

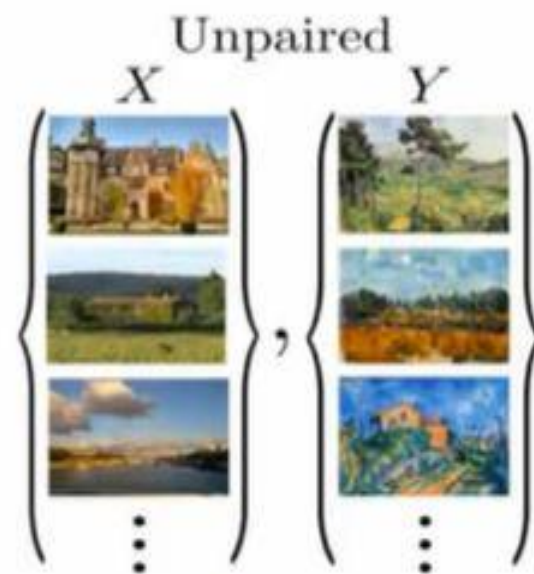
Cycle - GAN

Unpaired Image to Image Translation using
Cycle Consistent Adversarial Networks. (2018)



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Pix2Pix

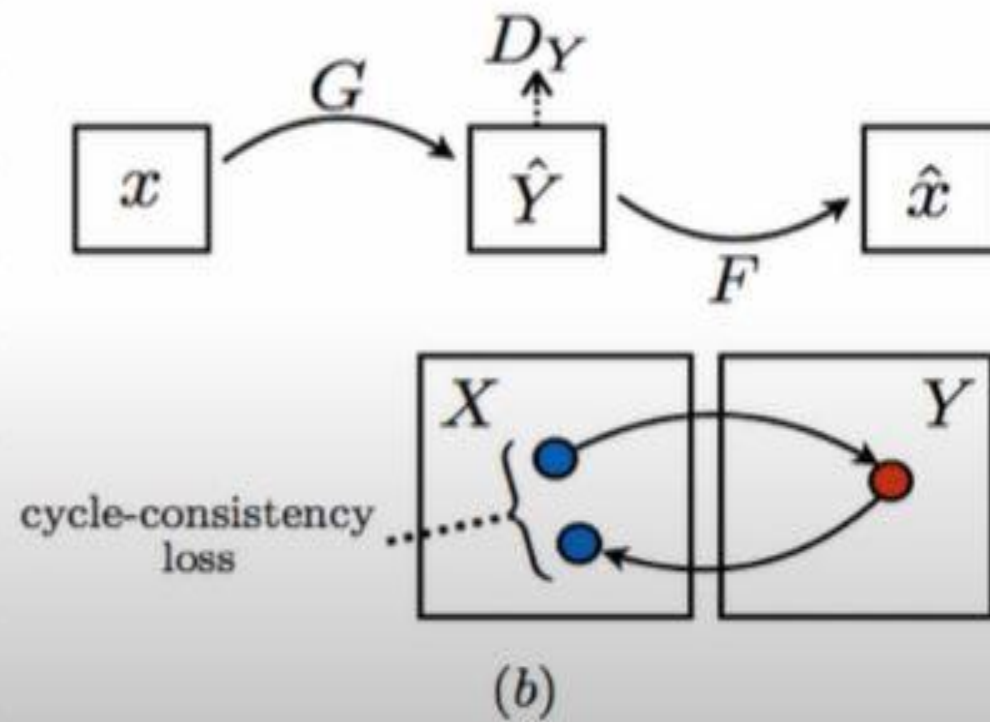
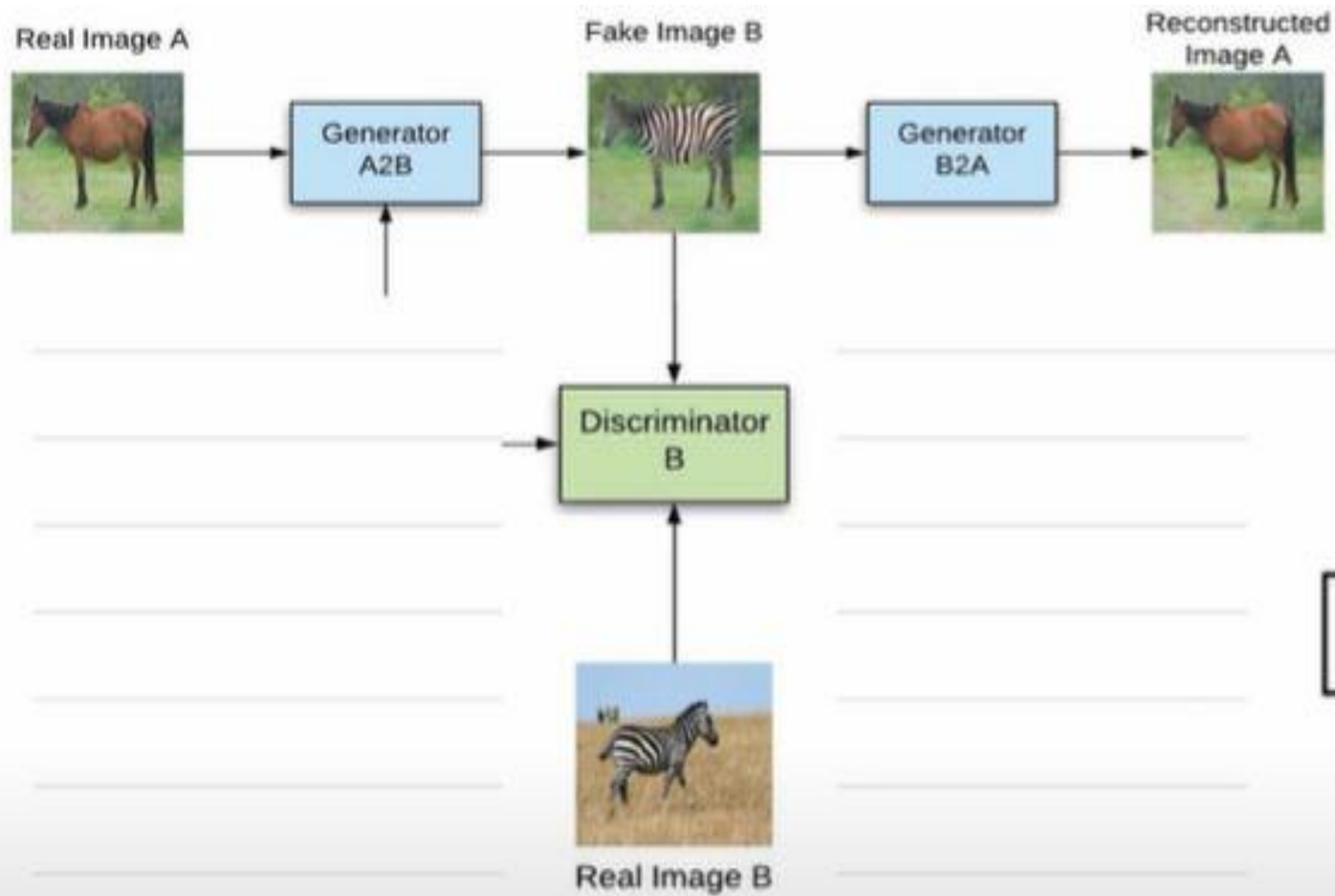


