




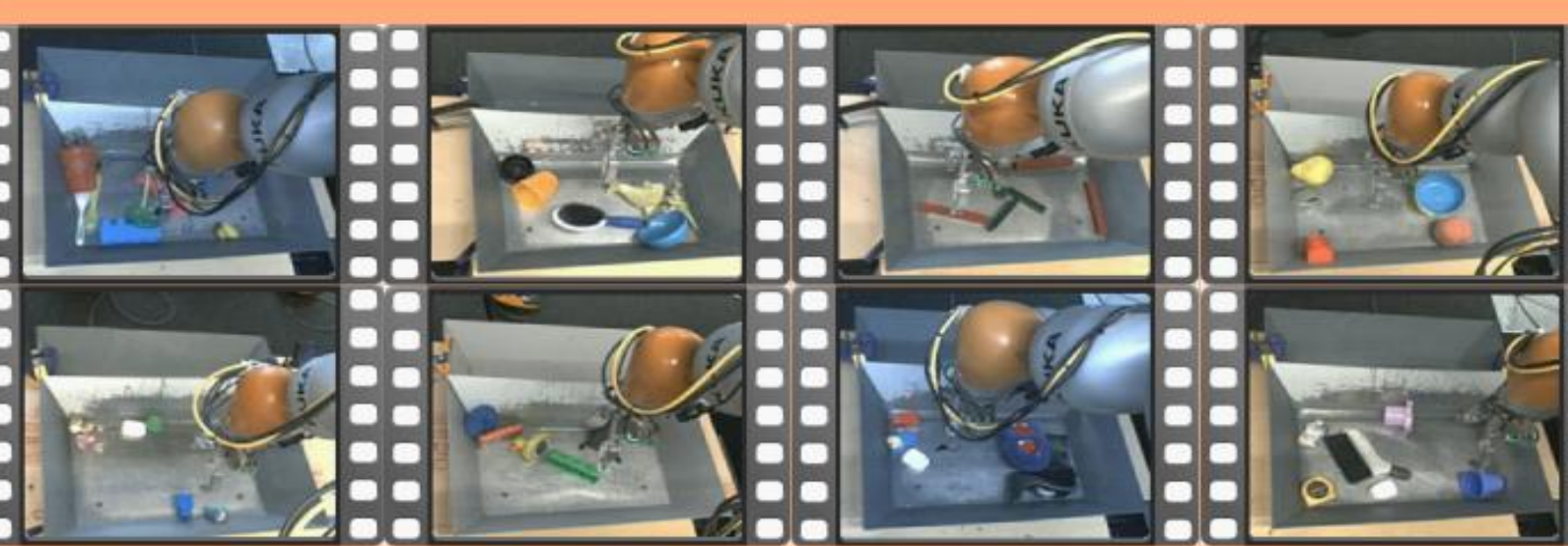
Challenge

Dataset A




Video of Robot A in Environment A

Dataset B




Video of Robot B in Environment B

Swap with Robot B



Swap with Robot A



We propose a **GAN-driven** video-diffusion approach that swaps robotic arms across domains **without paired data**—unlike prior work limited to the same environment, while preserving the reference arm's motion dynamics.

