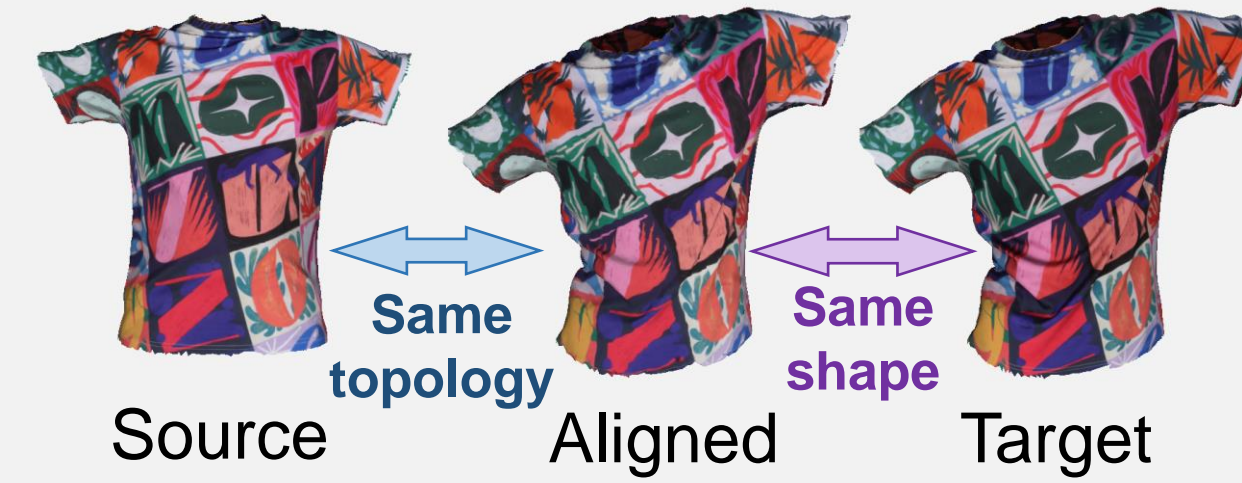


Introduction

Goal:

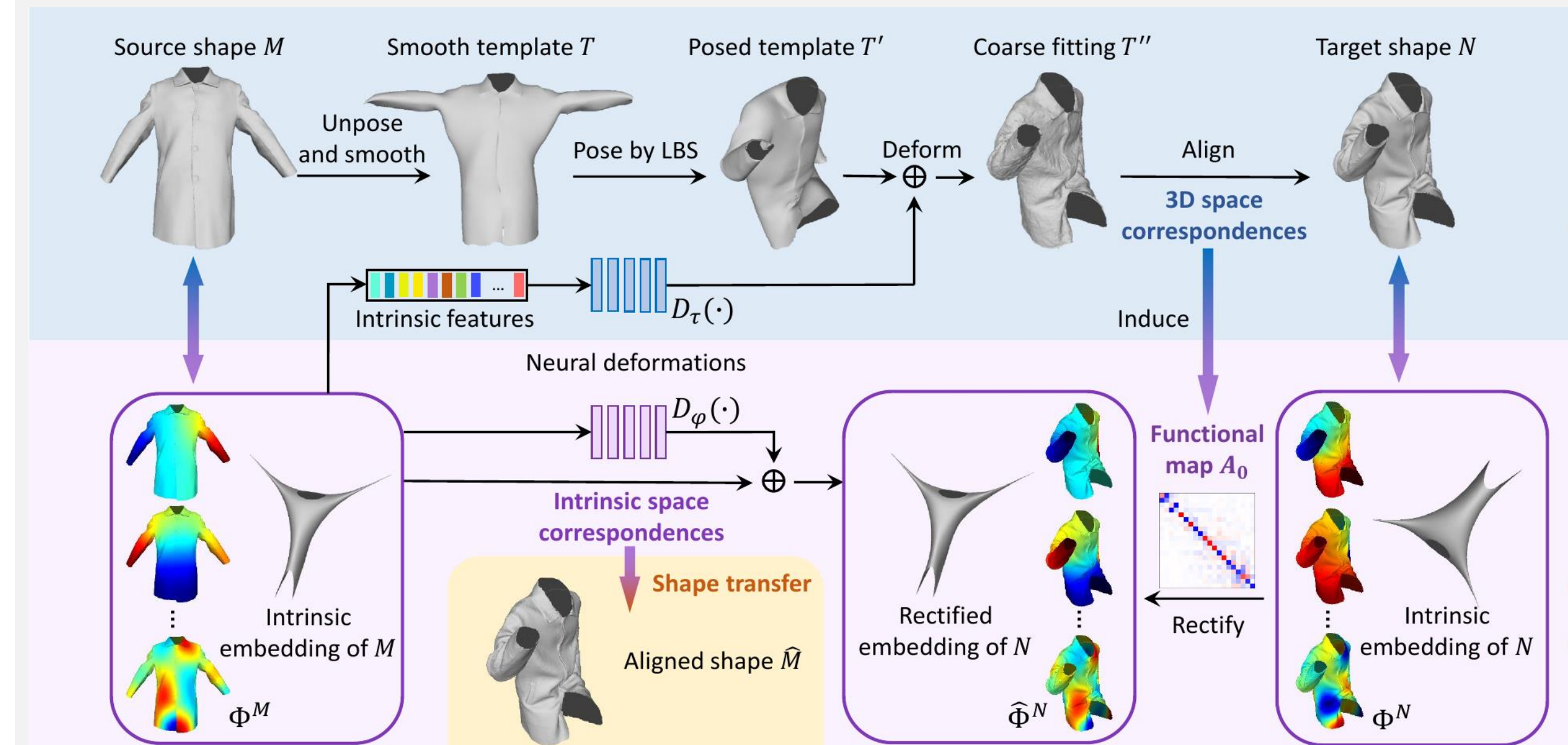
- align deformed versions of a garment
- at wrinkle-level and texture-level accuracy



