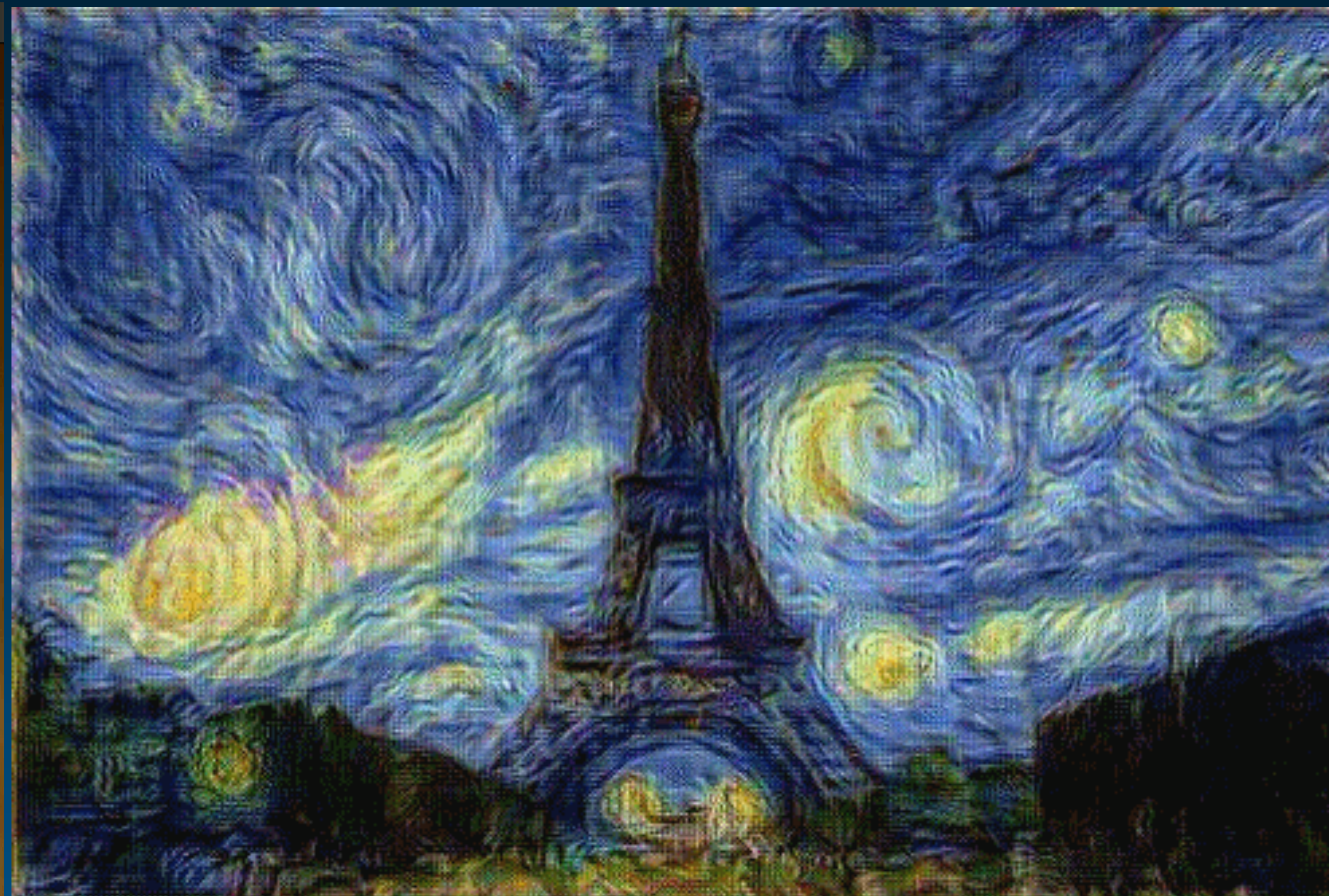


# Phase 0 2015-2016

## Deep Dream, Style Transfer, Texture Synthesis

Model is frozen, update the pixel values, different loss functions

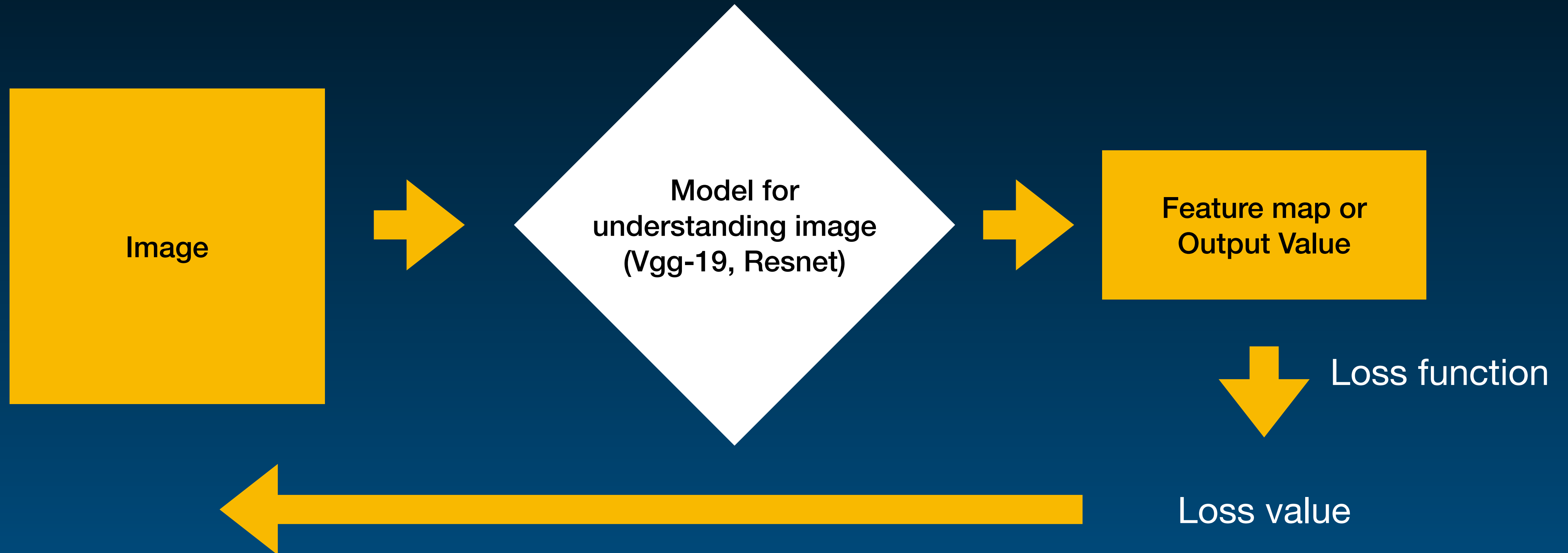




# Phase 0 2015-2016

## Deep Dream, Style Transfer, Texture Synthesis

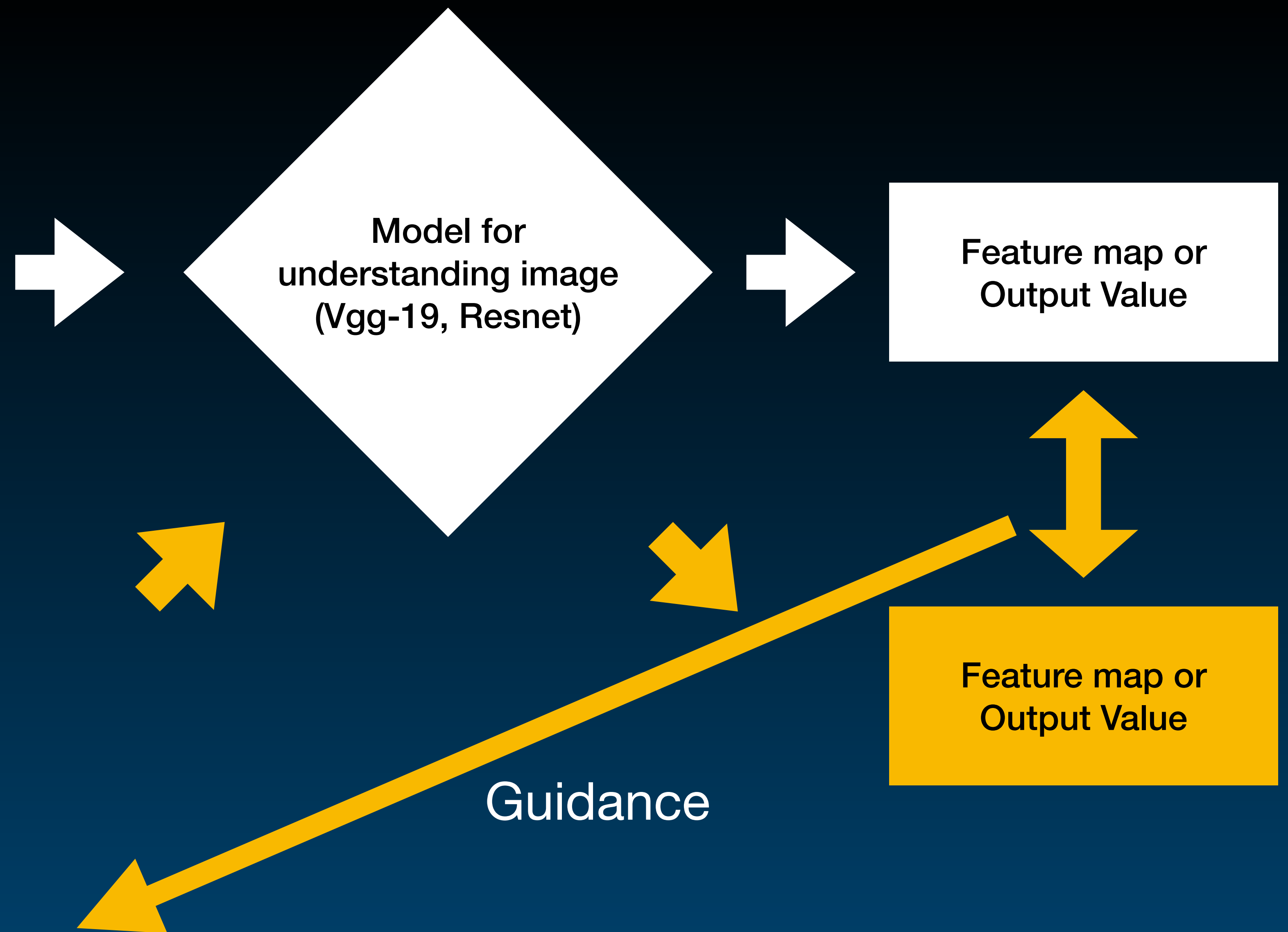
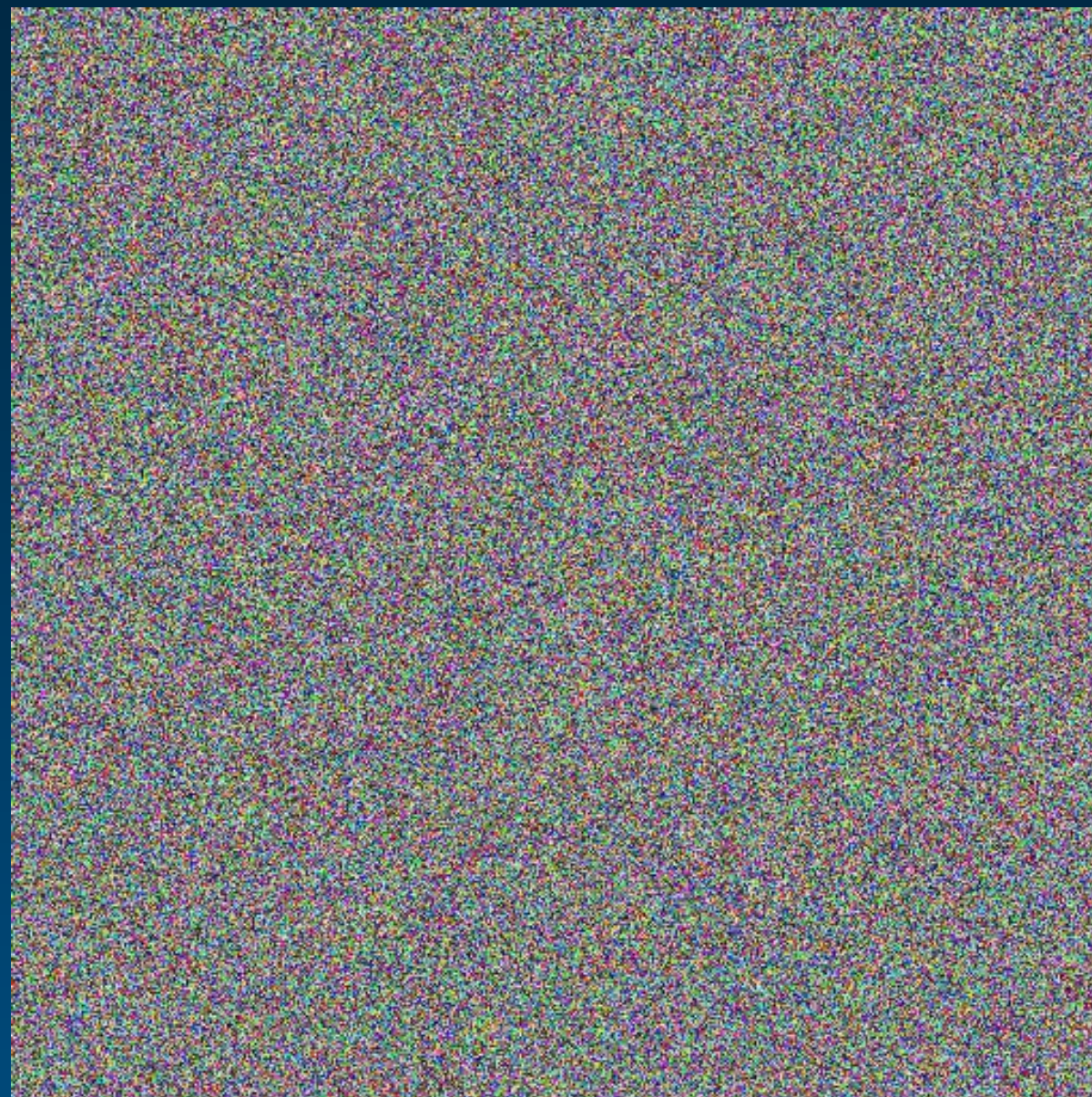
Model is frozen, update the pixel values, different loss functions







