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Introduction

- Existing Generative Neural Radiance Field (NeRF) models cannot conditionally synthesize samples with class labels.
- Class-continuous feature manipulation in 3D-aware generative model is significant to control the elaborate avatar settings in metaverse.

Rotate

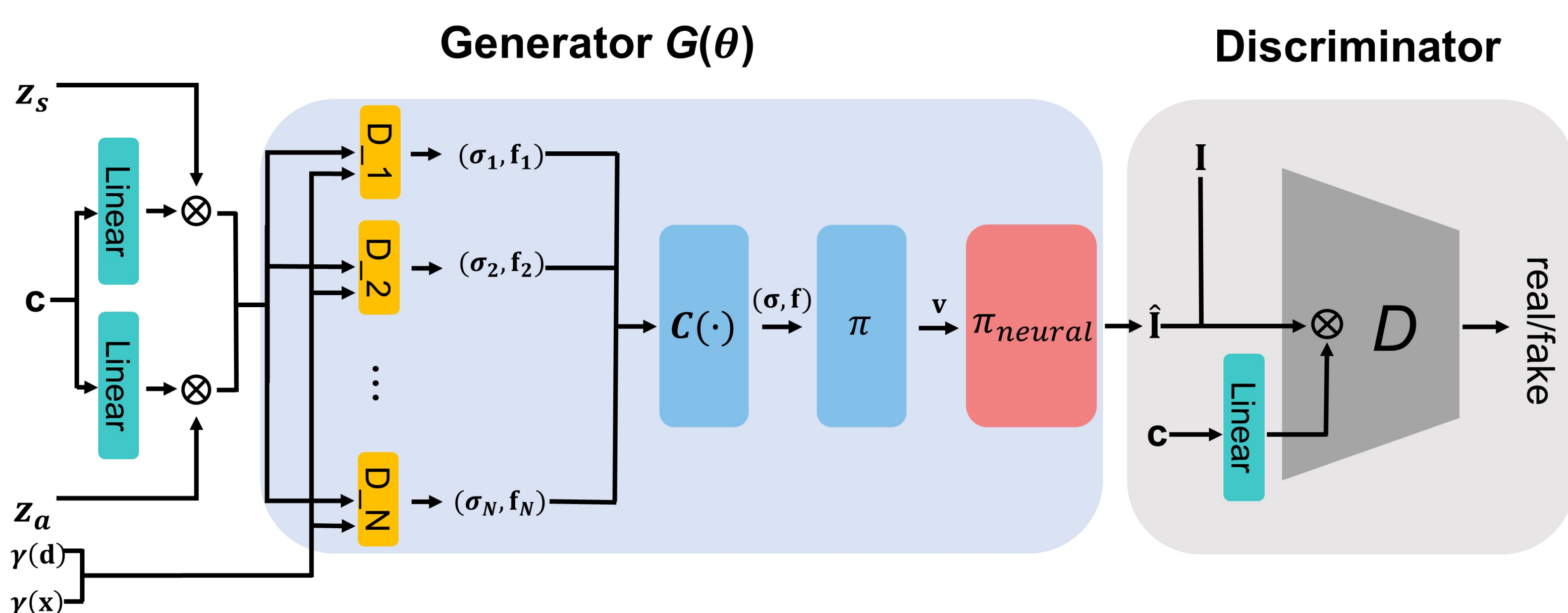


Contributions

- We propose the C³G-NeRF to address a novel task: conditional and continuous feature manipulation in 3D-aware image generation.
- We reduce training time and enhance performance by incorporating residual modules into the NeRF architecture.
- We showcase conditional and continuous feature manipulation in 3D-aware image generation using multiple datasets: AFHQ, CelebA, and Cars.
- Since our model can generate class-conditional 3D-aware images, we provide FID scores for each label in AFHQ and Cars datasets.

