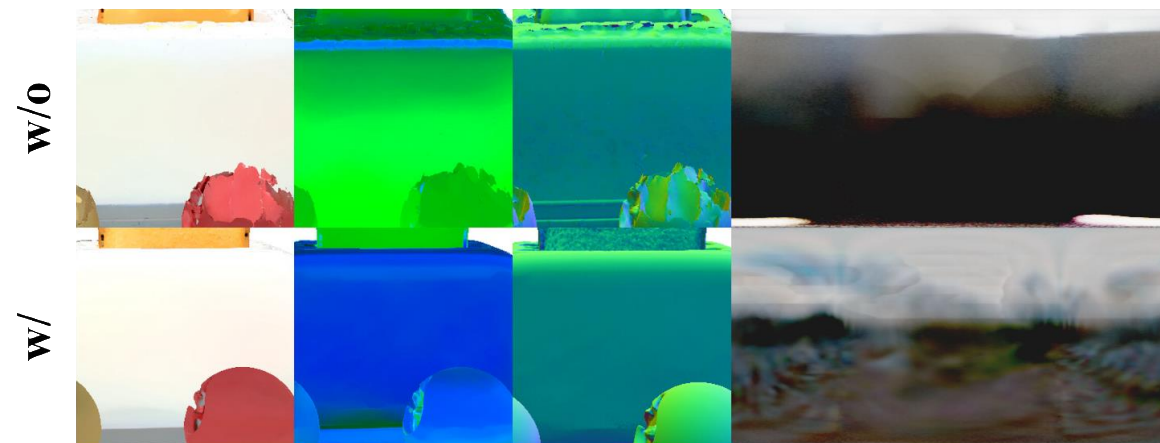
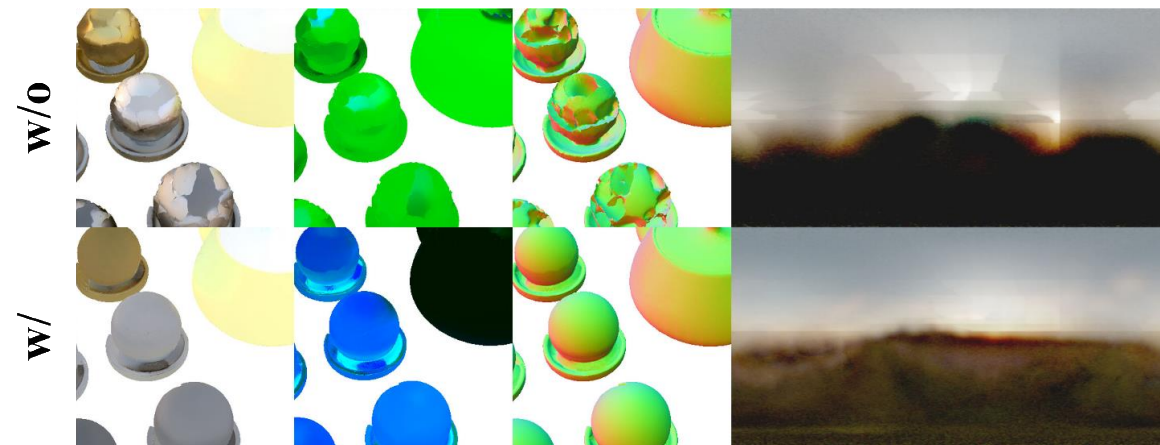
Ablation



GT

w/o initial geo

w/ initial geo



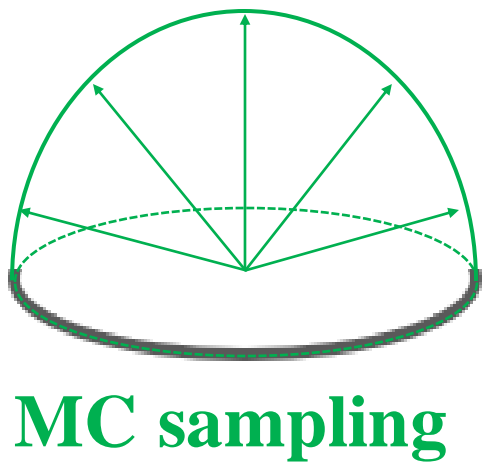
k_d

k_{orm}

Normal

Probe

Ablation



GT



Depth=1



Depth=2



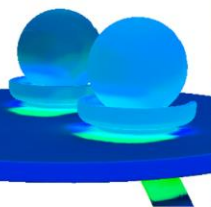
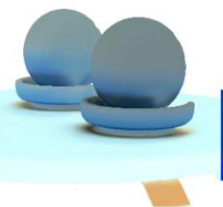
Depth=3



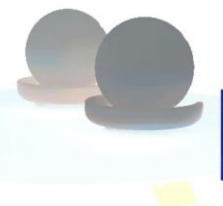
Toaster bread

Table materials

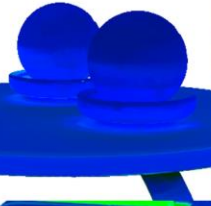
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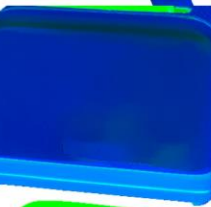
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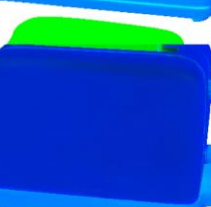
Depth=3



Depth=1



Depth=2



Depth=3



Detail

k_d

k_{orm}

Probe



Thank you!



SHANGHAI JIAO TONG
UNIVERSITY

Project Page: <https://zhutengjie.github.io/Ref-MC2/>
Official Code: <https://github.com/zhutengjie/Ref-MC2-Code>