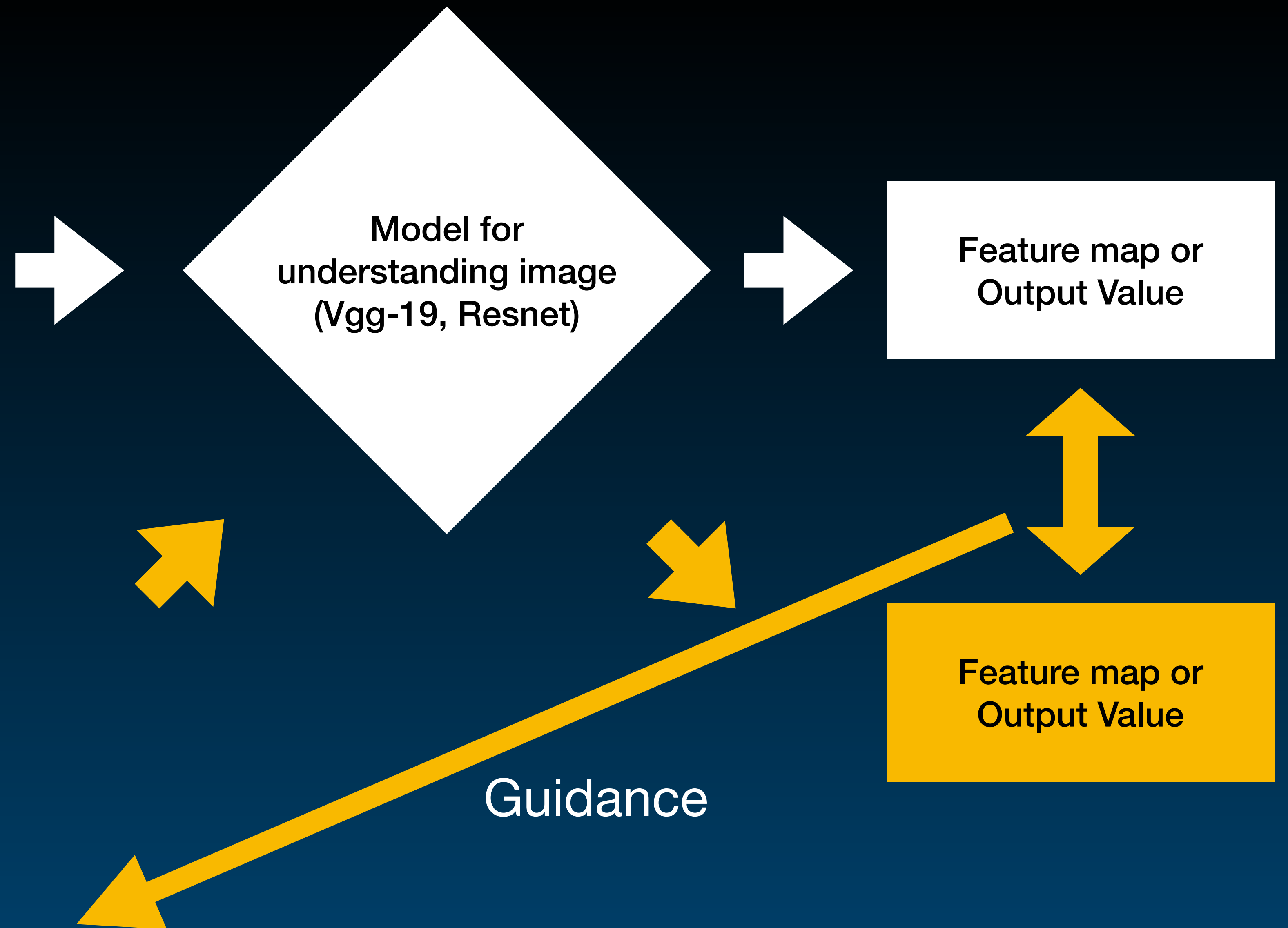
Georges Seurat, *Study for "A Sunday Afternoon on La Grande Jatte"*, 1884, oil on canvas, 70.5 x 104.1 cm, Metropolitan Museum of Art, New York



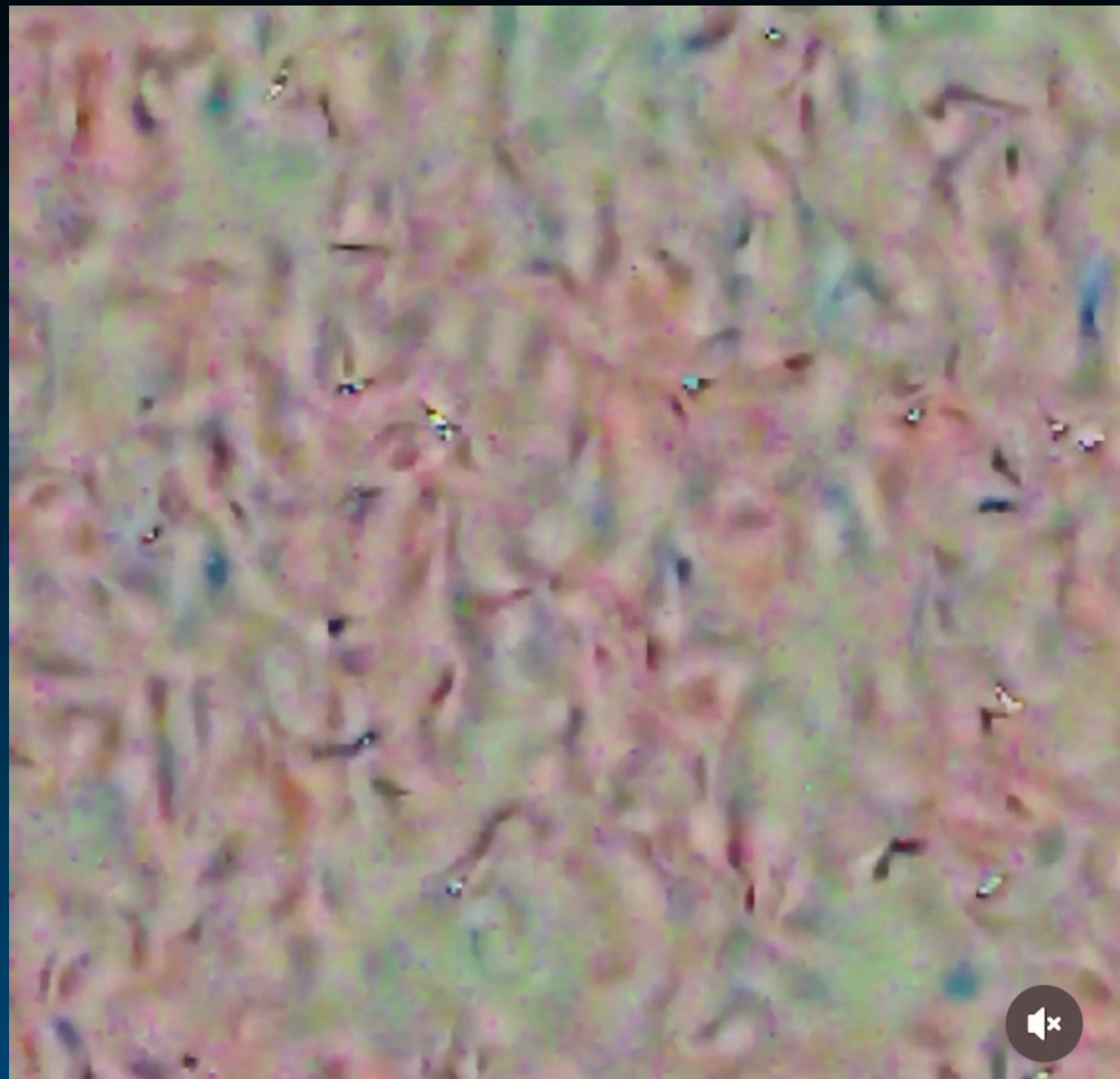




Georges Seurat, *Study for "A Sunday Afternoon on La Grande Jatte"*, 1884, oil on canvas, 70.5 x 104.1 cm, Metropolitan Museum of Art, New York









