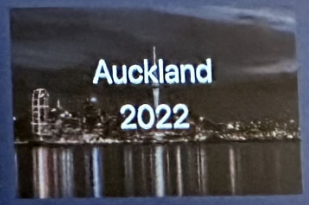
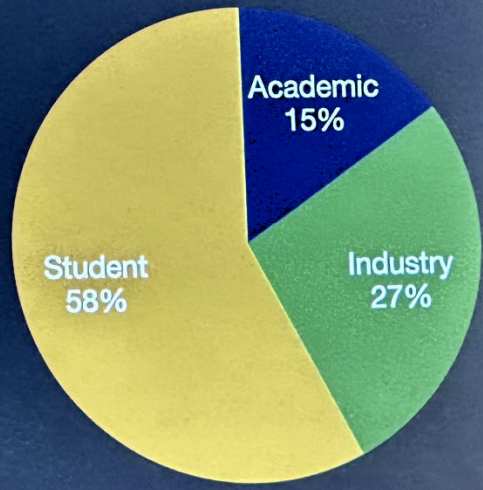
The Starling, Curio Collection by Hilton

History of CoRL



Largest CoRL to Date!!

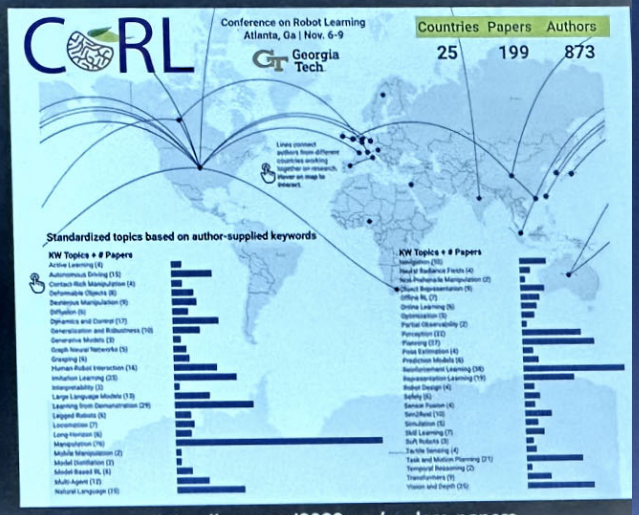
- 81% increase in in-person attendance from 2022
  - 912 total in person participants!!
- 78% decrease in virtual attendance
- 650 workshop attendees



Papers

- We have 498 submissions this year!
- 199 (39.9%) accepted papers
  - 33 oral presentation (6.6%)
  - 166 posters

	2023	2022	2021
Submissions	498	504	408
Oral	33	34	26
Poster	166	163	130
Acceptance	39.9%	39.0%	38.2%



CoRL Executive Board

President: Vincent Vanhoucke
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Secretary: Jens Kober
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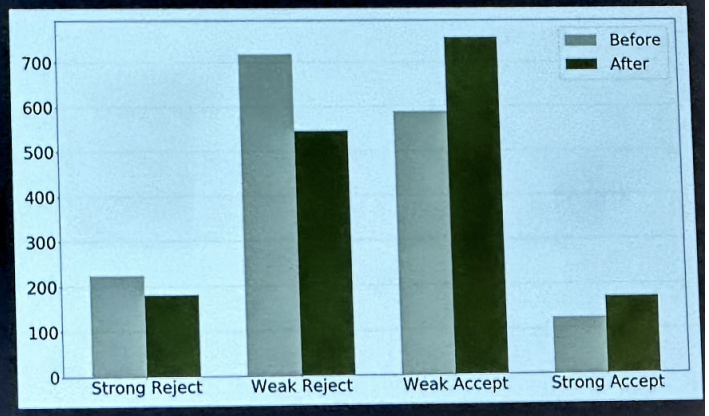
Aude Billard
Ken Goldberg
Marc Toussaint
Sergey Levine
Minoru Asada
Danica Kragic

Review Process

- 83 days
- 60 area chairs
- 551 reviewers
- 1658 reviews
  - 79% papers received 4+ reviews
  - Each paper received at least 3 reviews
- Rebuttal improved paper quality!
  - Each paper received on average 6 reviewer responses
  - 203 papers (40.7%) improved score



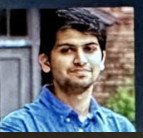
Workshops

- 32 workshop proposals
  - Strong emphasis on diversity and extra activities.
  - Popular keywords: Foundational Models, Representation Learning, Manipulation, Agility
- 11 accepted workshops (34%)
  - 9 full-day and 2 half-day workshops
  - Combined 225 workshop papers!

650 workshop attendees

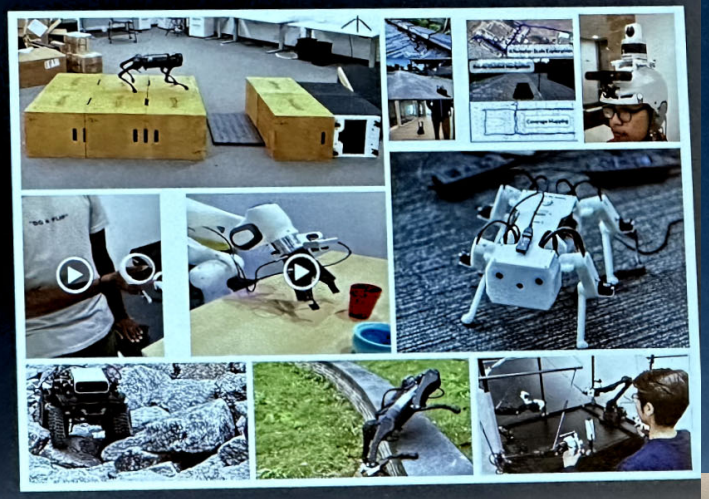
Robot Demonstrations

- 14 groups across diverse topics:
  - Locomotion
  - Navigation
  - Manipulation
  - Teleop
  - Language & Robotics
  - ....



Demo Chair:
Deepak Pathak (CMU)

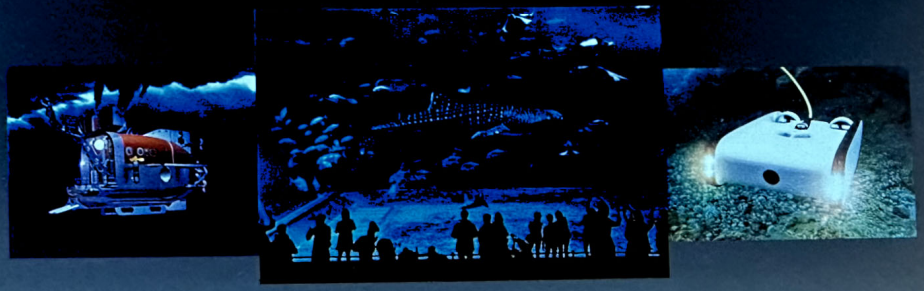
Location: "STATION" Room (near Hubs)
during morning & afternoon breaks

