Identity Decoupling for Multi-Subject Personalization of Text-to-Image Models

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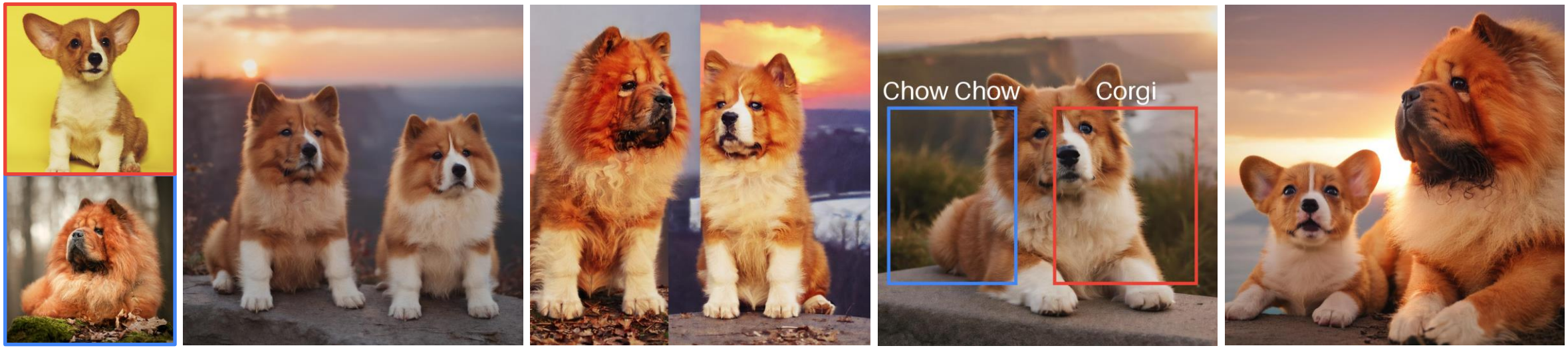
Multi-subject Personalization

Previous personalization methods often struggle to handle multiple subjects simultaneously, suffering from **identity mixing** during composition of subjects.



References **(a) DreamBooth (DB)** **(b) Cut-Mix** **(c) DB + Region Control** **(d) MuDI (Ours)**

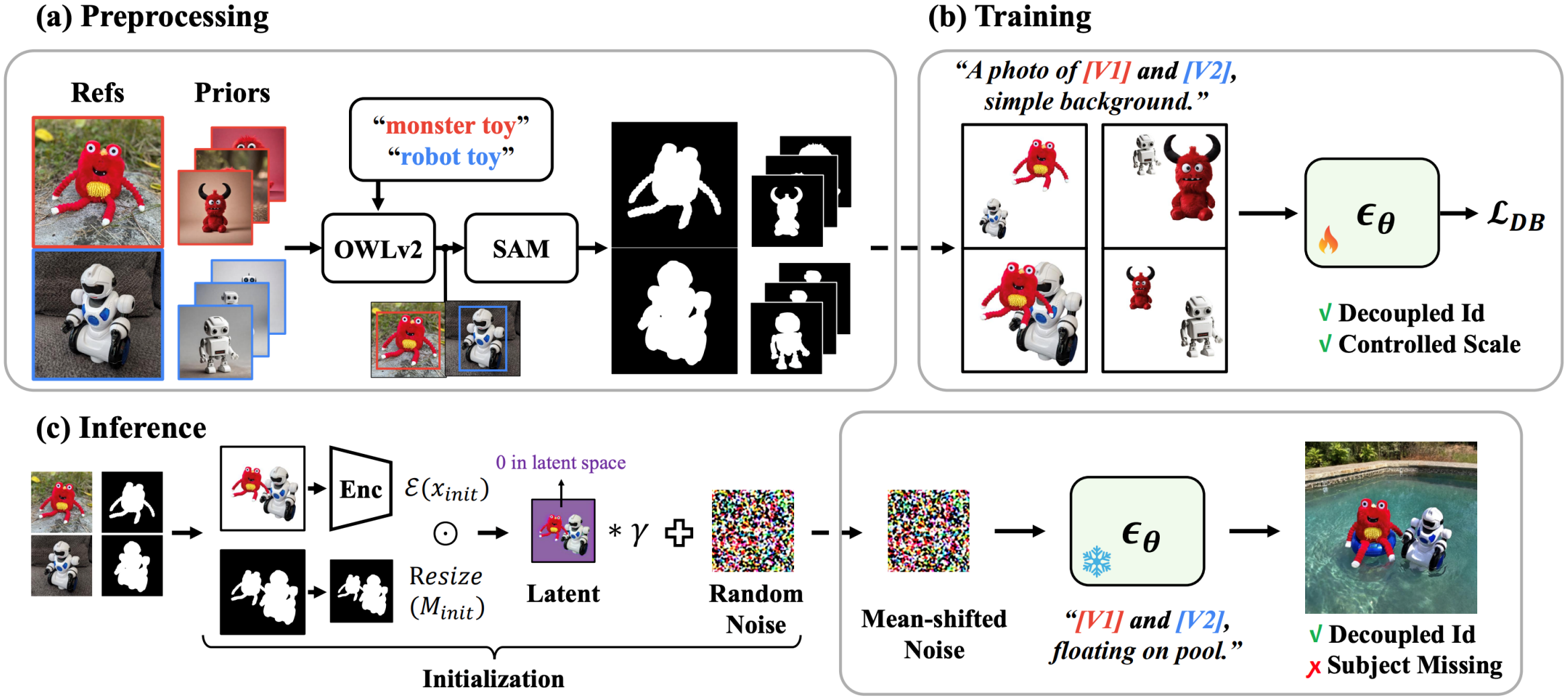
For example, DreamBooth generates images of dogs with mixed identities.

