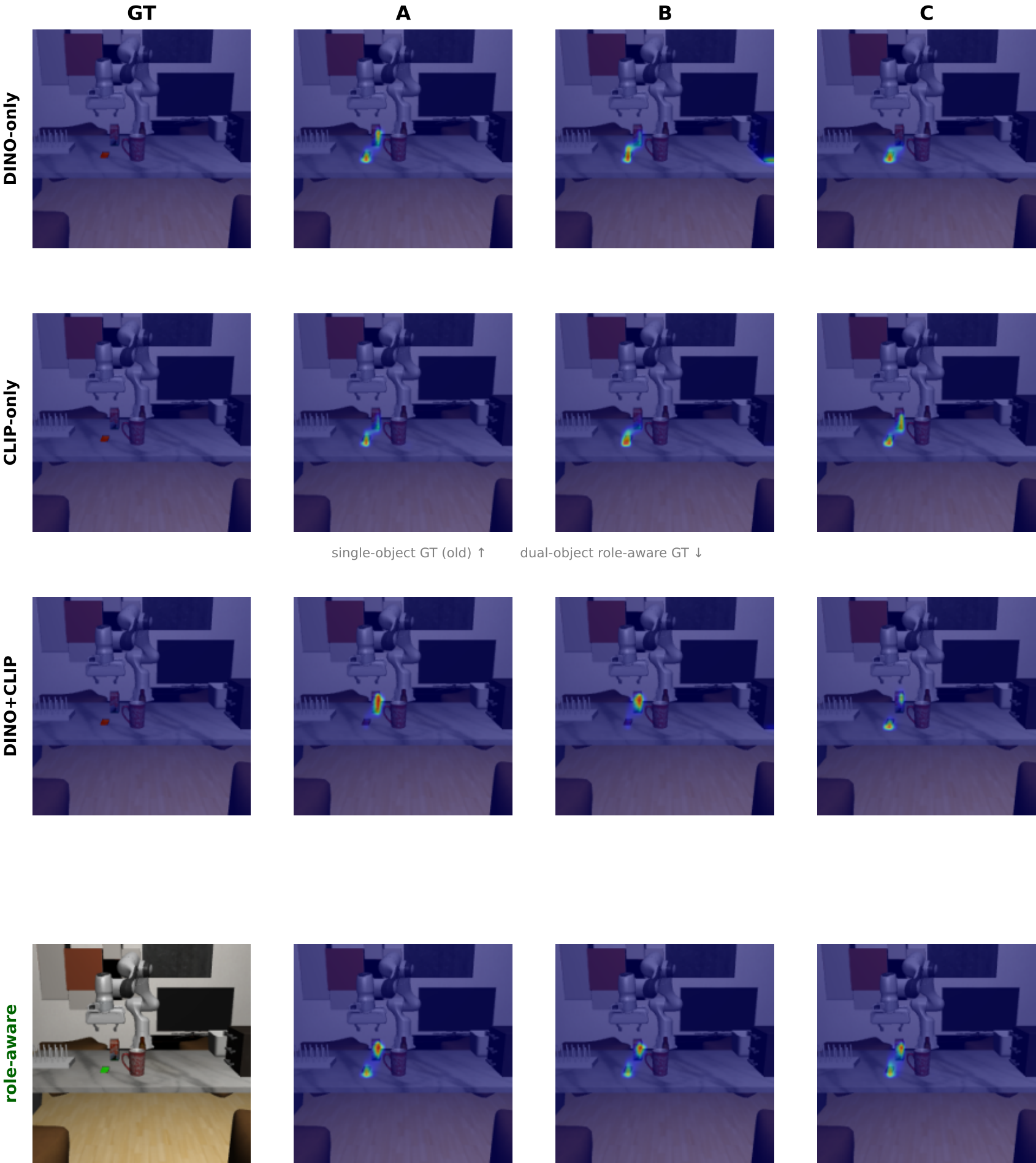


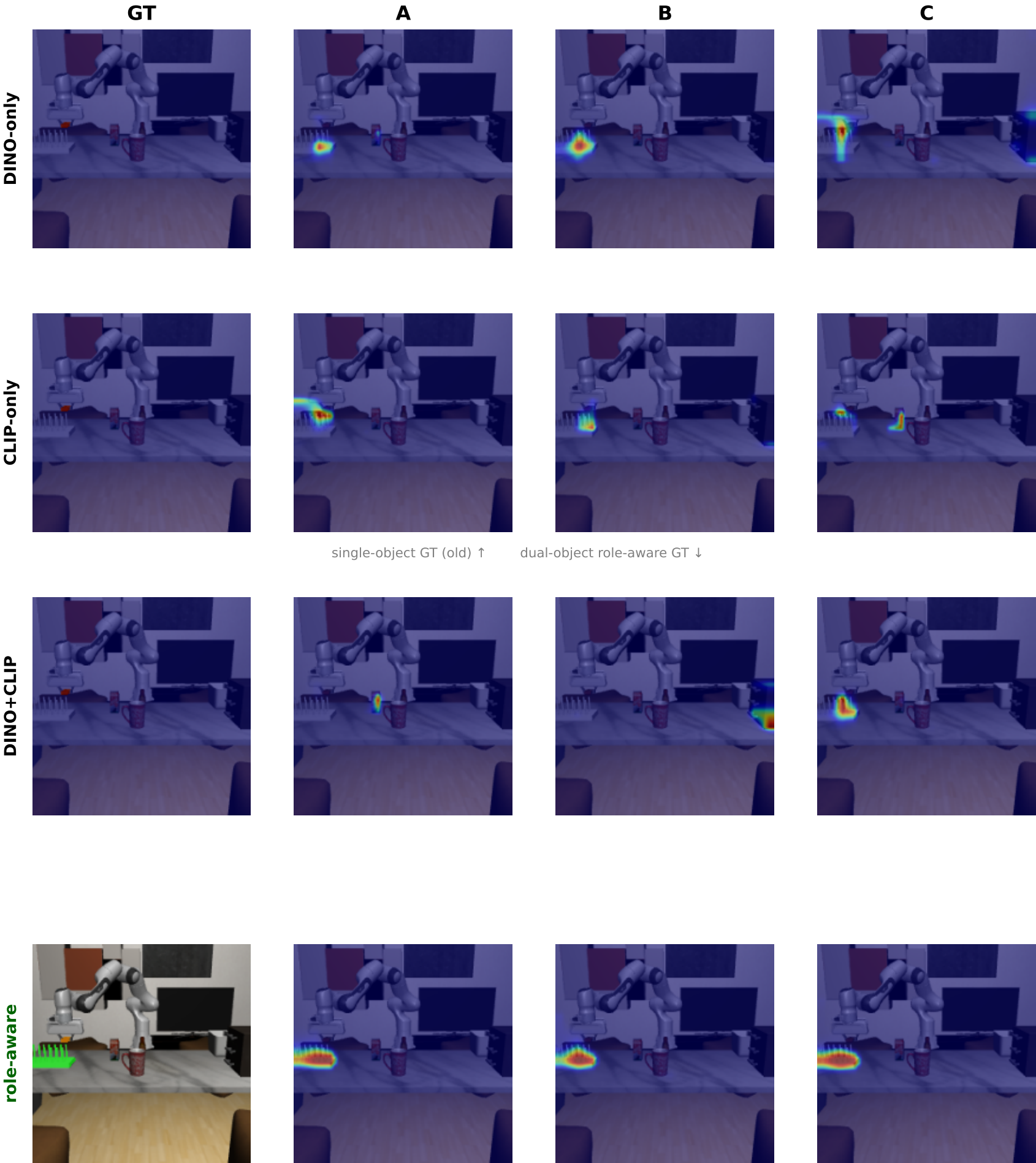
Memory_Execution_case1 — step: Pick up the butter from coffee table [grasp]

goal: After putting the butter and mug on the rack, pour in the milk, and check the wooden cabinet to