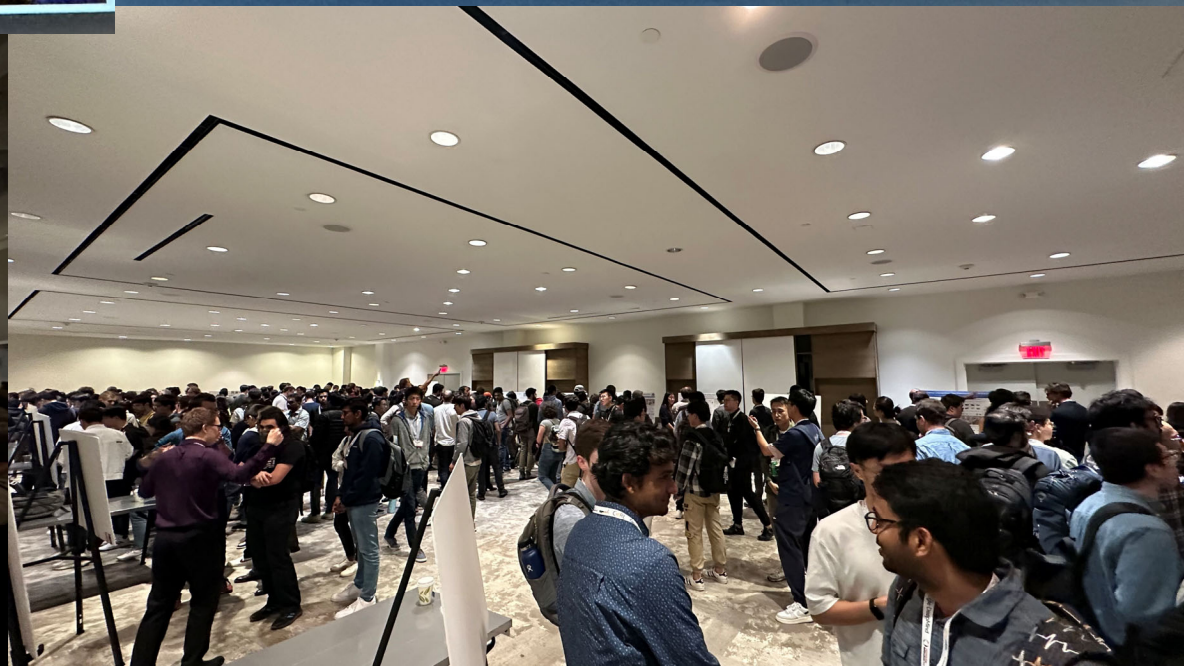


The Banquet @ The Georgia Aquarium (today)

- Buses load 5:00-6:00pm in the front of the hotel
  - White lanyard or ticket is required
- Keynotes on aquatic robotics!

