

モノクロ画像を入力としたカラー化 NeRF の構築

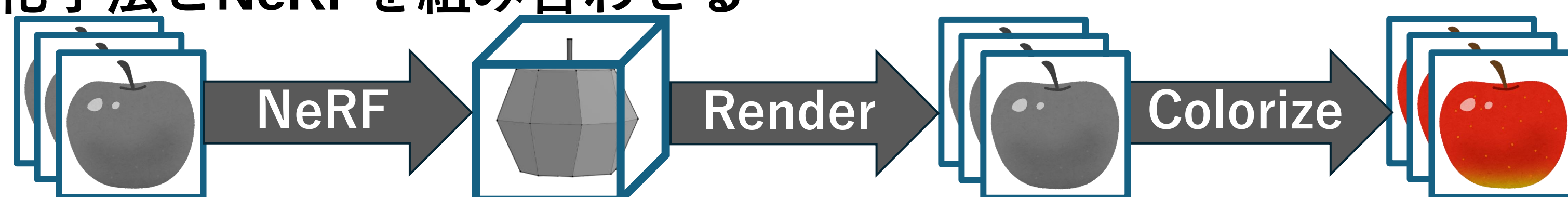
A construction of colorized NeRF with grayscale images

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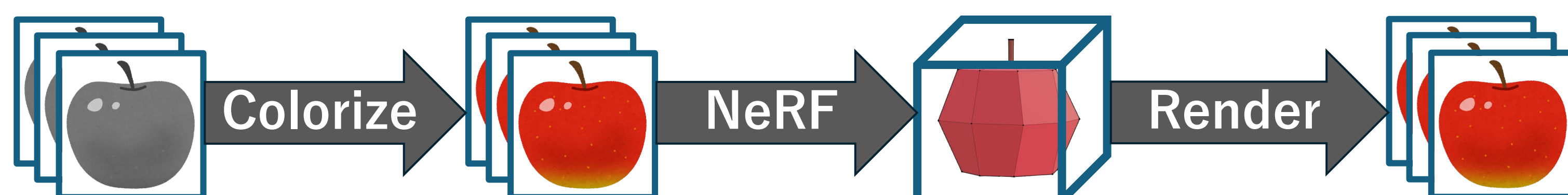
Background

- Novel view color image generation from grayscale images
モノクロ画像からの新規視点カラー画像生成
- Combine conventional image colorization method with NeRF
既存のカラー化手法とNeRFを組み合わせる