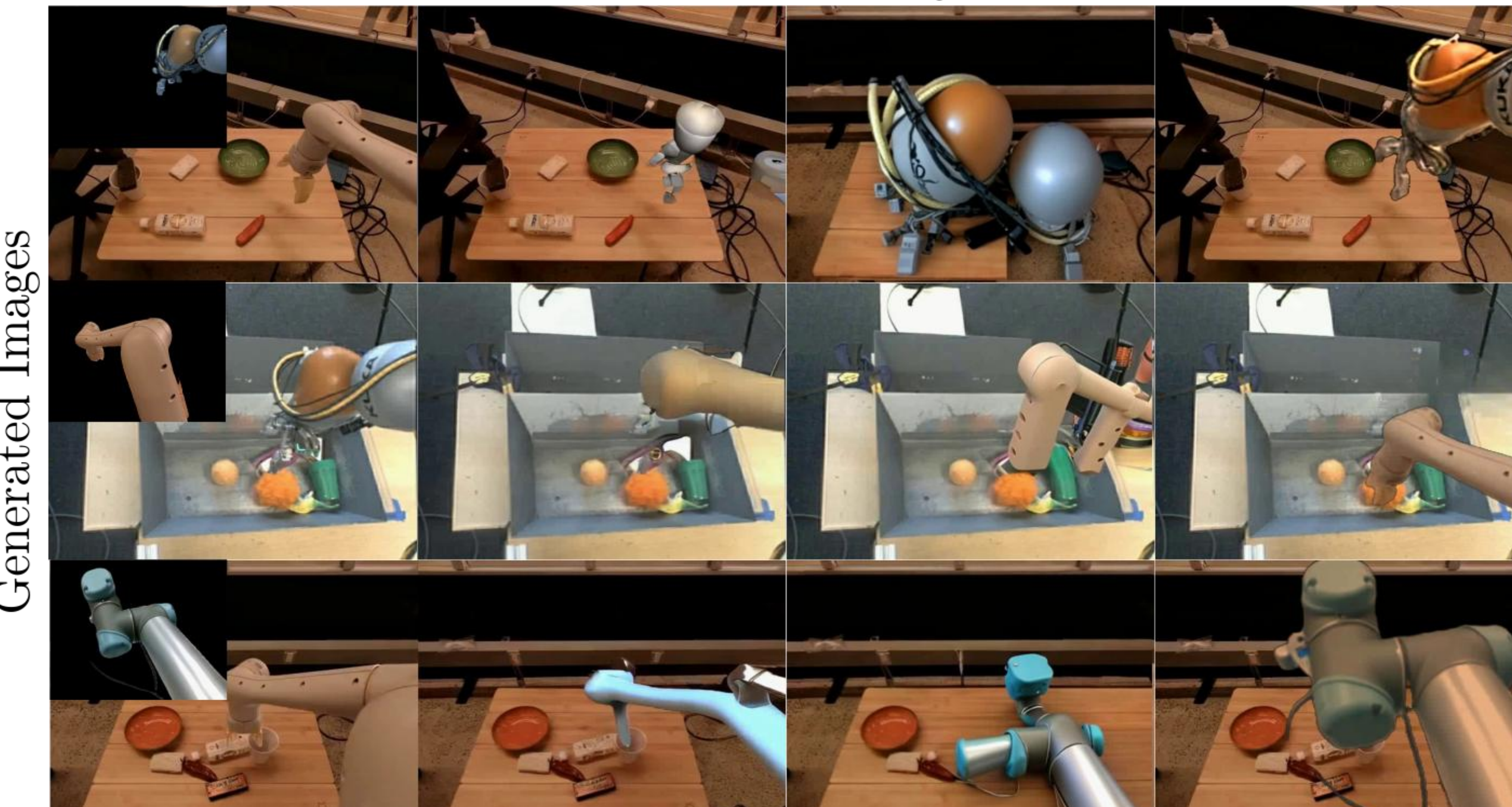
Image Editing Comparison

Source

PBE

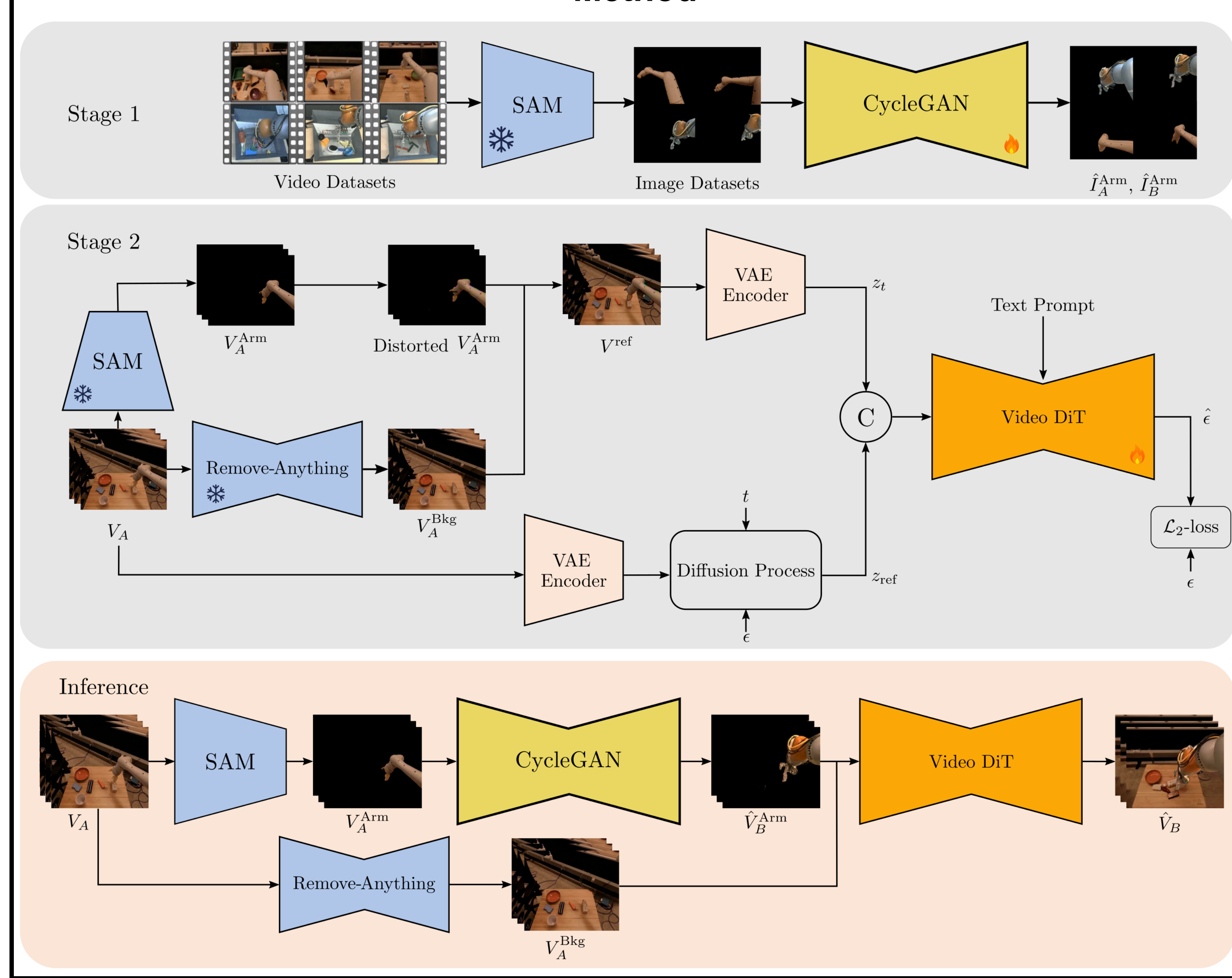
AnyDoor

Ours



Generated Images

Method



Contributions

1. Unpaired Swapping

- Robotic arm replacement in videos reduces data needs in **unpaired** embodiment transfer.

2. Hybrid Framework Pipeline

- Two-stage GAN-diffusion approach** with key design insights from ablation studies.

3. State-of-the-Art

- Superior results** on three benchmarks with strong generalization.