CORL
2023 Conference on Robot Learning
Atlanta, GA

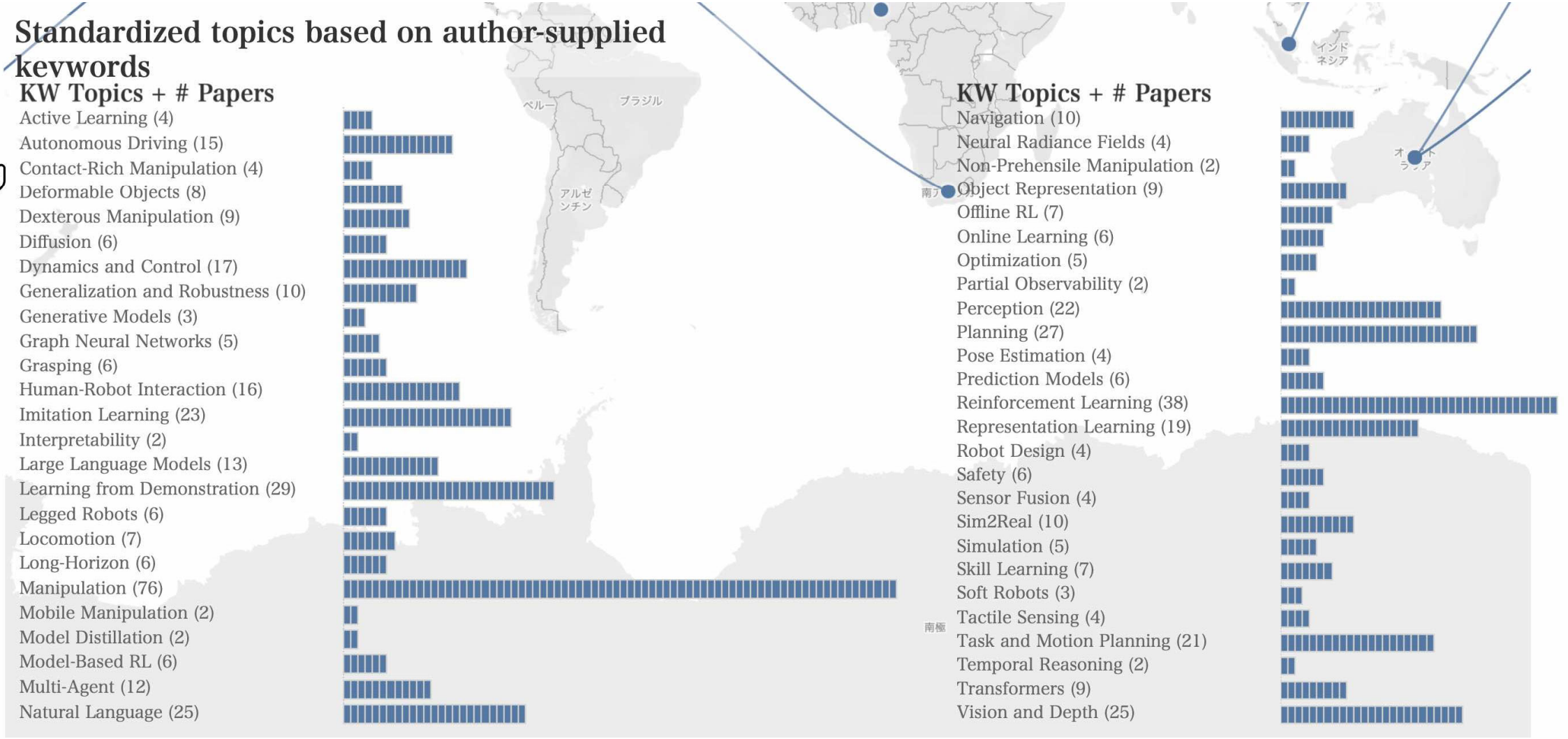




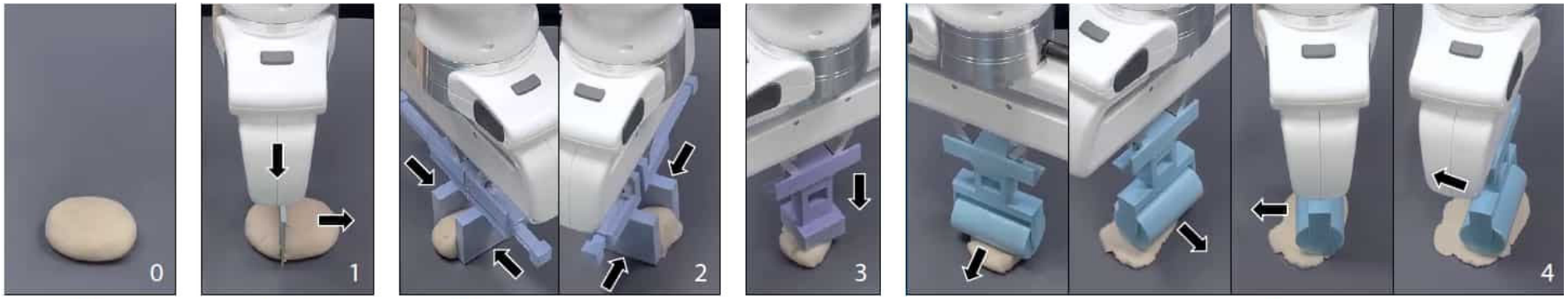
Workshops

1. Neural Representation Learning for Robot Manipulation
2. Workshop on Robot Learning in athlEtics
3. Towards Reliable and Deployable Learning-Based Robotic Systems
4. ***Bridging the Gap between Cognitive Science and Robot Learning in the Real World: Progresses and New Directions***
5. Pre-Training for Robot Learning Workshop
6. Towards Generalist Robots: Learning Paradigms for Scalable Skill Acquisition
7. Learning Effective Abstractions for Planning (LEAP)
8. Learning for Soft Robots: Hard Challenges for Soft Systems
9. 2nd Workshop on Language and Robot Learning (LangRob): Language as Grounding
10. What Robotics Tasks Should We Focus On?
11. Out-of-Distribution Generalization in Robotics: Towards Reliable Learning-Based Autonomy

Topics and # of papers



RoboCook: (2)



(1) 適当なサイズに生地をカット

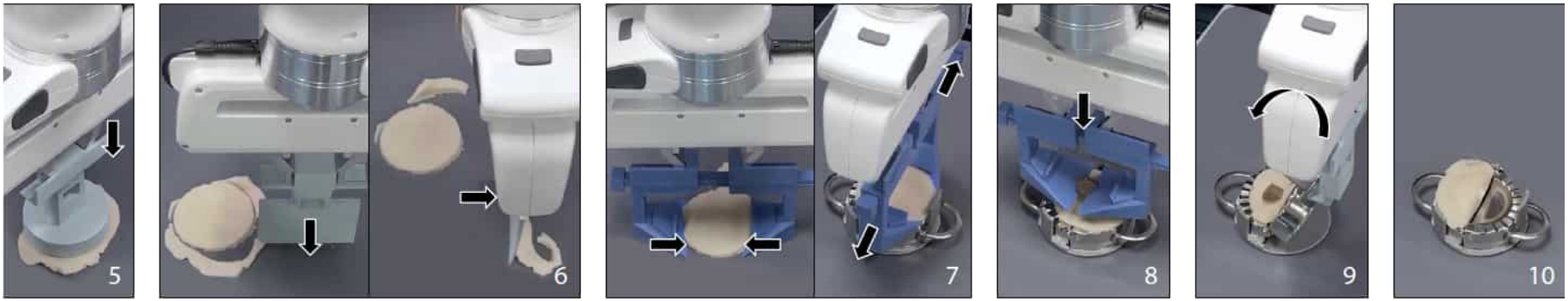
(2) 生地を引き伸ばして，整形

(3) 生地を平たくするためにプレス

(4) さらに平たくするためにロール

矢印は移動方向

RoboCook: (3)



(5) 餃子の皮を円形にカット

(6) 余分な生地を除去

(7) 皮を取り上げ，型に配置する

(8) 中身を足して

(9) 型を閉じて開く.

矢印は移動方向

RoboCook: (4)