# Phase 0

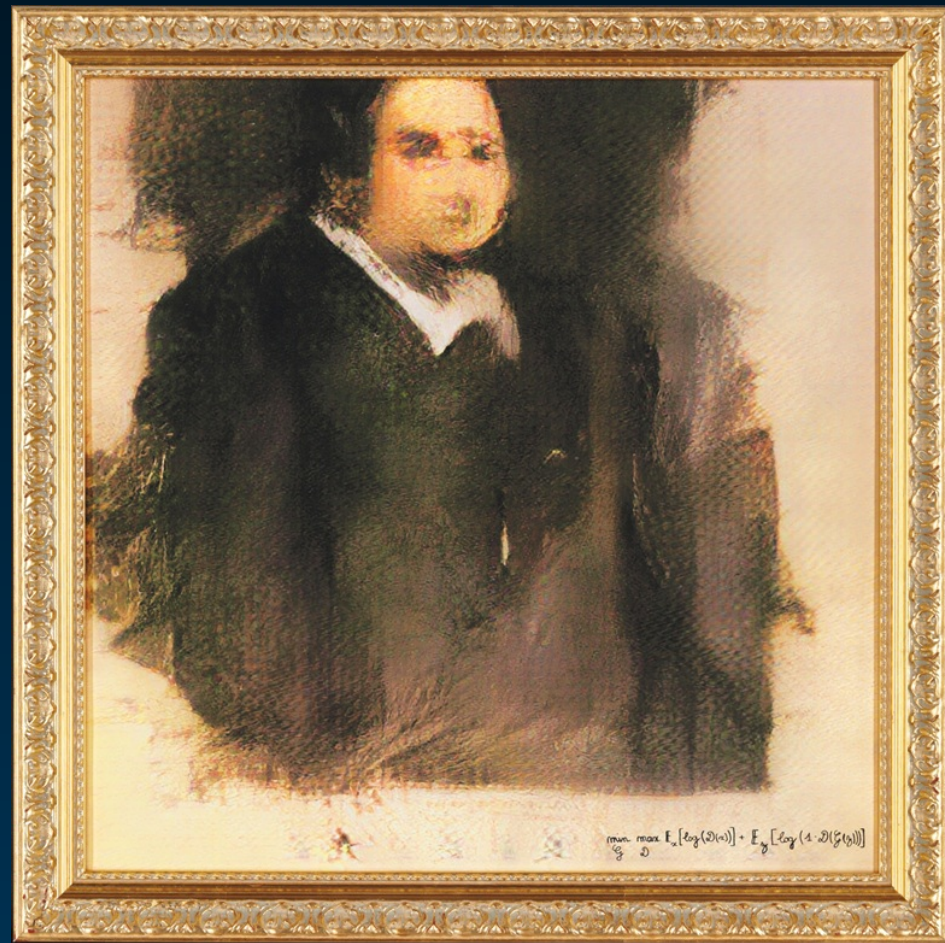
**Con: Too slow, time varies with resolution and epoch times.**

**Pro: easy to work with high resolution**



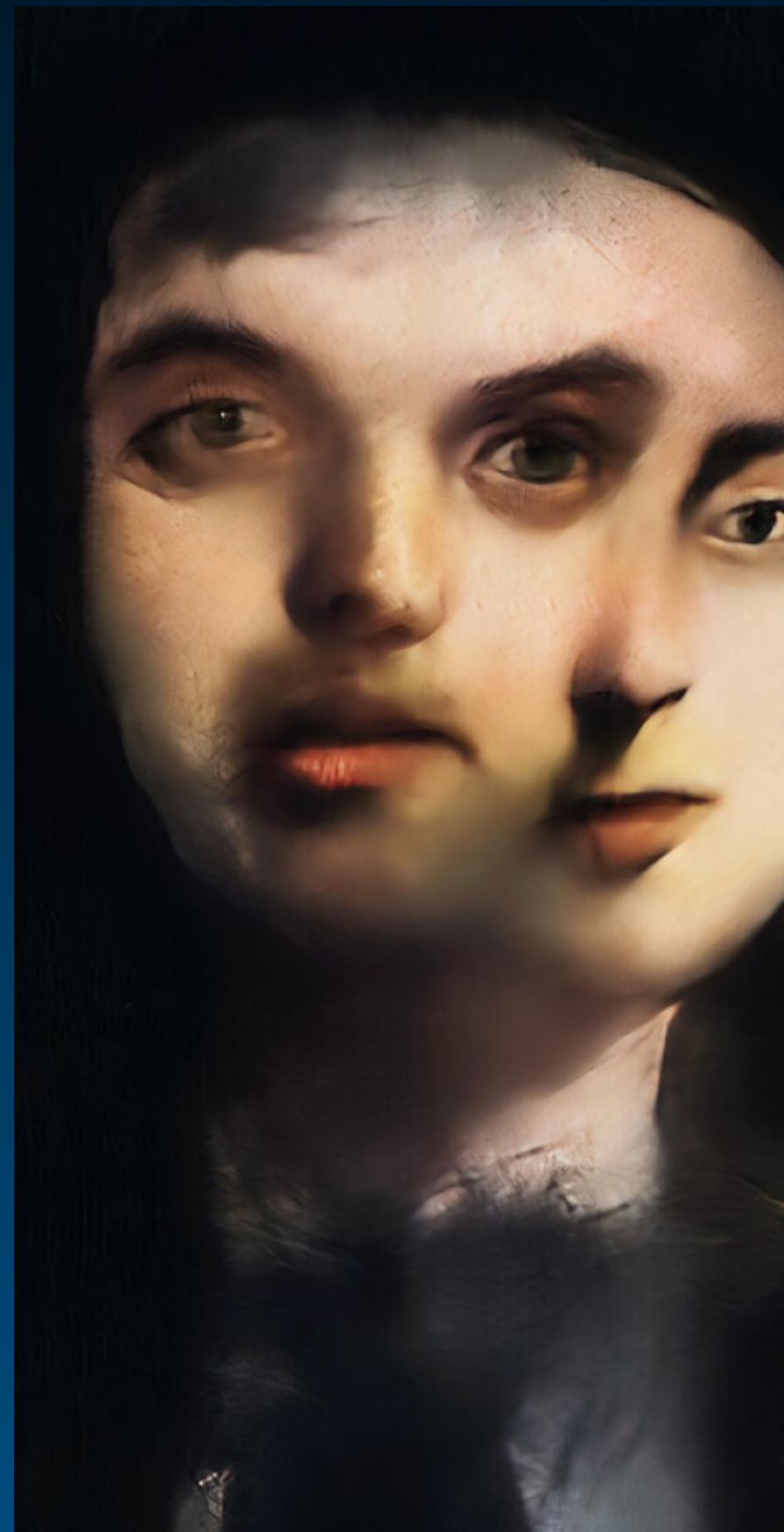
# Phase 1

## GAN, Autoencoder



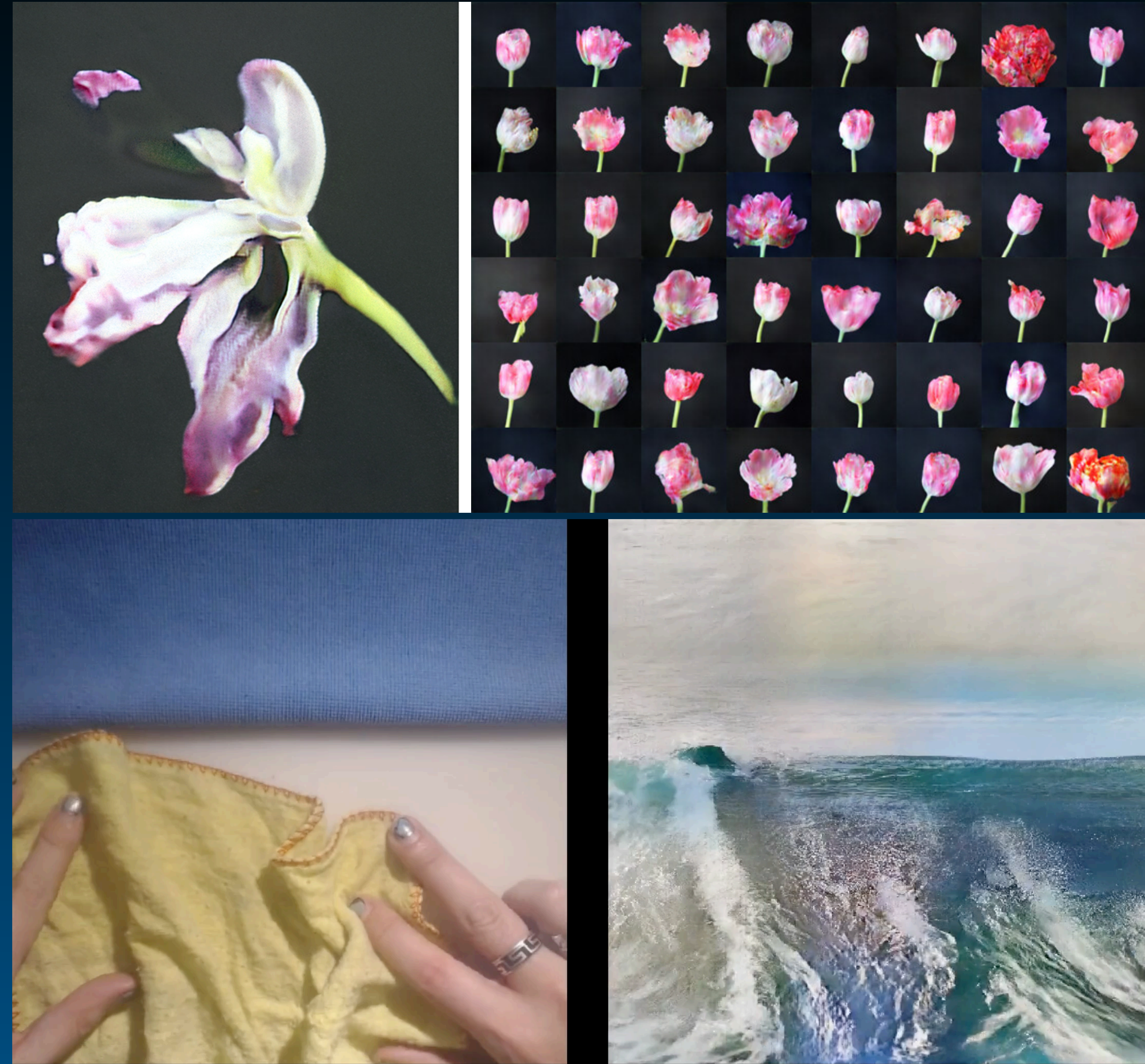
Left: Edmond de Belamy, from La Famille de Belamy, Generative Adversarial Network print, on canvas, 2018