Our Contributions

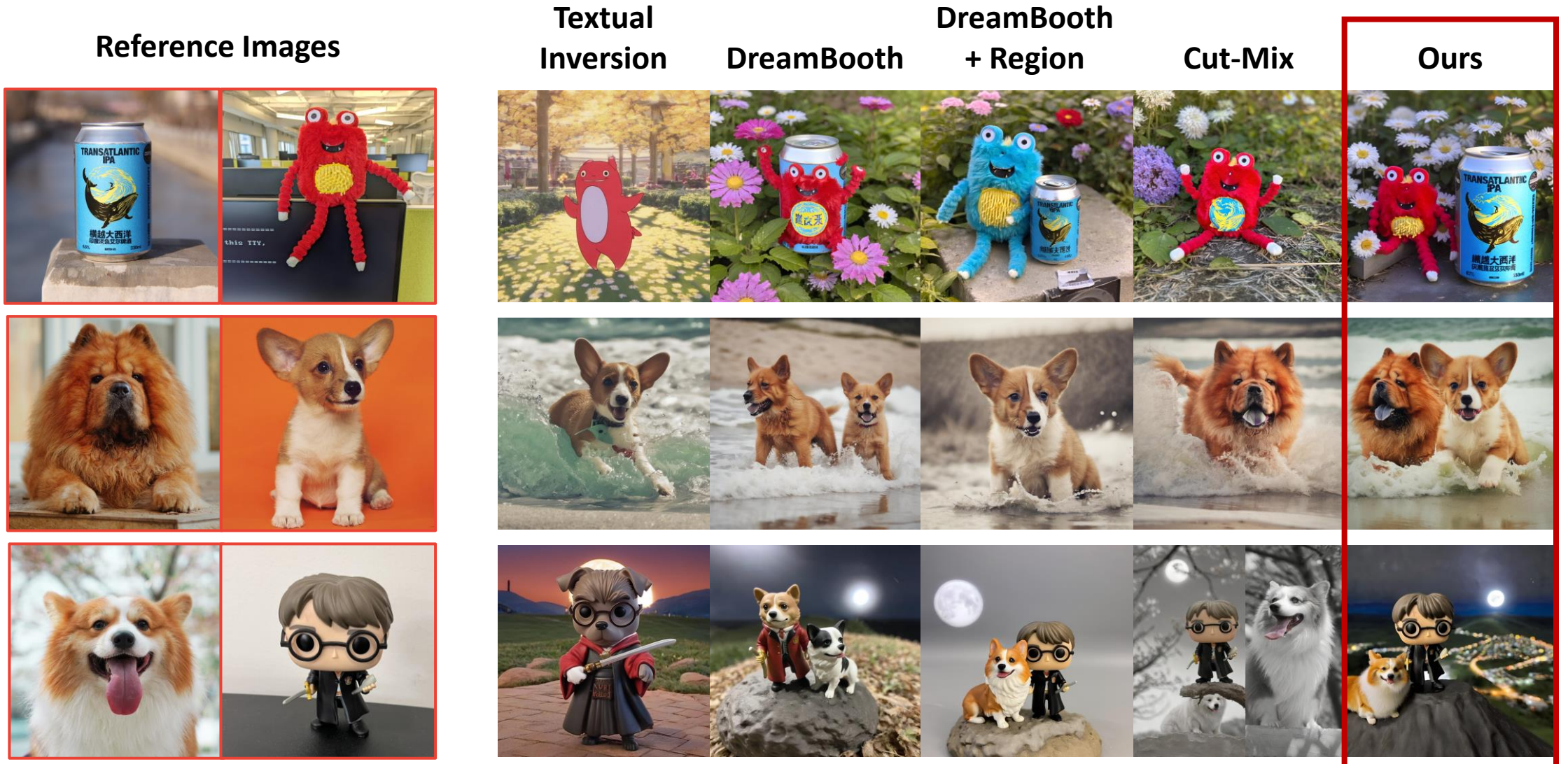
We present MuDI, a **multi-subject personalization framework** that **prevents identity mixing** even for highly similar subjects.