知覚入力はRGB-Dカメラからのロボット作業スペースのポイントクラウドで，生のポイントクラウドから以下の手順

(a) 興味ある部分の切り出し

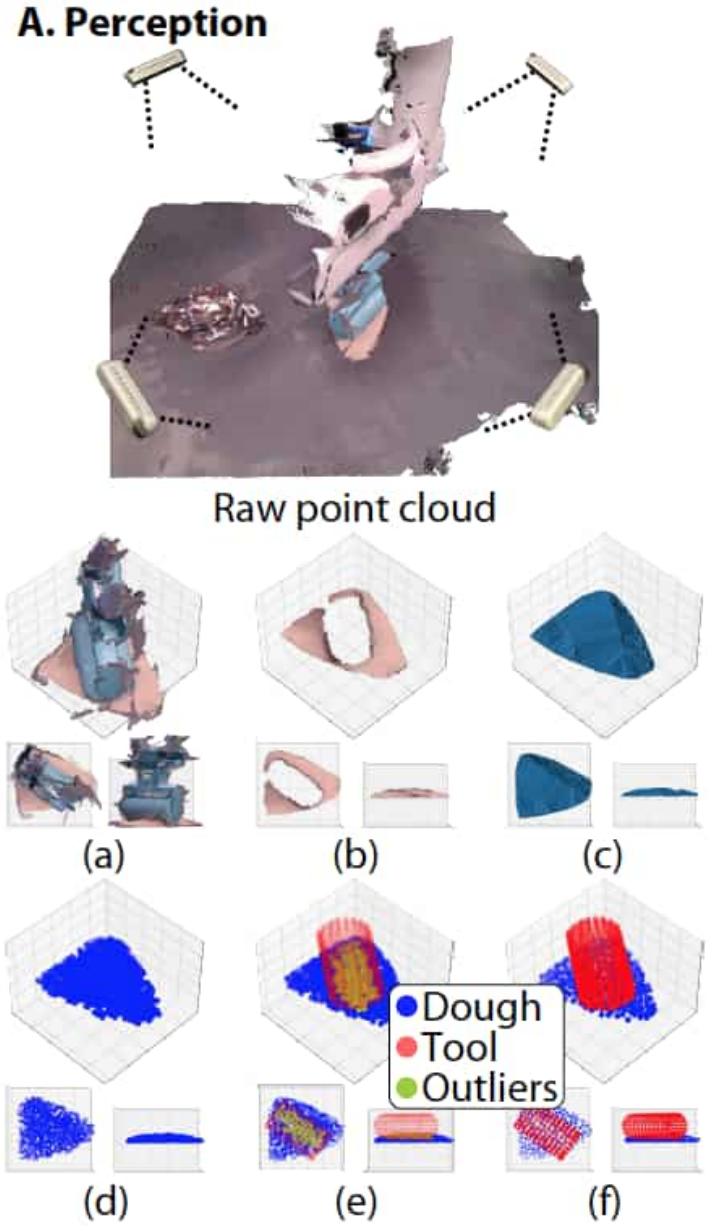
(b) 生地のポイントクラウドの抽出

(c) 防水メッシュの再構築

(d) メッシュ内のポイントサンプルのためにサイン入り距離関数（Signed Distance Function (SDF)）の利用

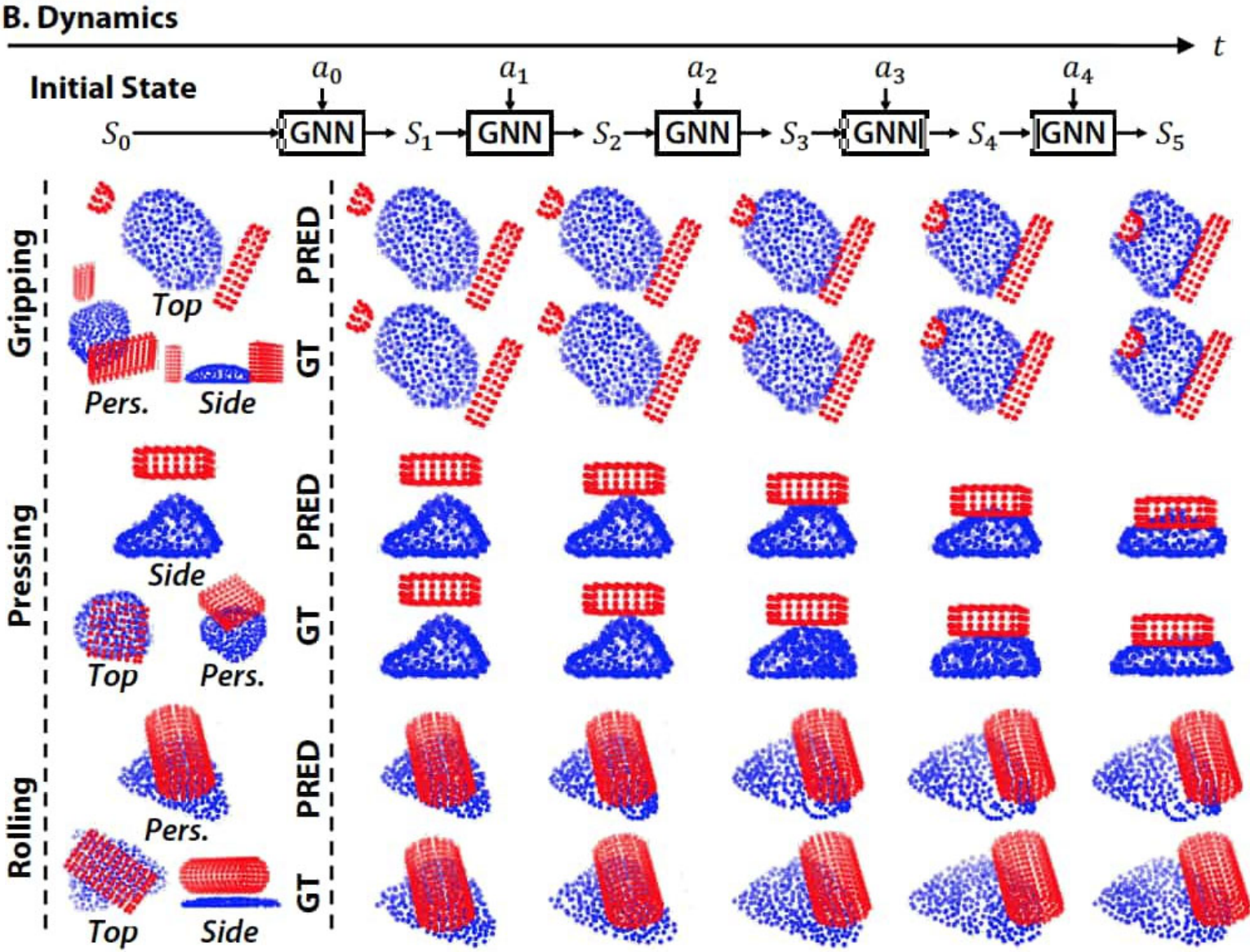
(e) 道具のSDF内のポイント除去

(f) 表面の300ポイントをサンプル

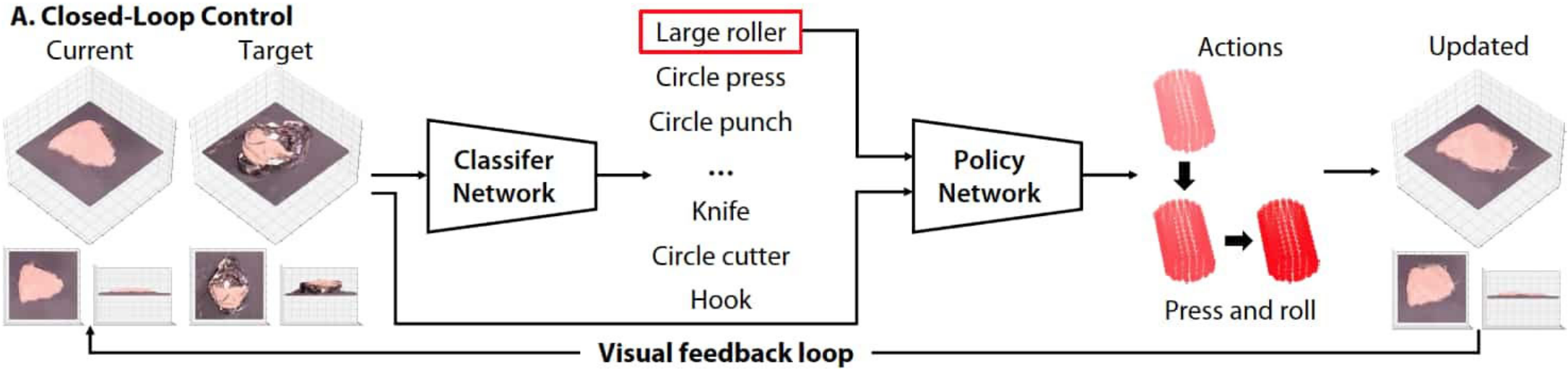


RoboCook: (5)

生地の握り，押し込み，引き伸ばしの過程のダイナミクス.
左：初期状態，
右：GNNによる予測（PRED）と真値（GT）の比較.

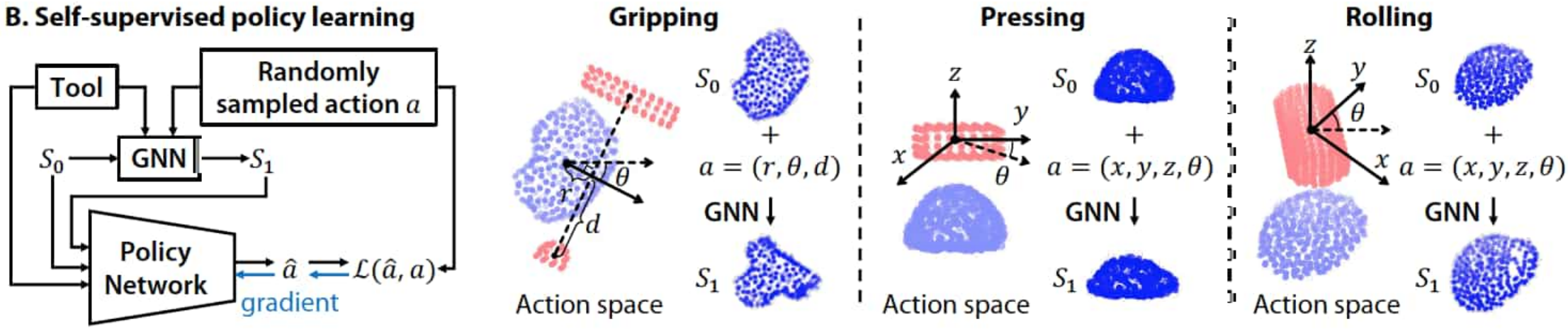


RoboCook: (6)



PointNetに基づく分類ネットワークが，現在の観測と目標の生地の状態に基づいて，適切な道具を同定する．自己教師型方策ネットワークは，これらを入力とし，操作行動を出力する．視覚フィードバックにより制御ループを閉じている．

