Image editing with GANs

Latent space

Sampling & Generation

z

z*

Inversion

Reconstruction& Manipulation

Fake Image

$x = G(z), z \sim N(0, 1)$

Real Image

(a) invert real image into latent space

$z^* = \arg\min_z (G(z), x)$

(b) manipulate the inverted image in the latent space

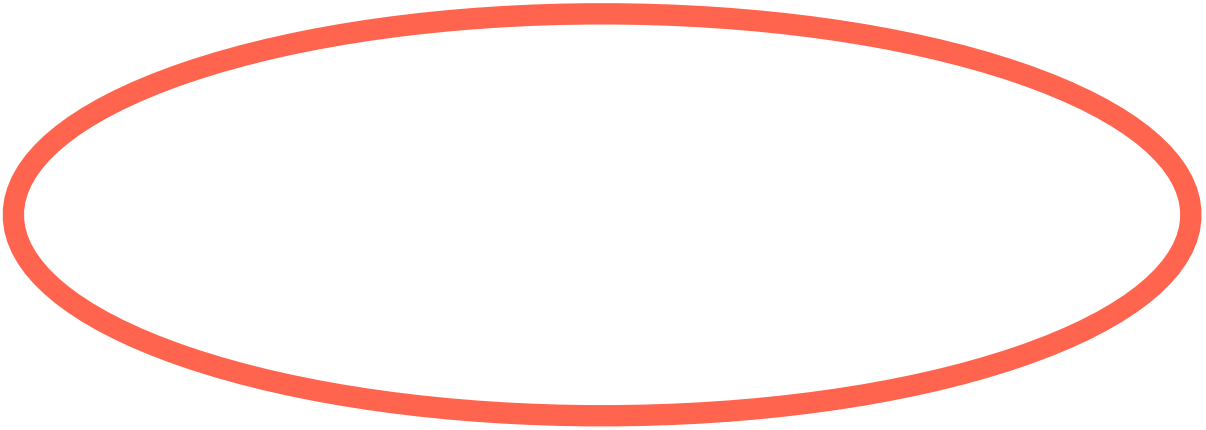
$x = G(z^*)$

$x = G(z^*+n_1)$

Decrease age

$x = G(z^*+n_2)$

Add smile



Use GAN inversion!

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Figure from [22]

[22] Xia *et al.* (2022)