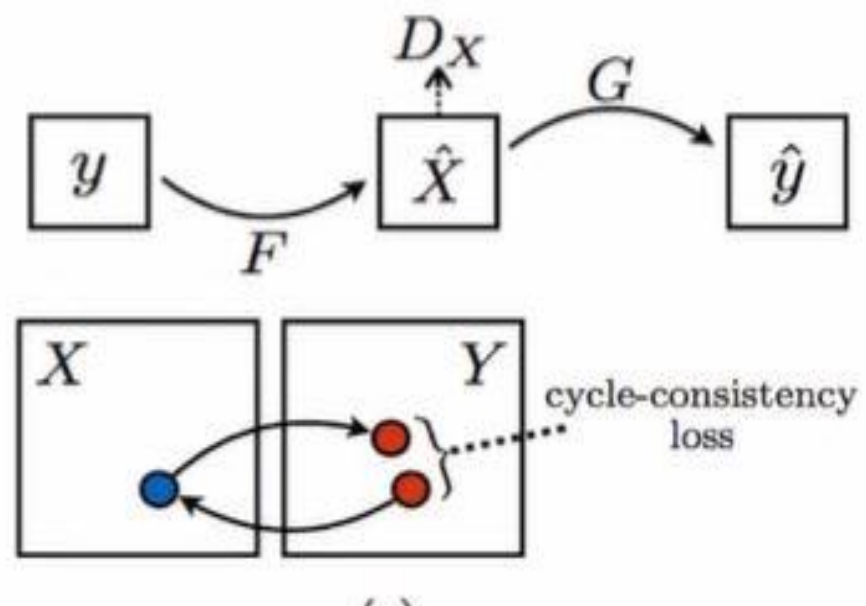
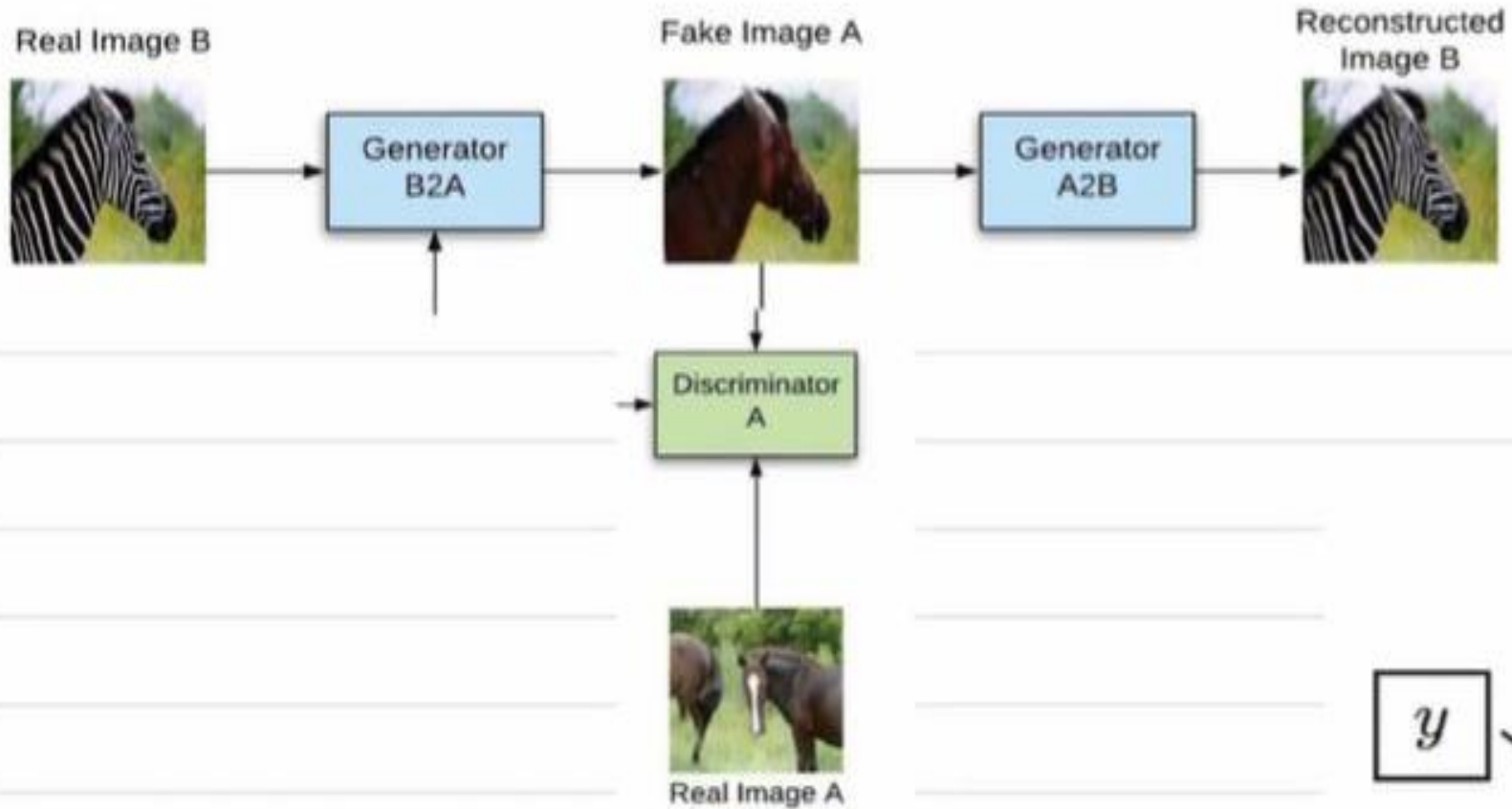
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