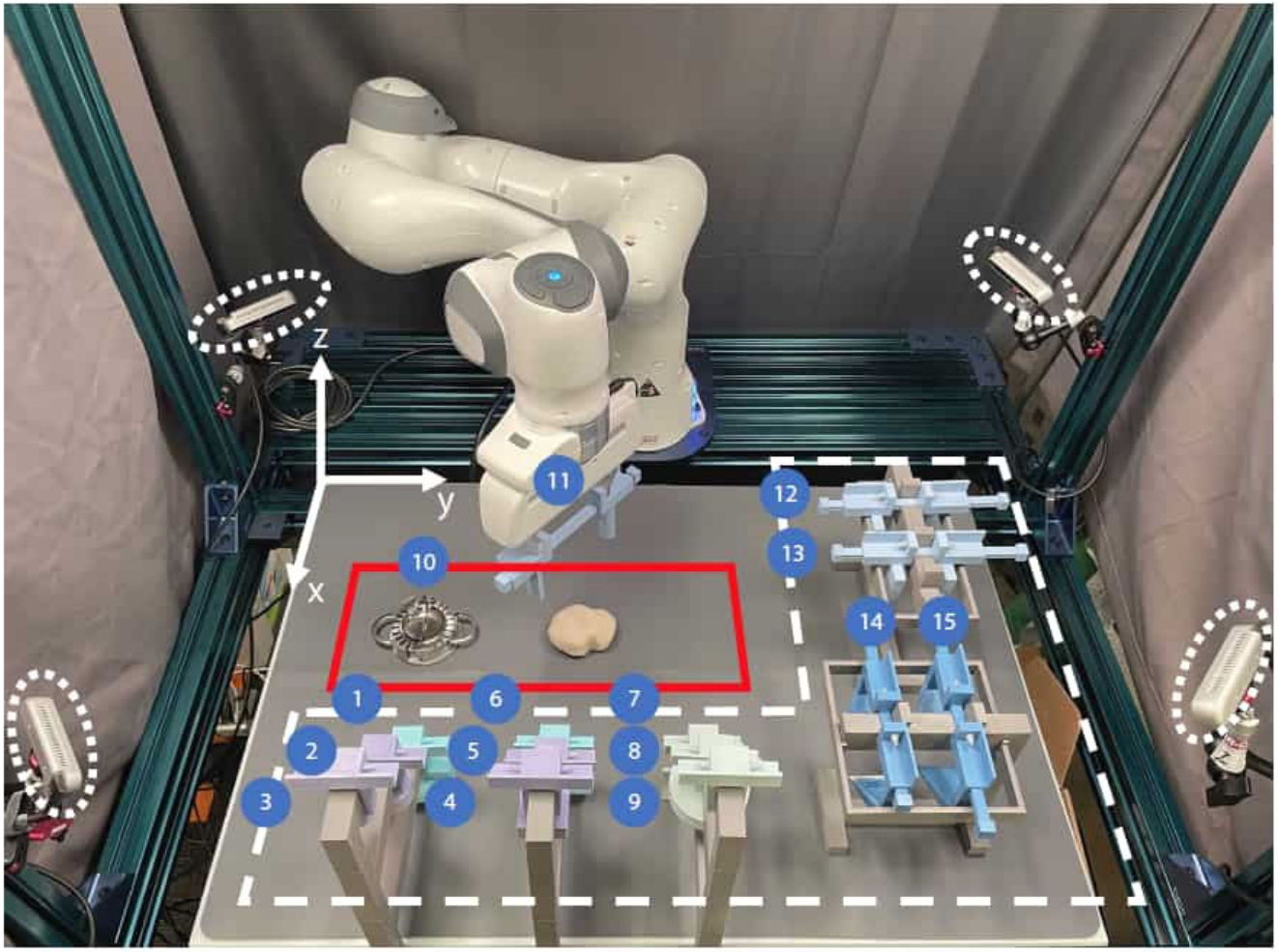
RoboCook: (7)



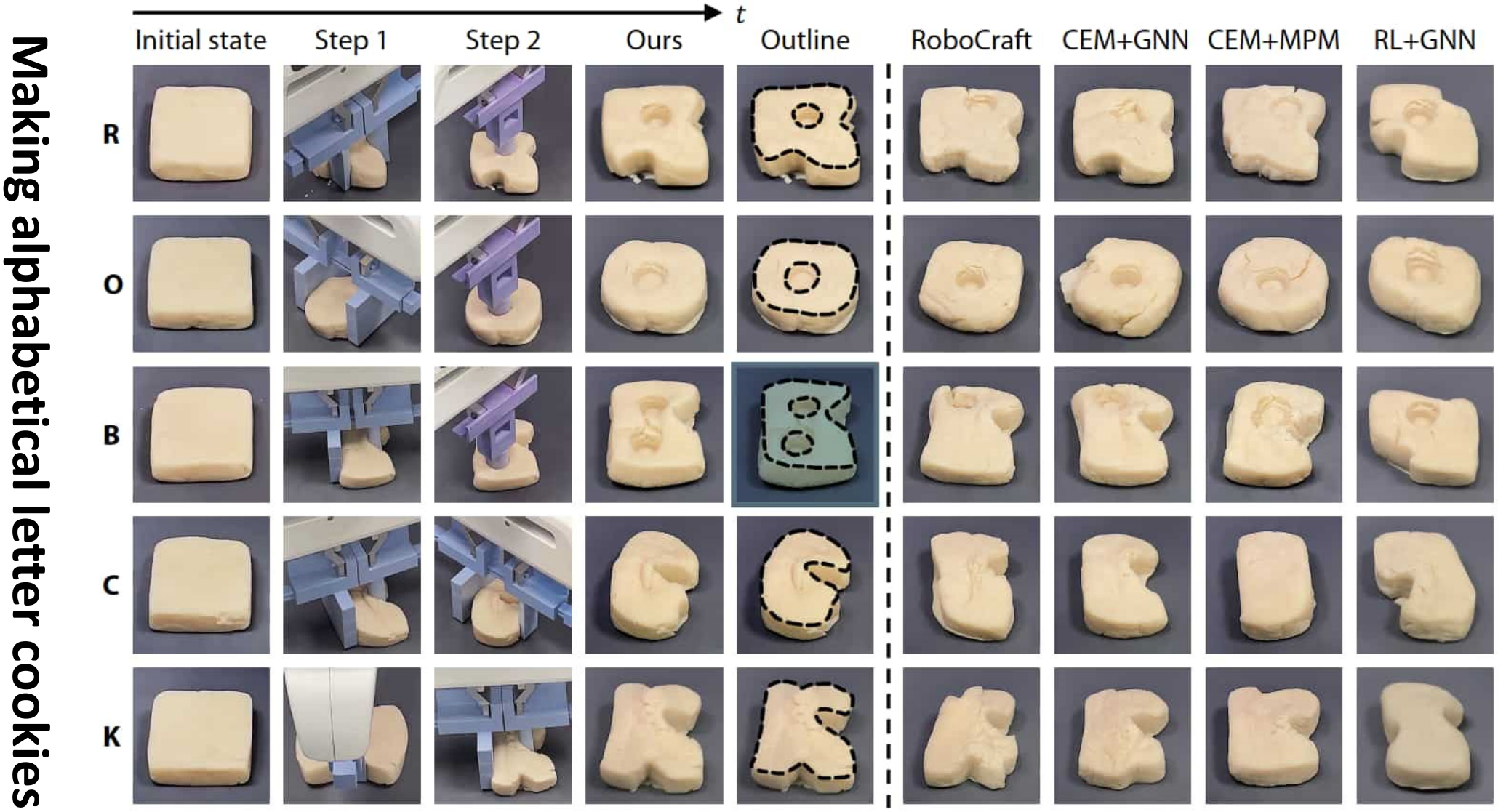
方策ネットワークアーキテクチャ：生地の握り，押し込み，引き伸ばしのパラメータ化された行動空間と方策ネットワークを訓練するための合成データをいかに生成するかを示している．

