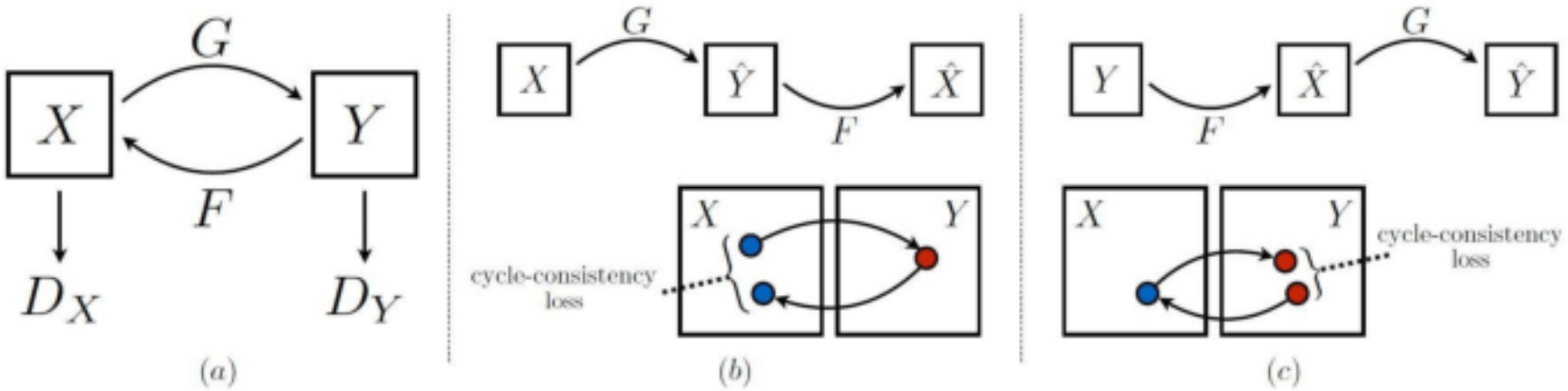
Esercitazione 7

CycleGAN

CycleGAN

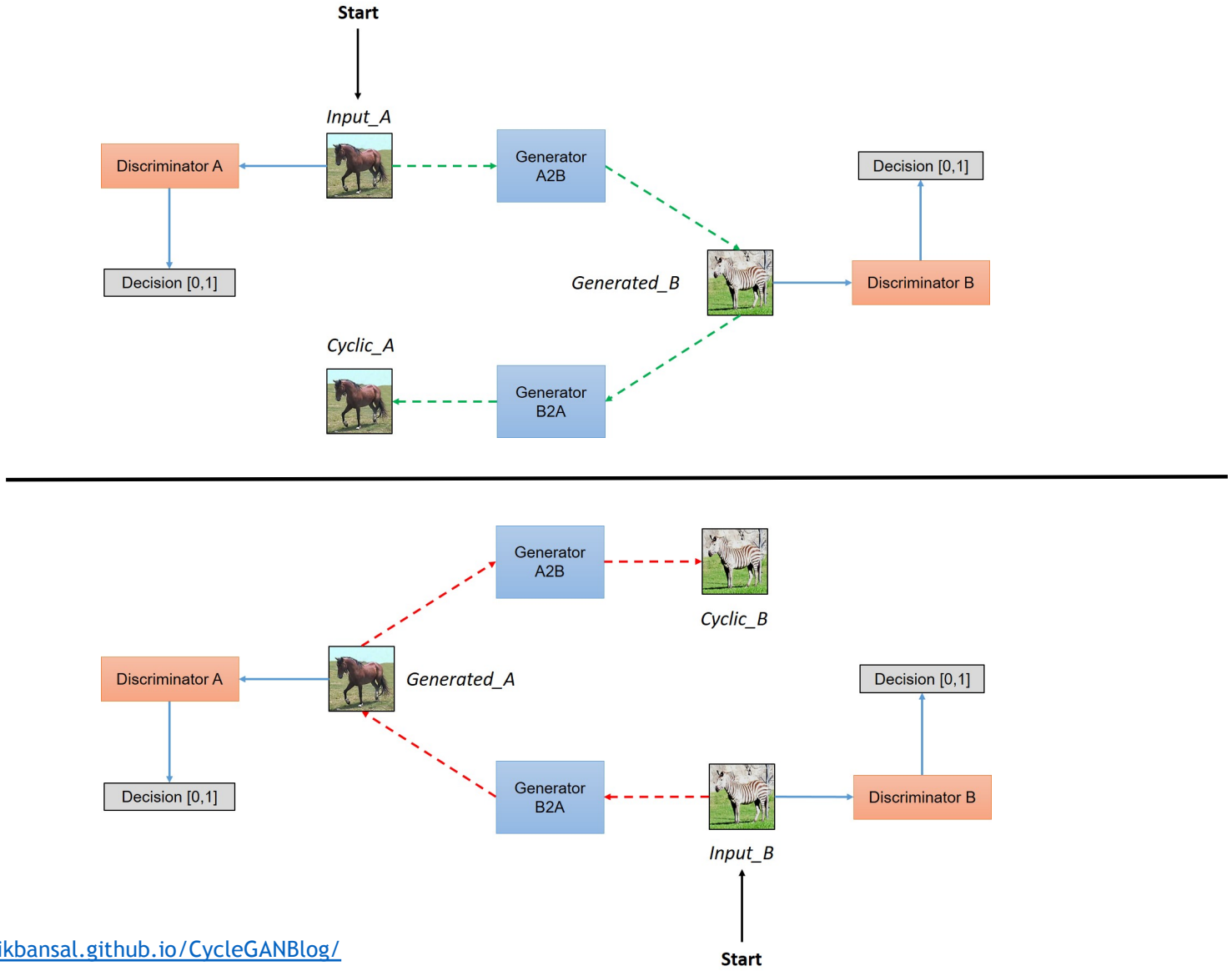

G
X
Y
F
D_X
D_Y
(a)
G
X
$\hat{Y}$
$\hat{X}$
F
X
Y
cycle-consistency loss
(b)
G
Y
$\hat{X}$
$\hat{Y}$
F
X
Y
cycle-consistency loss
(c)

CycleGAN

- Component-wise loss:
  - $L_{GAN}(D_A, G) = \mathbb{E}_x[\log D_A(x) + \log(1 - D_A(G(x)))\ ]$
