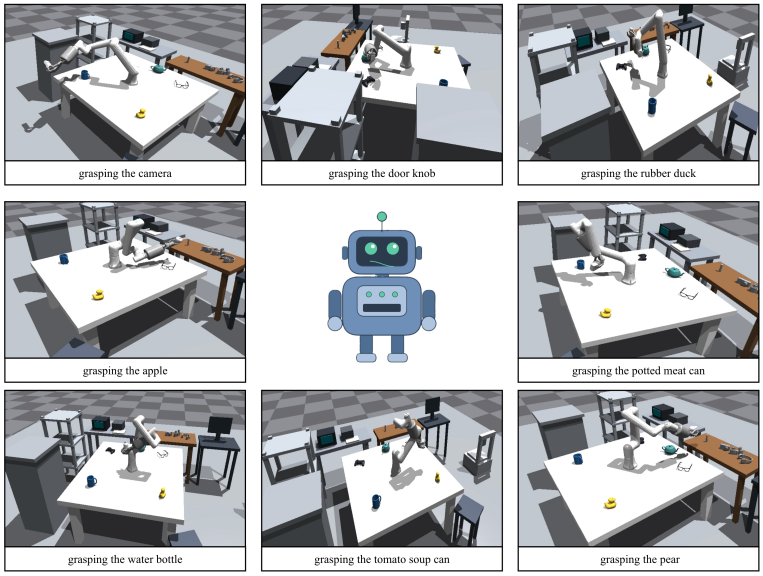
Supplementary Information

EfficientDexGrasp: Diverse and Physically Feasible Dexterous Grasping via Few-Step Diffusion Distillation

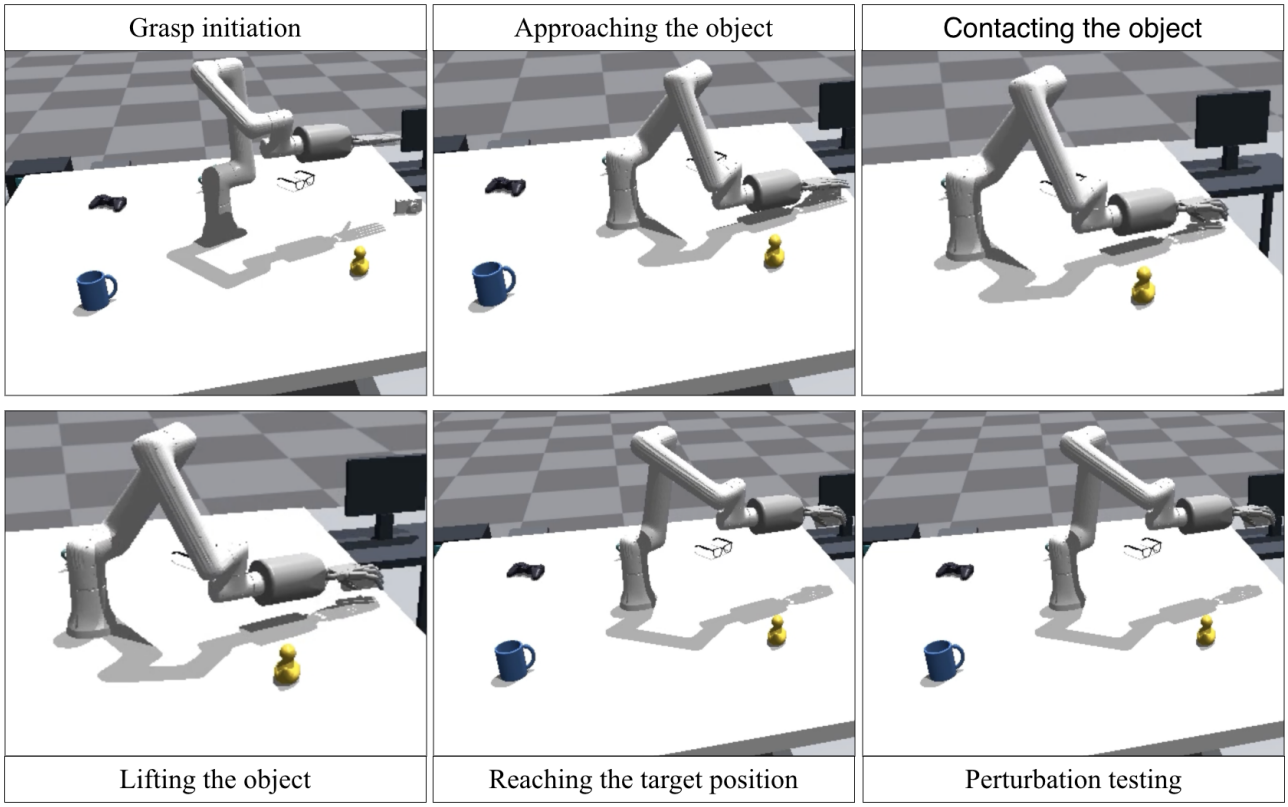
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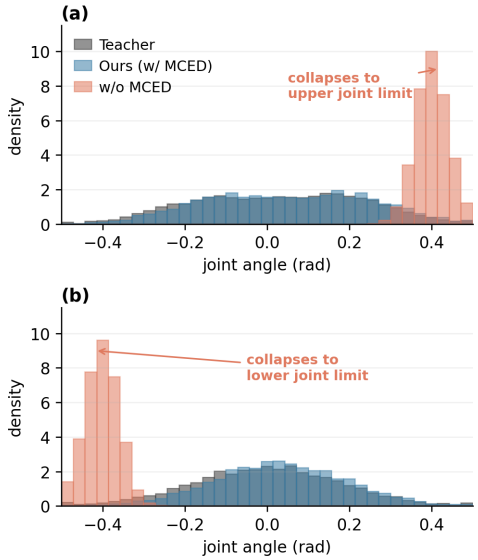
This file contains the qualitative visualizations referred to in the main text: the six-direction stability test in IsaacGym (Supplementary Fig. S1), a complete pick-and-place rollout (Supplementary Fig. S2), and per-joint angle distributions with and without MCED (Supplementary Fig. S3).



Supplementary Fig. S1. Qualitative visualization of the student model evaluated in the IsaacGym simulator. The generated grasp pose is loaded onto the ShadowHand, and external perturbation forces are applied along the six axis-aligned directions ($\pm X$, $\pm Y$, $\pm Z$) to assess grasp stability. Our student model produces a physically plausible grasp that remains stable under multi-directional disturbances.



Supplementary Fig. S2. Qualitative rollout of a complete grasp execution by our student model in the IsaacGym simulator. From left to right, top to bottom: (a) grasp initiation, (b) approaching the object, (c) contacting the object, (d) lifting the object, (e) reaching the target position, and (f) perturbation testing, in which external forces are applied along multiple directions to verify grasp stability. The generated grasp remains stable throughout the entire pick-and-place sequence and under multi-directional disturbances.



Supplementary Fig. S3. Per-joint angle distribution of generated grasps for a representative joint. Without MCED (red), the student collapses toward the joint limits—(a) the upper limit and (b) the lower limit—producing degenerate configurations pressed against the kinematic boundary. With MCED (blue), the distribution closely matches the teacher (gray), preserving the full range of valid articulations. Shown for one joint; the same pattern holds for the other joints we inspected.