

GarmentLab

Haoran Lu



01

Introduction

Challenges for Garment Manipulation



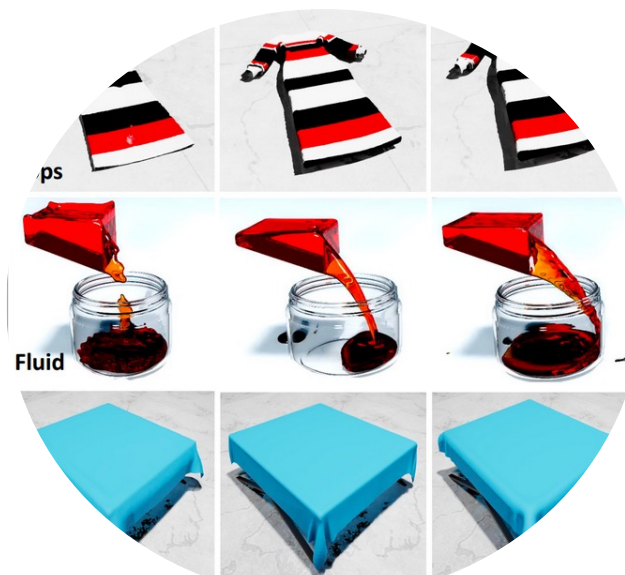
Deformations

Self-Deformation Complex Structure

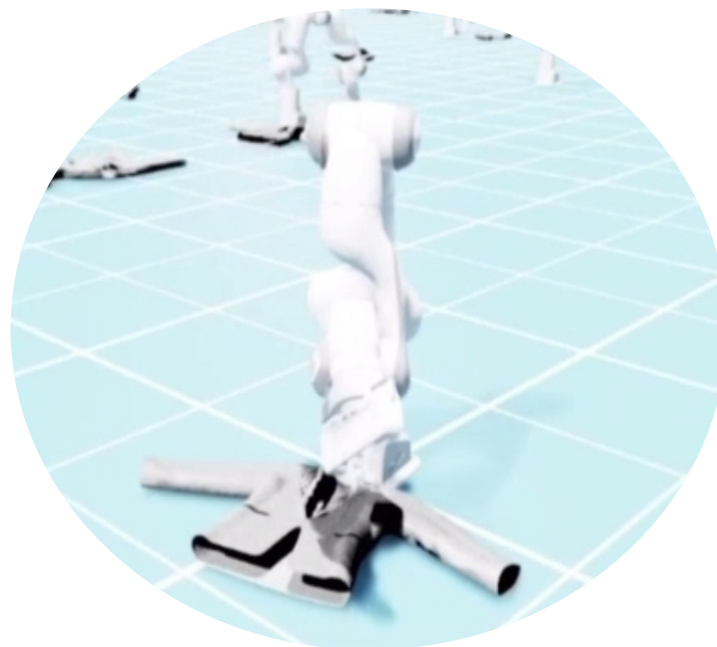
Interaction with different object

Large Sim2Real Gap

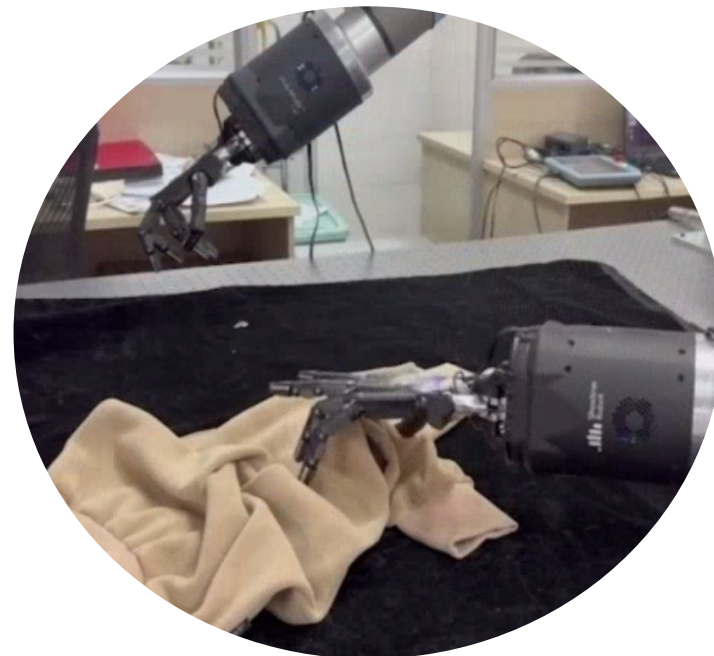
Characteristic



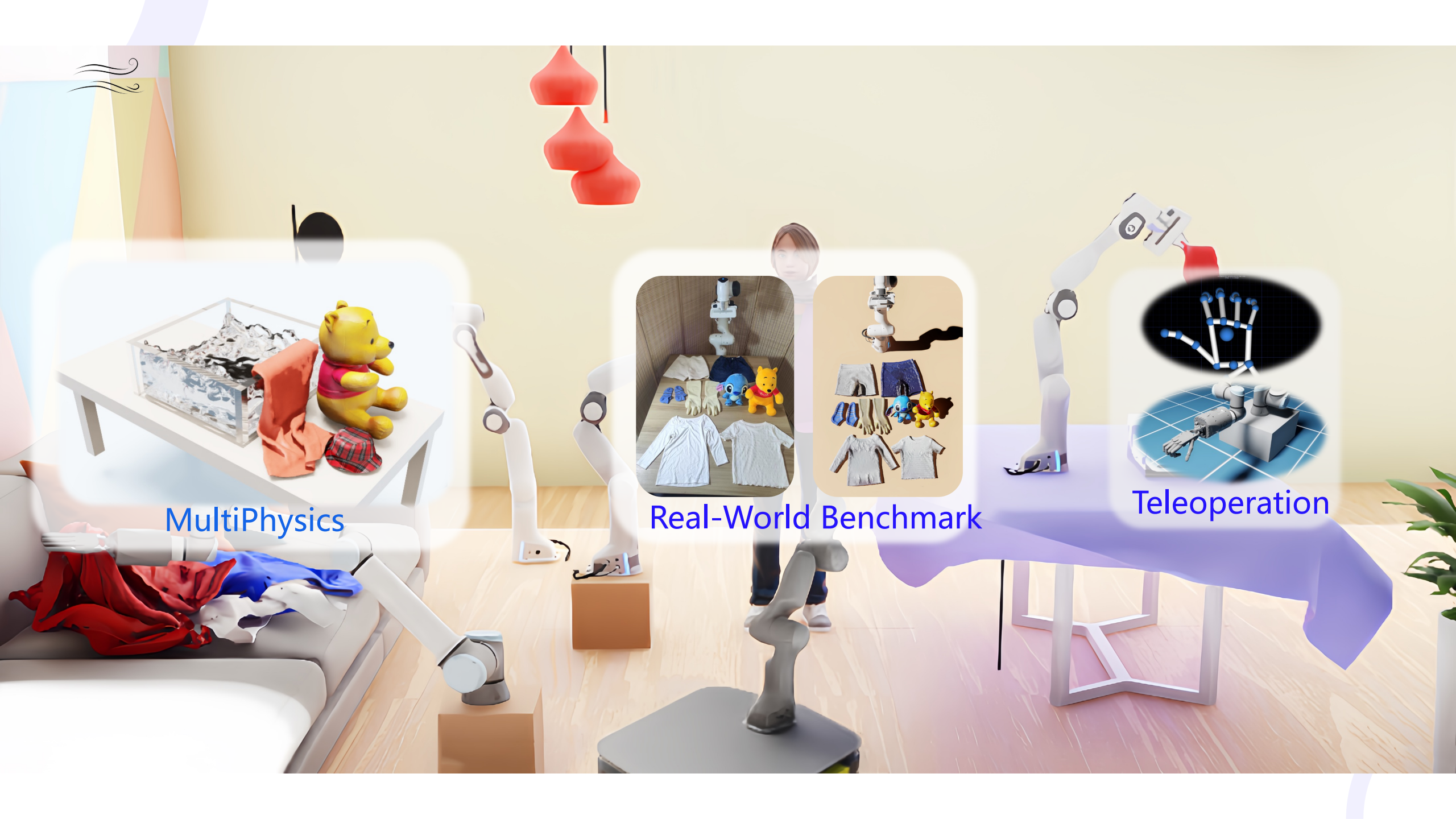