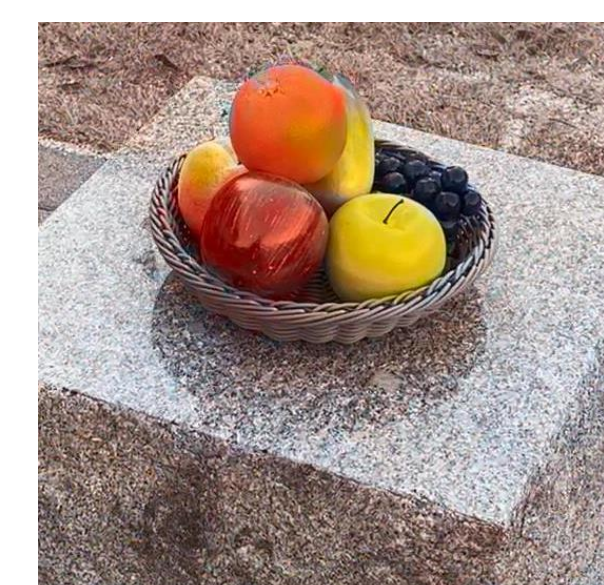
Baseline1



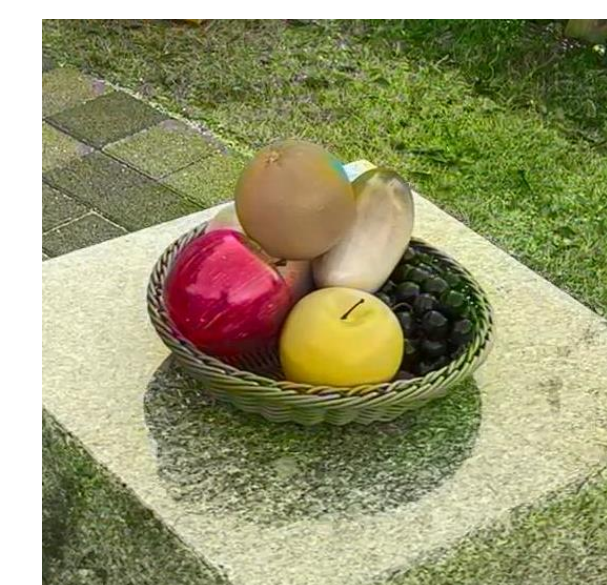
Baseline2



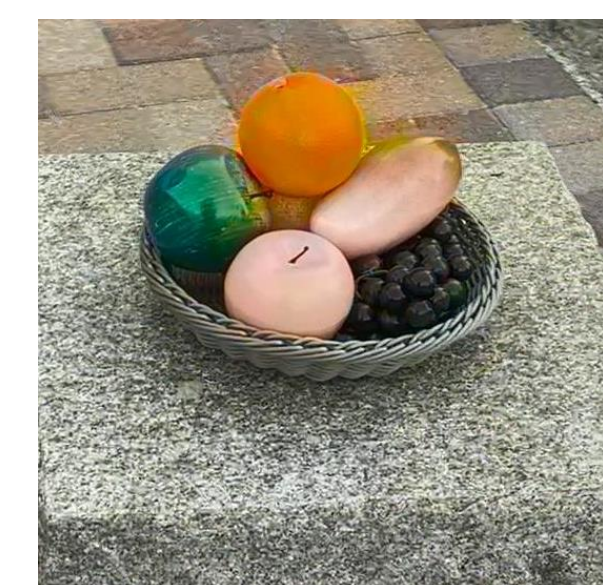
- Depending on the viewpoints, the colors of the same object can be estimated differently
同じ物体でも視点によって異なる色が推測されてしまう
- Minimize the color changes when the viewing direction is rotated
視線方向を回転させた際の色と回転させなかった際の色を近づける



