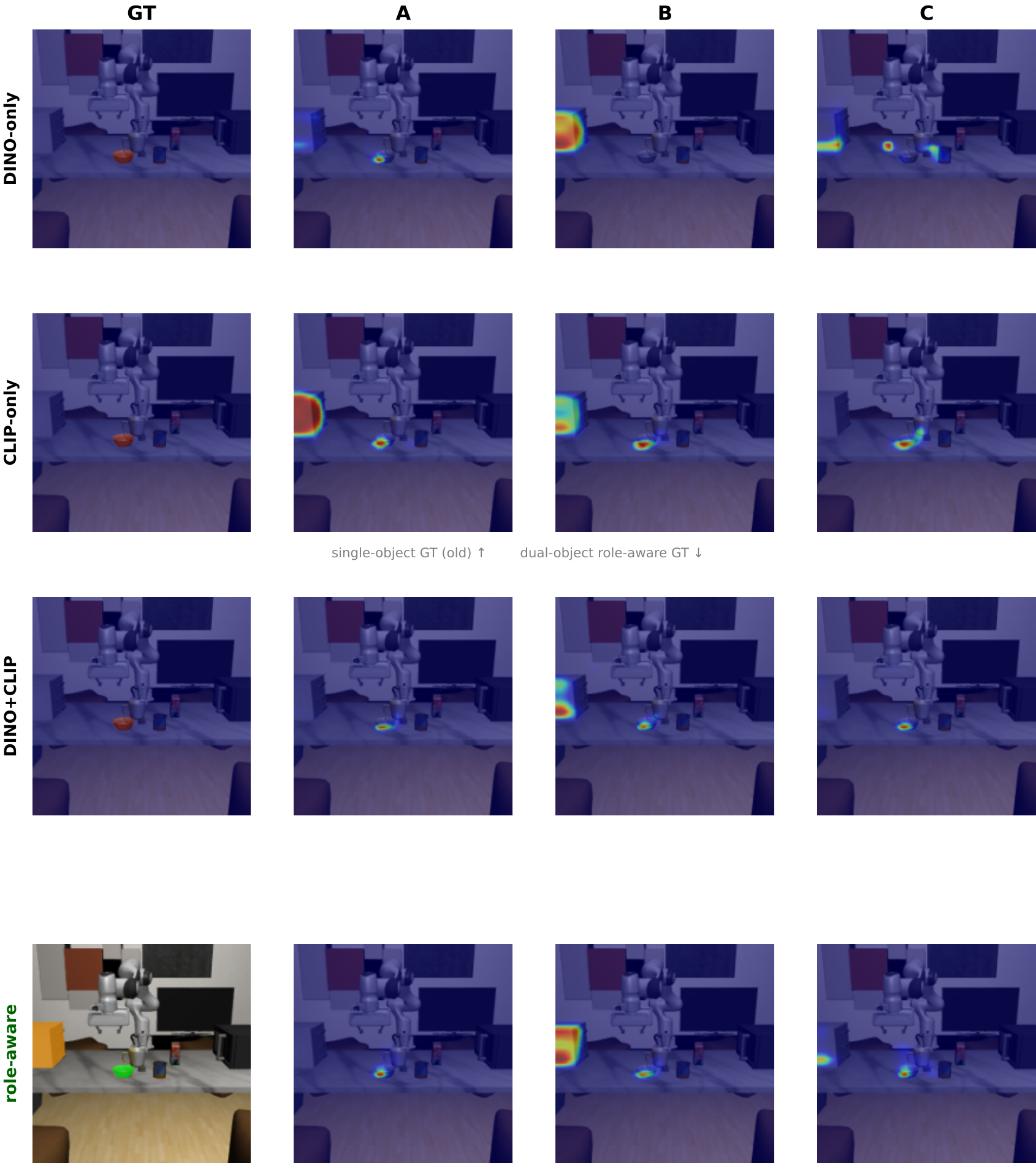


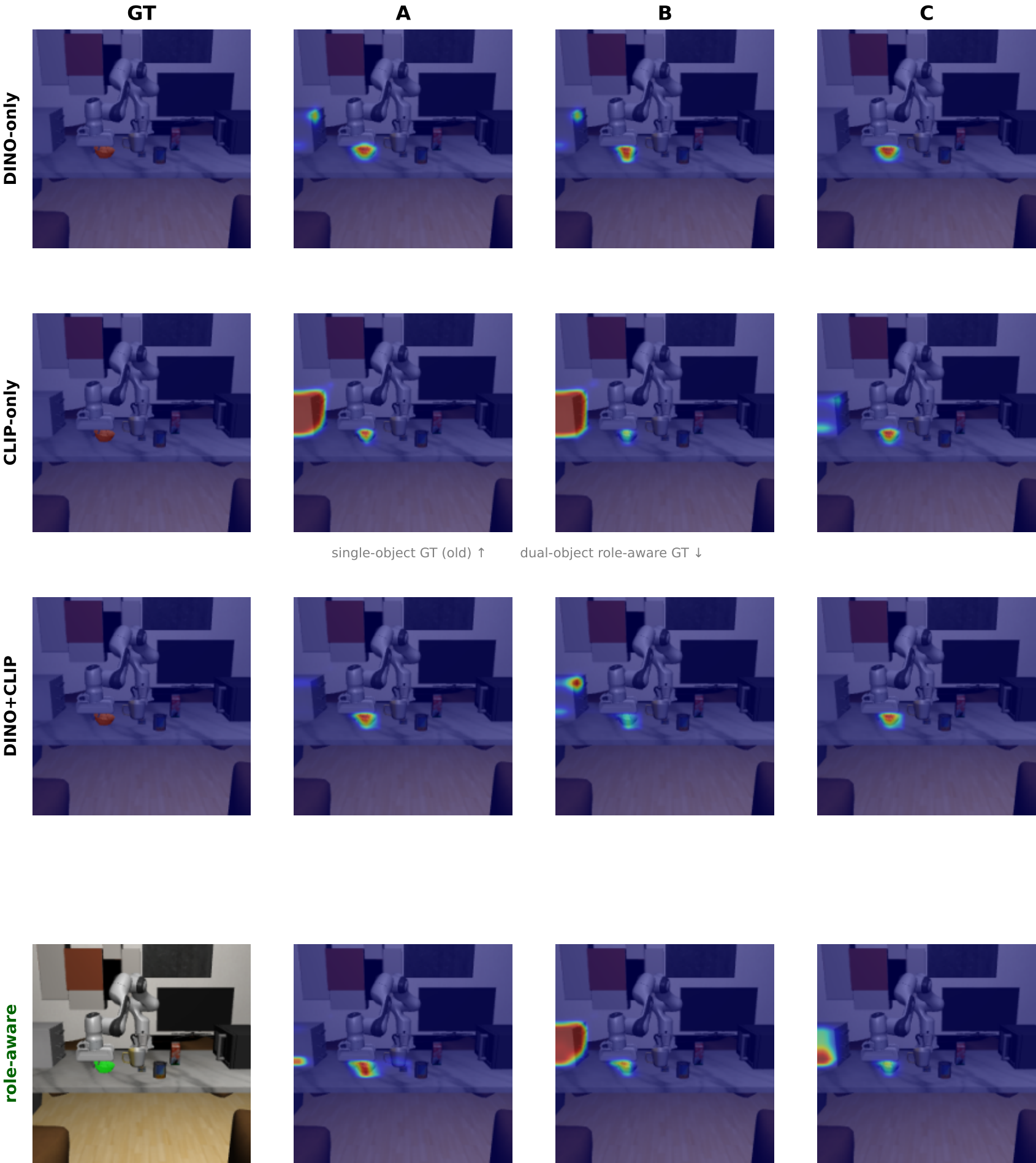
Memory_Execution_case9 — step: Pick up the akita black bowl from coffee table. [grasp]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug,reposition t