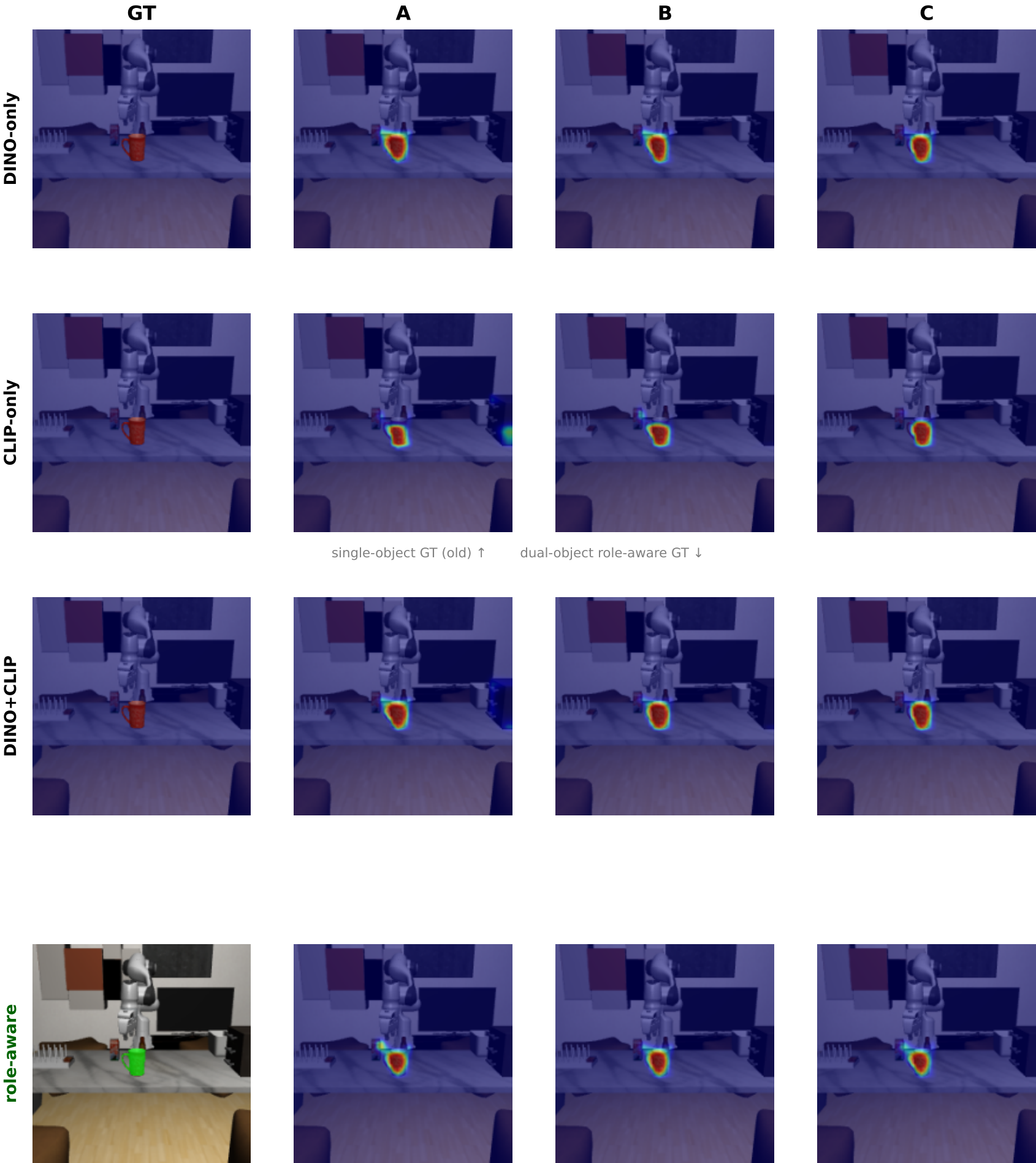
Memory_Execution_case1 — step: Place the butter onto the rack [release]

goal: After putting the butter and mug on the rack, pour in the milk, and check the wooden cabinet to



Memory_Execution_case1 — step: Pick up the red coffee mug from coffee table [grasp]

goal: After putting the butter and mug on the rack, pour in the milk, and check the wooden cabinet to



Memory_Execution_case1 — step: Place the red coffee mug onto the rack [release]

goal: After putting the butter and mug on the rack, pour in the milk, and check the wooden cabinet to