Rich



Efficient



Real



MultiPhysics

Real-World Benchmark

Teleoperation

GarmentLab Assets

Table 2: Key Components of GarmentLab Assets.

Asset Type	Sources	Categories
Garment and Cloth	ClothesNet	Hats, Ties, Masks, Gloves, Socks, Dishcloths, ...
Rigid and Articulated	ShapeNet, PartNet, YCB, PartNet-Mobility	Chairs, Boxes, Washing Machines, Storage Furniture, ...
Robot	-	Franka, UR5, RidgebackFranka, ShadowHands
Human Model	Omniverse HumanModel	-
Materials	Omniverse Base Material	Fabric, Carpet, Leather, Silk, Cotton, ...



02

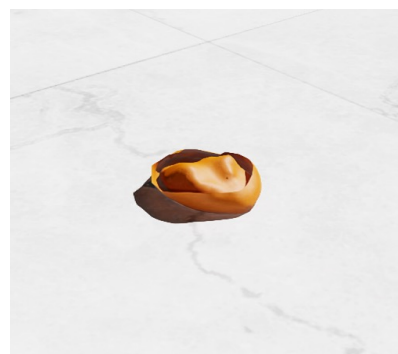
Physics



Tops



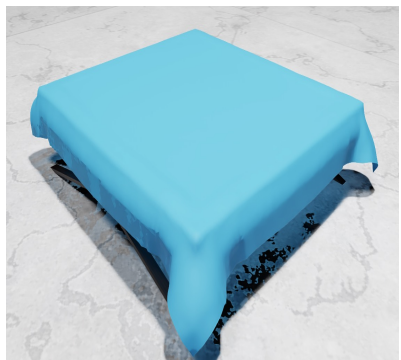
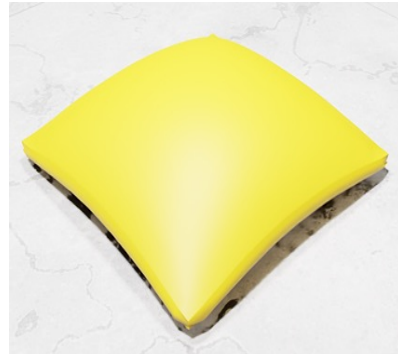
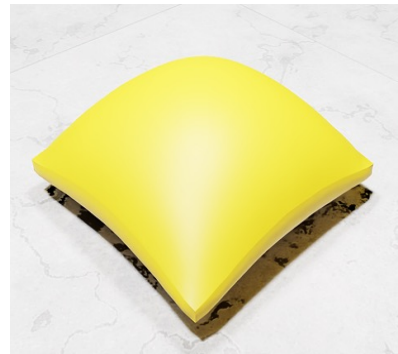
Hat