RoboCook: (8)

ハードウェアとセットアップ

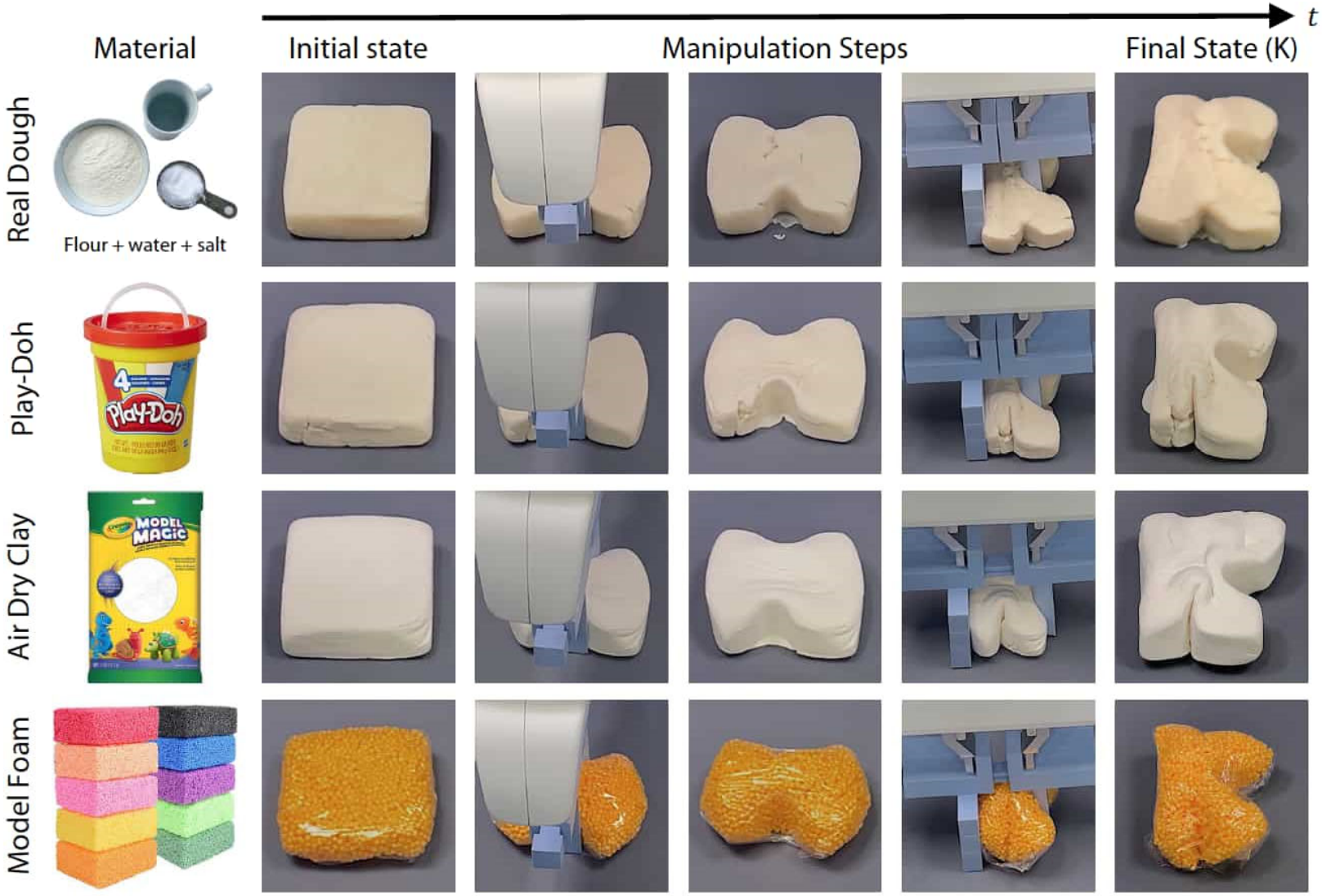


RoboCook: (10)

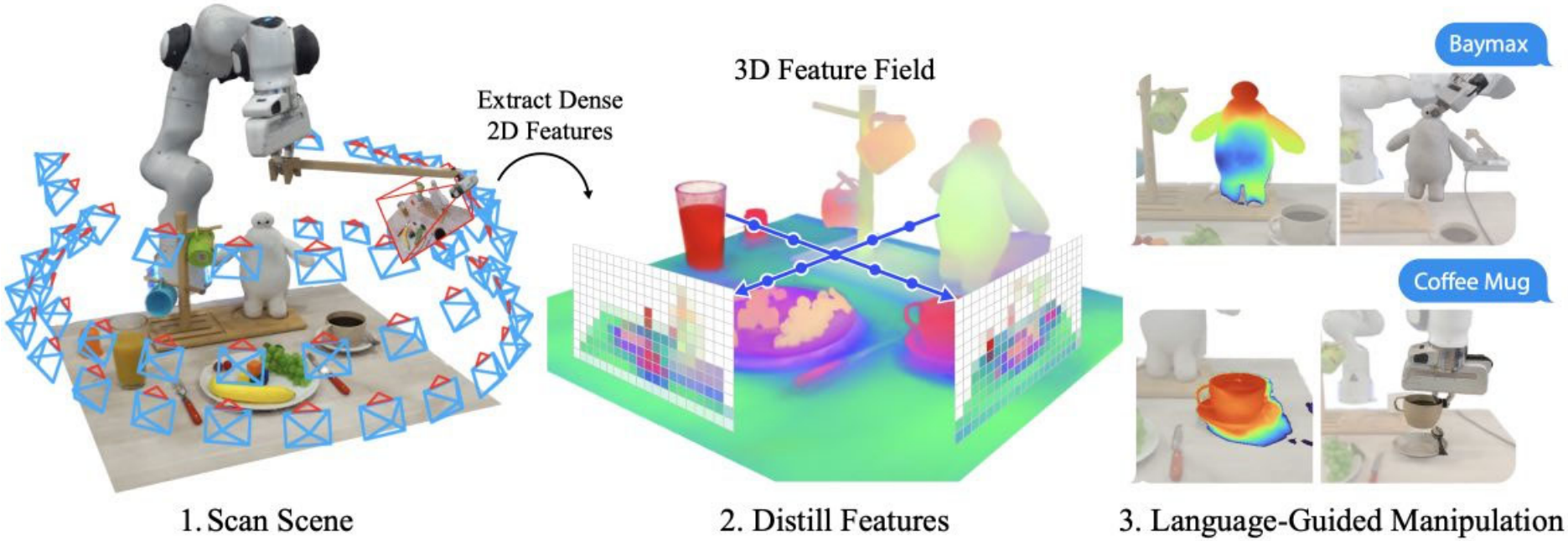

Making alphabetical letter cookies.
t
Initial state
Step 1
Step 2
Ours
Outline
RoboCraft
CEM+GNN
CEM+MPM
RL+GNN
R
O
B
C
K