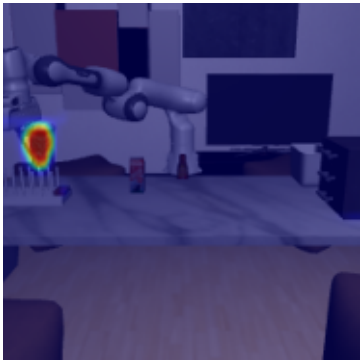
DINO-only



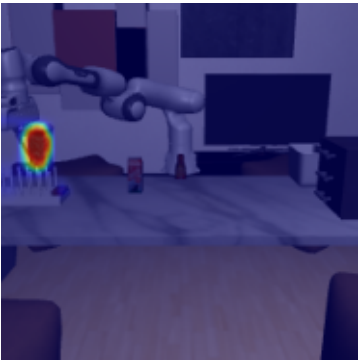
A



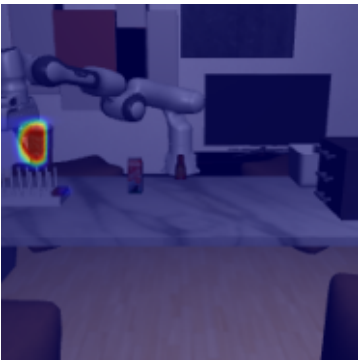
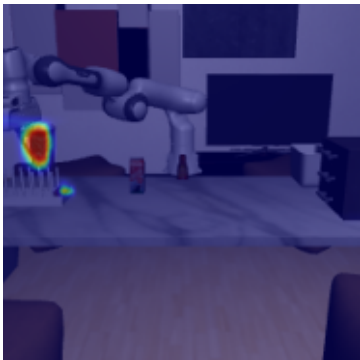
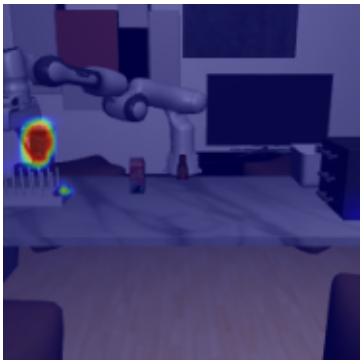
B



C

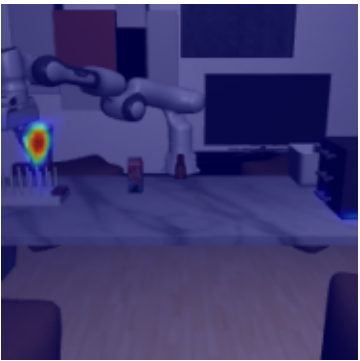
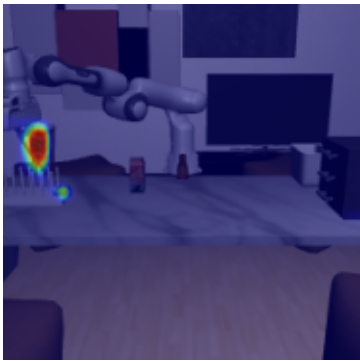
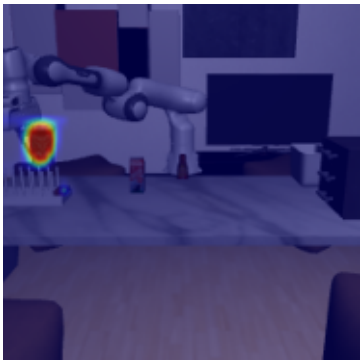


CLIP-only

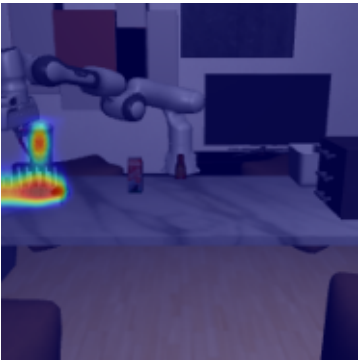
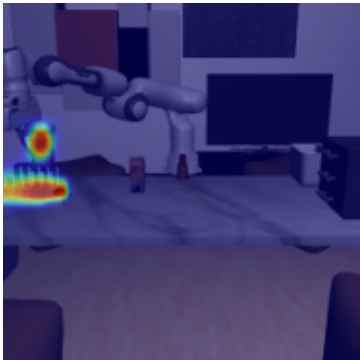
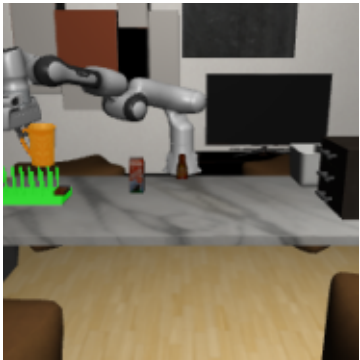


single-object GT (old) ↑ dual-object role-aware GT ↓

DINO+CLIP



role-aware



Memory_Execution_case1 — step: Pick up the milk from coffee table [grasp]