- Training: Data augmentation method that randomly composes segmented subjects
- Inference: Initialization techinque using mean-shifted random noise created from segmented subjects.
- New dataset and metrics to faciliate the evaluation of multi-subject personalization.

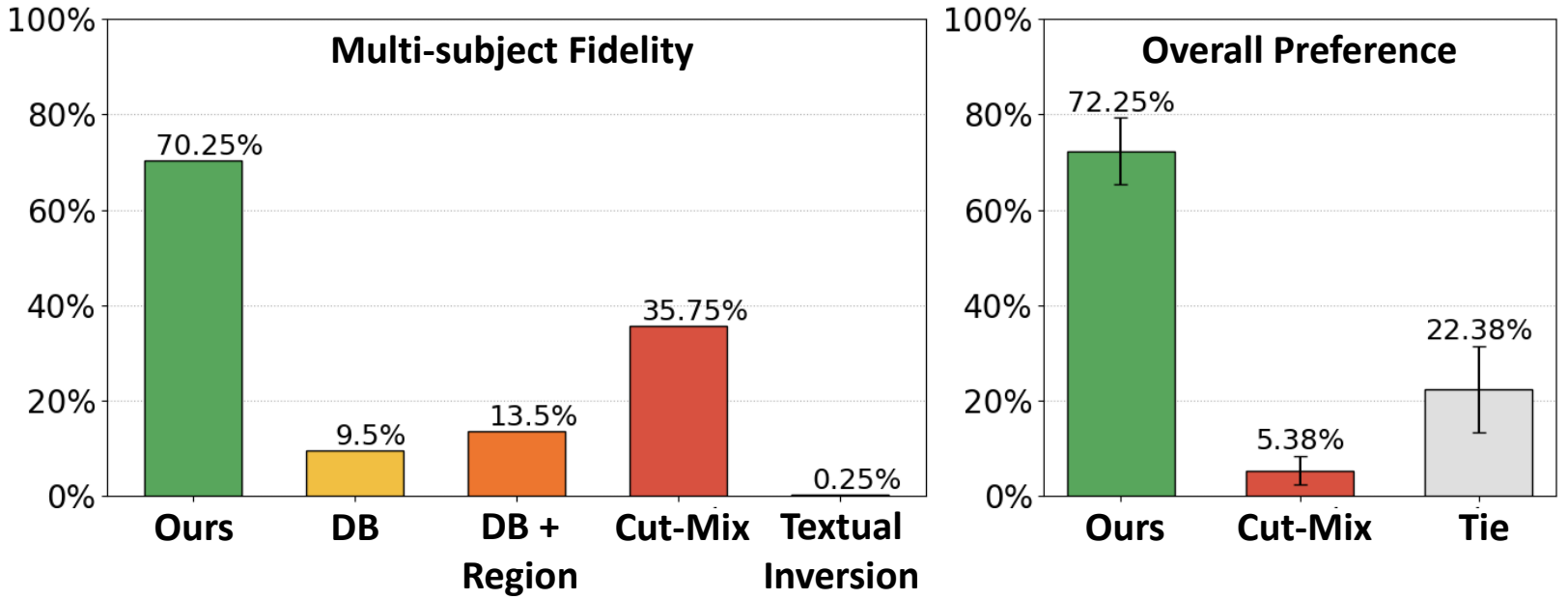
Multi-subject Personalization with MuDI



Qualitative Comparison



Human Evaluation and Metrics



Method	Multi-Subject Fidelity		Text Fidelity	
	D&C-DS↑	D&C-DINO↑	ImageReward†↑	CLIPs†↑
Textual Inversion	0.116	0.132	-0.149	0.227
DreamBooth (DB)	0.371	0.388	0.579	0.255
DB+Region	0.340	0.379	0.349	0.245
Cut-Mix	0.432	0.460	-0.287	0.225
Ours	**0.637**	**0.610**	**0.770**	**0.263**

MuDI is Model-Agnostic

Our framework can be used for **any pre-trained text-to-image diffusion models** (e.g., SDXL, FLUX) as our training/inference methods are architecture-agnostic.