RoboCook: (12) *Generalizing to different materials*

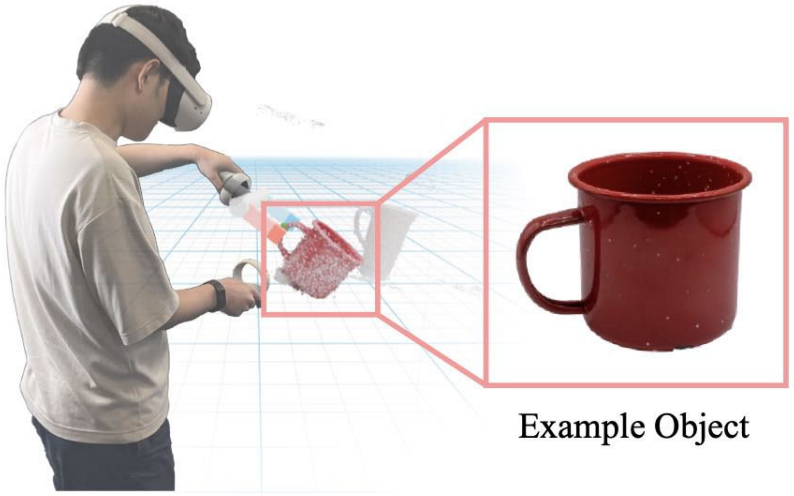
We showcase the dynamics model's capability to generalize to various materials by shaping a K without retraining.



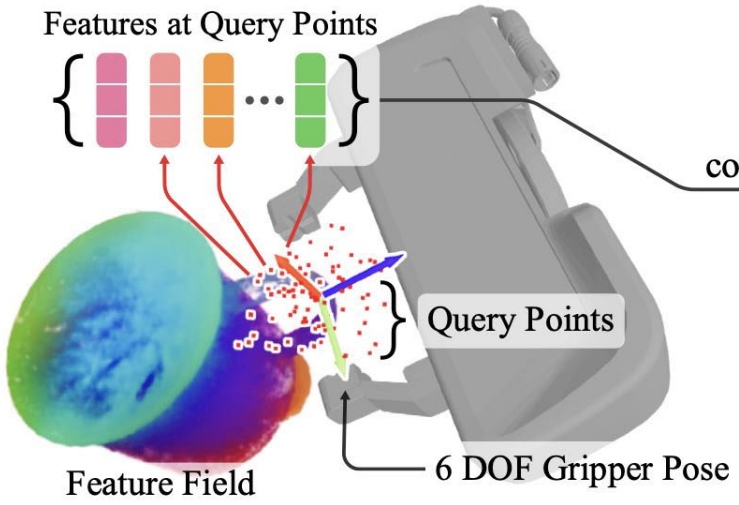
全体の流れ


Extract Dense
2D Features
3D Feature Field
Baymax
Coffee Mug
1. Scan Scene
2. Distill Features
3. Language-Guided Manipulation

