# Local-to-Global Registration for Bundle-Adjusting Neural Radiance Fields


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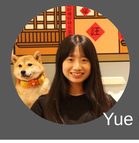
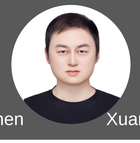
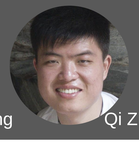

Yue Chen


Xingyu Chen


Xuan Wang


Qi Zhang


Yu Guo


Ying Shan


Fei Wang



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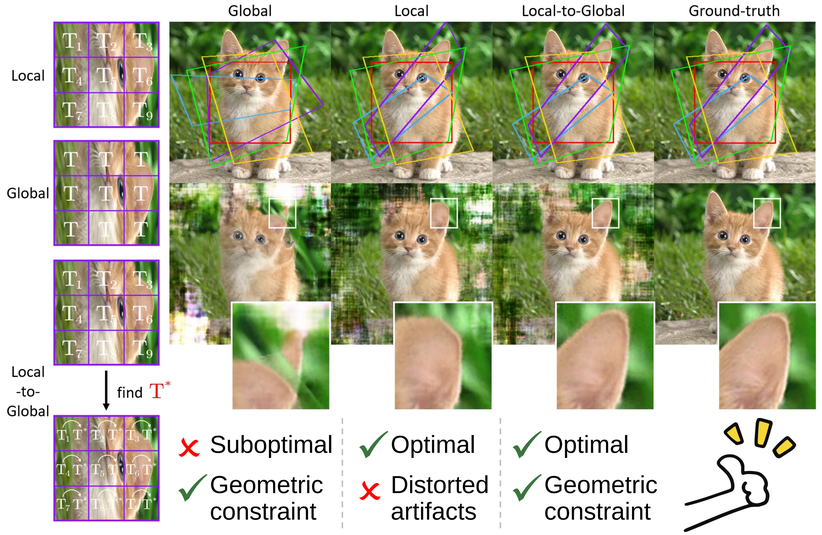
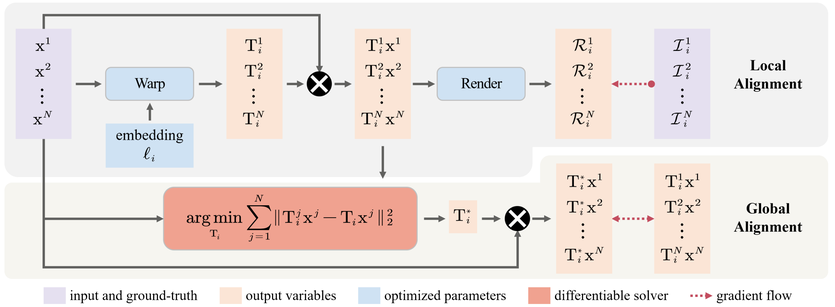
## Motivation




## Our Method

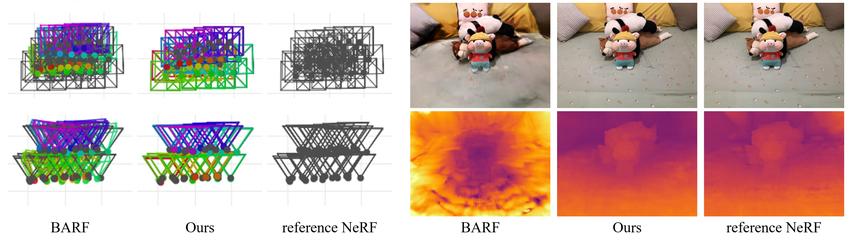



We propose a Local-to-Global registration method:

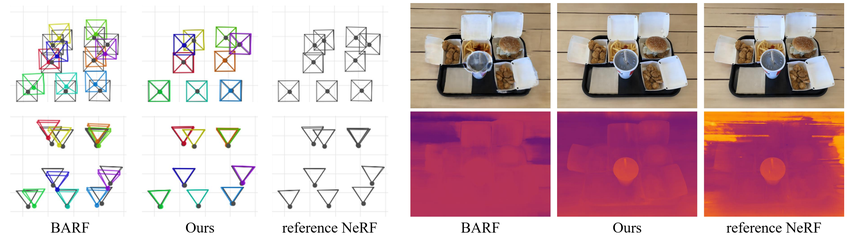
- **Local Alignment**: A warp neural field constructs pixel-wise transformations and transforms query coordinates into a global coordinate system. Then the color can be rendered to minimize photometric errors.
- **Global Alignment**: A differentiable parameter estimator produces frame-wise transformations condition on pixel-wise correspondences. The query coordinates are then transformed to apply a global geometric constraint.

## Bundle-Adjusting NeRF (3D): Real-World Scenes

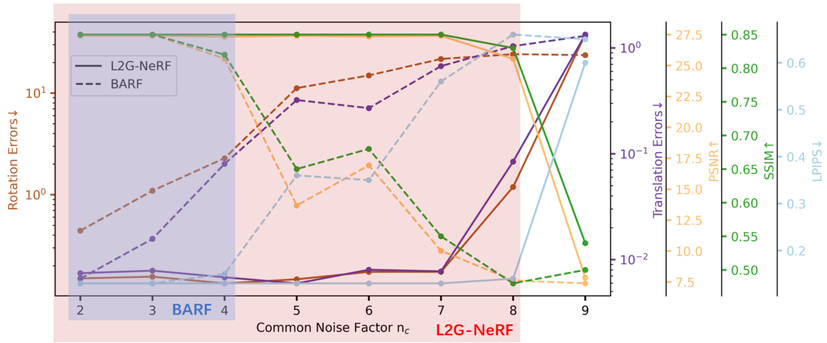
- Largest Displacements



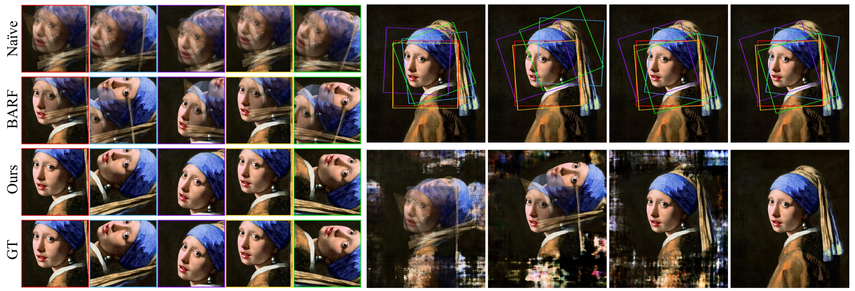

- Sparsest views



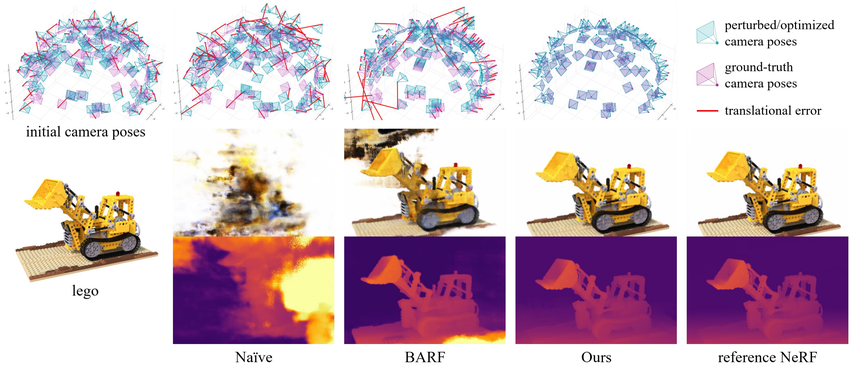

## Convergence




## Neural Image Alignment (2D)




## Bundle-Adjusting NeRF (3D): Synthetic Objects







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