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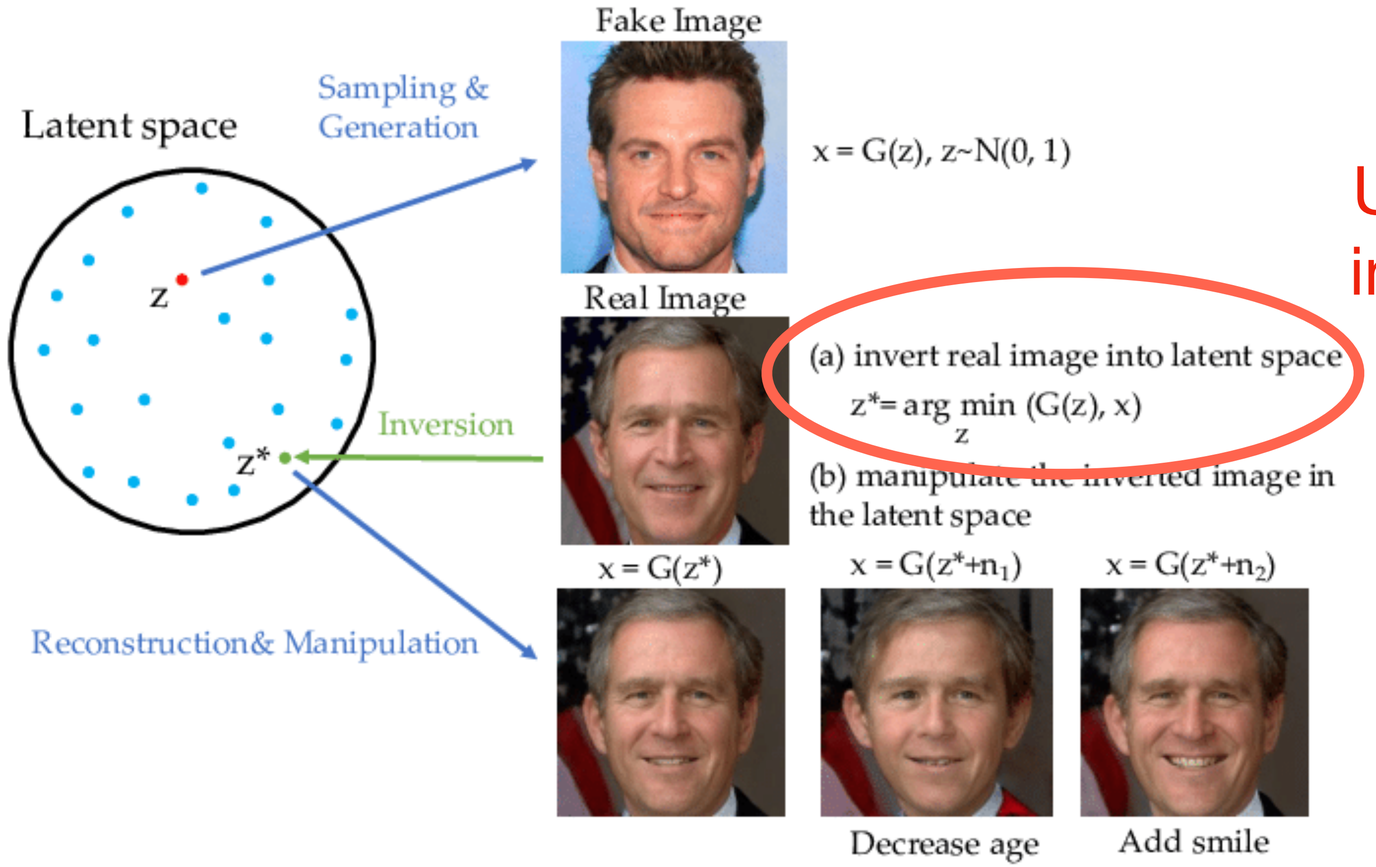


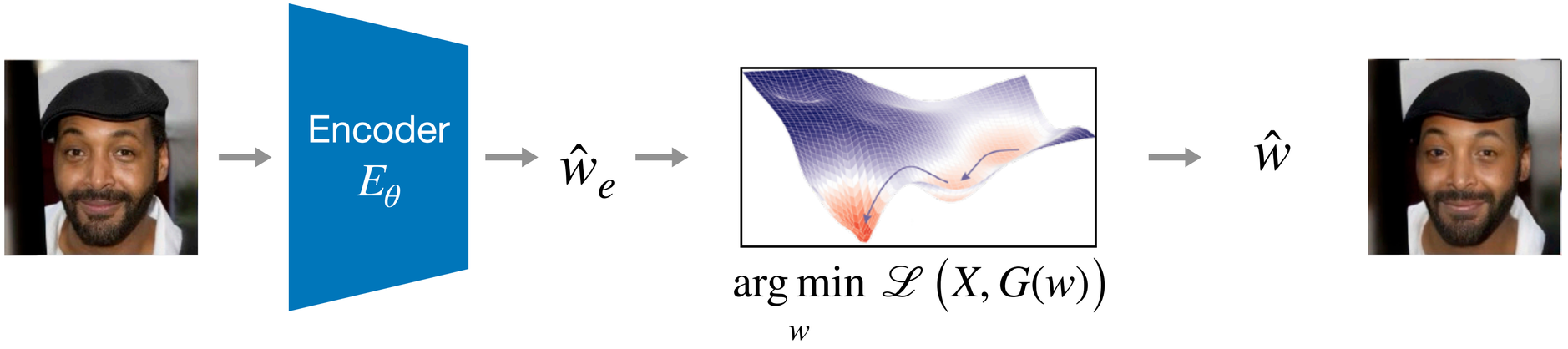
Use GAN inversion!

Figure from [22]

[22] Xia *et al.* (2022)

GAN inversion: connecting *real labeled images* to dataset generation

Given a pre-trained generator G and a similarity-based loss $\mathscr{L}$ (e.g., LPIPS)



Encoder (e.g., ReStyle [23]):
"Big picture" reconstruction

Optimization step:
Refines smaller details

[23] Alaluf *et al.* (2021)