

DUALAFFORD: LEARNING COLLABORATIVE VISUAL AFFORDANCE FOR DUAL-GRIPPER MANIPULATION



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ICLR

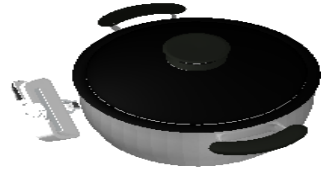
2023

Tencent

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Manipulating 3D Objects by Single Gripper

For objects:



too heavy to push

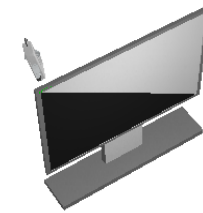


hard to pick up it steadily

For specific tasks:



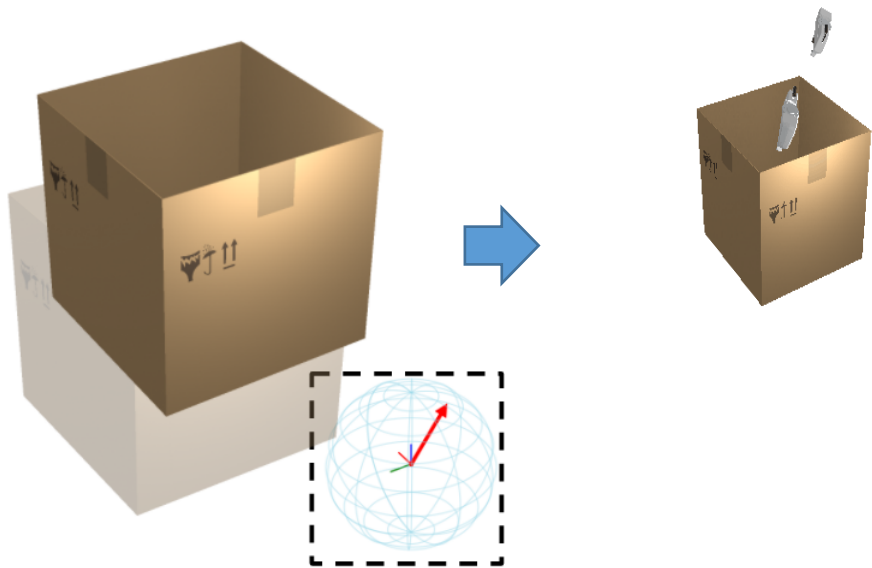
hard to push the box in the
direction indicating by the red
arrow