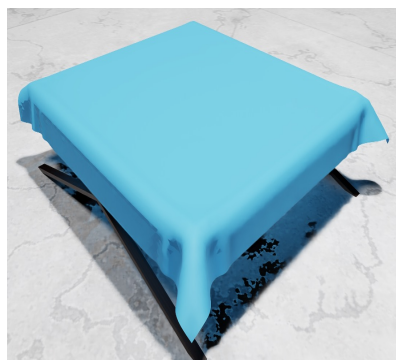
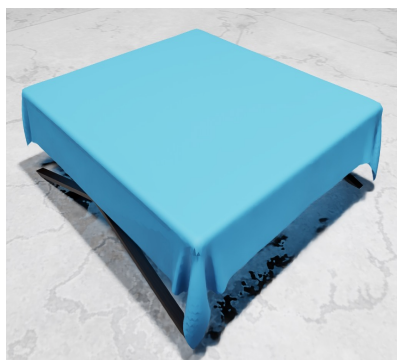
Fluid



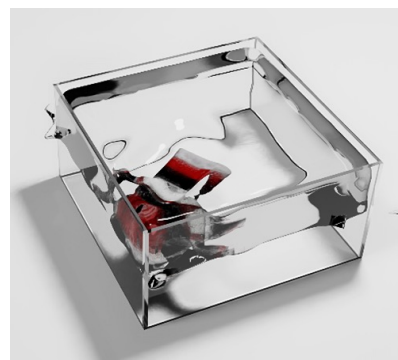