Middle: Memories of Passersby I by Quasimondo



Right Top: Mosaic Virus, Anna Ridler, 2018, [link](#)

Right Bottom: Learning to see, Memo Akten, 2017 [link](#)

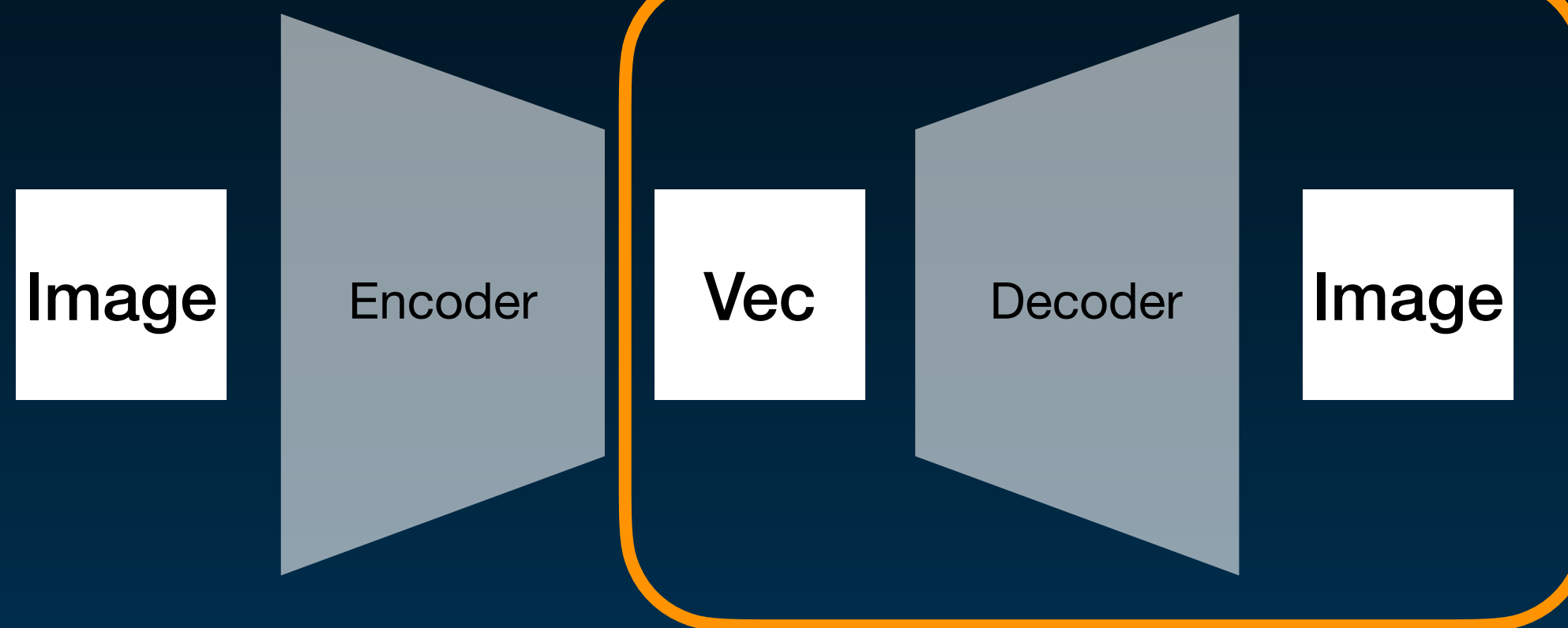




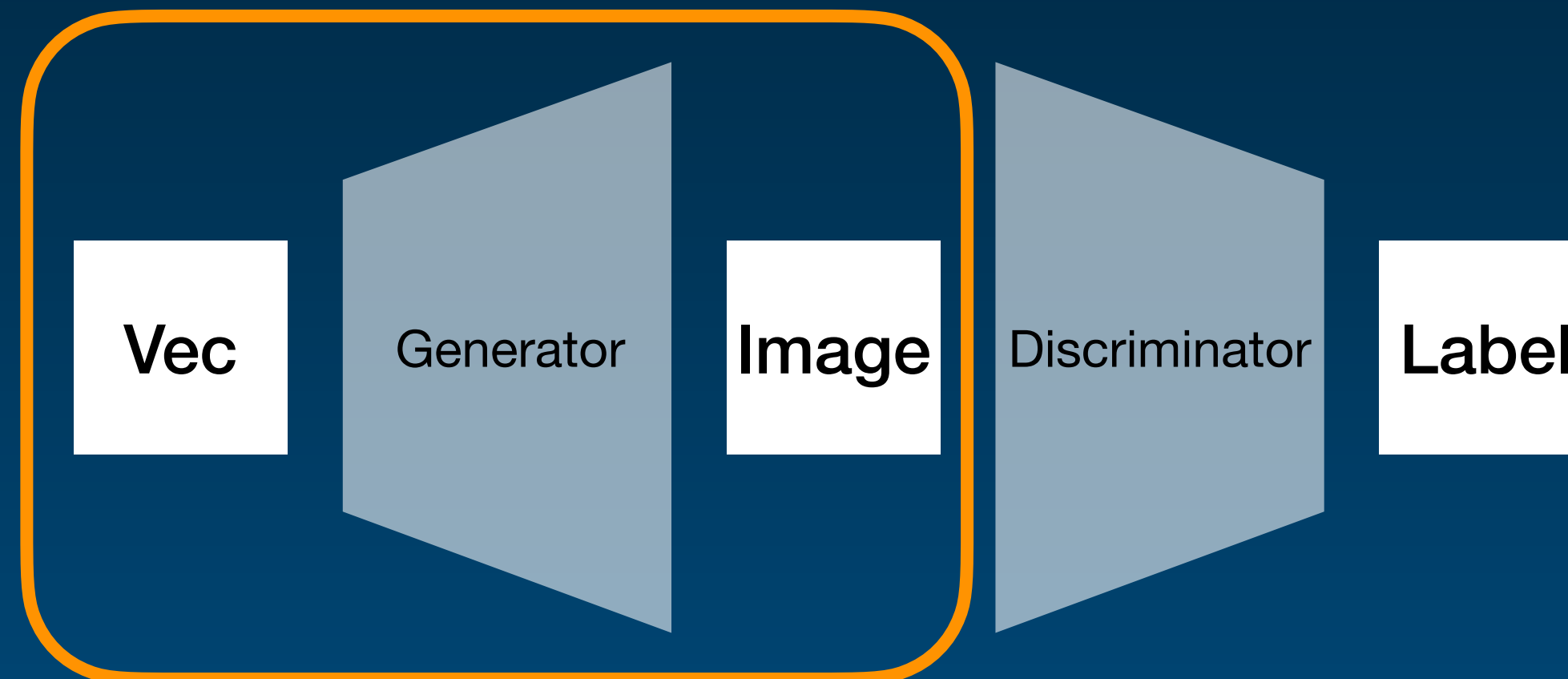
# Phase 1

## GAN, Autoencoder

Autoencoders

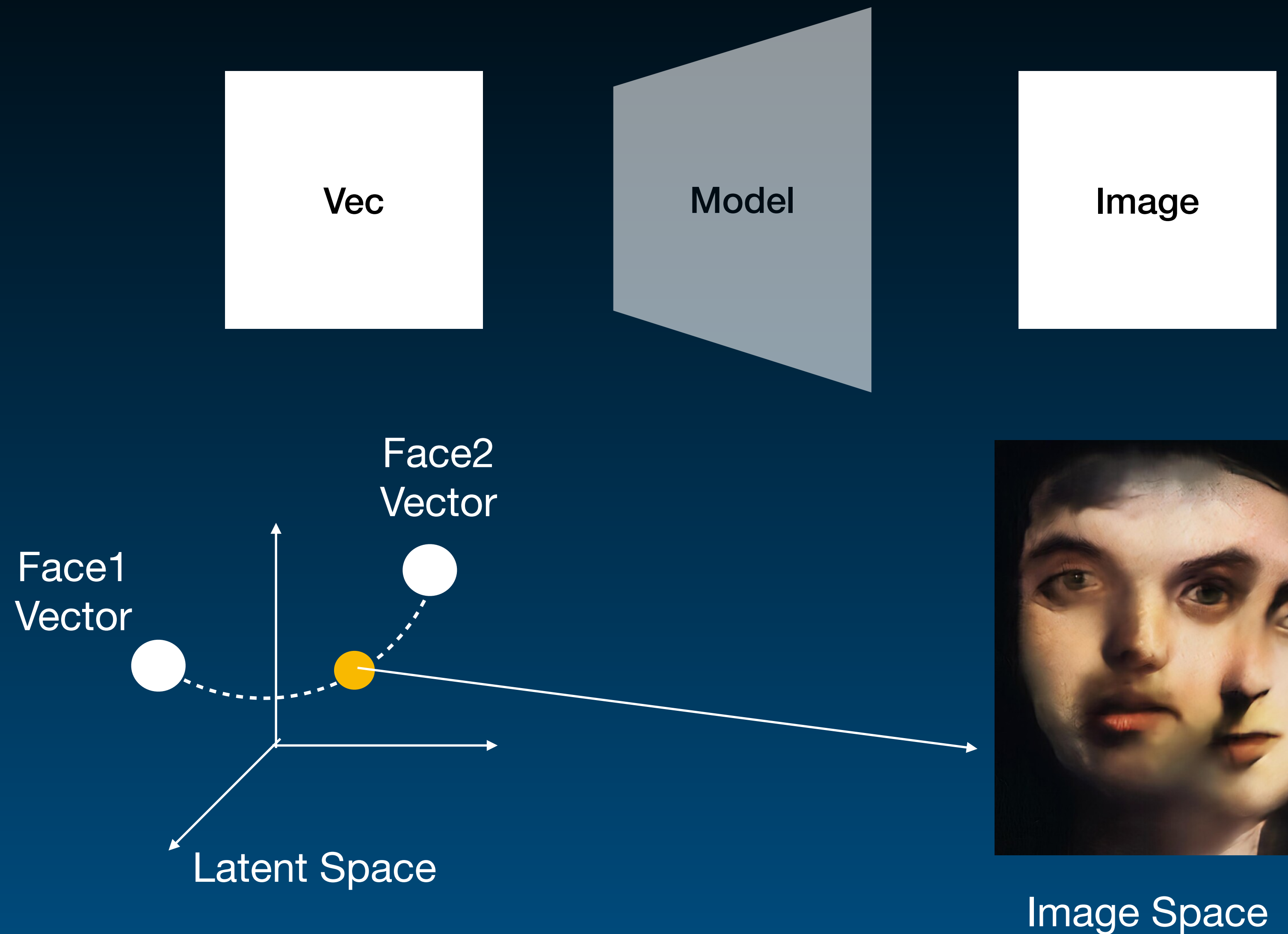


GAN





