



Latent Partition Implicit with Surface Codes for 3D Representation

Chao Chen¹, Yu-Shen Liu¹, Zhizhong Han²

¹School of Software, Tsinghua University, Beijing, China ²Department of Computer Science, Wayne State University, USA



Introduction

Background

*Implicit functions have been a popular representation for 3D objects or scenes. One drawback is that it is hard for them to represent a 3D shape as multiple parts.

*Current solutions learn various primitives and blend the primitives directly in the spatial space.

Issues

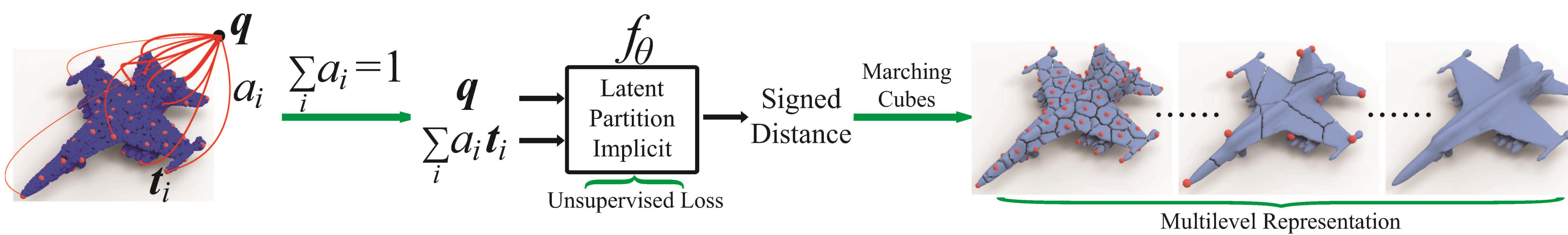
*However, These solutions are still struggle to approximate the 3D shape accurately.

Motivation

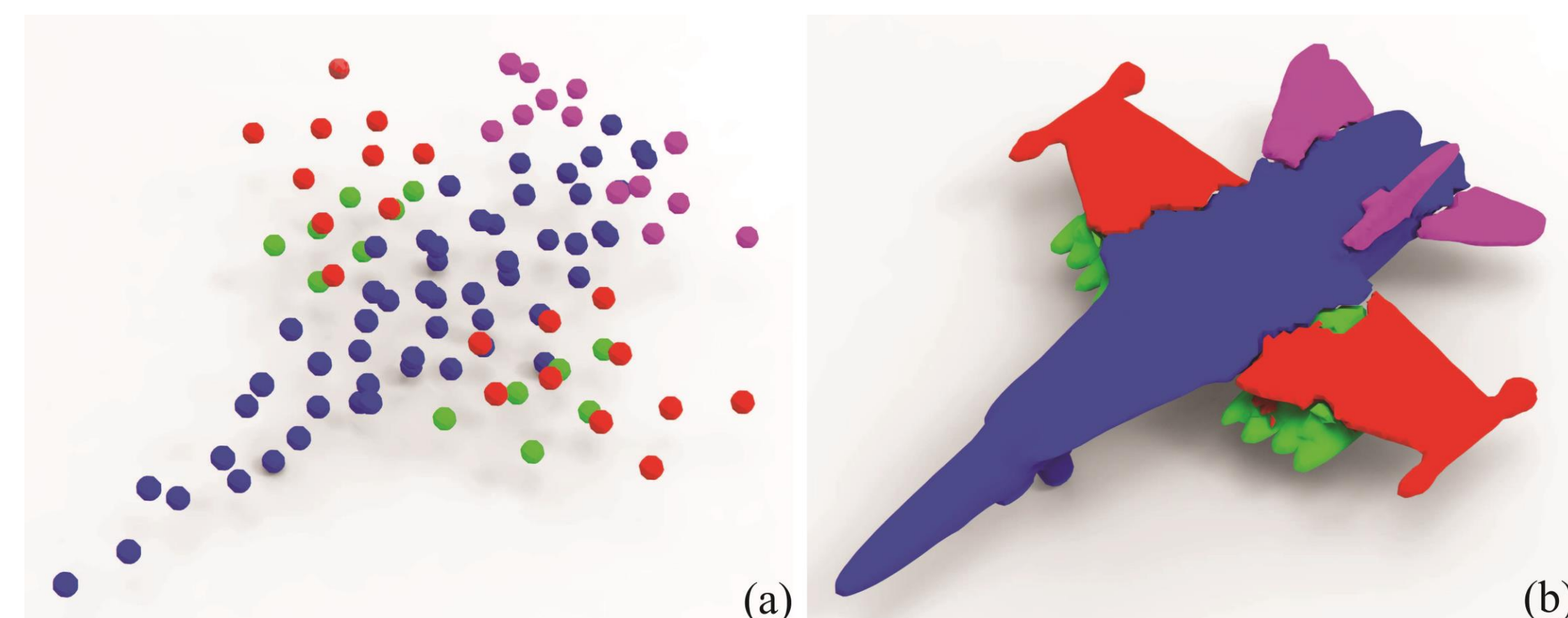
*To resolve this problem, we introduce a novel implicit representation to represent a single 3D shape as a set of parts in the latent space, towards both highly accurate and plausibly interpretable shape modeling.

