IMAGE-TO-IMAGE TRANSLATION with Deep Generative Models

INSTRUCTIONS

Members

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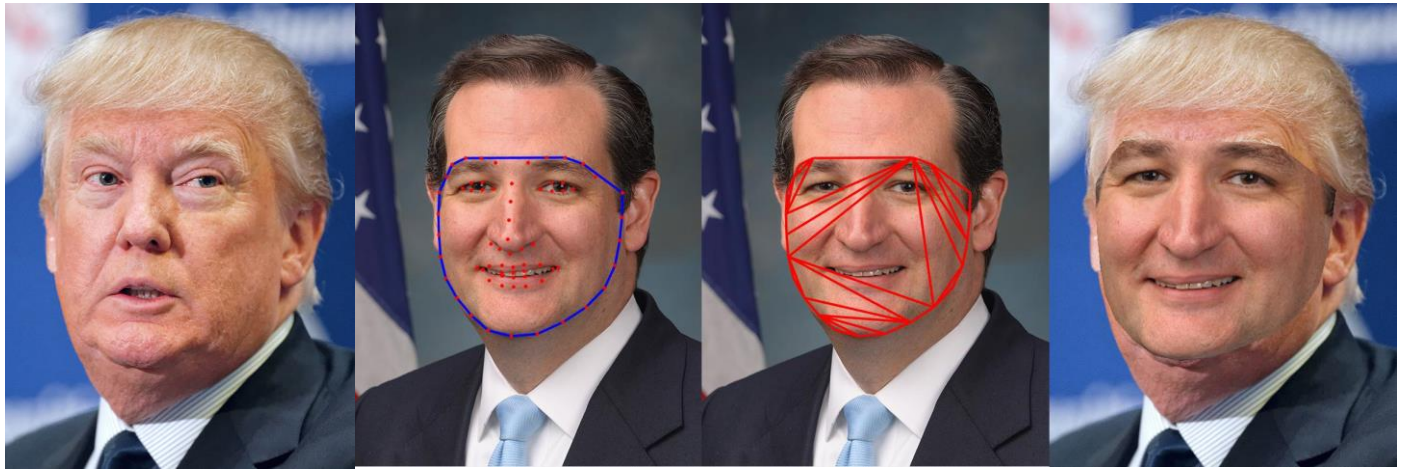
Misssion

Explore the possibilities of cutting edge technology in Image-to-Image translatiton