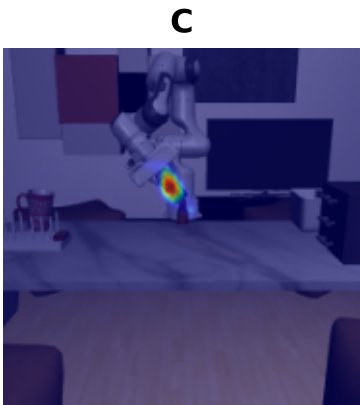
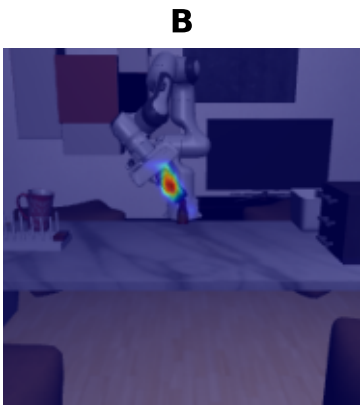
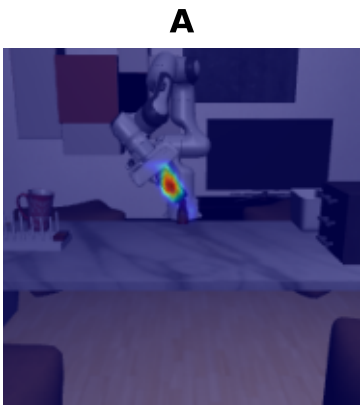
goal: After putting the butter and mug on the rack, pour in the milk, and check the wooden cabinet to



Memory_Execution_case1 — step: Pour out the milk from the milk container [manipulate]

goal: After putting the butter and mug on the rack, pour in the milk, and check the wooden cabinet to

DINO-only

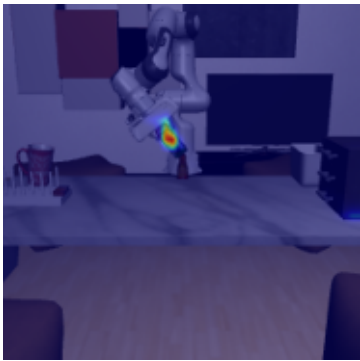
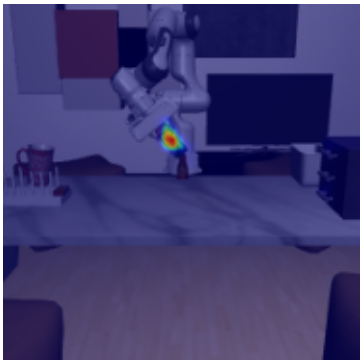
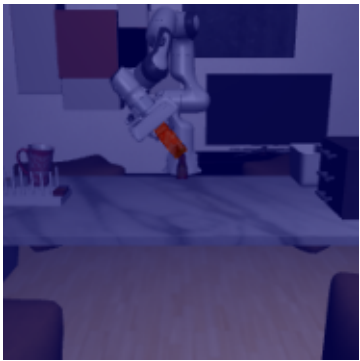