Method

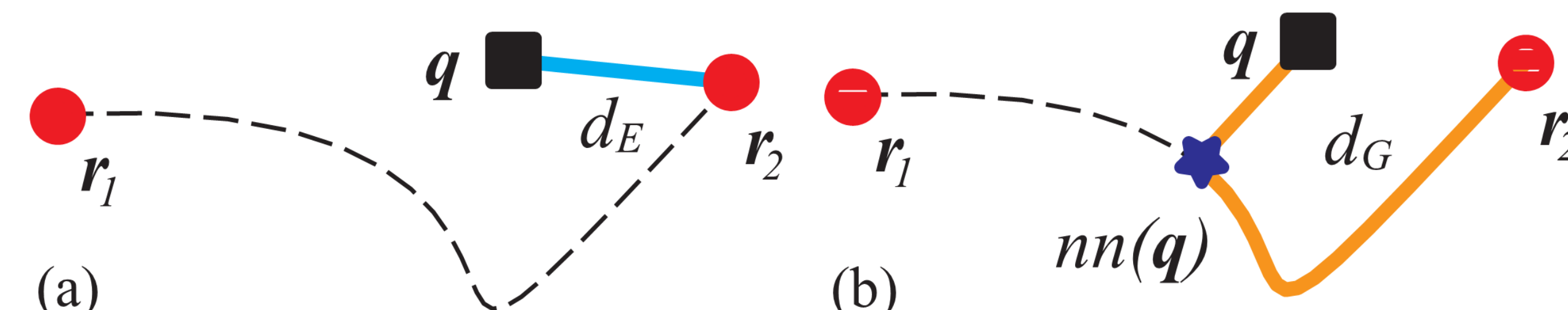
Demonstration of LPI



Semantic parts reconstruction

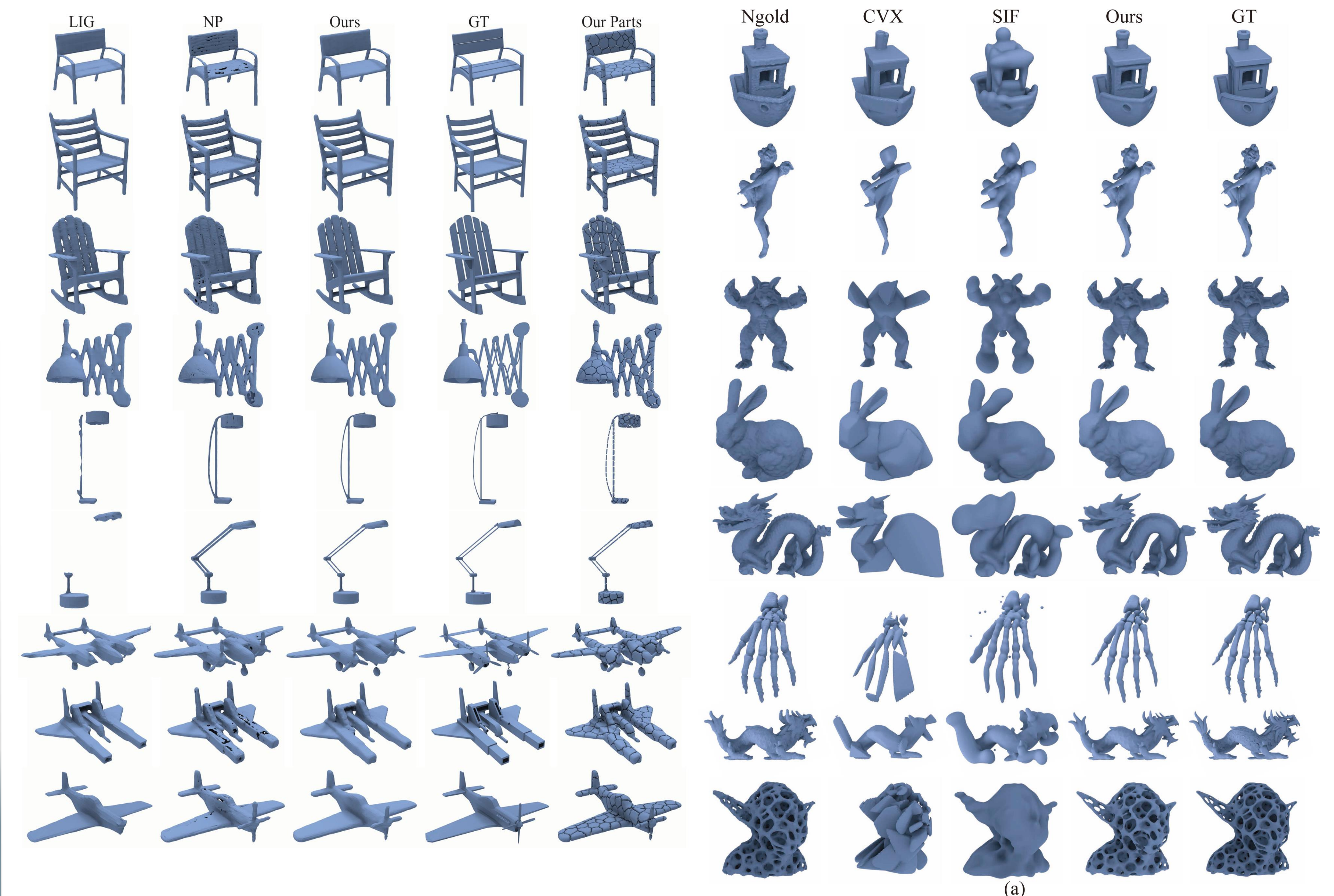


Euclidean distance & Intrinsic distance