People Transformation

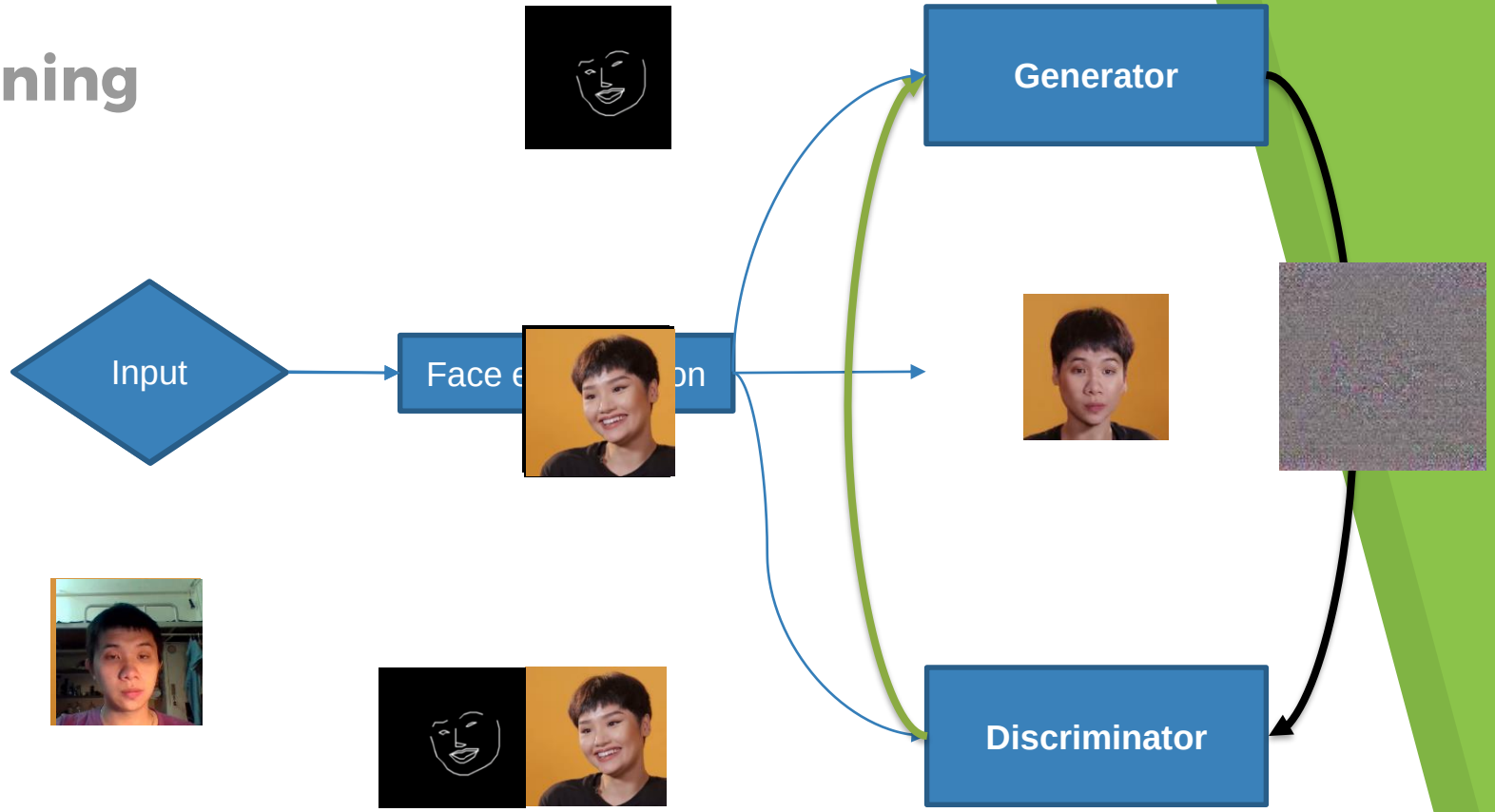
Hair replacement

Face swap

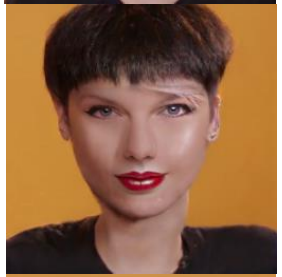


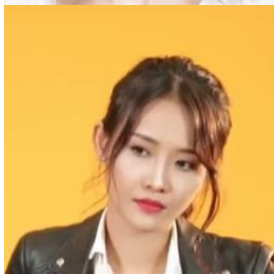
Conditional GANs

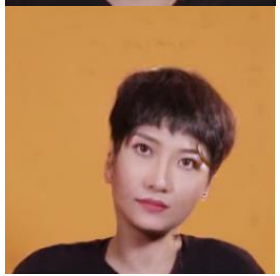
Training



Hair replacement application







Video to video Translation

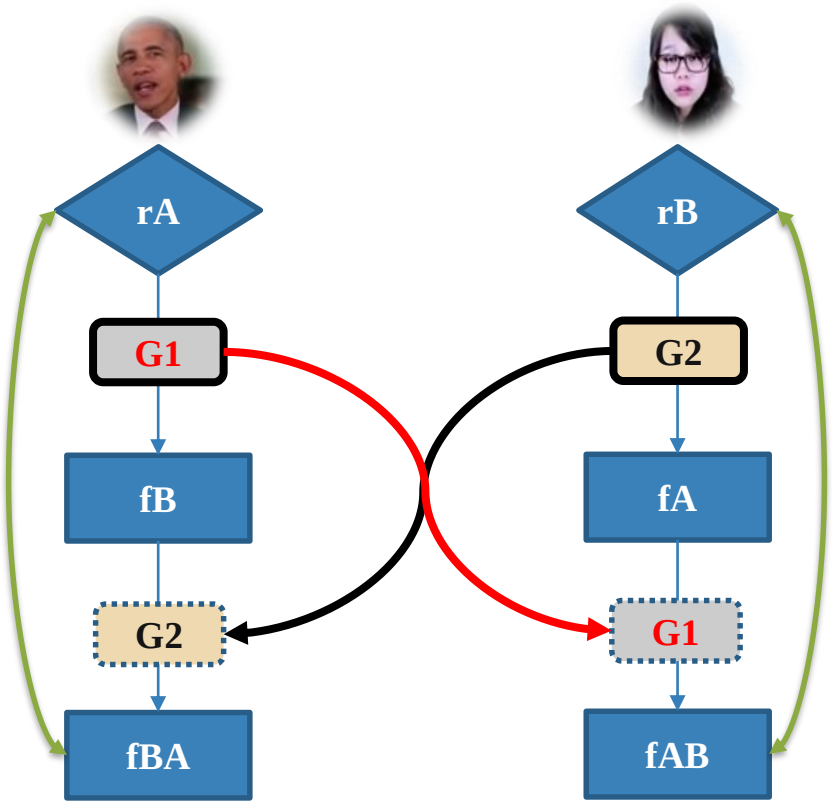
Problem

Shaking artifact

Unnatural face line

Incorrect inputs

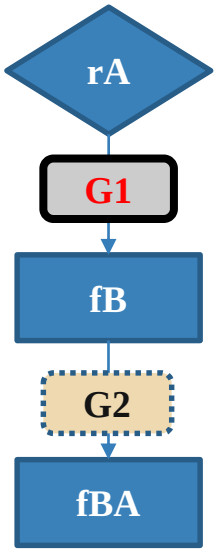
Cycle GANs

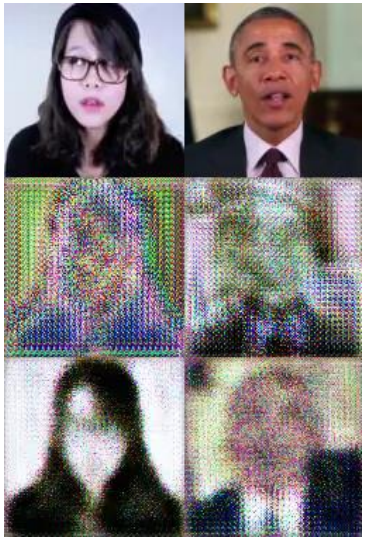


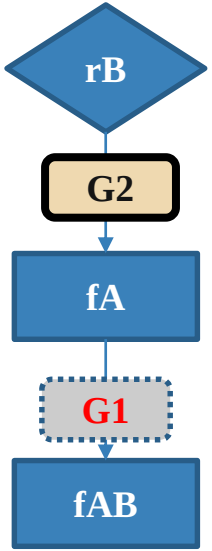
GENERATOR 1	
Translate	A to B
Look like	B
Act like	A

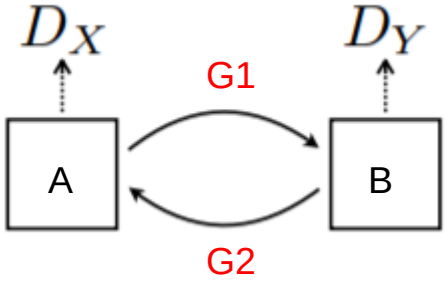
GENERATOR 2	
Translate	B to A
Look like	A
Act like	B

Cycle GANs









$$\mathcal{L}_{\text{cyc}}(G, F) = \mathbb{E}_{x \sim p_{\text{data}}(x)}[\|F(G(x)) - x\|_1] + \mathbb{E}_{y \sim p_{\text{data}}(y)}[\|G(F(y)) - y\|_1].$$

Cycle Loss

$$\mathcal{L}(G, F, D_X, D_Y) = \mathcal{L}_{\text{GAN}}(G, D_Y, X, Y) + \mathcal{L}_{\text{GAN}}(F, D_X, Y, X) + \lambda \mathcal{L}_{\text{cyc}}(G, F),$$

Total Loss

Cycle GANs

INPUT TARGET

APPLICATION

SAMPLE 01

(Original)

HORSE TO ZEBRA

REFERENCE

[1] Image-to-Image Translation with Conditional Adversarial Networks

https://arxiv.org/pdf/1611.07004.pdf

[2] Deep Residual Learning for Image Recognition

https://arxiv.org/abs/1512.03385

[3] *Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks*

https://arxiv.org/abs/1703.10593

[4] U-Net: Convolutional Networks for Biomedical Image Segmentation

https://arxiv.org/pdf/1505.04597.pdf

Thank you