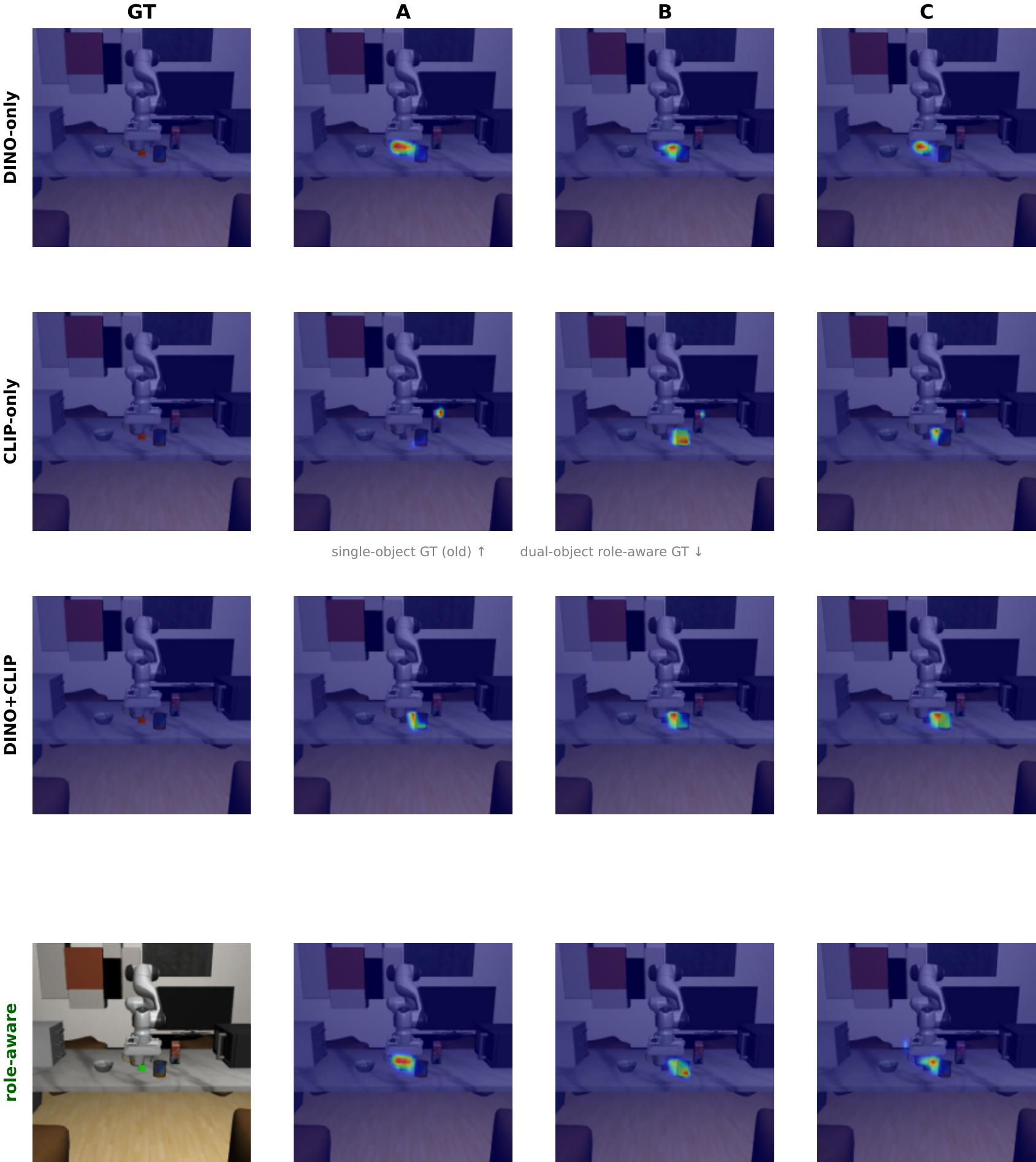
Memory_Execution_case9 — step: Place the akita black bowl on table surface. [release]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug,reposition t