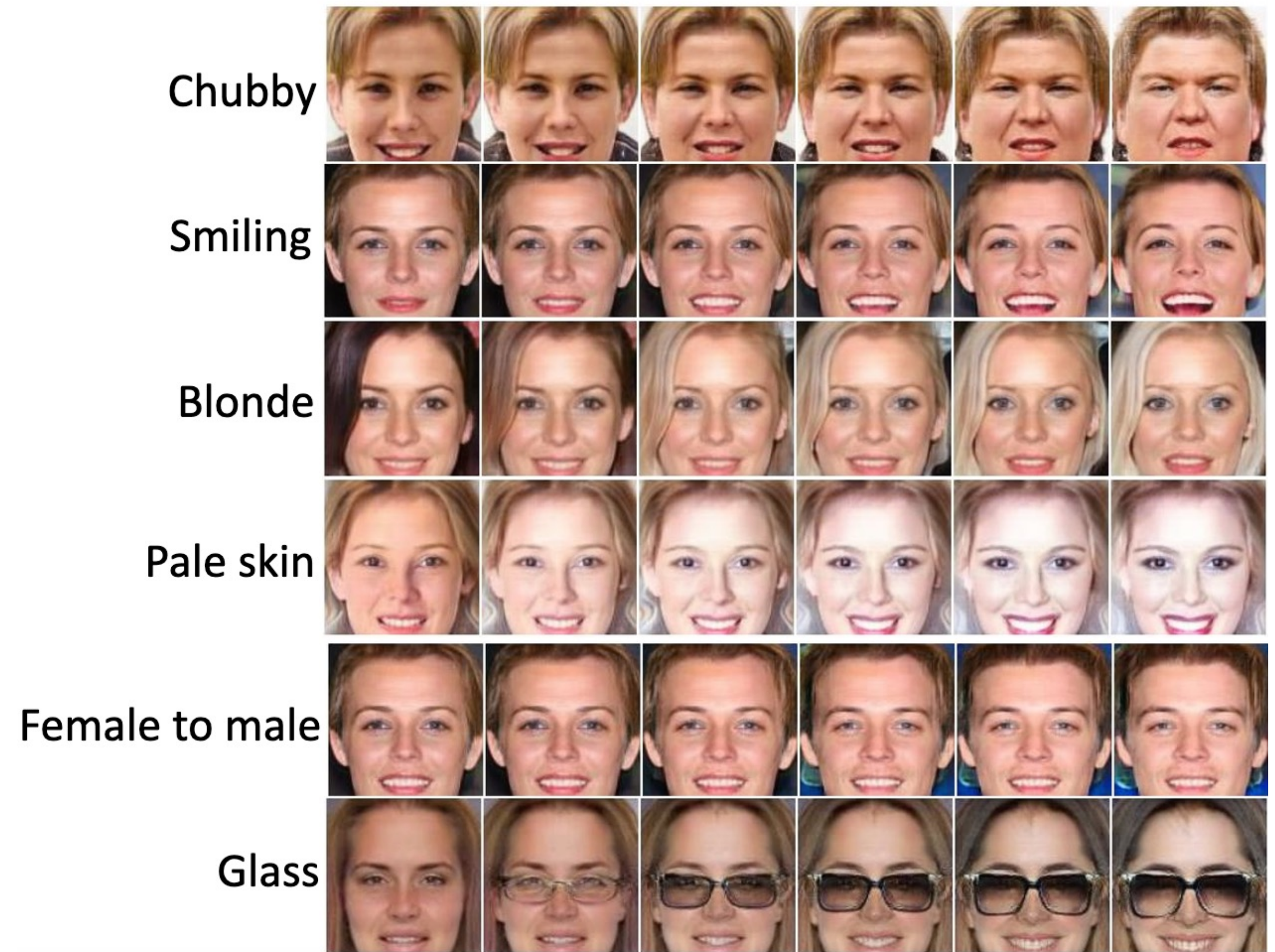
Methods

- Class-Continuous Conditional NeRF (C³G-NeRF) projects conditional labels to the generator and the discriminator.
- Residual Module enables to train C³G-NeRF.



Experiments

0 ← Label interpolation → 3



Feature Manipulation



Image translation (Cat to Dog)

MODEL	AFHQ (FID)			CELEBA(FID)		CARS(FID)		
	64 ²	128 ²	256 ²	64 ²	128 ²	64 ²	128 ²	256 ²
BASELINE	212.74	226.51	239.01	55.90	83.89	228.66	244.55	266.51
Ours	26.72	25.79	28.58	5.60	7.64	44.79	43.29	31.63

MODEL	AFHQ (KID)			CELEBA(KID)		CARS(KID)		
	64 ²	128 ²	256 ²	64 ²	128 ²	64 ²	128 ²	256 ²
BASELINE	0.200	0.352	0.323	0.119	0.296	0.096	0.166	0.303
Ours	0.077	0.059	0.051	0.046	0.023	0.057	0.039	0.043

Baseline model is conditional GIRAFFE without residual modules.

Model	Cars (KID)		Cars (FID)	
	64 ²	128 ²	64 ²	128 ²
pi-GAN	0.105	0.083	137.34	104.51
Ours	0.057	0.039	44.79	43.29

Comparison to pi-GAN

Acknowledgements

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