Pillow

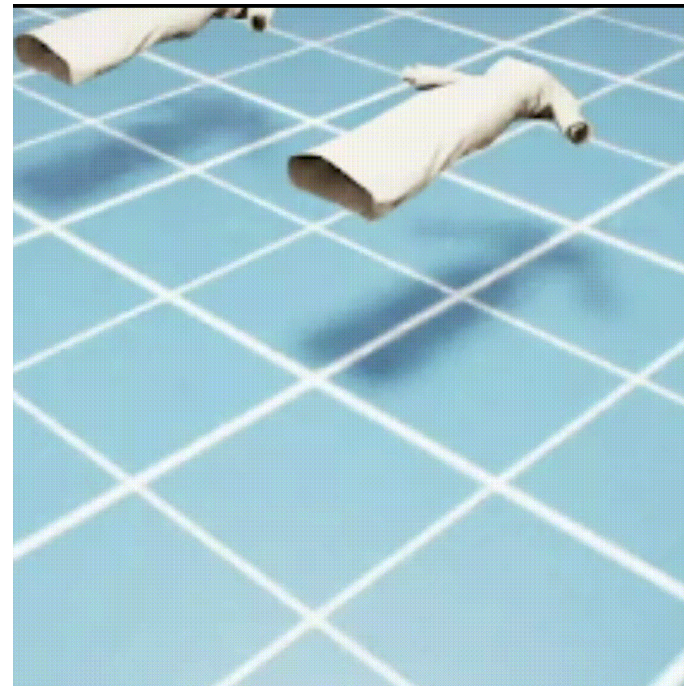
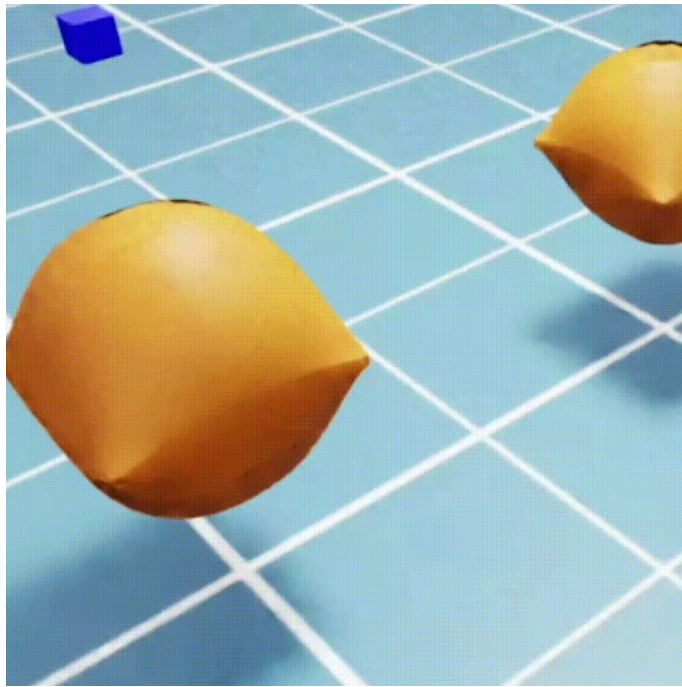
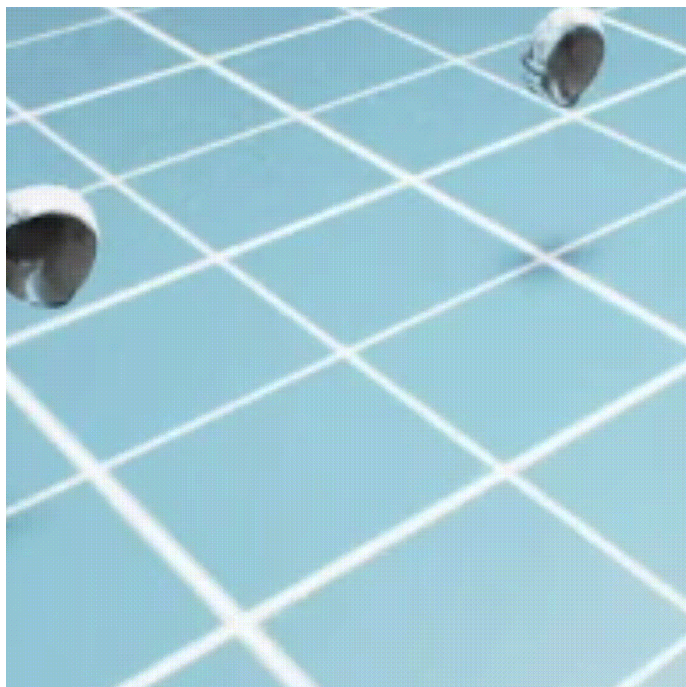