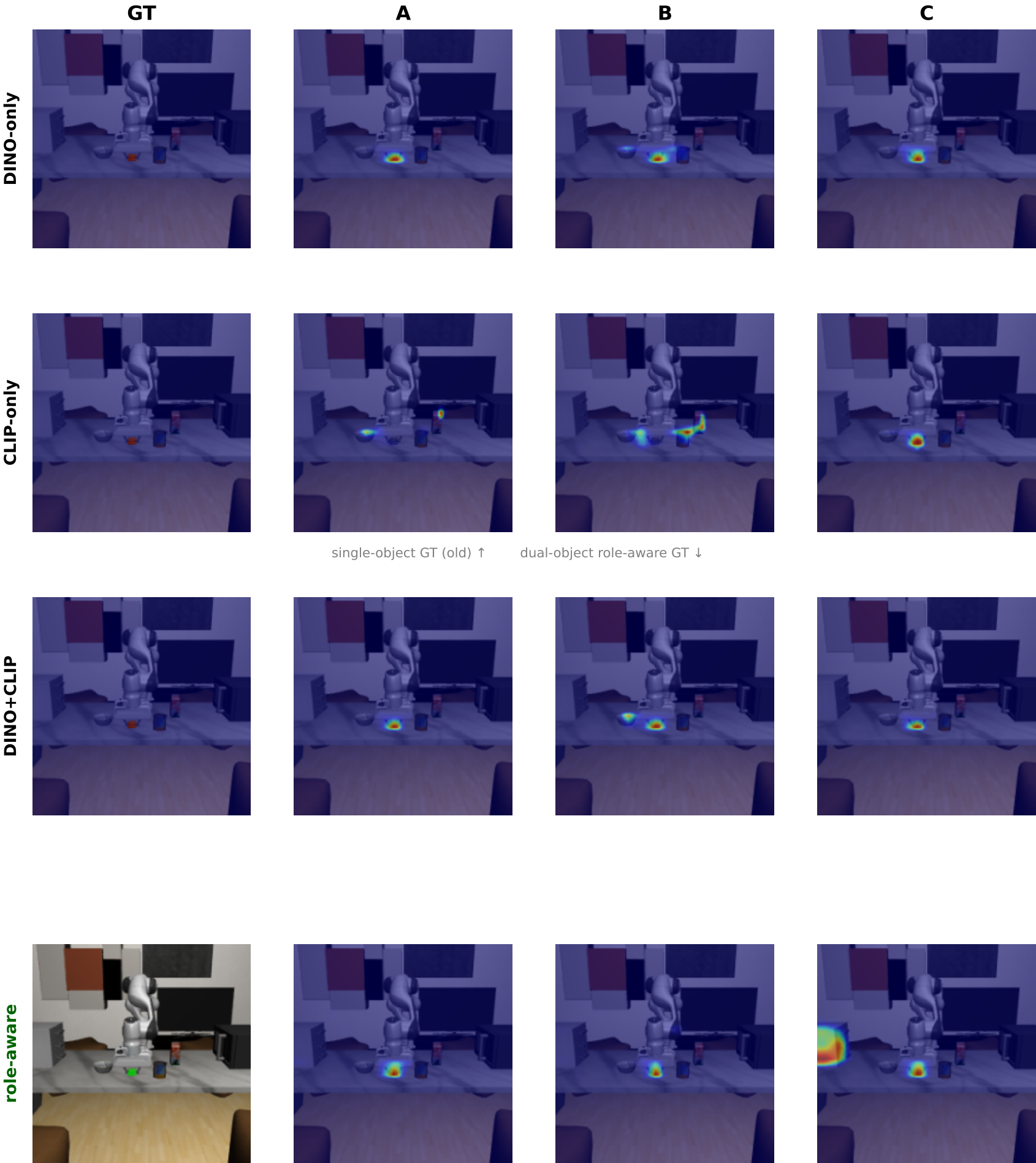
Memory_Execution_case9 — step: Pick up the popcorn from coffee table. [grasp]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug,reposition t



Memory_Execution_case9 — step: Place the popcorn on coffee table. [release]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug,reposition t