Video Editing Comparison

Source

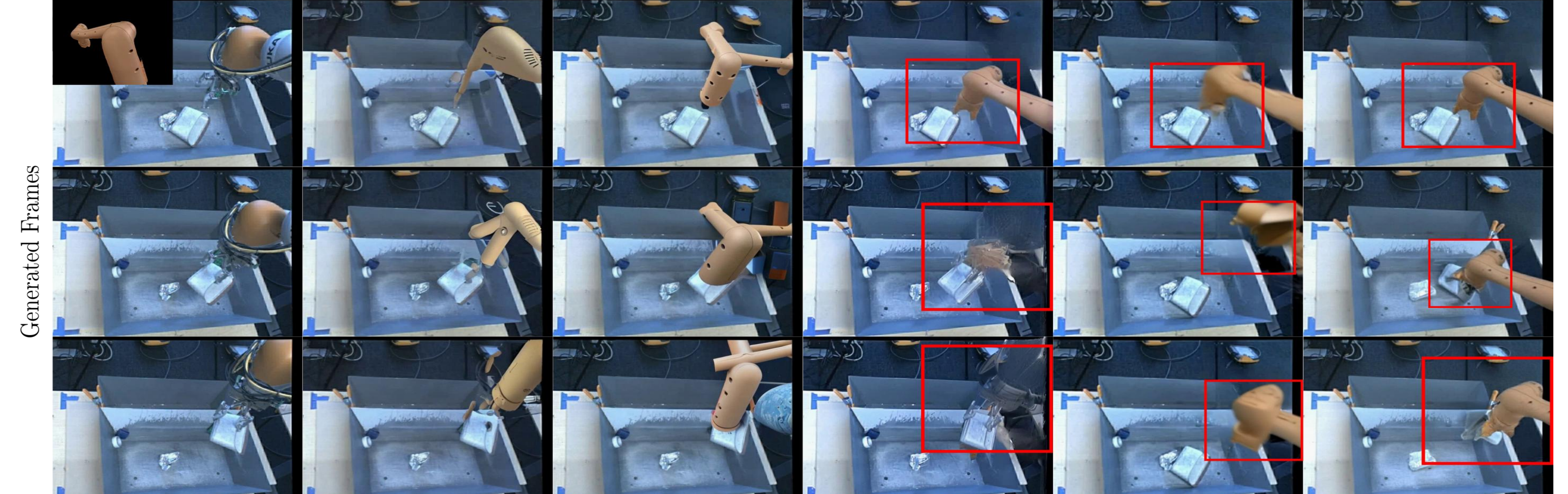
PBE(per frame)

Anydoor(per frame)

AnyV2V

I2VEdit

Ours



Generated Frames

Qualitative Results

Method	Google robot \rightarrow Kuka robot						Kuka robot \rightarrow Google robot						Google robot \rightarrow UR5					
	Mot. Cons.	Bg. Cons.	Subj. Cons.	Tem. Fli.	Can be Swapped	User Pref.	Mot. Cons.	Bg. Cons.	Subj. Cons.	Tem. Fli.	Can be Swapped	User Pref.	Mot. Cons.	Bg. Cons.	Subj. Cons.	Tem. Fli.	Can be Swapped	User Pref.
PBE (Per-frame)	0.9777	0.9119	0.8455	0.9761	✗	0	0.9729	0.9336	0.8739	0.9694	✗	0	0.9787	0.9345	0.8806	0.9758	✗	0
AnyDoor (Per-frame)	0.9423	0.8956	0.8605	0.9343	✗	0	0.9381	0.8826	0.8458	0.9314	✗	0	0.9185	0.9007	0.8639	0.9093	✗	0
AnyV2V	0.9869	0.9213	0.8732	0.9830	✓	13.99	0.9832	0.9000	0.8845	0.9806	✓	3.28	0.9872	0.9129	0.9174	0.9825	✓	6.74
I2VEdit	0.9864	0.9479	0.9139	0.9726	✓	20.69	0.9881	0.9465	0.9374	0.9866	✓	4.56	0.9839	0.9459	0.9104	0.9755	✓	17.52
CycleGAN	0.9822	0.9492	0.9247	0.9765	✗	0	0.9767	0.9473	0.9274	0.9730	✗	0	0.9747	0.9416	0.9400	0.9656	✗	0
I2V-Original	0.9895	0.9414	0.9230	0.9884	✗	0	0.9904	0.9482	0.9312	0.9924	✗	0	0.9908	0.9612	0.9484	0.9906	✗	0
I2V-Bkg	0.9938	0.9535	0.9416	0.9946	✗	0	0.9922	0.9537	0.9535	0.9945	✗	0	0.9936	0.9527	0.9412	0.9946	✗	0
I2V-Swapped	0.9875	0.9268	0.9413	0.9857	✗	8.64	0.9944	0.9824	0.9473	0.9960	✓	30.47	0.9869	0.9455	0.9116	0.9857	✗	19.24
<i>Ours with CUT</i>	0.9889	0.9645	0.9413	0.9892	✓	27.97	0.9927	0.9638	0.9560	0.9946	✓	29.13	0.9905	0.9588	0.9549	0.9926	✓	24.62
<i>Ours with CycleGAN</i>	0.9894	0.9617	0.9381	0.9892	✓	28.71	0.9934	0.9558	0.9573	0.9952	✓	32.56	0.9906	0.9628	0.9737	0.9926	✓	31.88