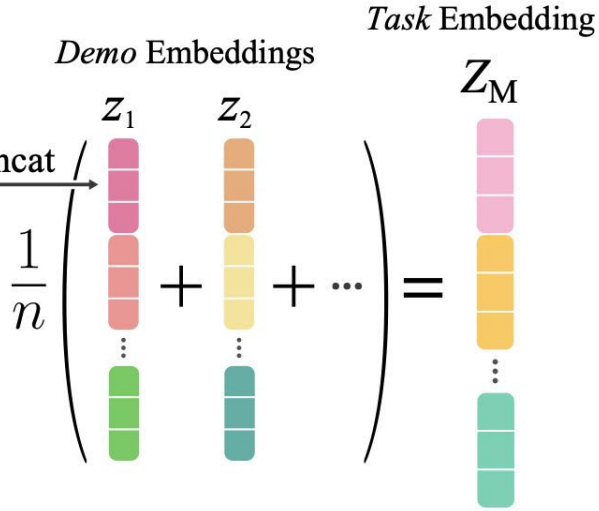
6自由度ポーズの表現



(a) Collect Demonstrations in VR

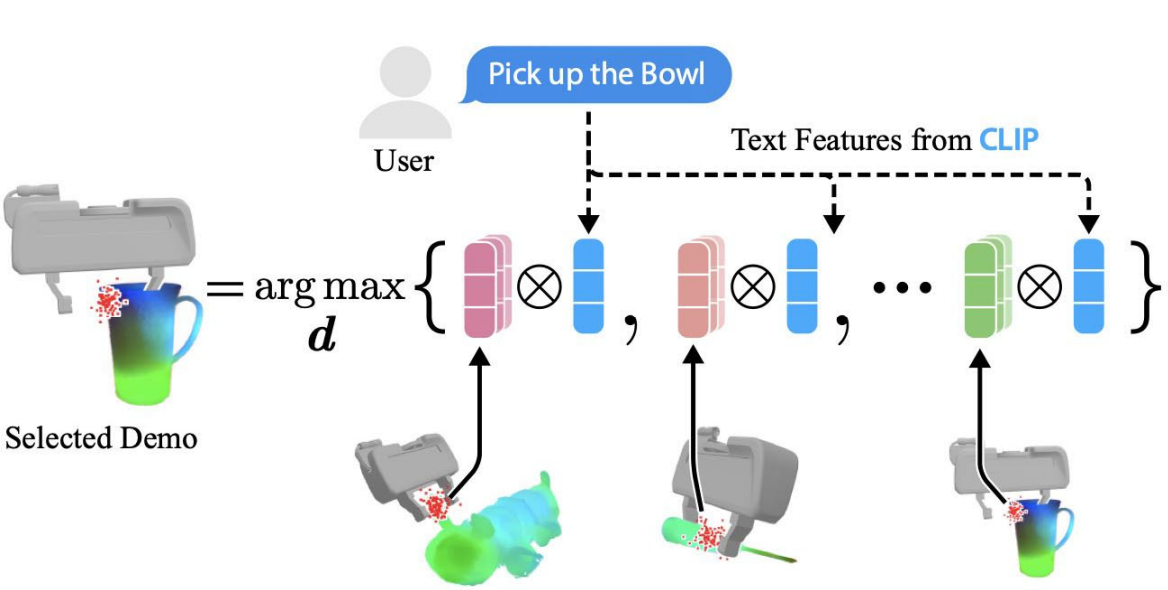


(b) Sample Feature Vectors

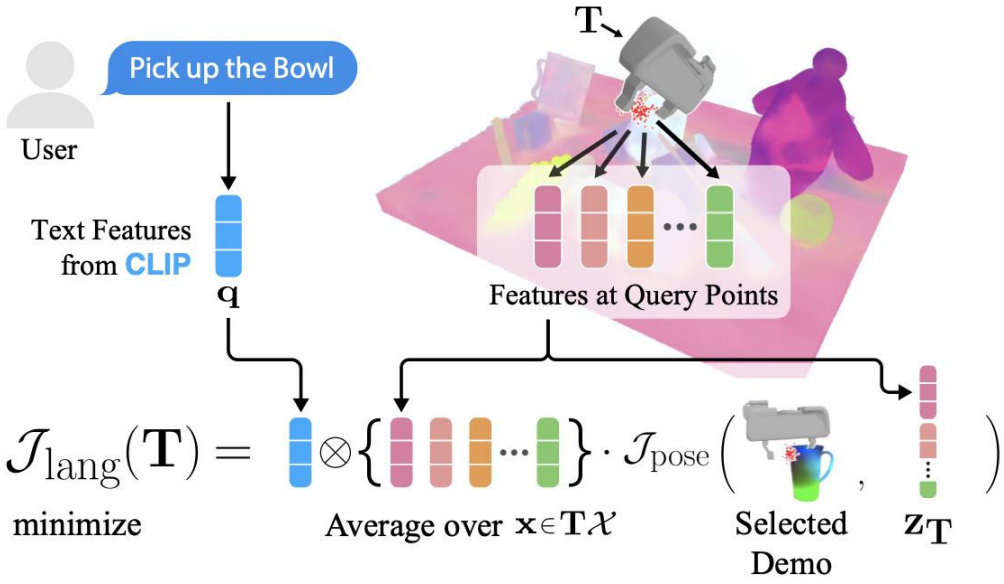


(c) Average Over *n* Demos

言語ガイド付き操作のためのパイプライン



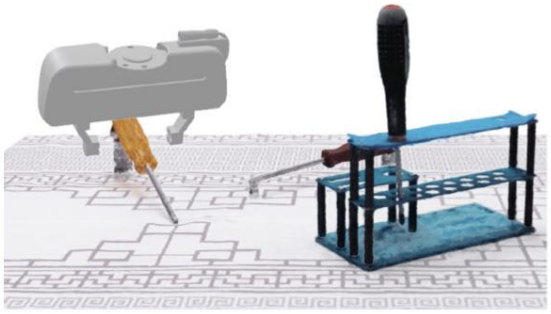
(a) Retrieving Demonstrations



(b) Language-Guided Pose Optimization

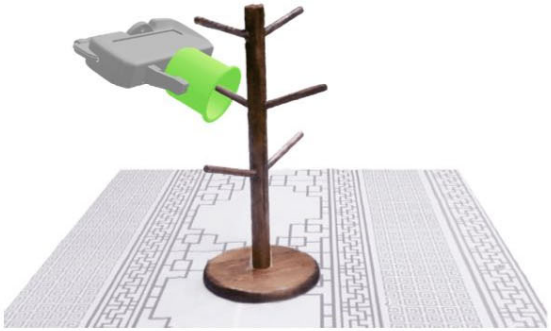
把持と配置の5つのタスク

(a) Grasp mug (lip)



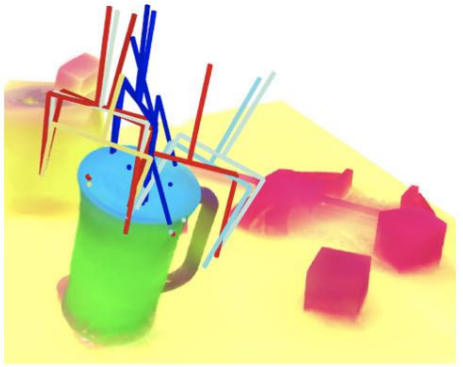
(b) Grasp screwdriver

(c) Grasp caterpillar

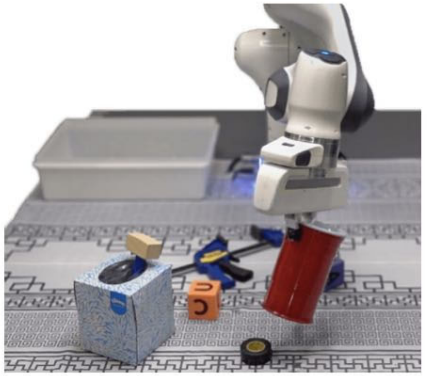


(d) Place cup on rack

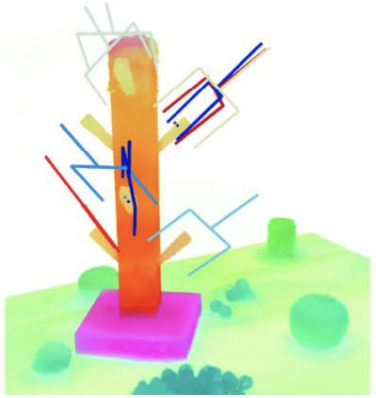
新しい物体への汎化例



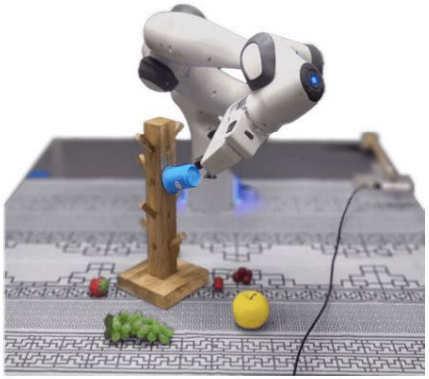
(a) Top 10 Grasps



(b) Robot Execution

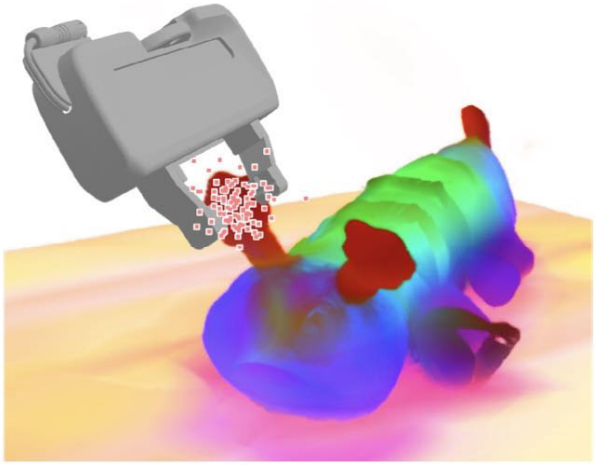


(c) Top 10 Grasps

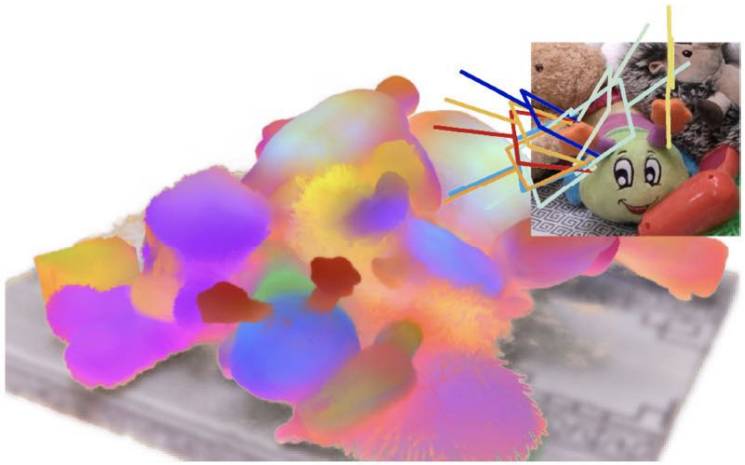


(d) Robot Execution.

乱雑なシーンにおける把持



(a) Demonstration (1 of 2)



(b) Feature Field of Cluttered Scene

(c) Robot Execution

言語ガイド付き操作の実行