View1



View2



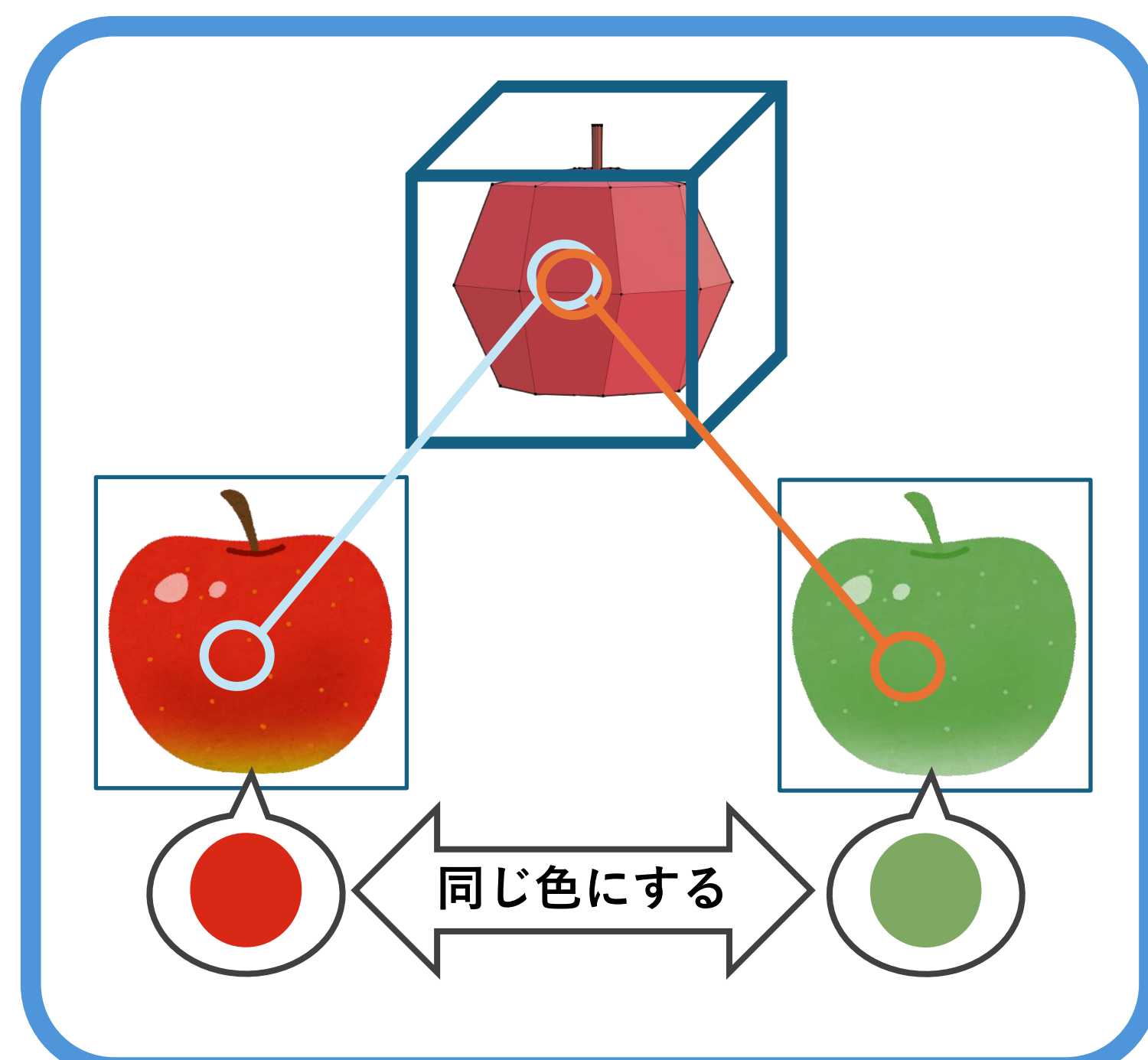
View3

Method



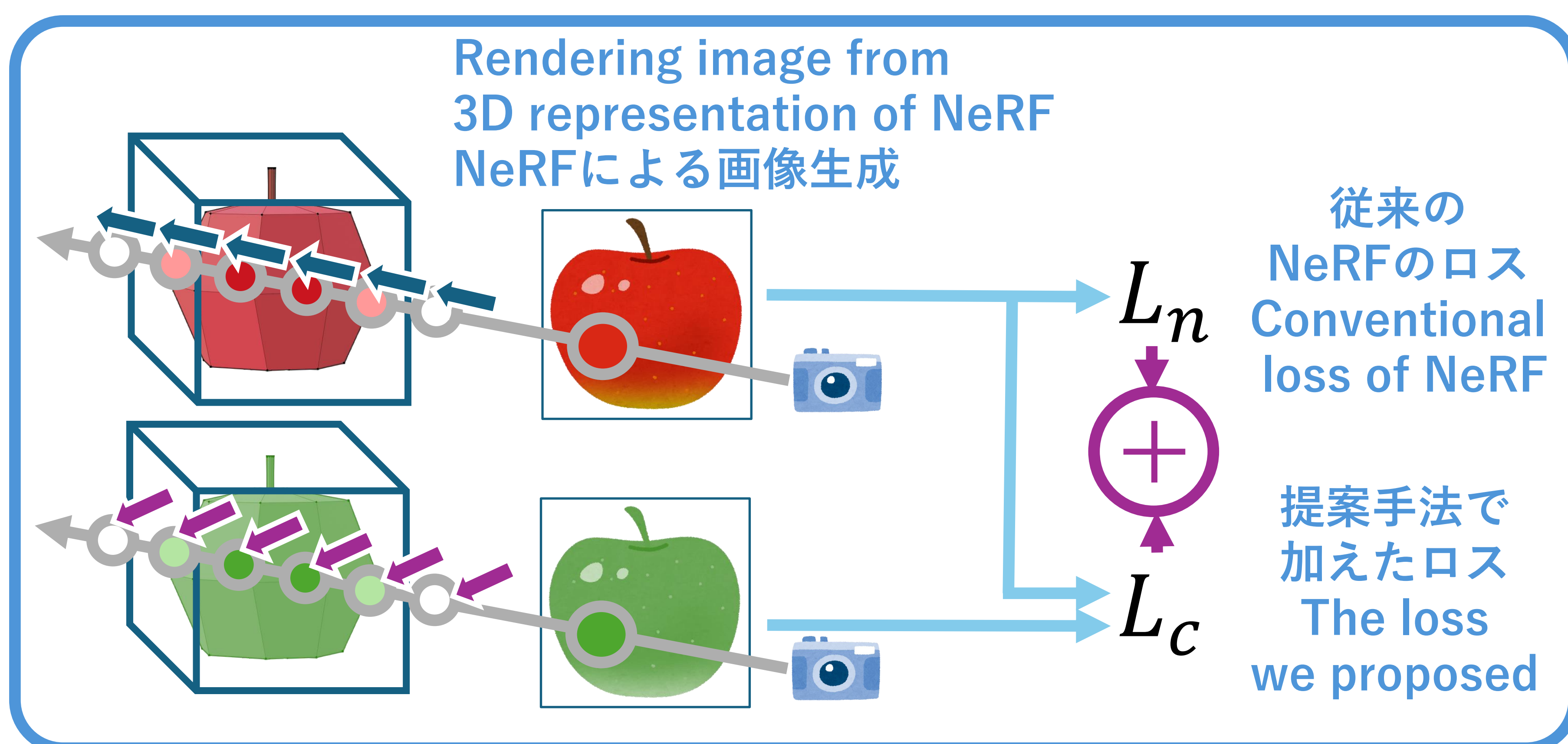
Train by conventional NeRF loss L_n and color difference L_c

