ATARA: Automated Task-Agnostic Random Actions

Sim RL ⇨ **Policy** ❄ ⇨ Viable EEF-QPOS Mapping
a_0 ... a_n

Cons of Naïve Random Data

inefficient coverage

redundant motions

self-collisions

Our Task-Agnostic Data Collection

Cubic Workspace Coverage

Randomize Wrist

Task-Agnostic Training Set

Random Data
o_0 ... o_t
a_0 ... a_t

610k <image, action>

⭐ AnyPos: Training with Arm-Decoupling and Direction Aware Decoder for High-Precision Pred.

Arm-Decoupled Estimation

Left Arm   Right Arm
Left Gripper   Right Gripper

⇨ Visual Encoder ⇨

Direction Aware Decoder (DAD)

Multi-scale Dilated Conv.
⇩
Deform Conv. 2d
⇩
Angle-Sensitive Pooling

	horiz.	diag.	vert.
0			
45			
90			
135			

⇩
MLP
⇩
Action

High Precision Requirement

t0   minor movement

t0 - success

$qpos(r) = [\ldots, 0.82, -0.41, -0.07, \ldots]$

t1

t1 - failure

$qpos(r) = [\ldots, 0.72, -0.46, 0.07, \ldots]$

Brings 0.1 difference!