  - $L_{GAN}(D_B, F) = \mathbb{E}_y[\log D_B(x) + \log(1 - D_B(F(y)))\ ]$

- Consistency loss:
  - $L_{CYCLE}(G, F) = \mathbb{E}_x\left[\left\|F\left(G(x)\right) - x\right\|_1\right] + \mathbb{E}_y[\|G(F(y) - y\|_1]$

- Overall loss:
  - $L_{GAN}(D_A, D_B, G, F) = L_{GAN}(D_A, G) + L_{GAN}(D_B, F) + \lambda L_{CYCLE}(G, F)$



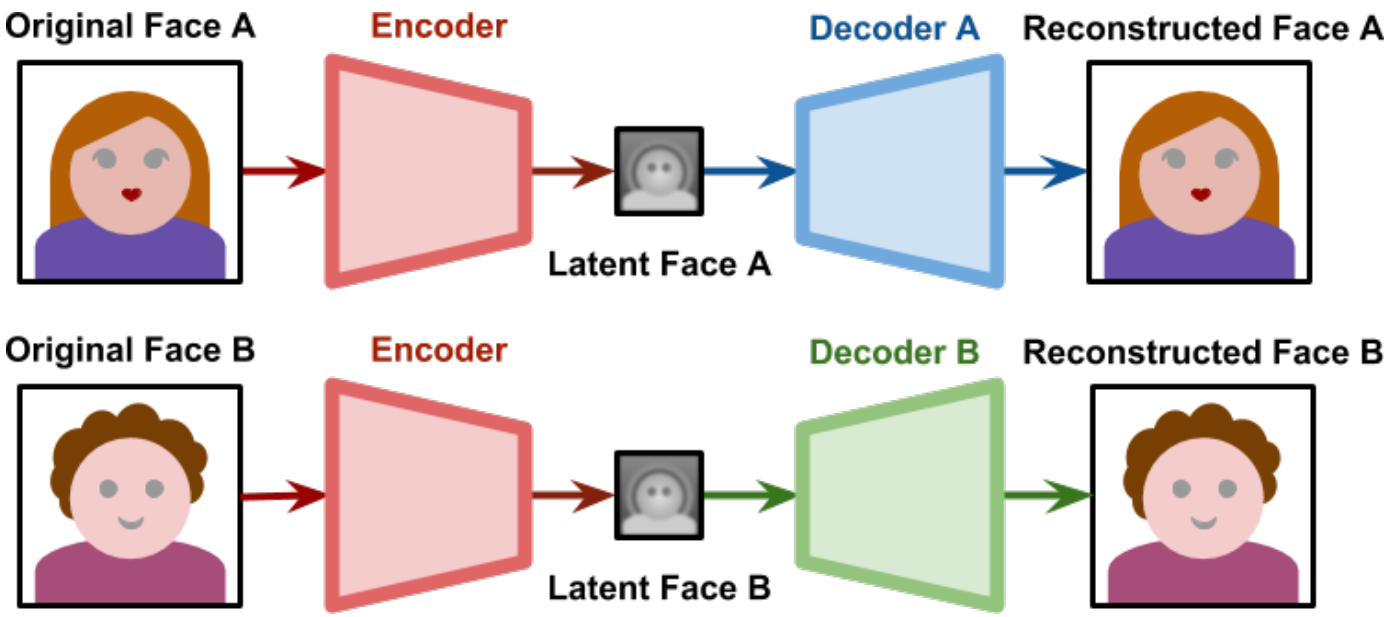
https://hardikbansal.github.io/CycleGANBlog/