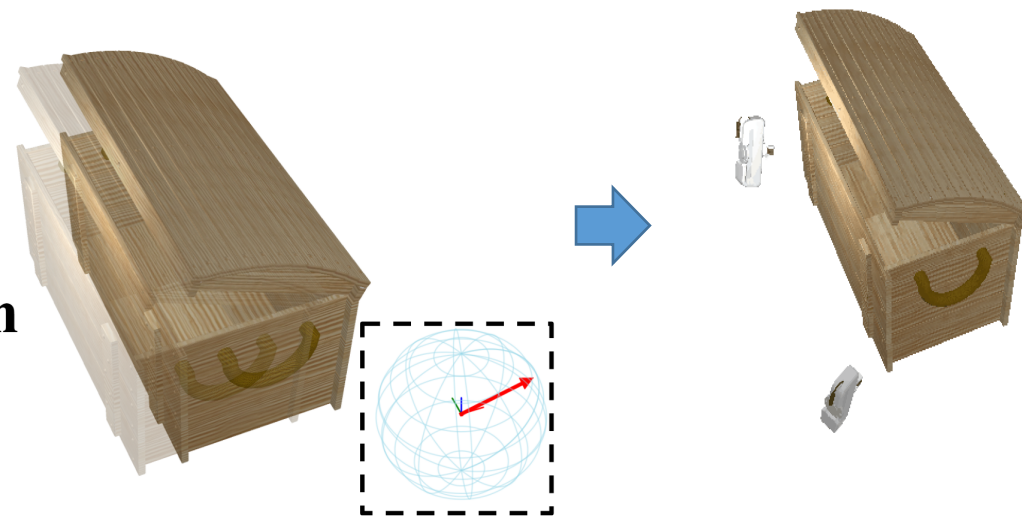
hard to control the
rotation angle

Manipulating 3D Objects Collaboratively

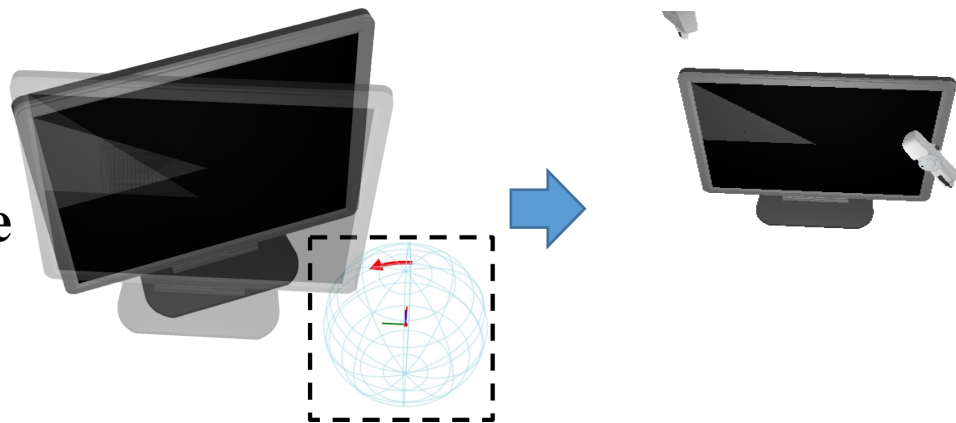
Pick-up



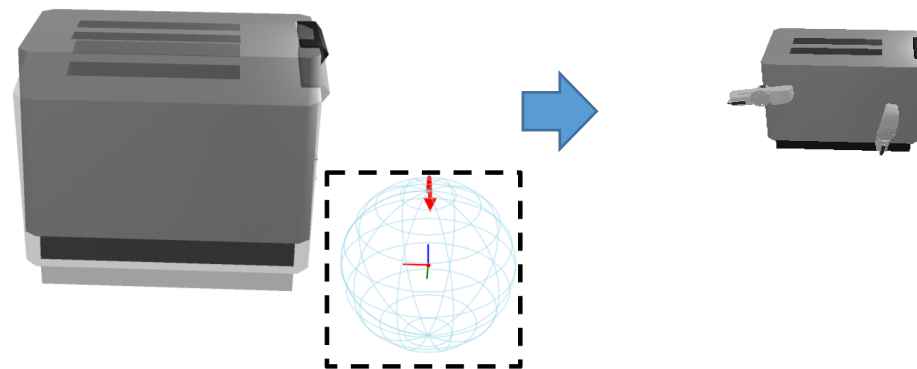
Push



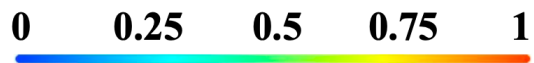
Rotate



Topple

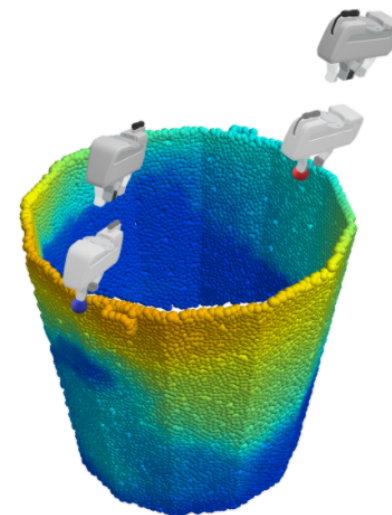
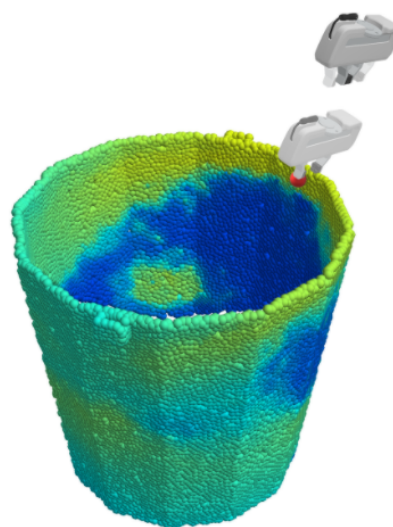