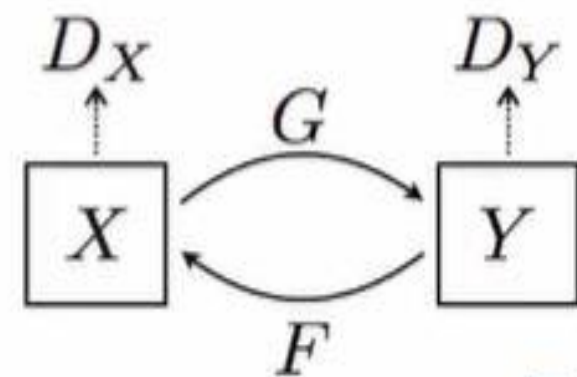
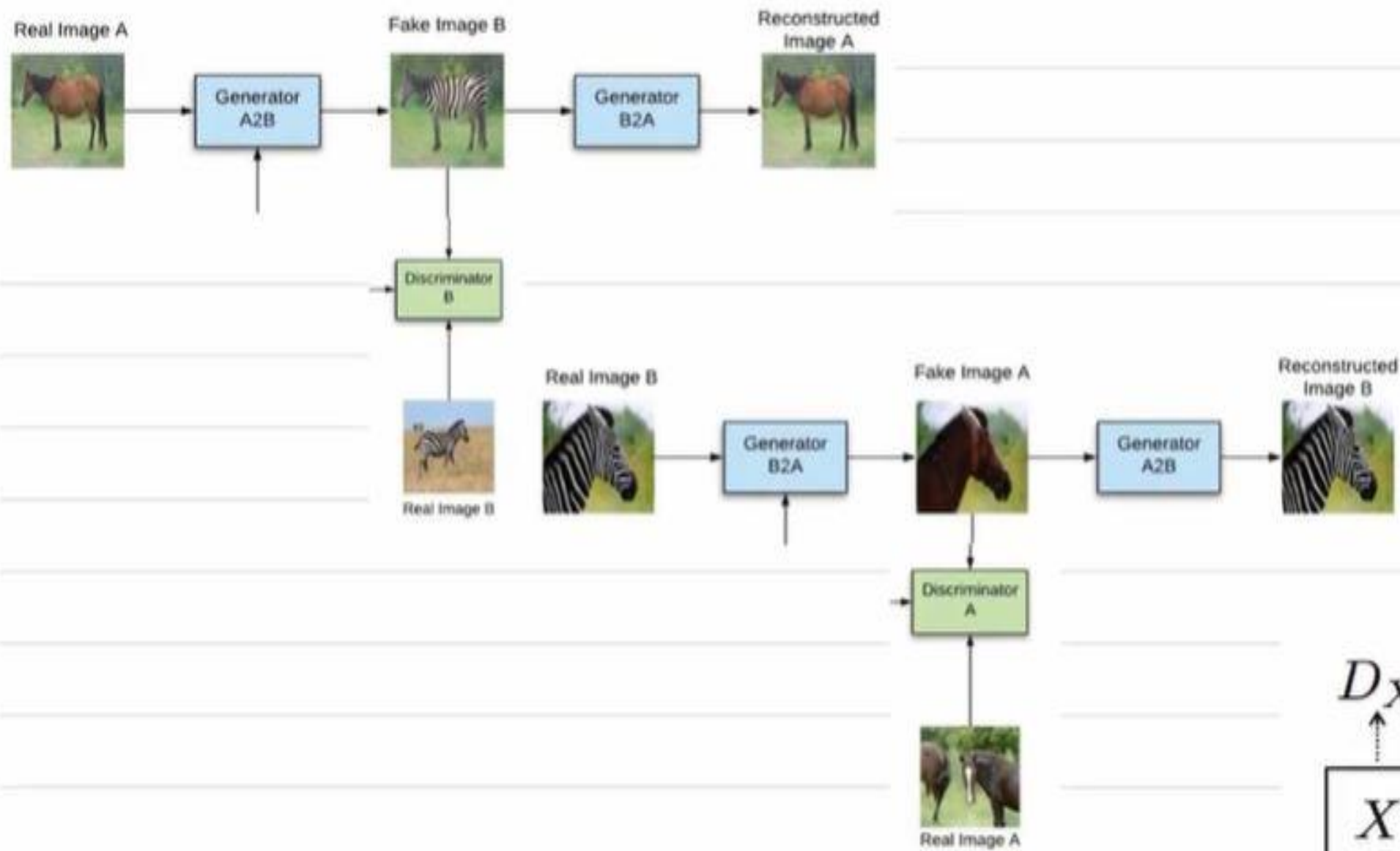
Disco GAN
Dual GAN
Cycle GAN