Existing methods:

- Extrinsic: unavoidable tradeoff between rigidity and flexibility
- Intrinsic: needs isometric assumptions; intrinsic embeddings have ambiguity
...but for garment deformations, **non-rigid wrinkle details matter**

Method



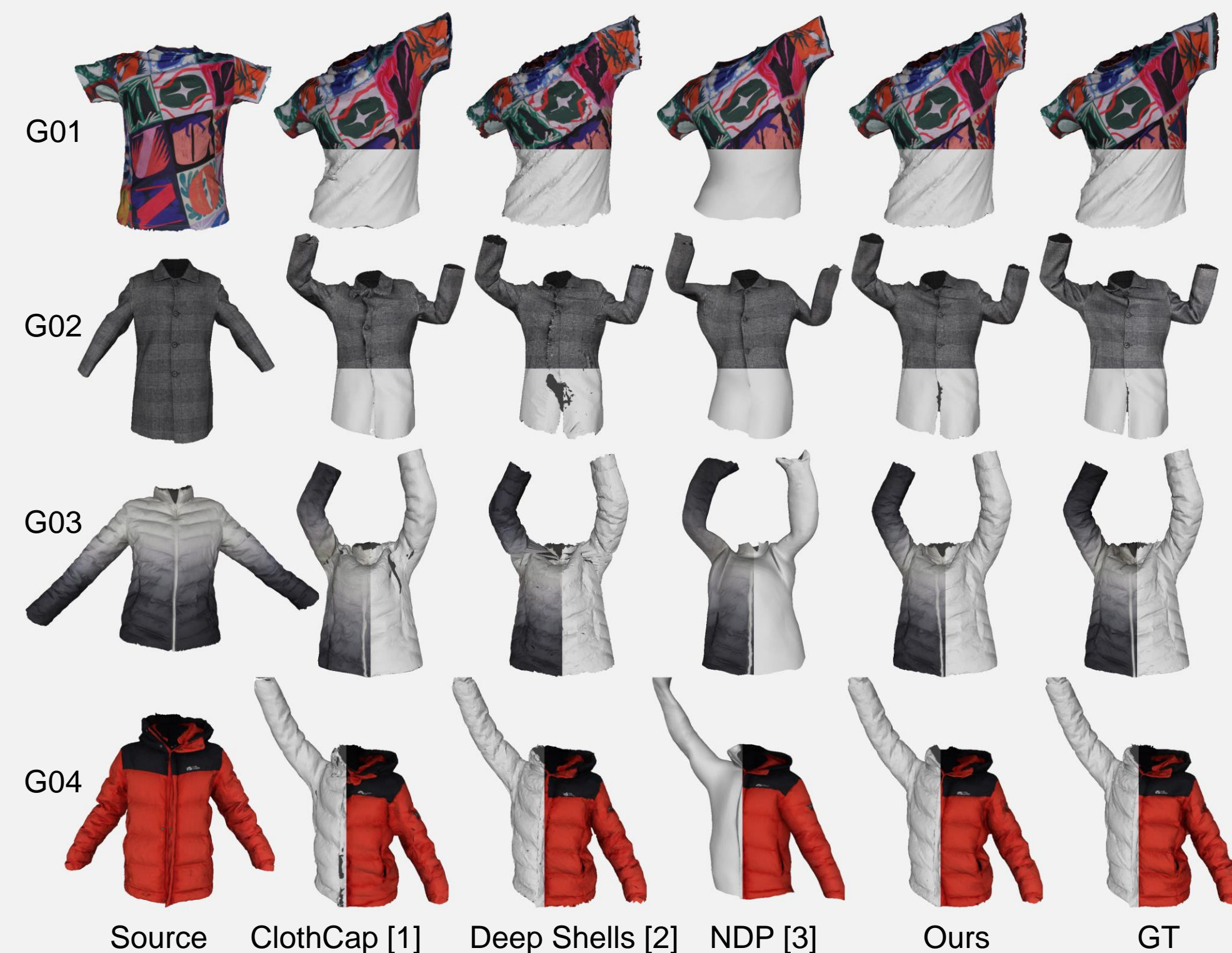
Motivation: intrinsic embeddings are "flat" and thus easier to align