Reference Images

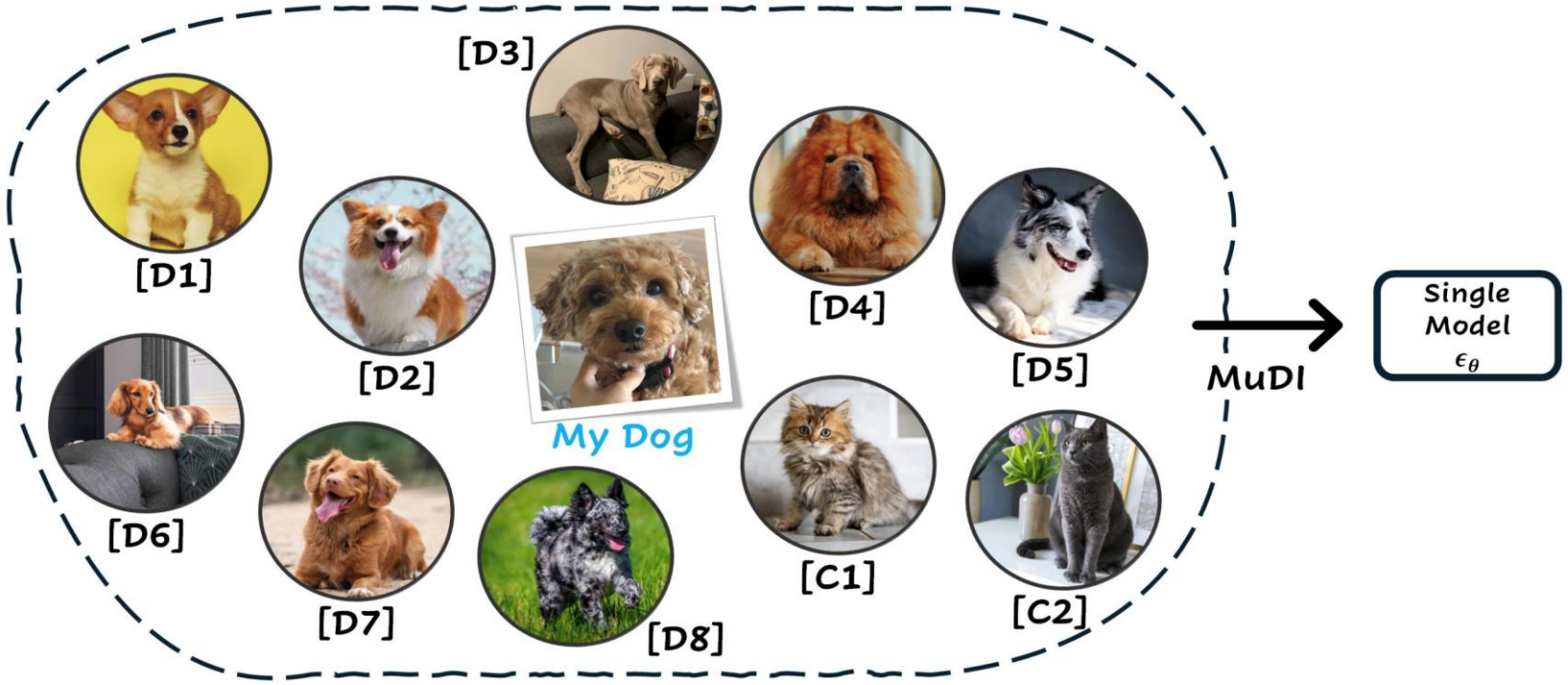
FLUX w/ DreamBooth

FLUX w/ MuDI (Ours)

Personalizing Multiple Subjects

Personalizing 11 Subjects with Single Model

MuDI can **personalize 11 different dogs and cats** all at once with **fine-tuning a single model**!



... playing in the fields of flowers.

... in birthday party.

Thank You!

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