Garment-Rigid



Fluid-Garment







03

Tasks

UniGarment Task



Fold

Garment-Garment



Wash

Garment-Fluid



Store Cloth

Garment-Rigid



ClothPacking

Garment-Deform



Dress up

Garment-Avatar

Task Demo

Simple Task

Long-horizon Task





04

Sim2Real



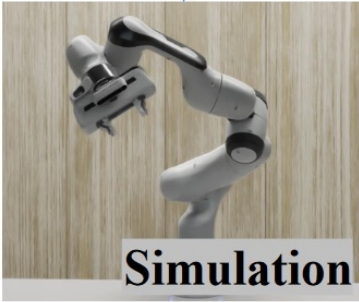
ROS

Trajectory Recording



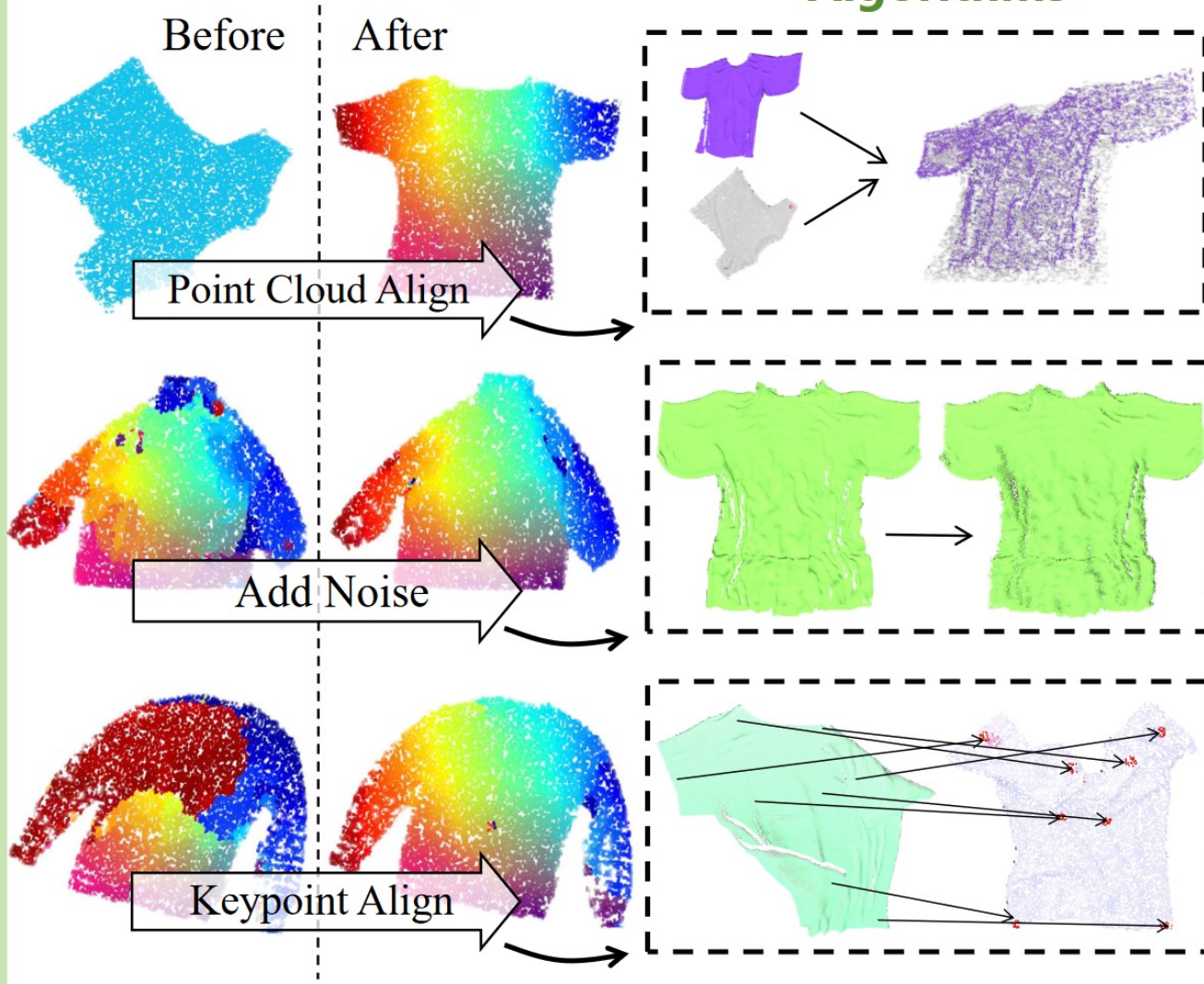
offline data

synchronize



Real-World Correspondence

Algorithms

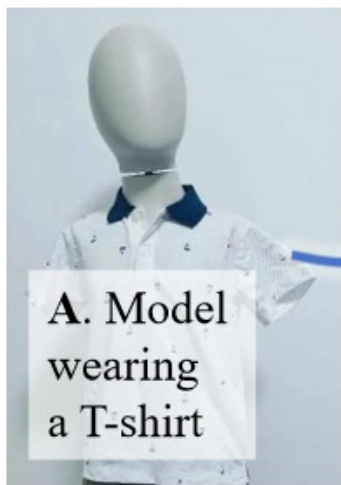




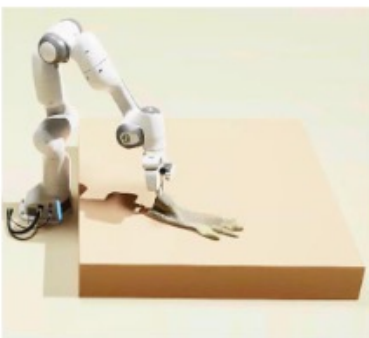
05

**RealWorld
Benchmark**

a. Scan Pipeline



b. Real-World Benchmark



Thanks

Q&A