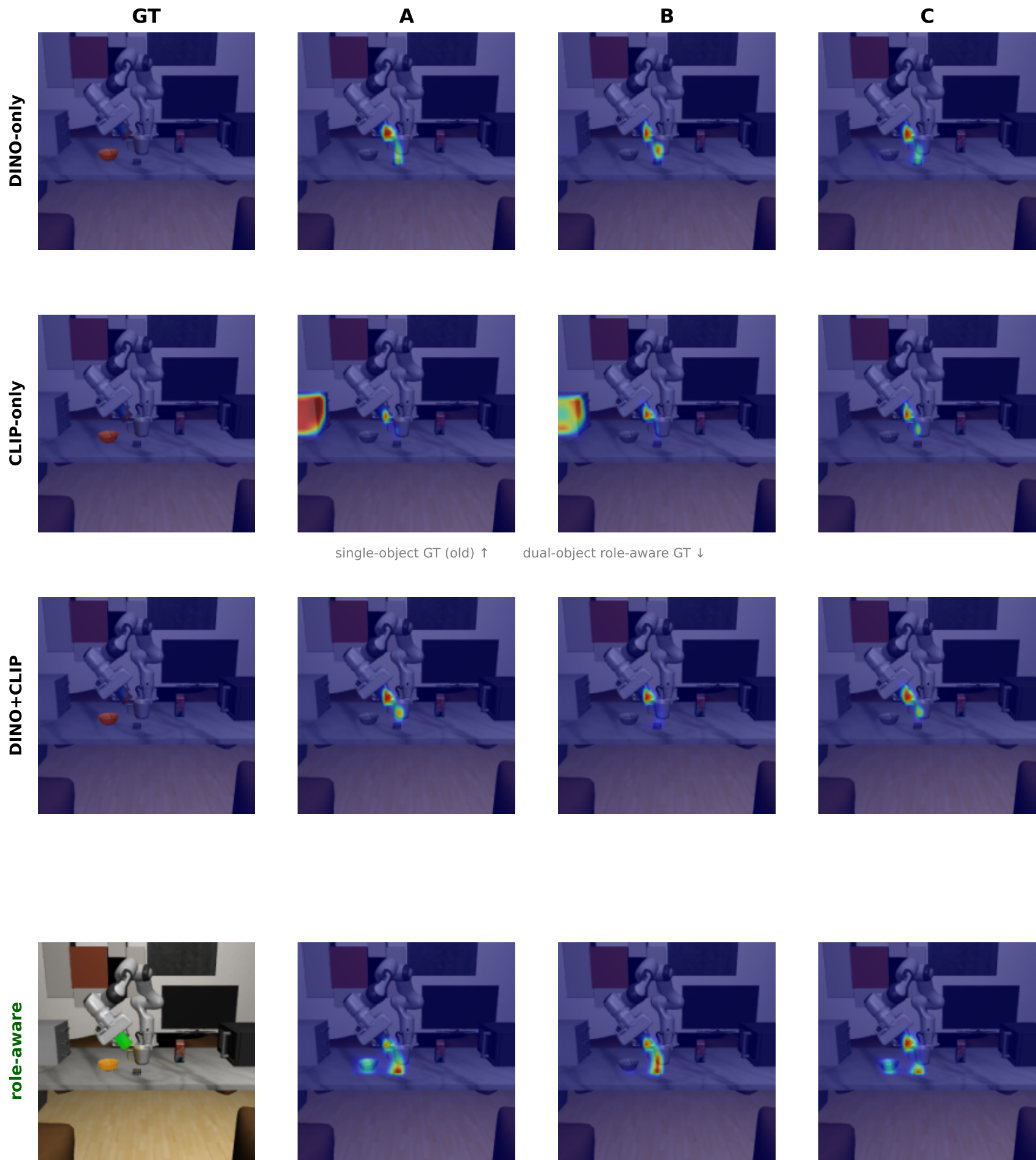
Memory_Execution_case9 — step: Pick up the alphabet soup from coffee table. [grasp]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug,reposition t



Memory_Execution_case9 — step: Pour out the alphabet soup into the akita black bowl. [manipulate]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug, reposition t



Memory_Execution_case9 — step: Place the empty alphabet soup on table surface. [release]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug,reposition t

