Hierarchical Embodiment Data





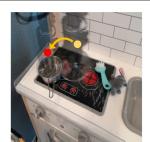
Plan: Positioning over pot cover, Grasping the pot

cover, Lifting ...

Subtask: Grasping the pot cover

Reason: The robot is closing its gripper around the

pot cover's handle to securely pick it up...



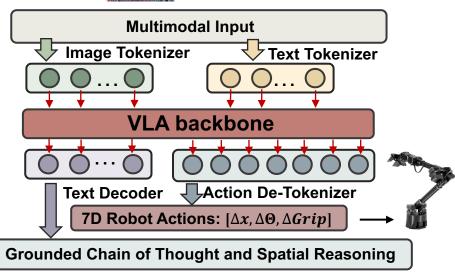
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2D Gripper Position of Future State

3D Spatial Movements to Future State

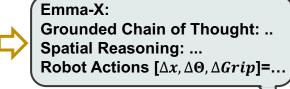


Emma-X



Closed-Loop Robot Control Policy

User: Wipe the stove with the towel.







Downstream Real Robot Manipulation

Task: put the blue cube on the left plate Current Gripper: [104, 52]



Subtask: Reaching for the blue cube

Reason: The robot arm is moving downwards and positioning its gripper above the blue cube to prepare for grasning

Tuture State Gripper Position: [128, 124] **3D Movement:** move forward 22 steps; move right 32 steps; move downward 142 steps

Task: wipe the stove with the towel Current Gripper: [142, 95]



Subtask: Reaching for the towel

Reason: The robot needs to grasp the towel to be able to wipe the stove

Future State Gripper Position: [147, 132]

3D Movement: move forward **22** steps; move left **22** steps: move downward **72** steps

Task: put banana in pot Current Gripper: [89, 169]



Subtask: Moving banana to pot

Reason: The robot arm is moving the banana towards the pot. This action is necessary to position the banana

above the pot before dropping it.

Future State Gripper Position: [74, 147]

3D Movement : move forward 1 steps; move left **42** steps; move upward **62** steps