Perceiving and Manipulating 3D Objects

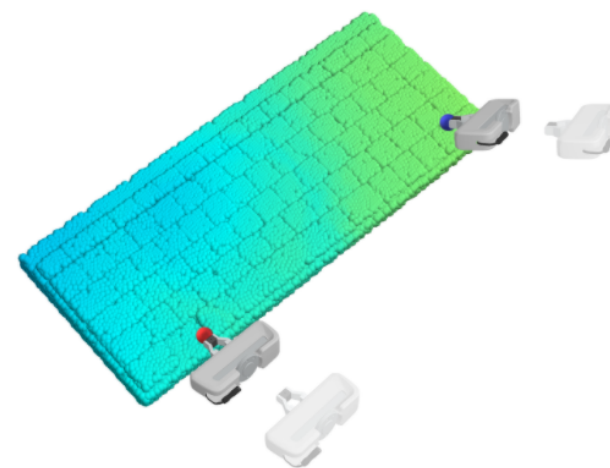
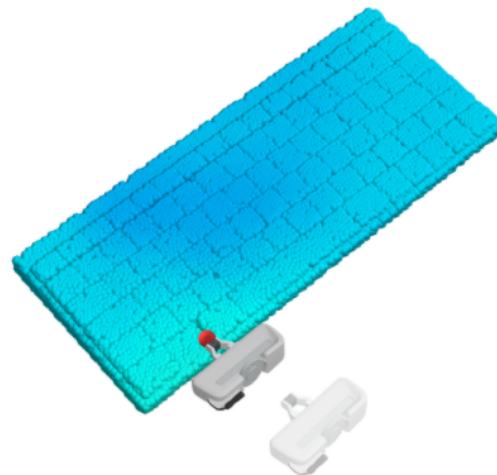
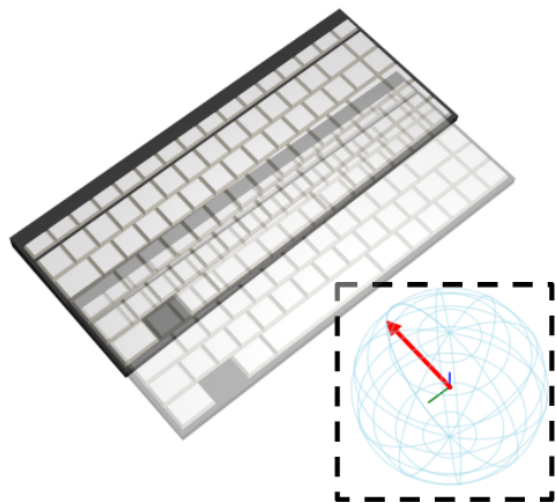