DINO-only



CLIP-only



DINO+CLIP



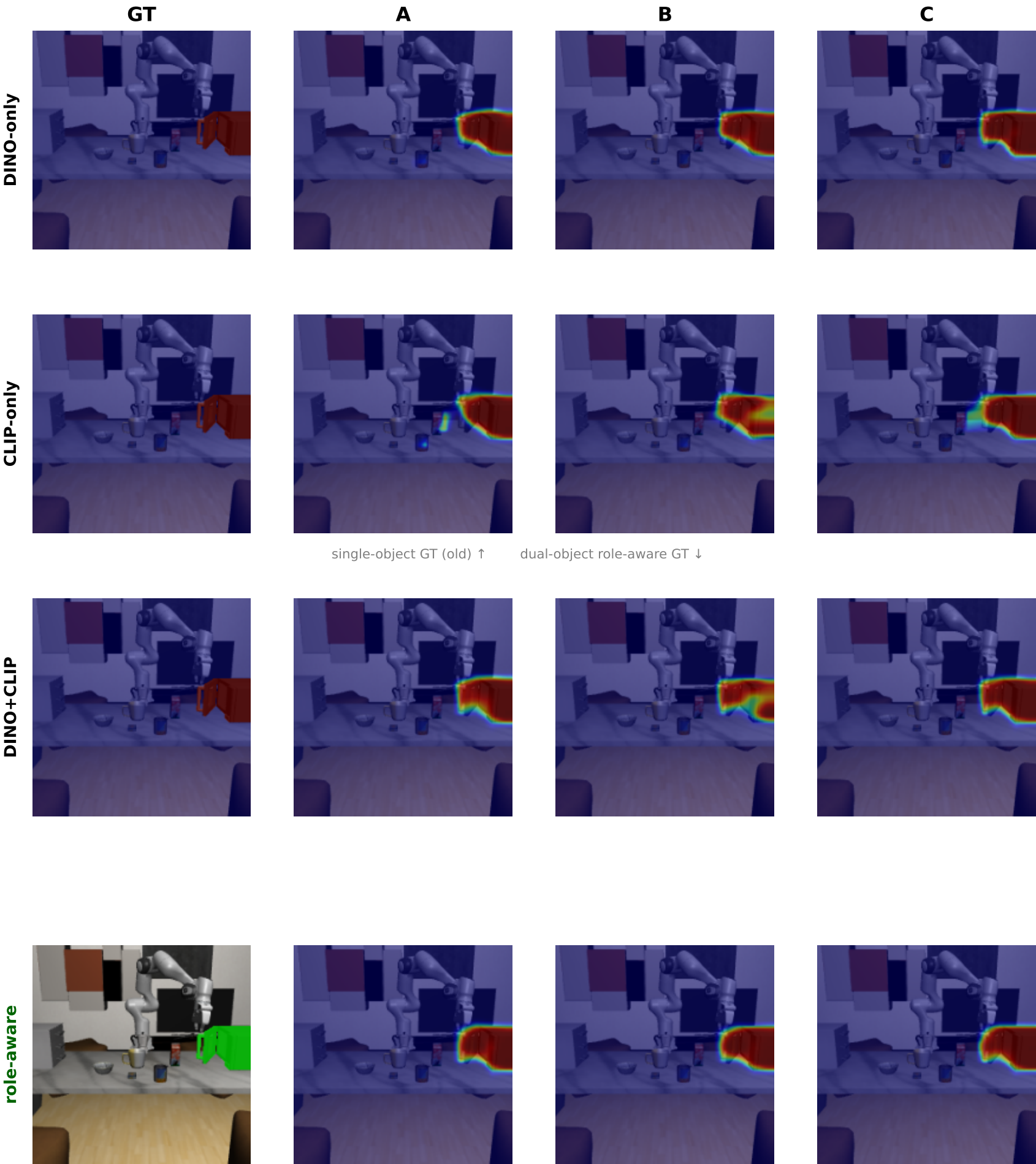
role-aware



single-object GT (old) ↑ dual-object role-aware GT ↓

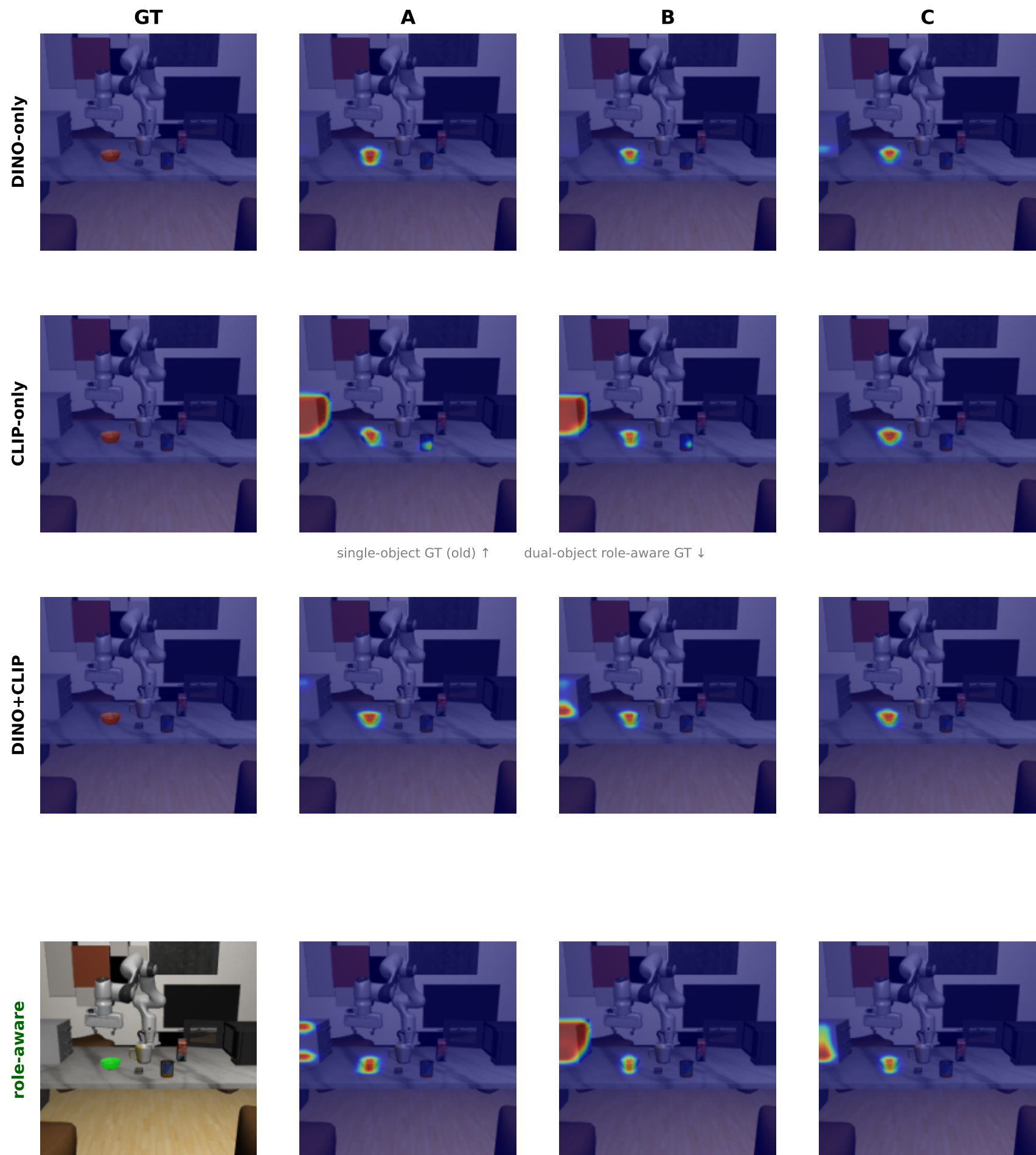
Memory_Execution_case9 — step: Open the microwave at top side. [manipulate]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug, reposition t



Memory_Execution_case9 — step: Pick up the akita black bowl with soup from table surface. [grasp]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug, reposition t



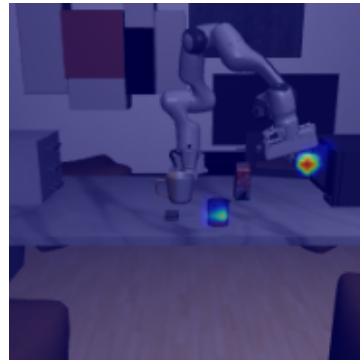
Memory_Execution_case9 — step: Place the akita black bowl with soup into the microwave heat [release]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug, reposition t