Challenge: Intrinsic embeddings are ambiguous

Key ideas:

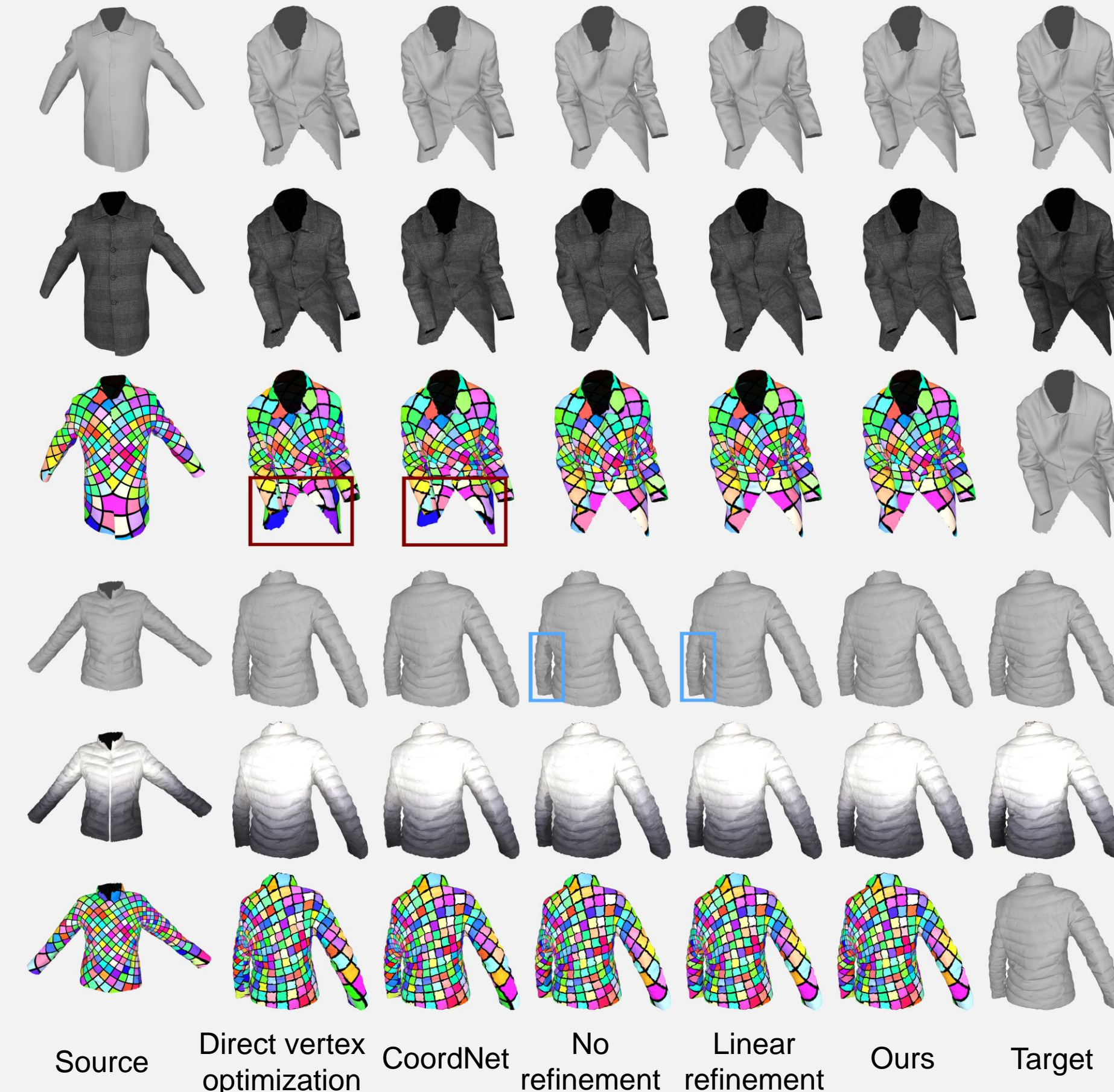
- Use **extrinsic fitting** to resolve intrinsic ambiguity
- Use **intrinsic neural fields** to model deformation
- Also use **neural fields** to align intrinsic embeddings
- Use **intrinsic correspondences** for final alignment