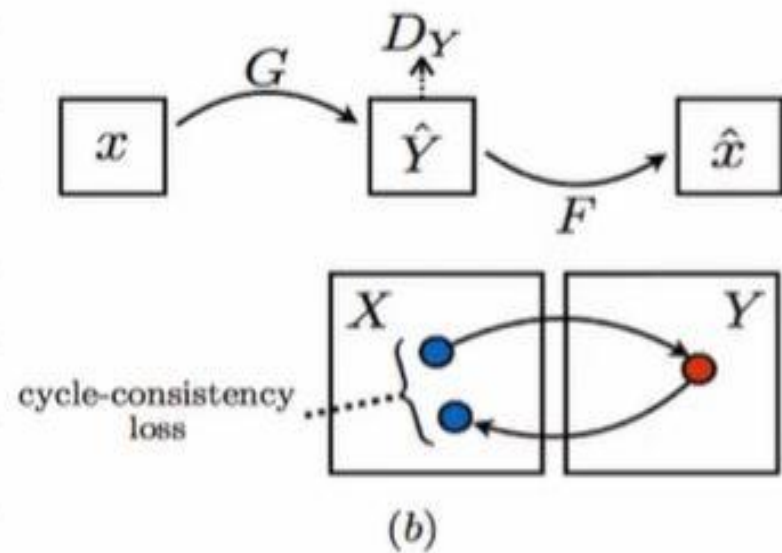
Image to Image Translation











Adversarial Loss

$$L_{GAN_1}(G, D_Y, X, Y) = E_{y \sim p_{data}(y)} \log [D_Y(y)] + E_{x \sim p_{data}(x)} \left[\log (1 - D_Y(G(x))) \right]$$

Cycle consistency Loss:

$$L_{cyc_2}(G, F) = E_{x \sim p_{data}(x)} \left[\|F(G(x)) - x\|_1 \right]$$

Adversarial Loss

$$L_{GAN_2}(F, D_x, Y, X) = E_{x \sim p_{data}(x)} \log [D_x(x)] + E_{y \sim p_{data}(y)} [\log (1 - D_x(F(y)))]$$

Cycle consistency loss:

$$L_{cyc_2}(F, G) = E_{y \sim p_{data}(y)} [\|G(F(y)) - y\|_1]$$

Combined objective function is

$$L(G, F, D_x, D_y) = L_{GAN1}(G, D_y, X, Y) + L_{GAN2}(F, D_x, Y, X) \\ + L_{cyc1}(G, F) + L_{cyc2}(F, G)$$

Optimization:

$$G^*, F^* = \arg \min_{G, F} \max_{D_x, D_y} L(G, F, D_x, D_y)$$