Given a vector and a trained model, it outputs a image





# Phase 1

## Other attempts

Better resolution

More aesthetic controls

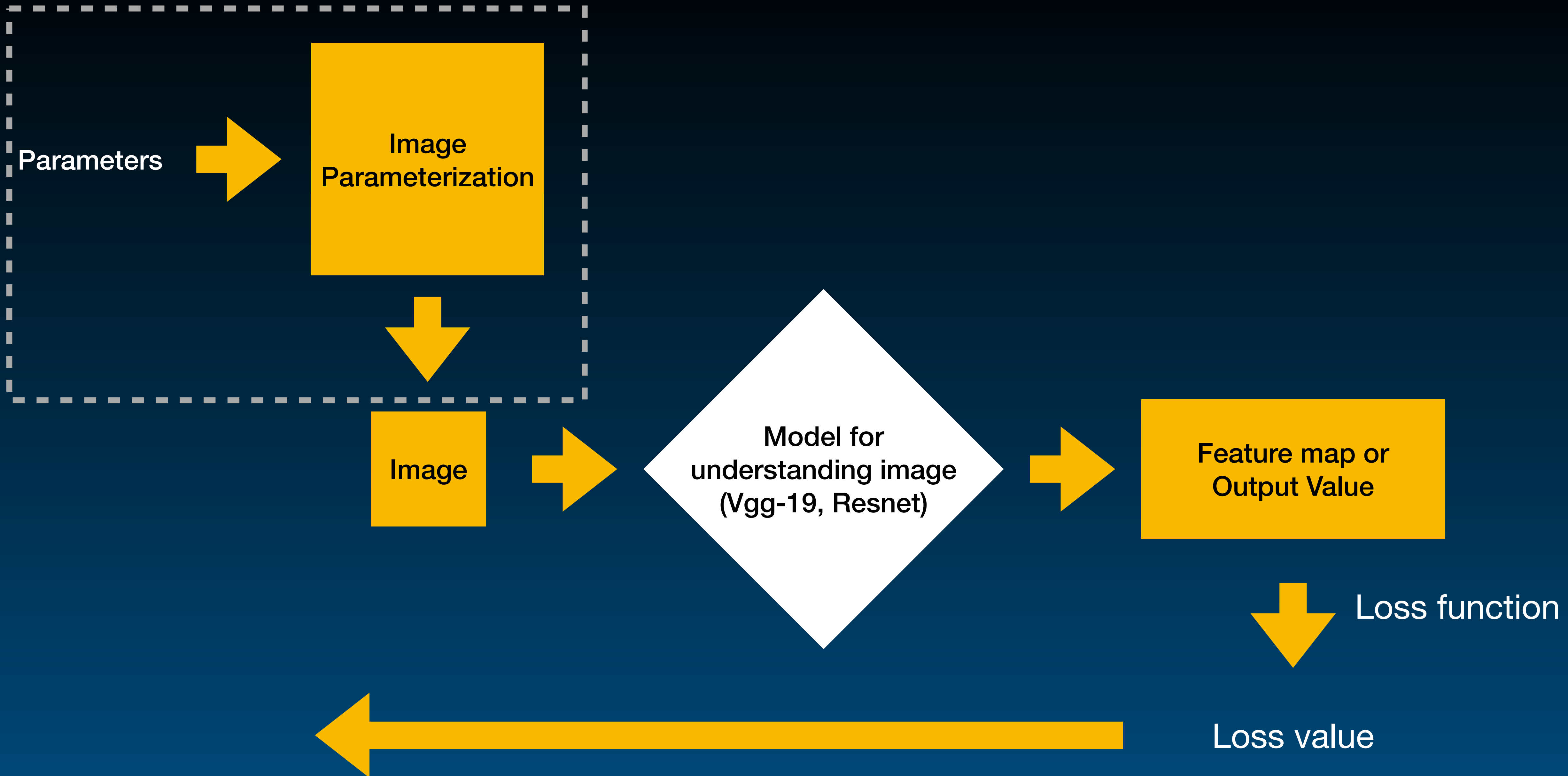


Perception Engine, Tom White, 2018, [link](#)

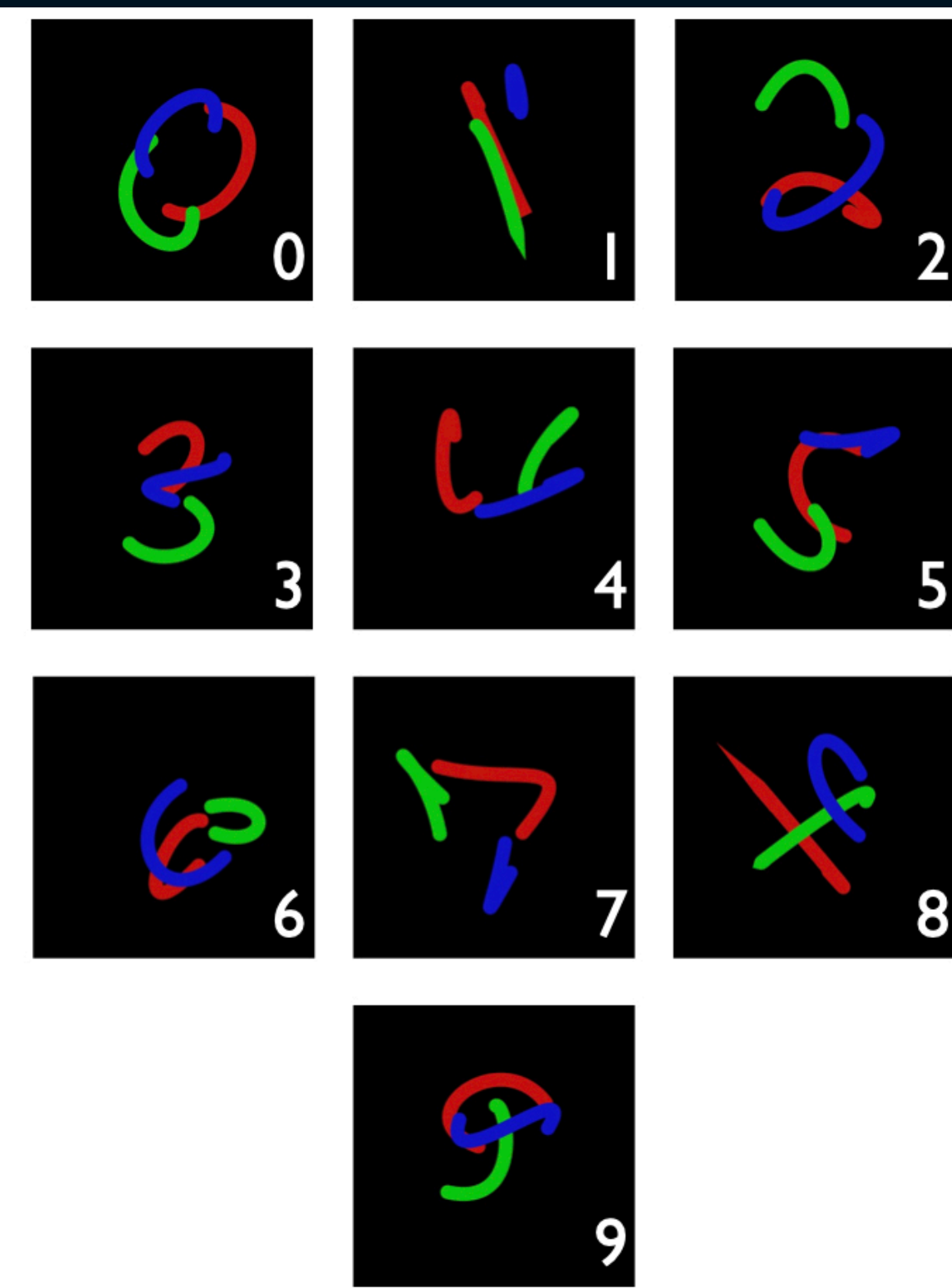
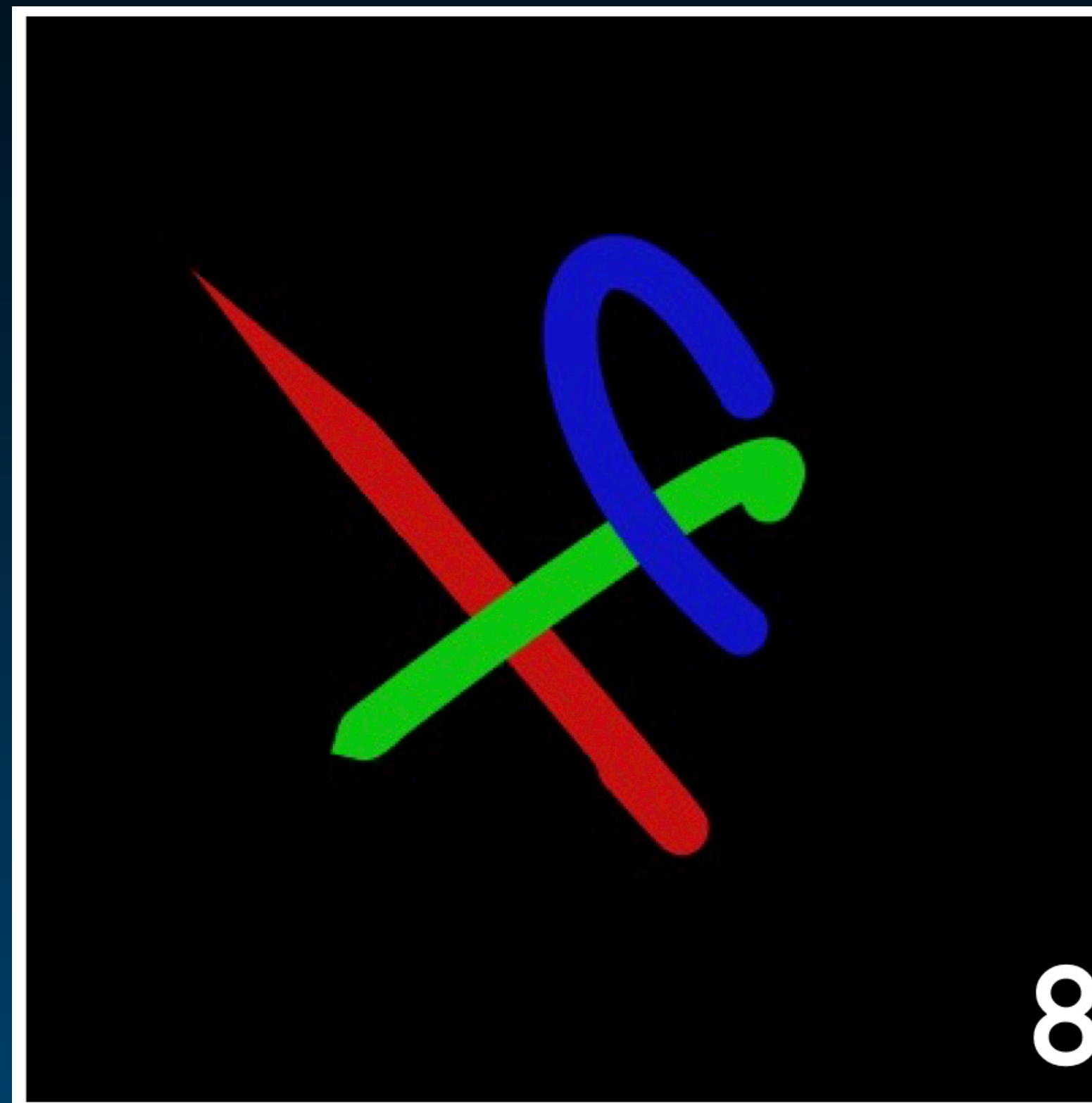
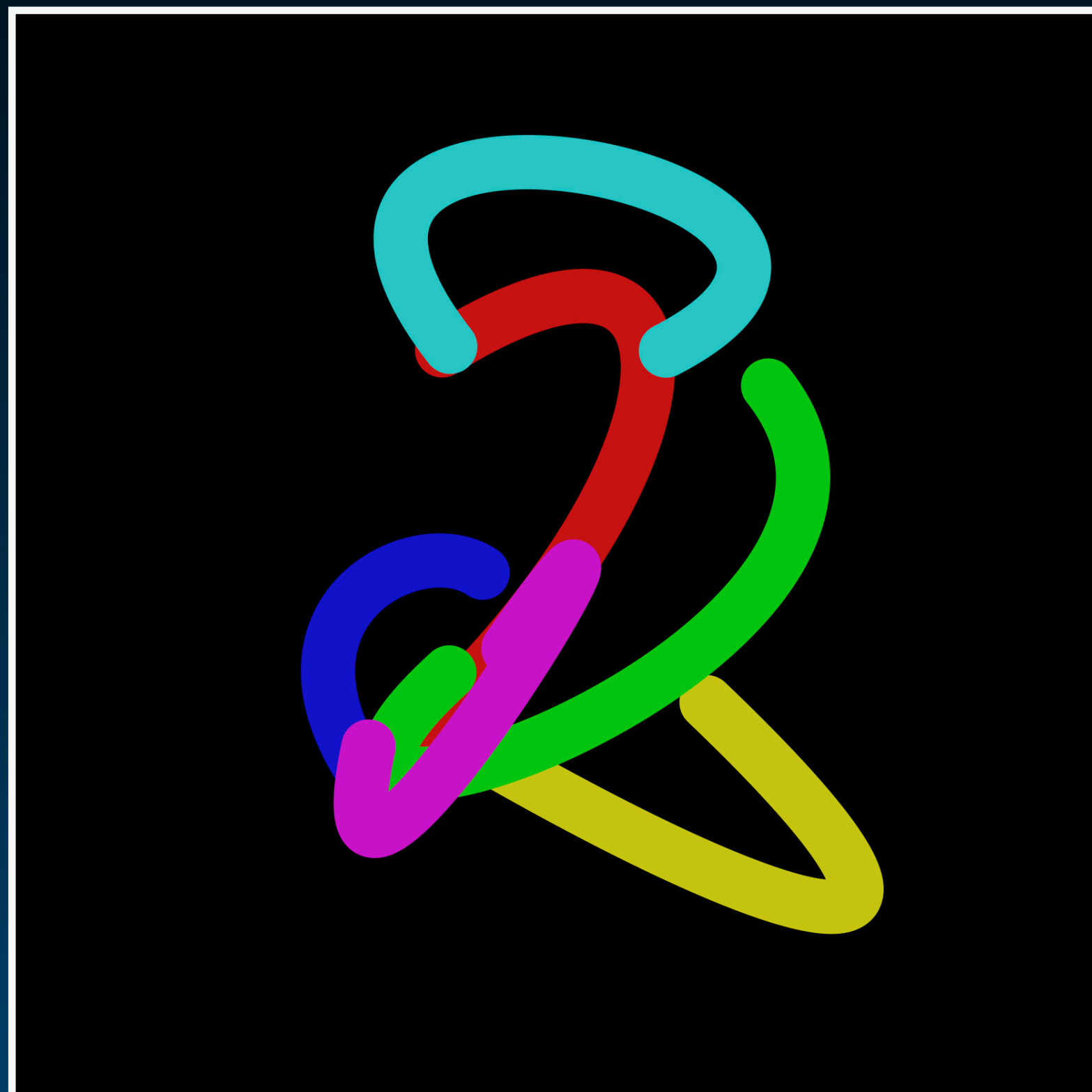