Affordance \rightarrow Contact point \rightarrow Gripper Orientation

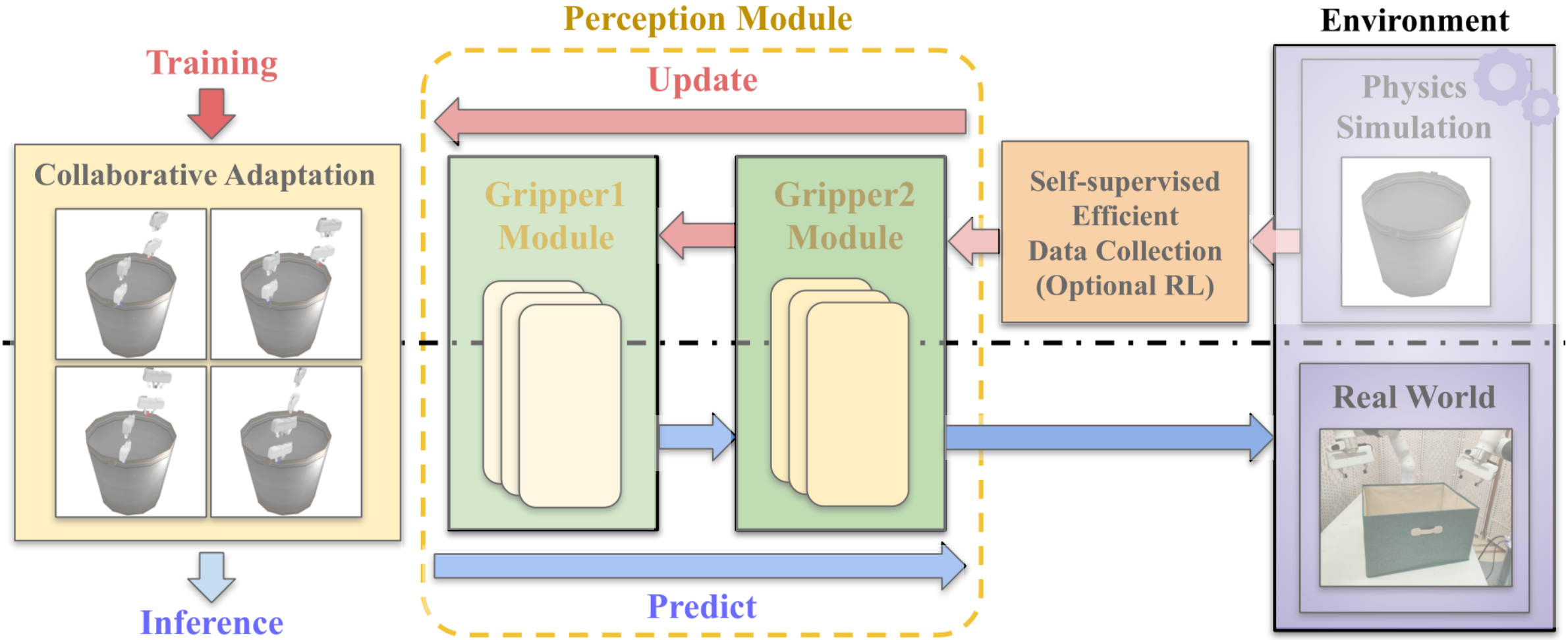
Pick-up



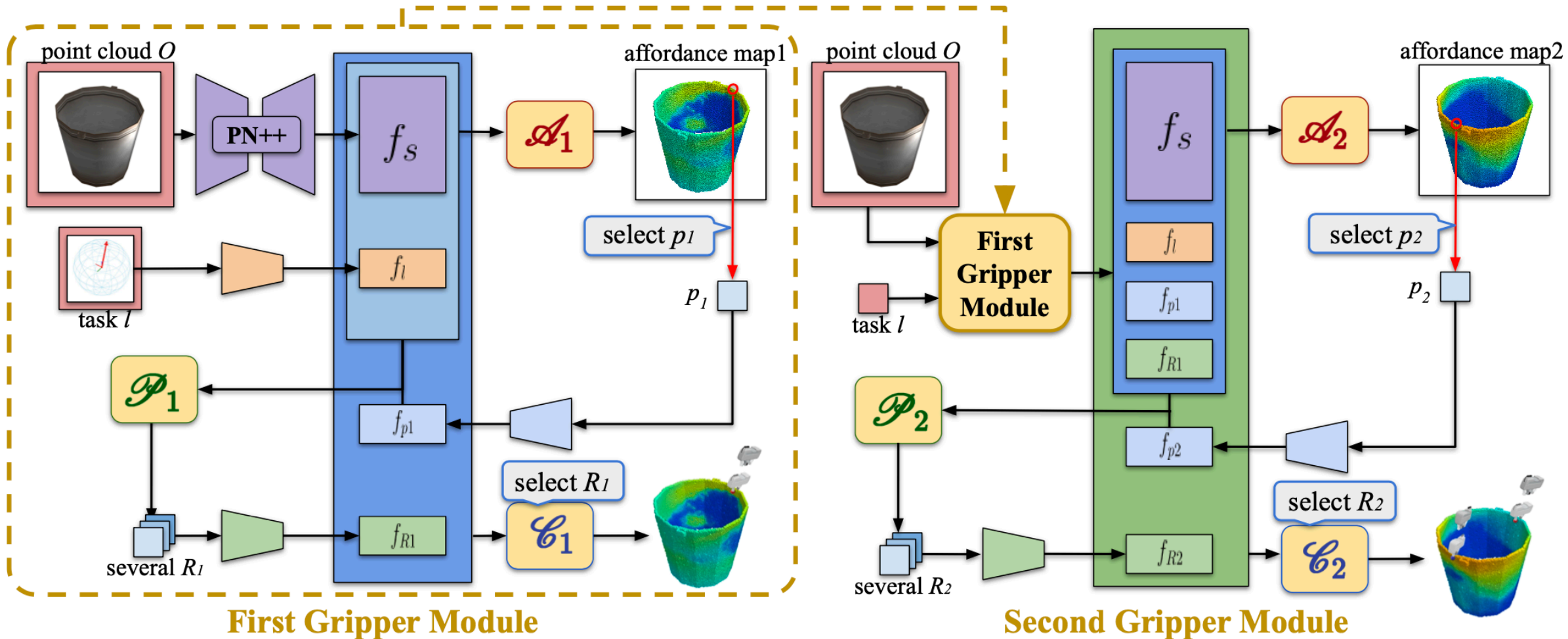
Push



DualAfford: An Interaction-for-Perception Framework

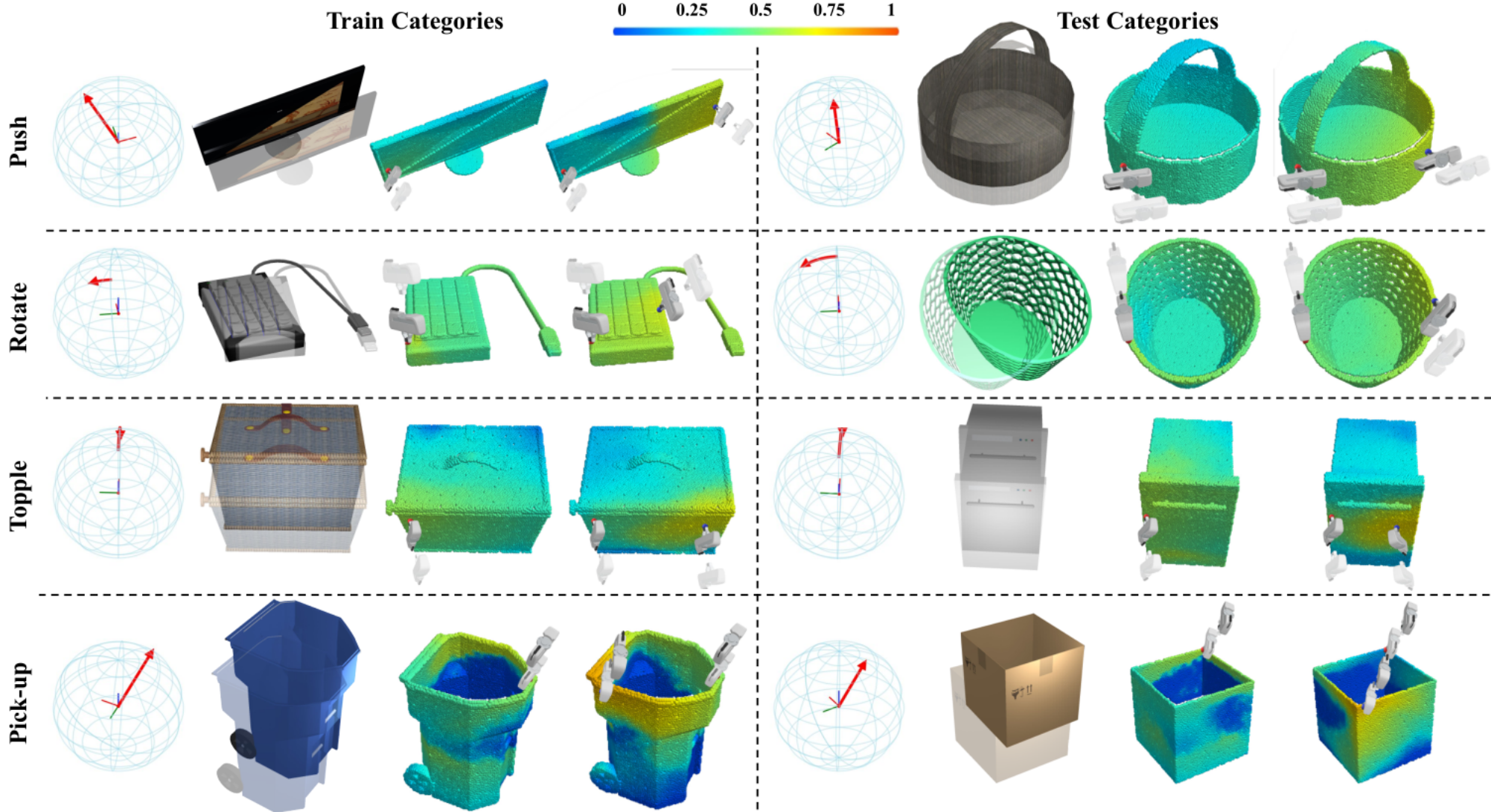