CycleGAN

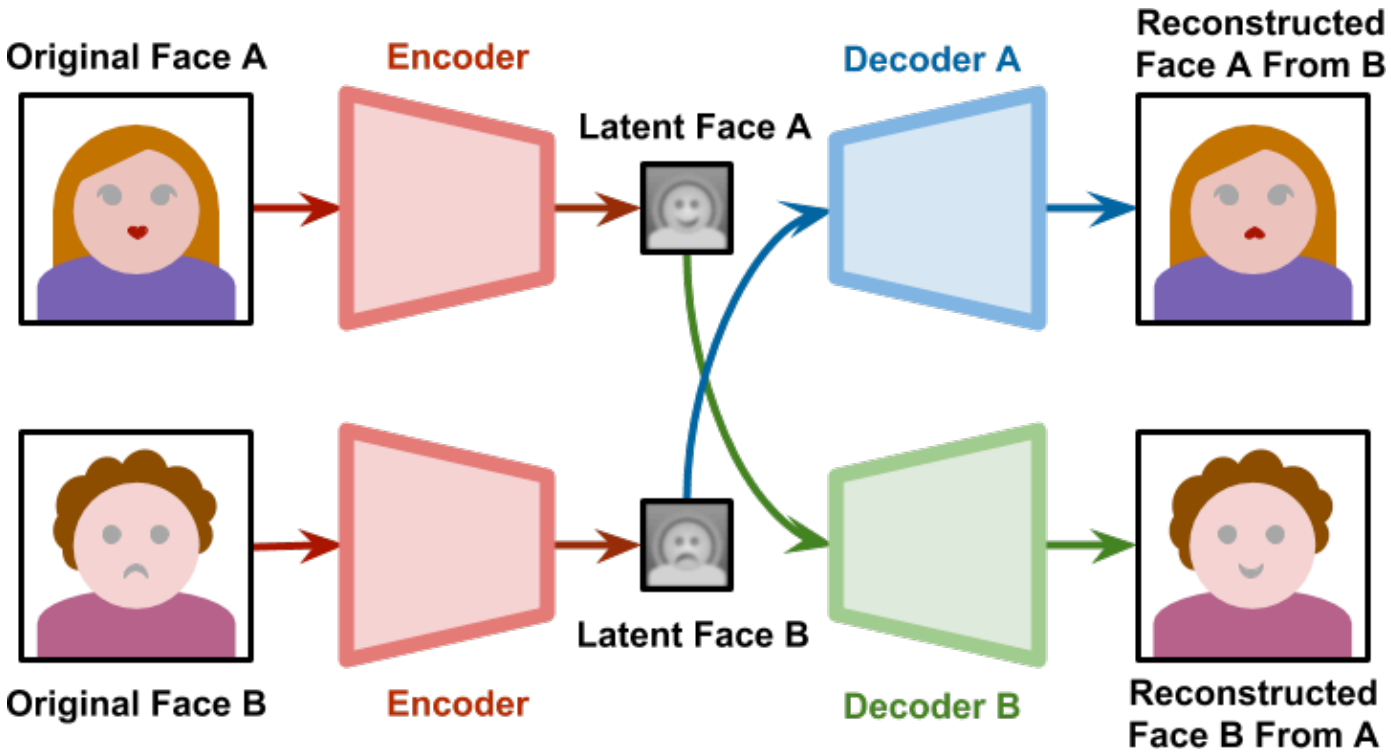
Real

Fake

Deep Fake


Original Face A
Encoder
Decoder A
Reconstructed Face A
Latent Face A
Original Face B
Encoder
Decoder B
Reconstructed Face B
Latent Face B

Deep Fake


Original Face A
Encoder
Latent Face A
Decoder A
Reconstructed Face A From B
Original Face B
Encoder
Latent Face B
Decoder B
Reconstructed Face B From A

Deep Fake

Thanks to

- https://github.com/junyanz/pytorch-CycleGAN-and-pix2pix
- https://github.com/jinfagang/faceswap_pytorch