Comparisons



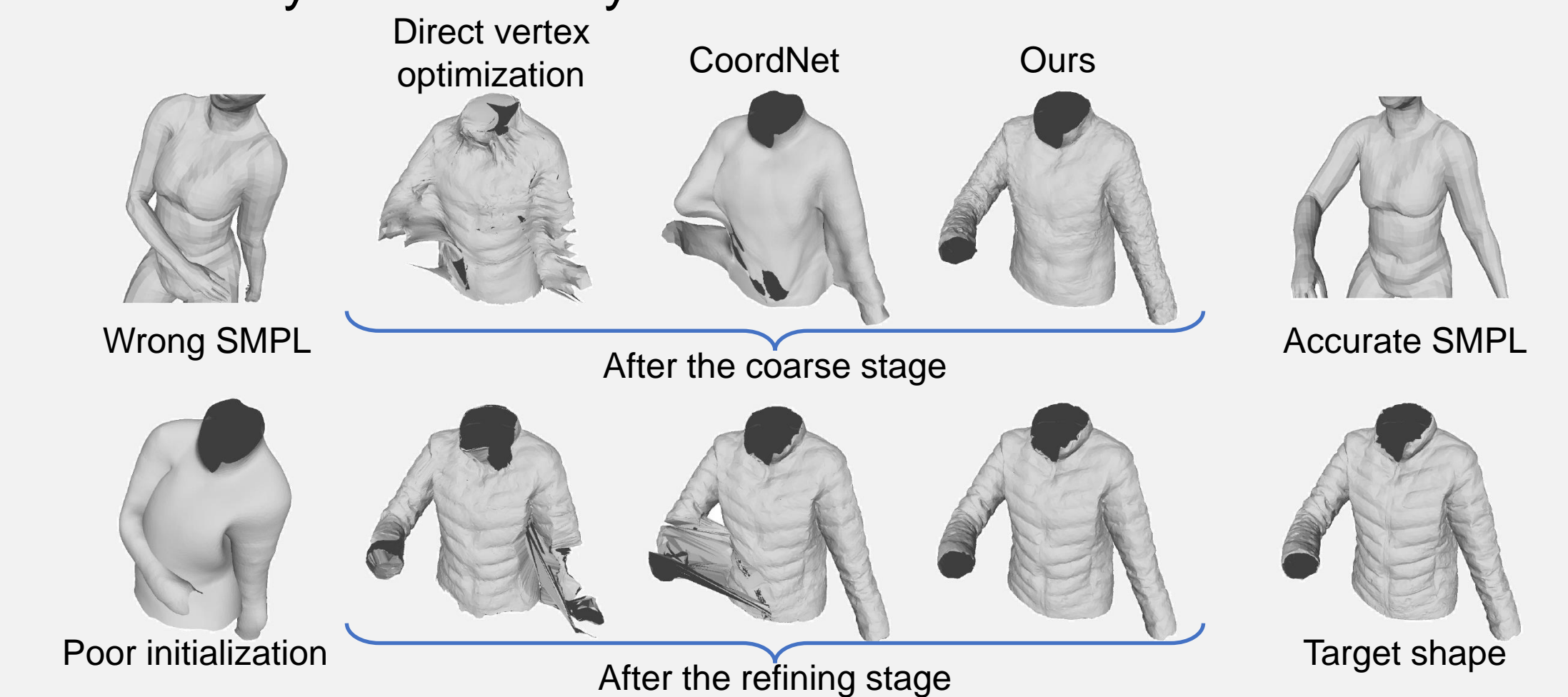
[1] Pons-Moll et al. ClothCap: Seamless 4D clothing capture and retargeting. TOG 2017.
[2] Eisenberger et al. Deep Shells: Unsupervised shape correspondence with optimal transport. NeurIPS 2020.
[3] Li et al. Non-rigid point cloud registration with neural deformation pyramid. NeurIPS 2022.

Ablation Studies



Robustness to Poor Initialization

Benefiting from the intrinsic deformation network, the method can deal with poor initializations, e.g., self-intersections caused by inaccurately estimated SMPL



Code & Data

- 4 garments
- 496 scans
- With SMPL