Detailed Architecture Details of the Per-Percept Module Framework



see the main paper
for more technical details

Results of Actionability Prediction networks

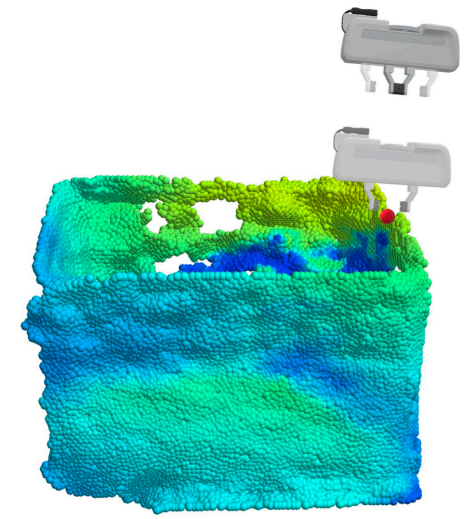


Real-world Experiments

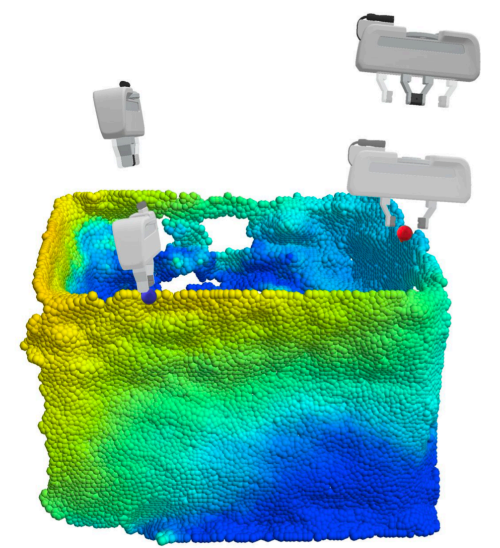
1. pick up a container



Affordance 1



Affordance 2

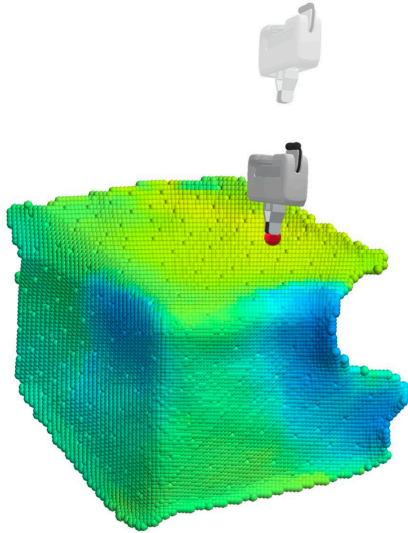


Real-world Experiments

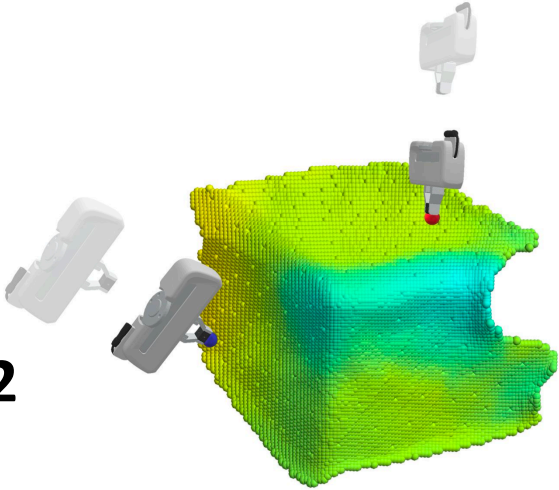
2. rotate a box



Affordance 1



Affordance 2