GT



A



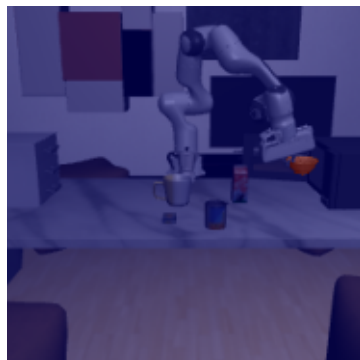
B



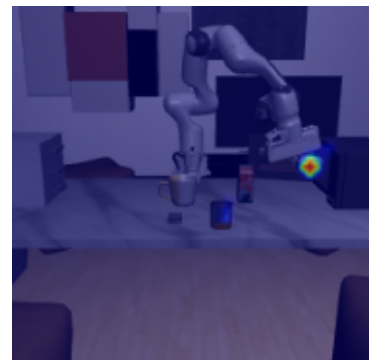
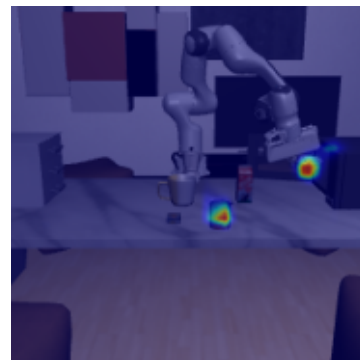
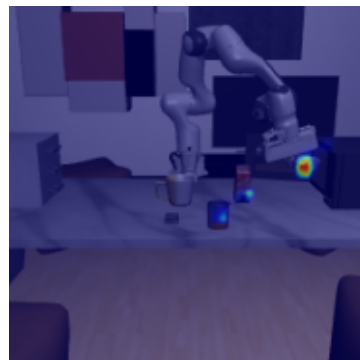
C



DINO-only



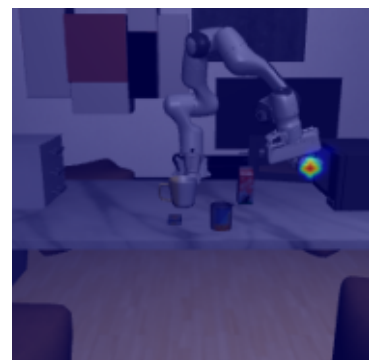
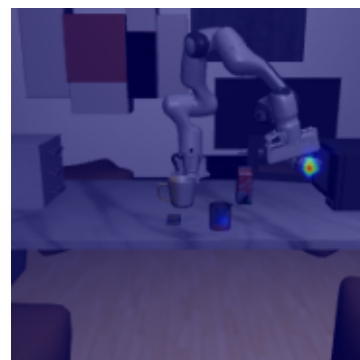
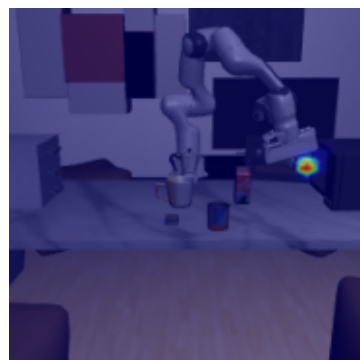
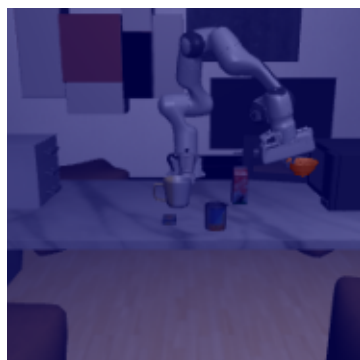
CLIP-only



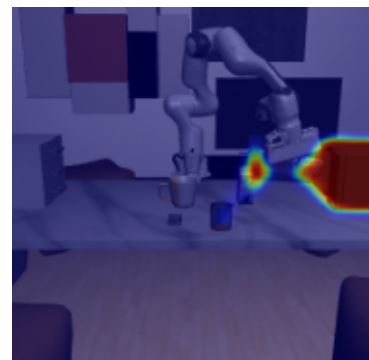
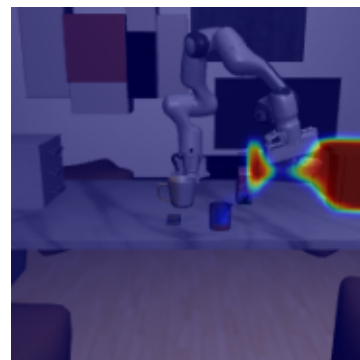
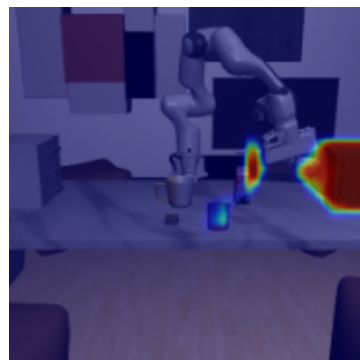
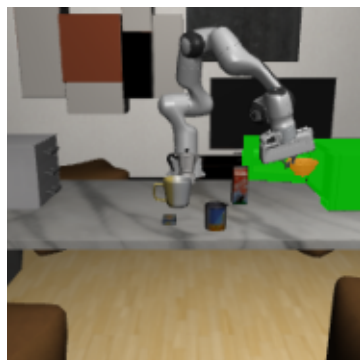
single-object GT (old) ↑