Perception Engine, Tom White, 2018 [link](#)









Digit Abstraction, Weihao Qiu, 2020



# Phase 1

## Cons:

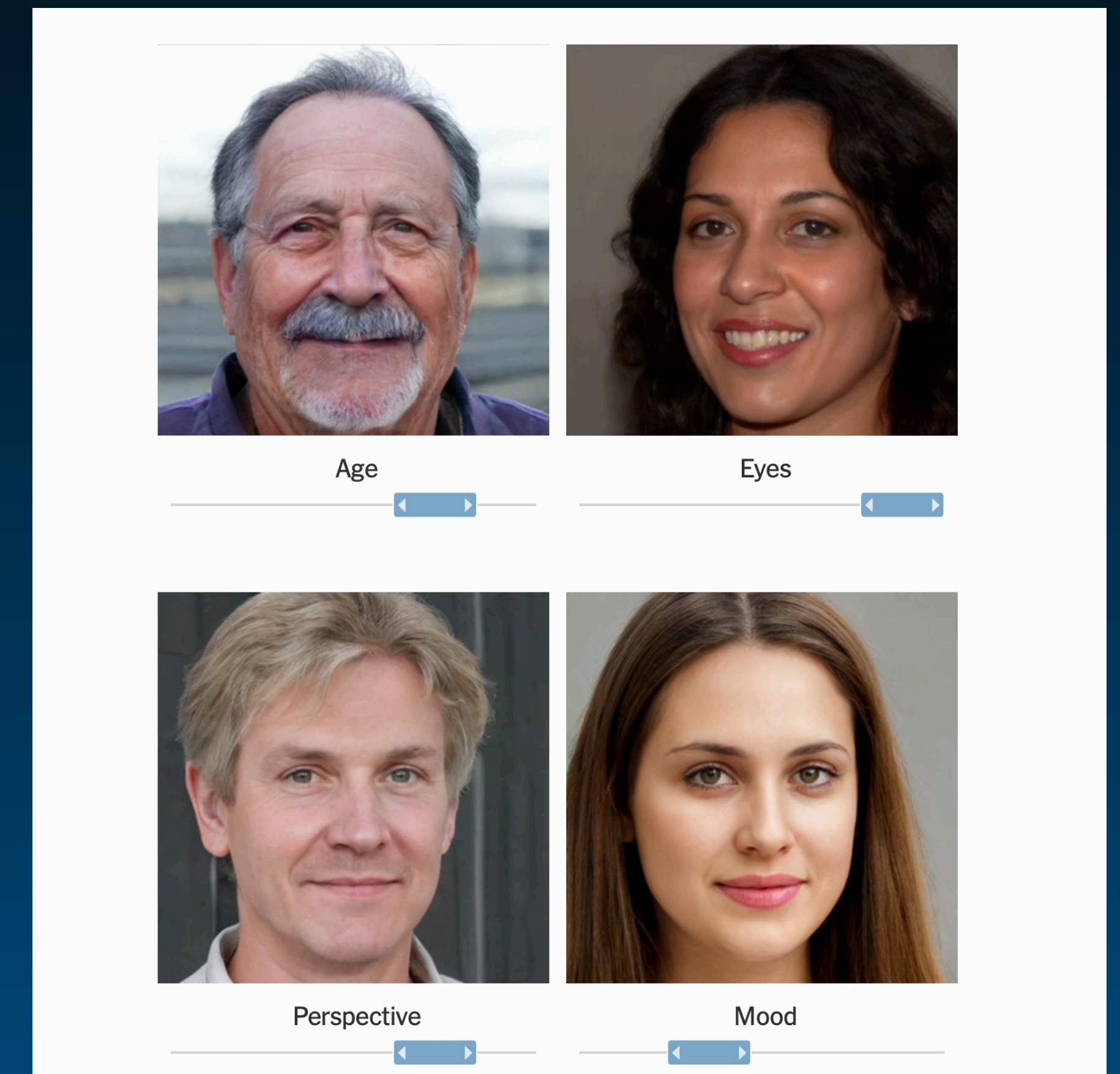
hard to train, limited resolution (256x256), **checker patterns, lack controls**



# Phase 2

## StyleGAN, BigGAN, VQVAE, p2s2p

1. Improve Image quality by improving “modeling” what is an image
  - > StyleGAN
2. Encode the controls to the right vector
  - > Multi-modal Style Encoding
  - > Deep Image Prior