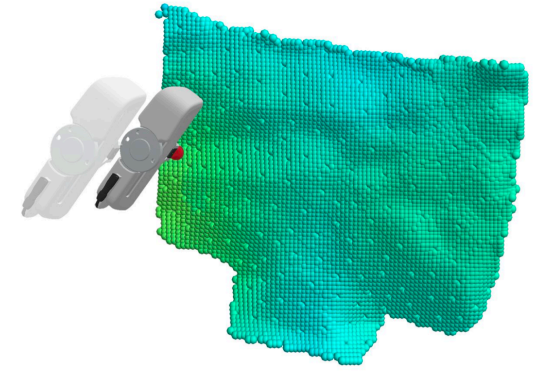


Real-world Experiments

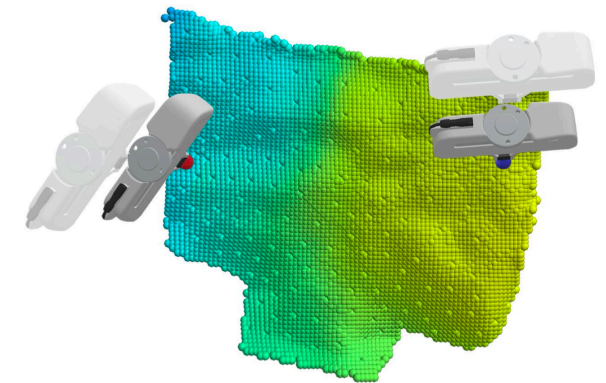
3. push a display



Affordance 1



Affordance 2

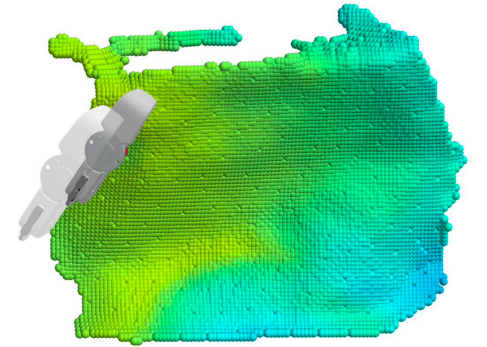


Real-world Experiments

4. topple a bucket



Affordance 1



Affordance 2