dual-object role-aware GT ↓

DINO+CLIP

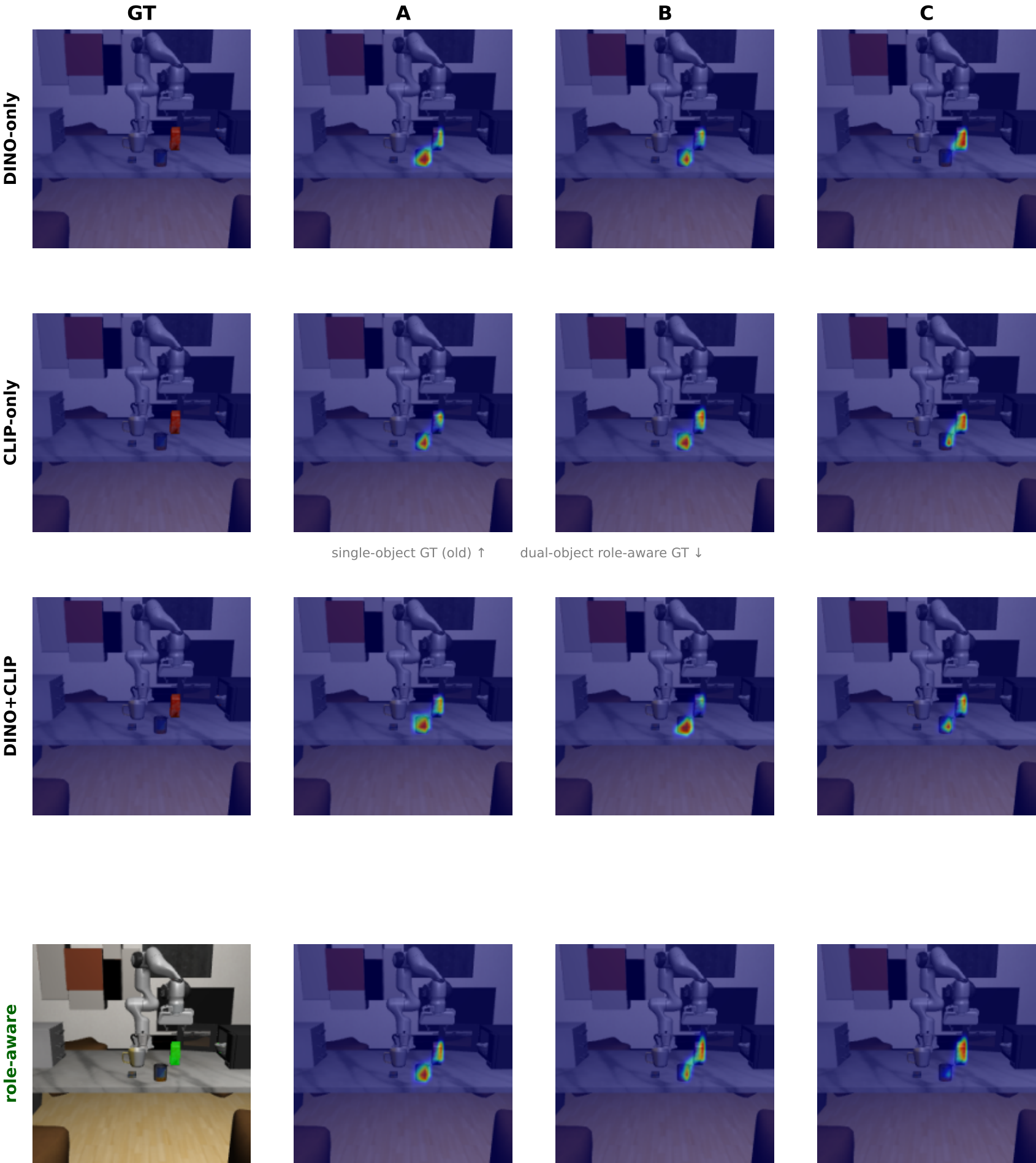


role-aware



Memory_Execution_case9 — step: Pick up the milk from its storage. [grasp]

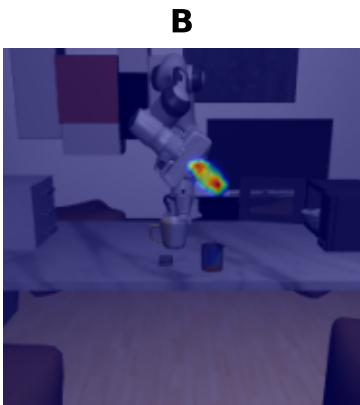
goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug,reposition t



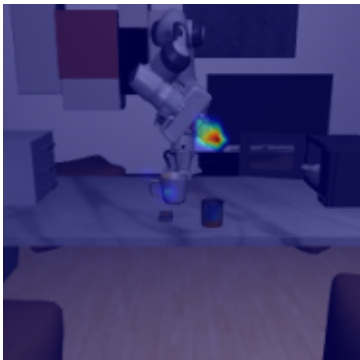
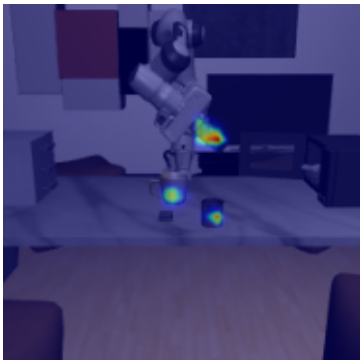
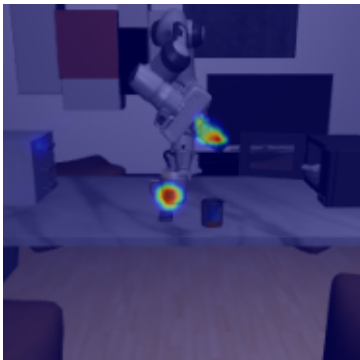
Memory_Execution_case9 — step: Pour out the milk into the white yellow mug. [manipulate]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug, reposition t

DINO-only

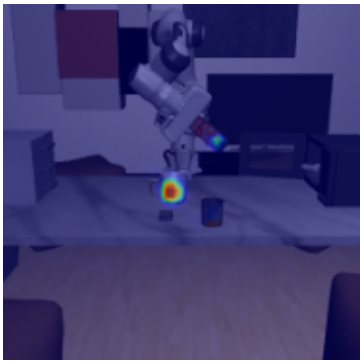
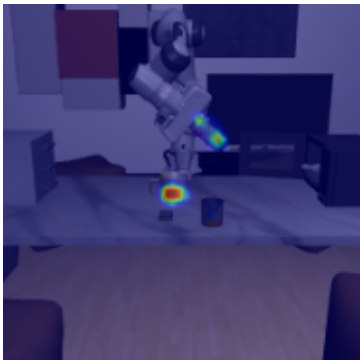
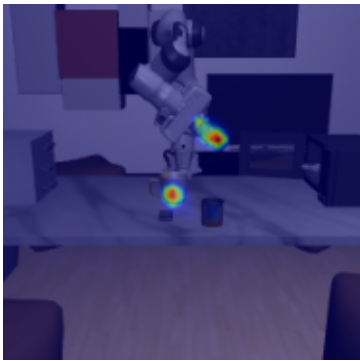