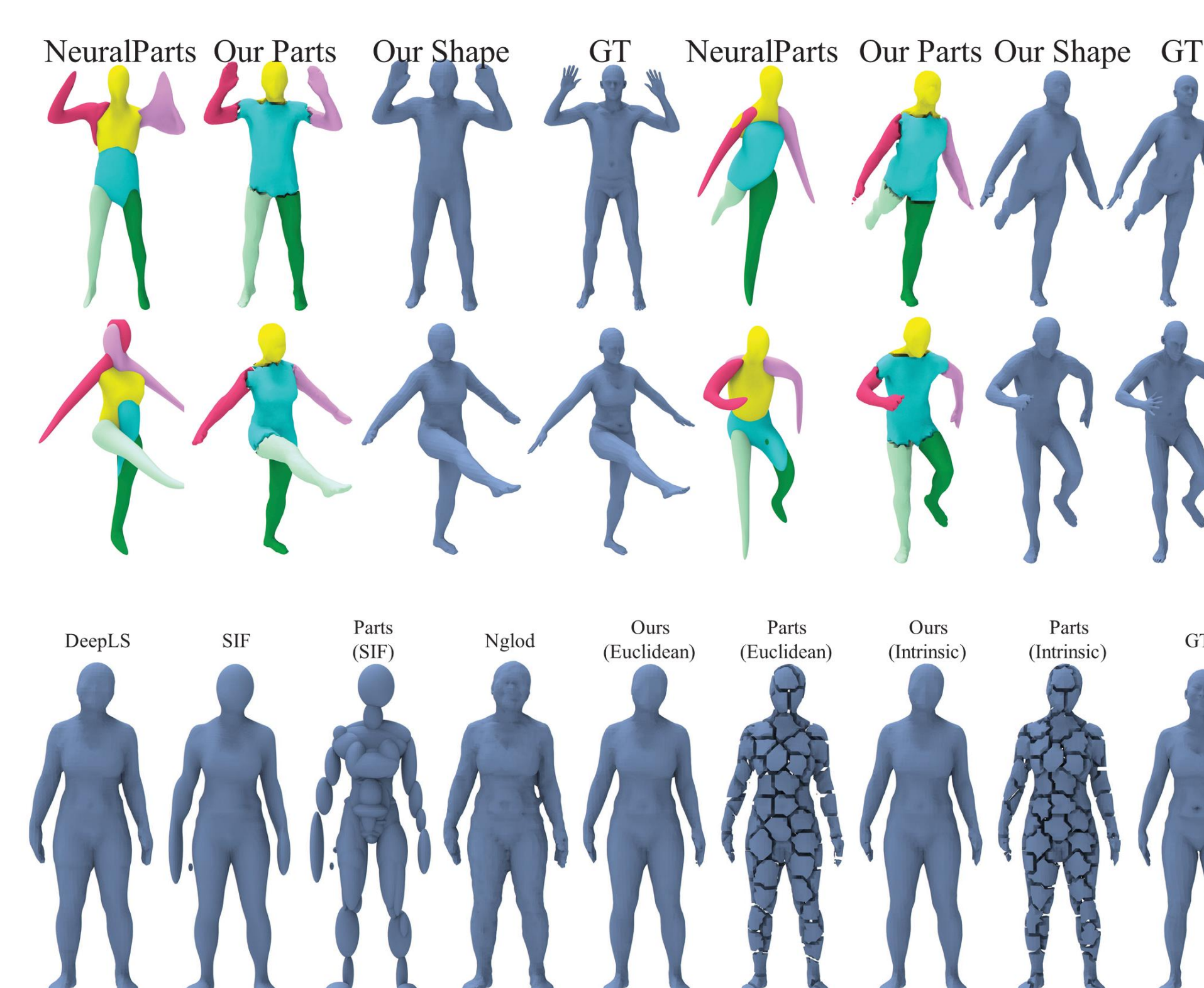


Results

Visual comparison under ShapeNet Visual comparison under FAMOUS



Visual comparison under D-FAUST



Shape abstraction with instance segmentation