CLIP-only

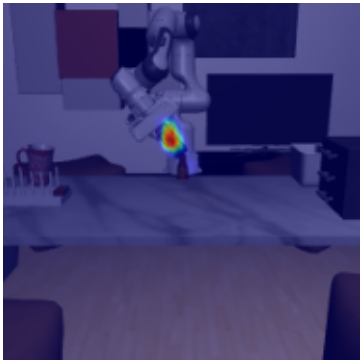


single-object GT (old) ↑ dual-object role-aware GT ↓

DINO+CLIP

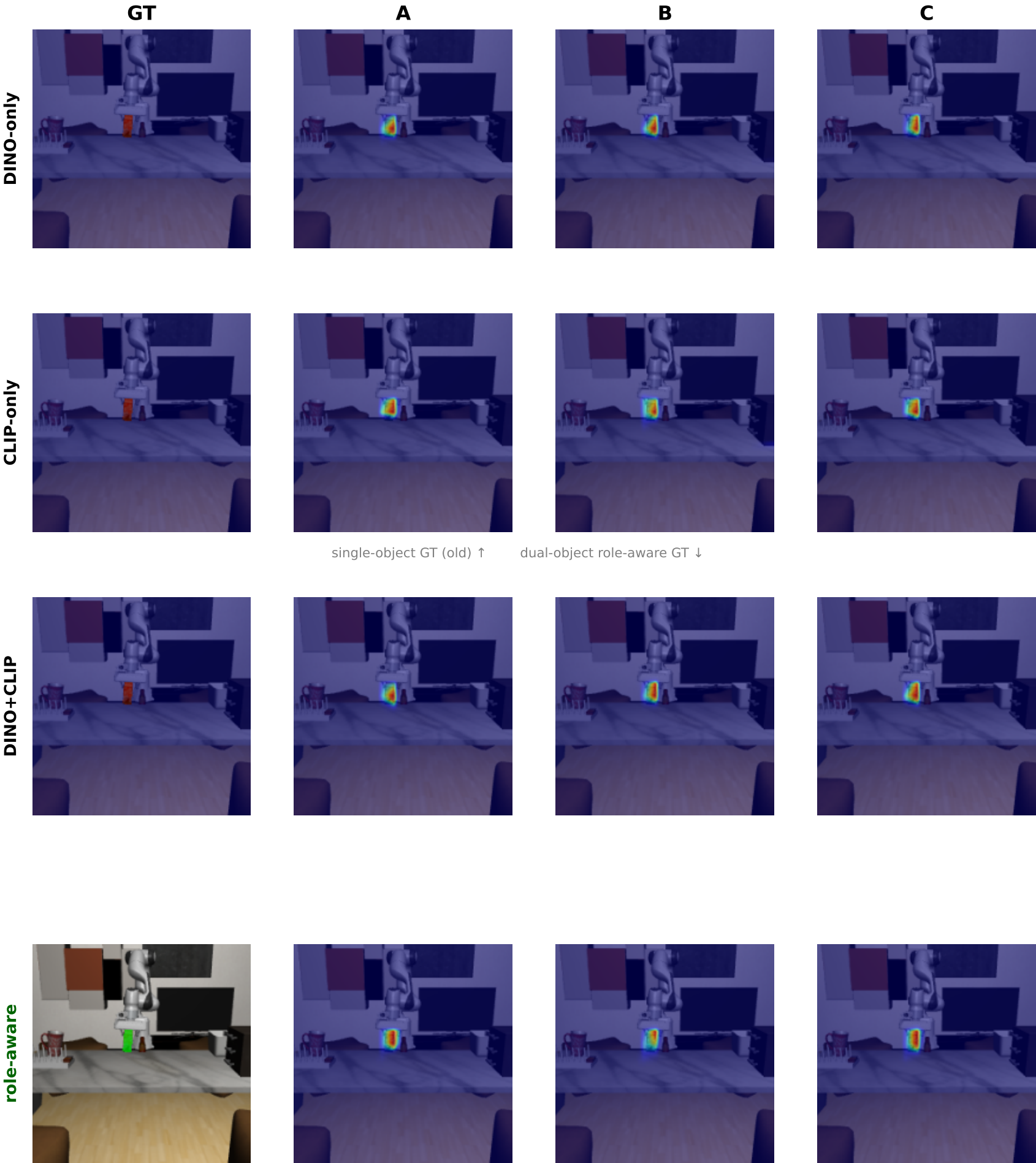


role-aware



Memory_Execution_case1 — step: Place down the milk onto coffee table [release]

goal: After putting the butter and mug on the rack, pour in the milk, and check the wooden cabinet to



Memory_Execution_case1 — step: Open the wooden cabinet top region [manipulate]

goal: After putting the butter and mug on the rack, pour in the milk, and check the wooden cabinet to

