

Motivation

3D Gaussian Splatting Deformation:

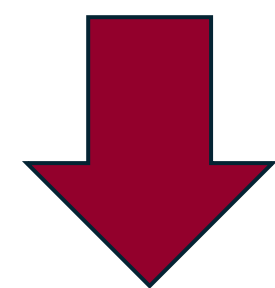
- Per-Gaussian offset? Unstructured → Noisy Geometry



(A) Directly optimizing 3D GS

(B) Ours

- Text-prompt Instruction? ✗ accurate ✗ Intuitive



- ✓ Intuitive: Sketch-guided
- ✓ High-fidelity: Cage-based
- ✓ Semantic aware: 3D-aware SDS

Method

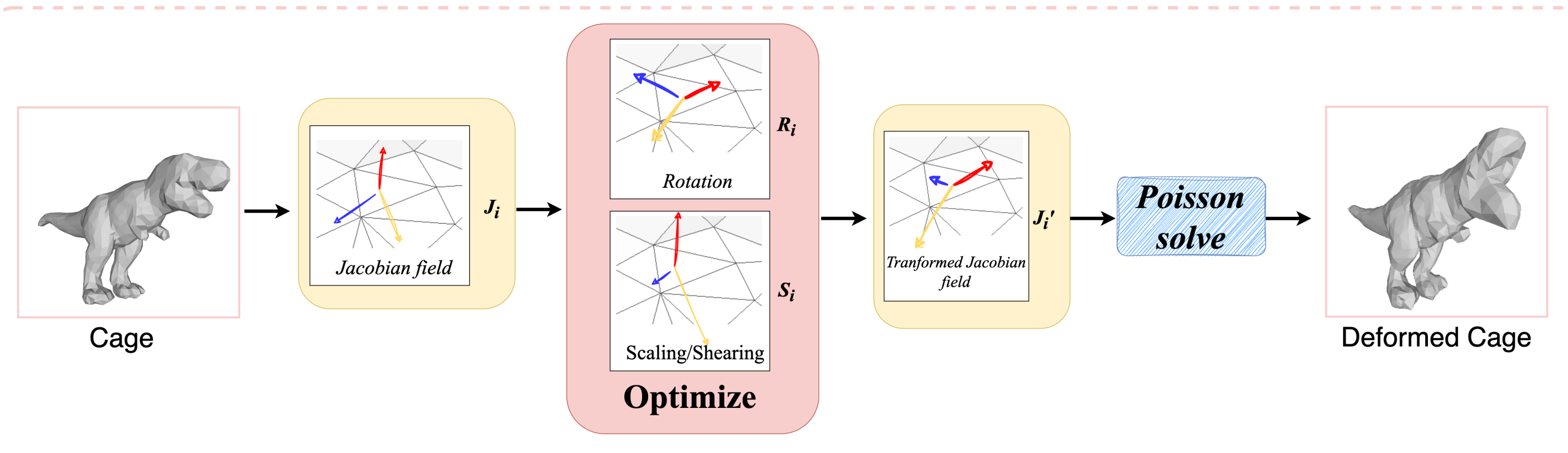
- Harmonic Cage Deformation:

$$f_{v,n}(p) = \sum_{v \in V} v \cdot \phi(p) + \sum_{n \in F} n \cdot \psi(p)$$

- Cage-based Deformation for Gaussians:

$$\mu' = f(\mu), \Sigma' = J_f R S S^T R^T J_f^T$$

- Controlling Cages via Neural Jacobian Fields:



- Sketch-guided 3D GS Deformer:

$$\mathcal{L}_{sil} = \|sil(I_D) - I_E\|^2$$

$$\mathcal{L}_{total} = \alpha \mathcal{L}_{sil} + \mathcal{L}_{SDS}$$

Experiments