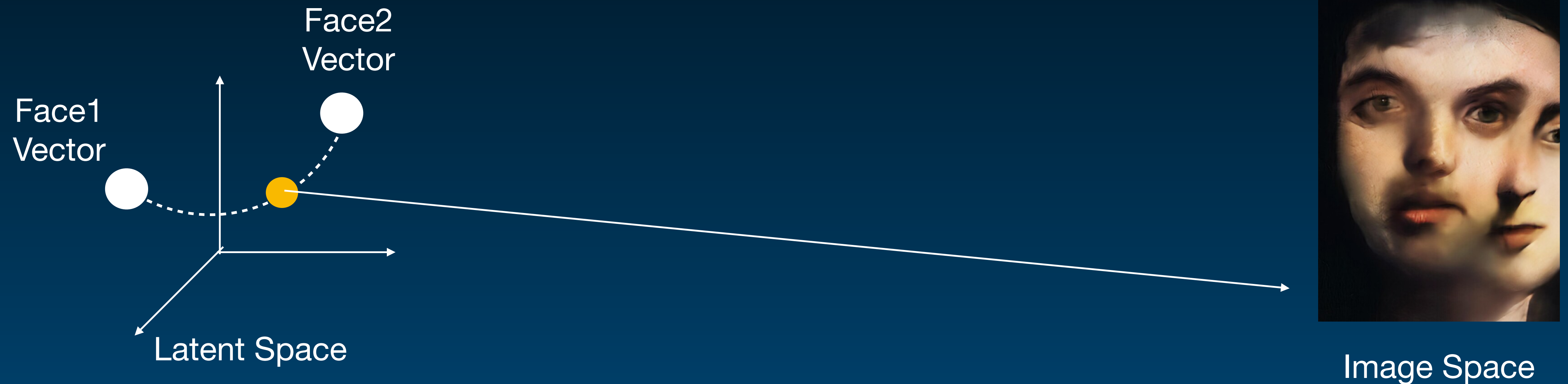


Report about StyleGAN, New York Times, [link](#)



# Phase 2

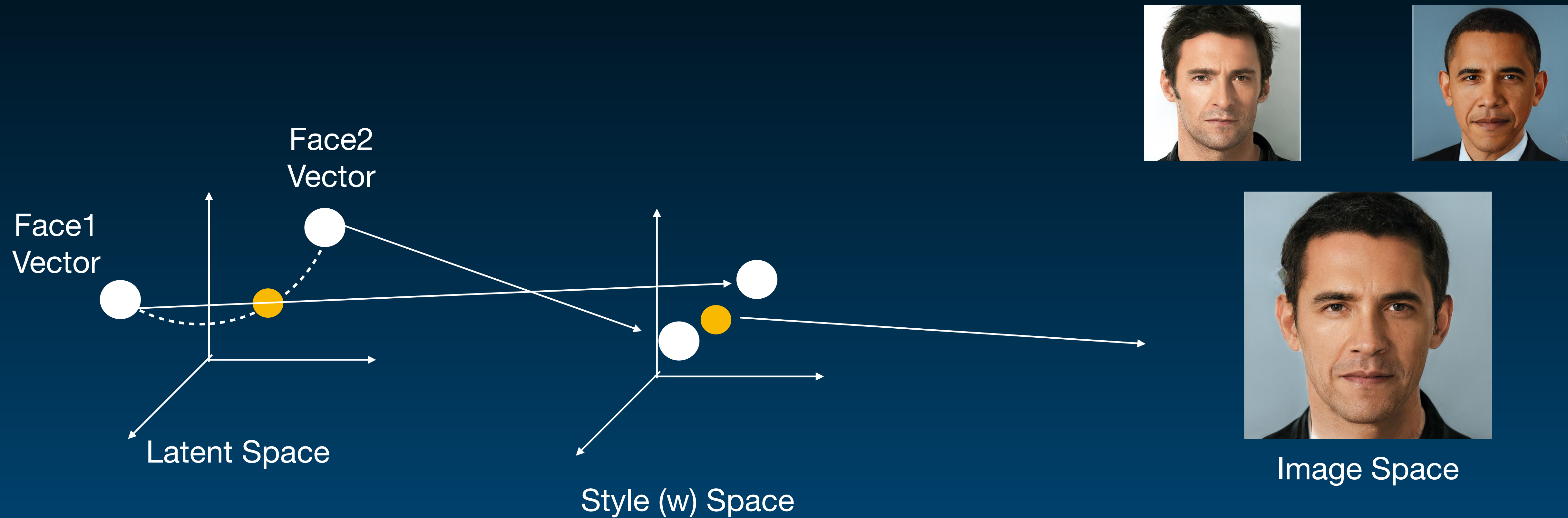
## StyleGAN, BigGAN, VQVAE, p2s2p





# Phase 2

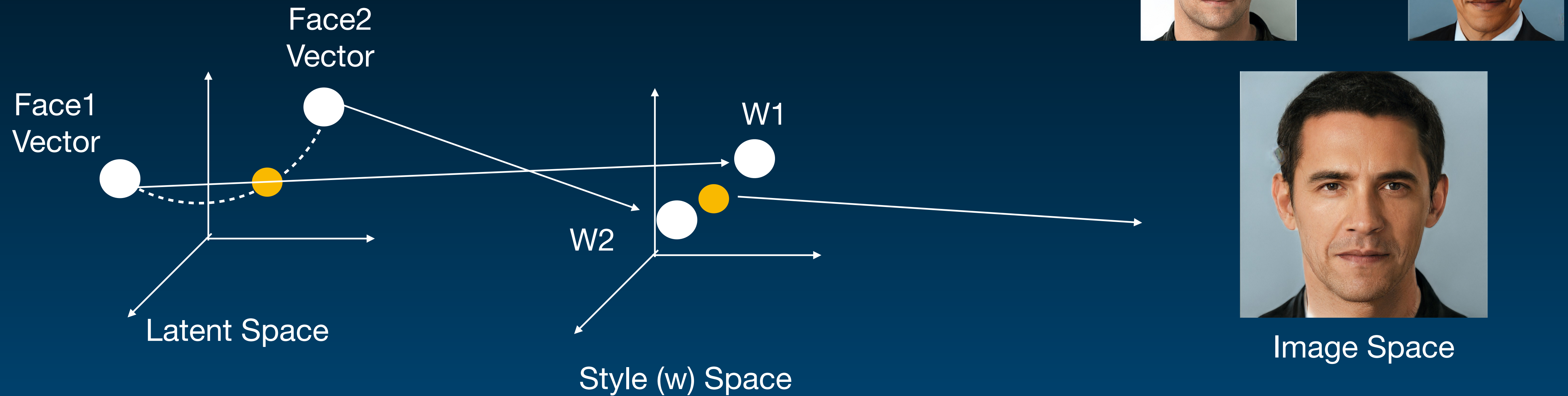
## StyleGAN, BigGAN, VQVAE, p2s2p





# Phase 2

## StyleGAN, BigGAN, VQVAE, p2s2p

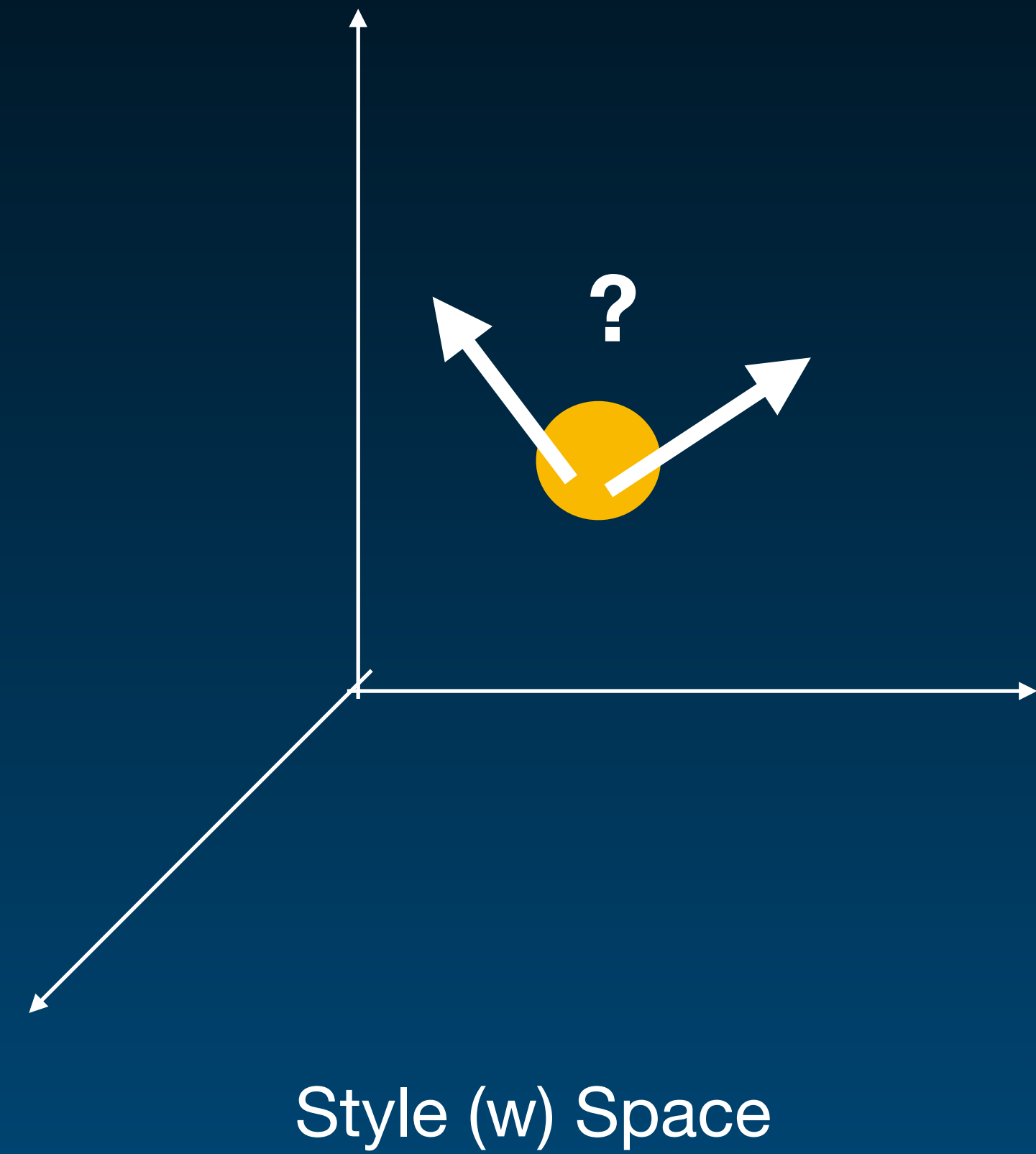
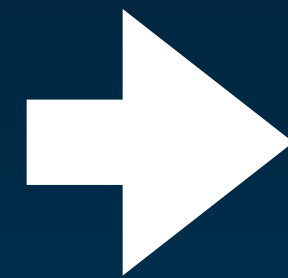