CLIP-only

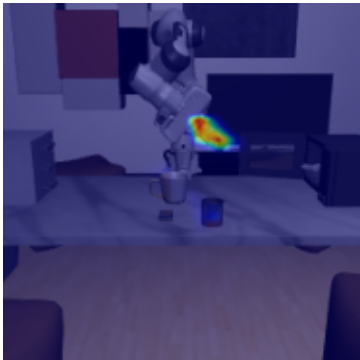
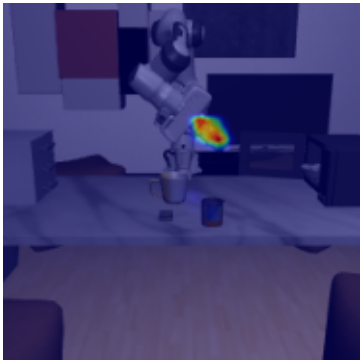
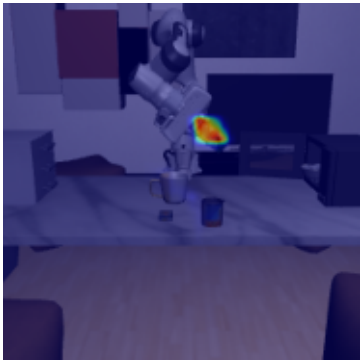


single-object GT (old) ↑ dual-object role-aware GT ↓

DINO+CLIP

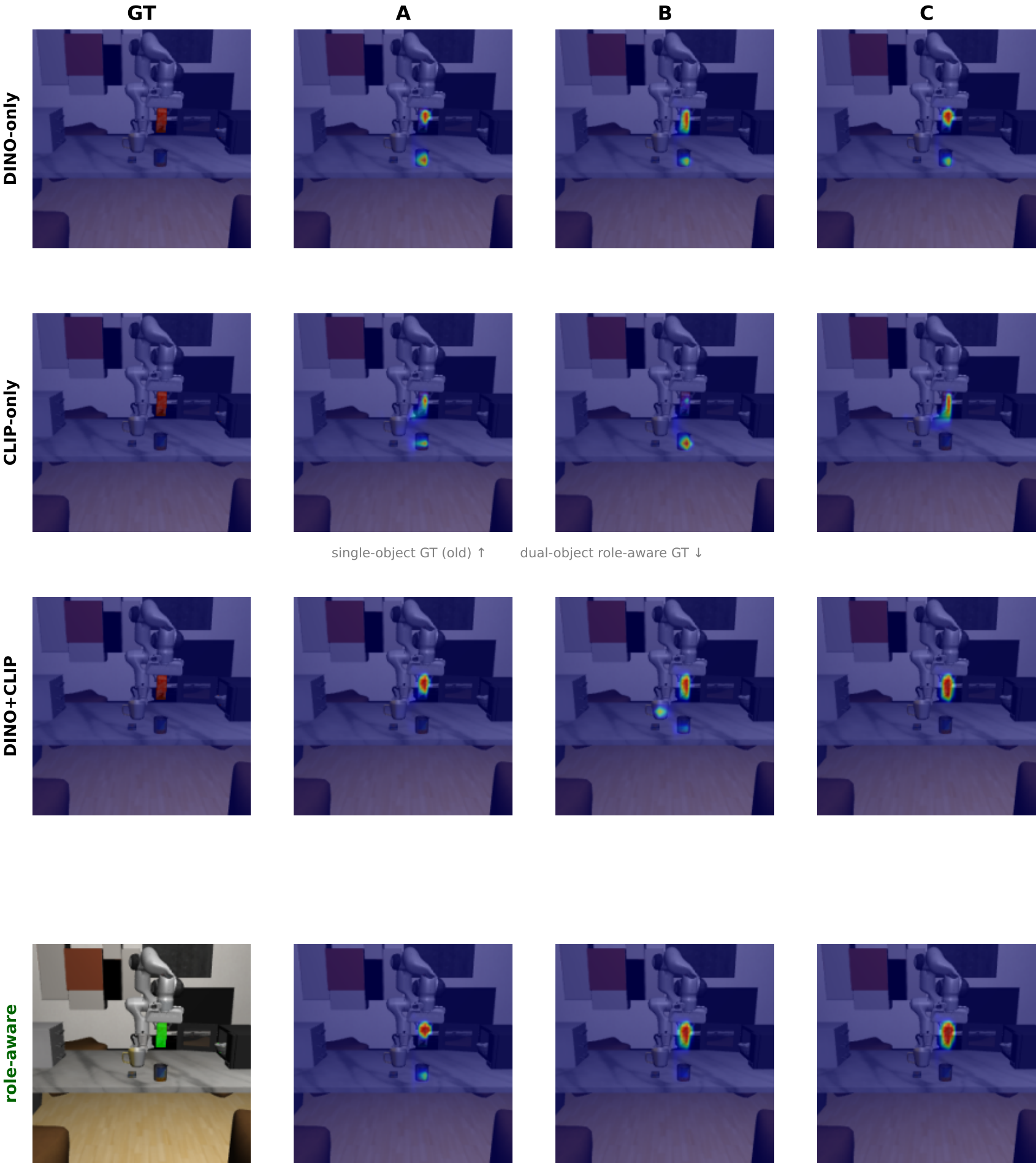


role-aware



Memory_Execution_case9 — step: Place the milk on table surface. [release]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug,reposition t



Memory_Execution_case9 — step: Open the top region of the white cabinet [manipulate]

goal: Heat the alphabet soup in a bowl using the microwave□pour a cup of milk into a mug,reposition t