従来のNeRFのロスである L_n と視線方向による色の差 L_c により学習する



このアイデアをNeRFの構造に合わせて近似的に実装

Implement this idea in a way that aligns with the structure of NeRF



Experiments

- Quantitive experiment
画素値の測定による実験
Render images, track points across frames, and analyze color of pixel
- Subjective experiment
被験者実験
Six participants rate the generated videos on "naturalness" and "color consistency/stability"

Quantitive experiment	Average difference of color	
Baseline1	355.7	
Baseline2	16.0	
Proposed	10.6	
Subjective experiment	Propotion of highest rating	
	naturalness	consistency
Baseline1	0.11	0.02
Baseline2	0.33	0.41
Proposed	0.56	0.57

Baseline1

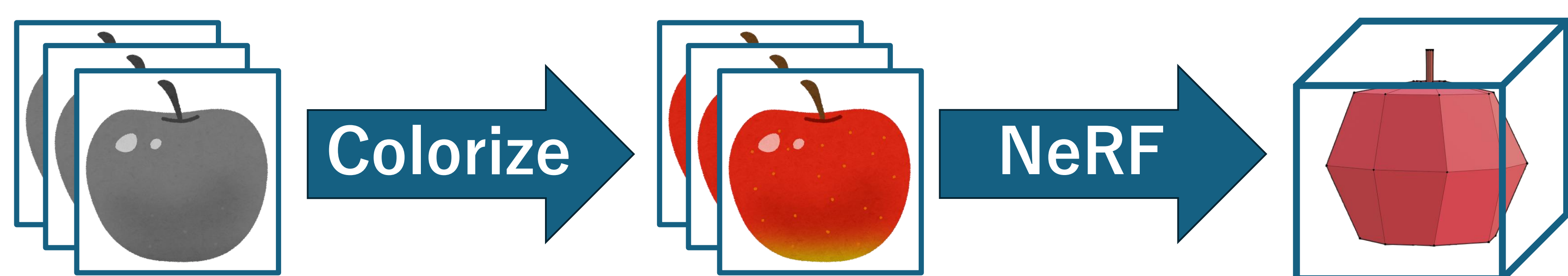


Baseline2



Proposed





Method

NeRF