# Phase 2.2

## Style Encoding

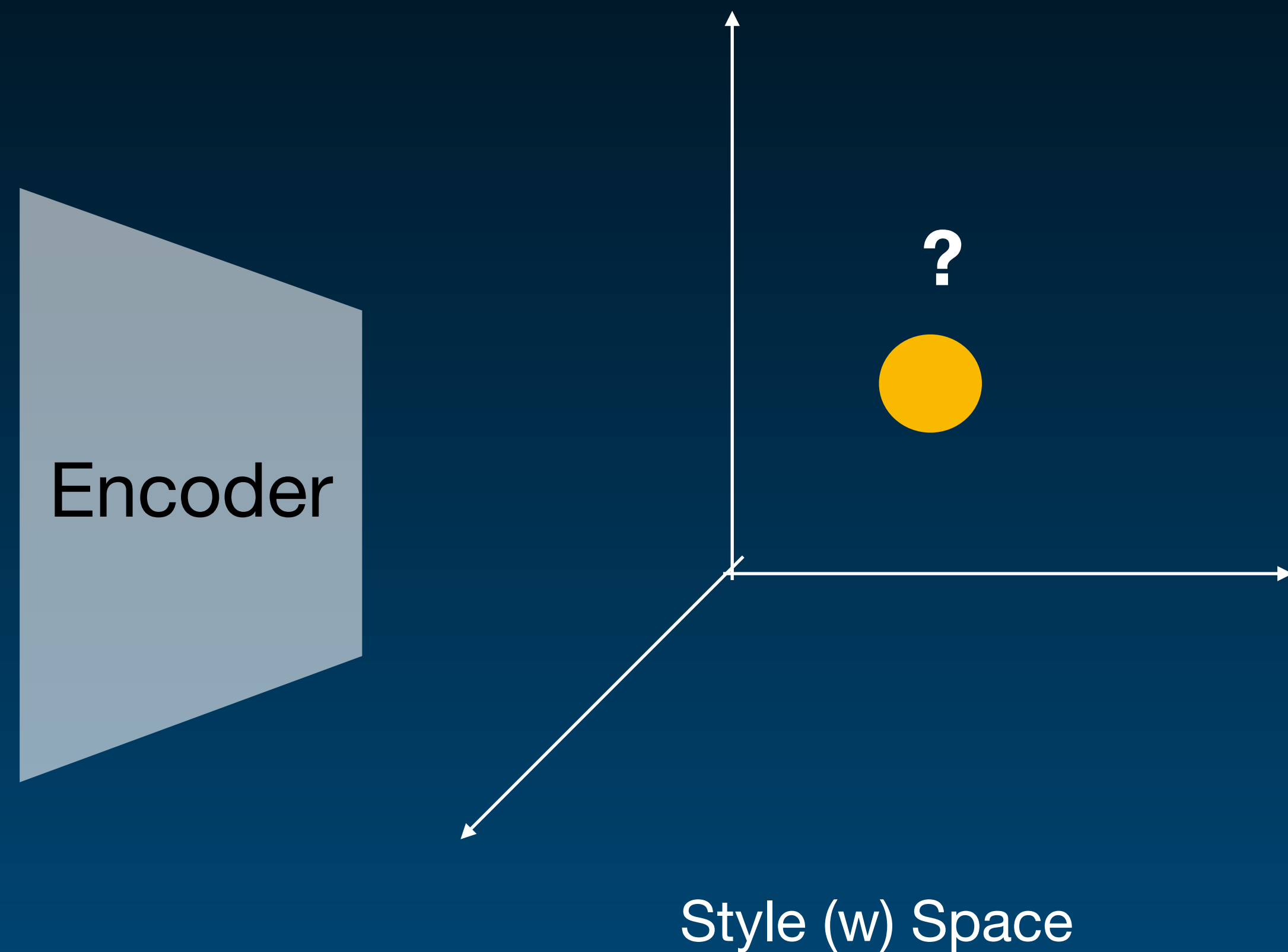
Parameter Controls





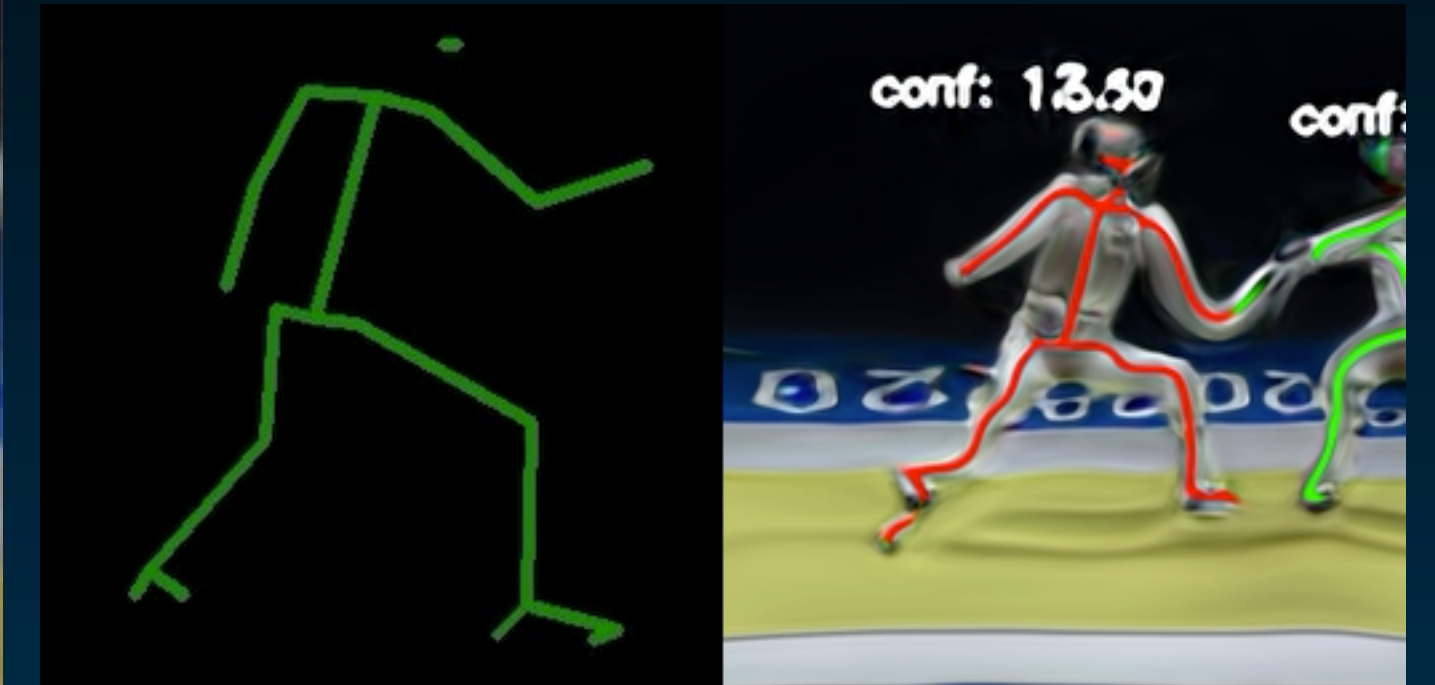
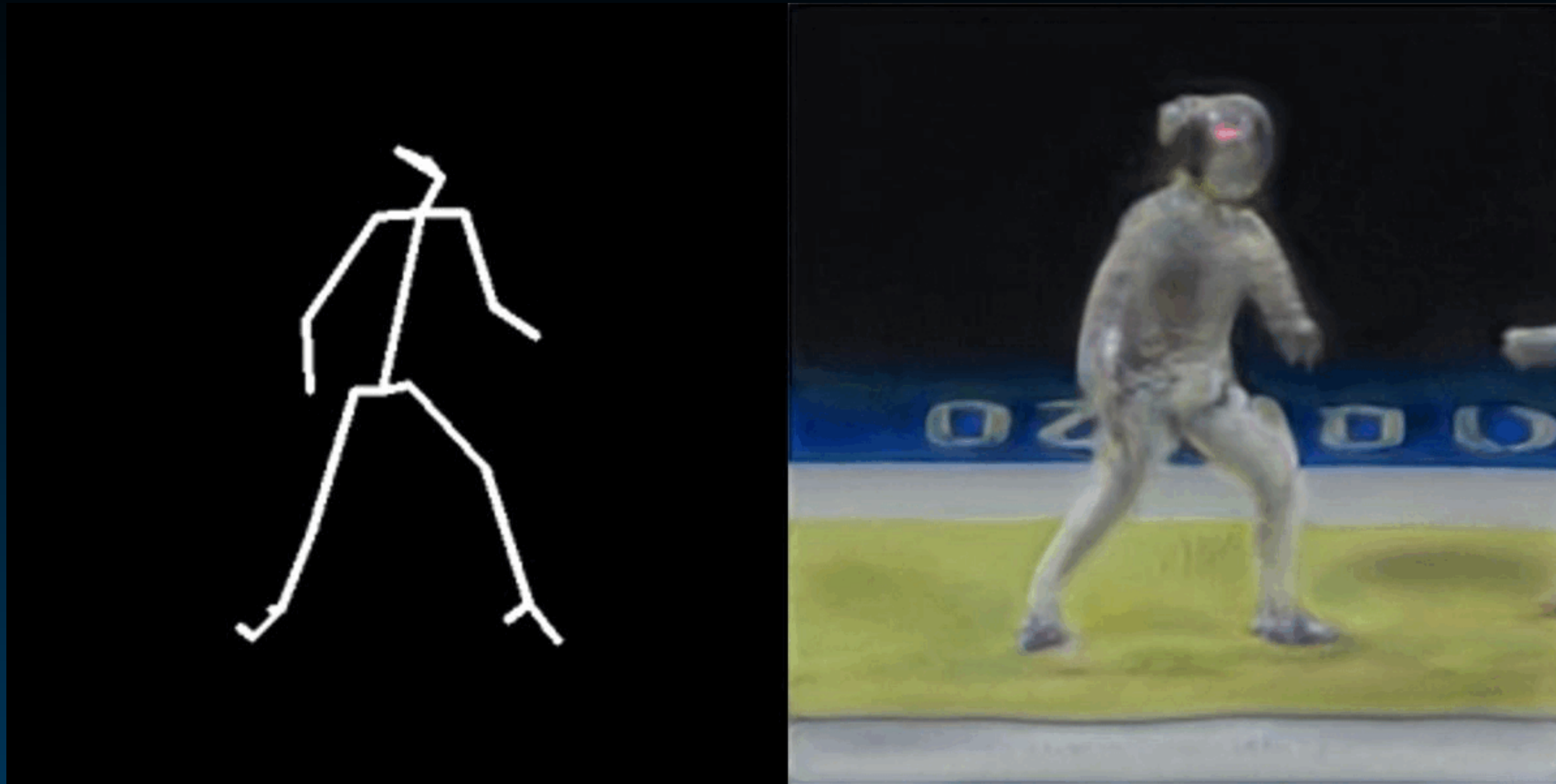
# Phase 2.2

## Style Encoding



Zhan, Fangneng, et al. "Multimodal image synthesis and editing: A survey." arXiv preprint arXiv:2112.13592 (2021).





Using pixel2style2pixel, [link](#)

Requires pair of data

Requires retraining for different images

Image quality is not good if the dataset is not aligned properly