Face swap on video using conditional GANs
Is face transfer a solved problem?
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NO.
Old “classic” methods
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Now $P_G(x; \theta)$ is a NN
Generative adversarial models

Diagram:
- Real world images
- Sample
- Discriminator
- Real
- Fake
- Loss
- Generator
- Latent random variable
- Sample

Process:
1. Real world images are sampled.
2. Latent random variable is generated.
3. Generator takes the sampled latent variable and produces a fake sample.
4. Discriminator is trained to distinguish between real and fake samples.
5. Loss is computed based on the discriminator's output.
StyloGAN architecture
StyloGAN samples
Conditional video generation

Nvidia Video2Video 2018
https://tcwang0509.github.io/vid2vid/
Identity transfer

Deep Video Portraits

Source Sequence  →  Reenactment

Deep fake
Autoencoders
Deep fake architecture
Make faces swap must be as easy as make style transfer.
Without model retrain. Instantly.
Face swapper architecture

- Identity image
- Attribute image
- Identity encoder
- Attribute encoder
- Decoder
- Refiner
- Discriminator
- Swapped image
- Same identity?
Face representation task
SphereFace: Deep Hypersphere Embedding for Face Recognition
Interpolation in latent space
Video frame consistent
Butterworth filter

Amplitude vs. Time for different orders:
- **1st Order**
- **2nd Order**
- **3rd Order**
- **4th Order**
- **5th Order**
- **6th Order**

Gain (dB) vs. Normalized Frequency (Hz):

- **Maximally Flat**
- **Ideal “Brick Wall” Response**

90° Corner
Butterworth filter
Optical flow
Optical flow
Conditional face generation result on video
Demo with Maleficent
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facebook - https://goo.gl/nFxJzP

NeoCortex - https://neocortex.co/

#reflect - https://reflect.tech