Kepco - UET

Trường Đại học Công nghệ

FINAL PROJECT

Presented by: Nguyễn Quý Đang - 22022500

OVERVIEW

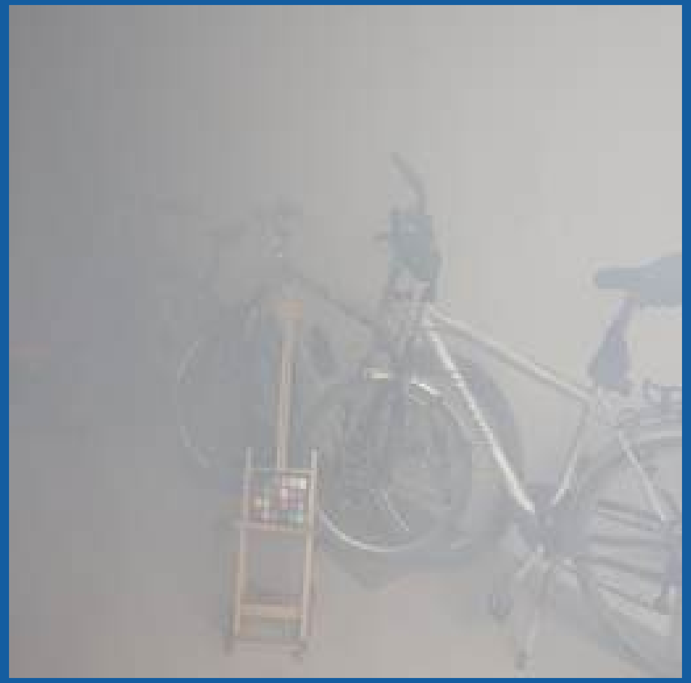
01 Dehazing

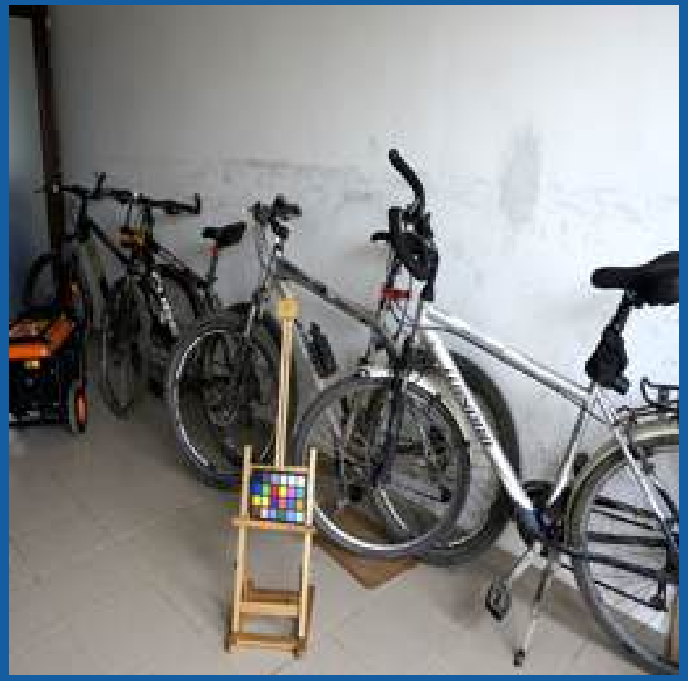
02 CycleGan

03 Virtual try on

04 VITION

01 Dehazing





02 CycleGAN

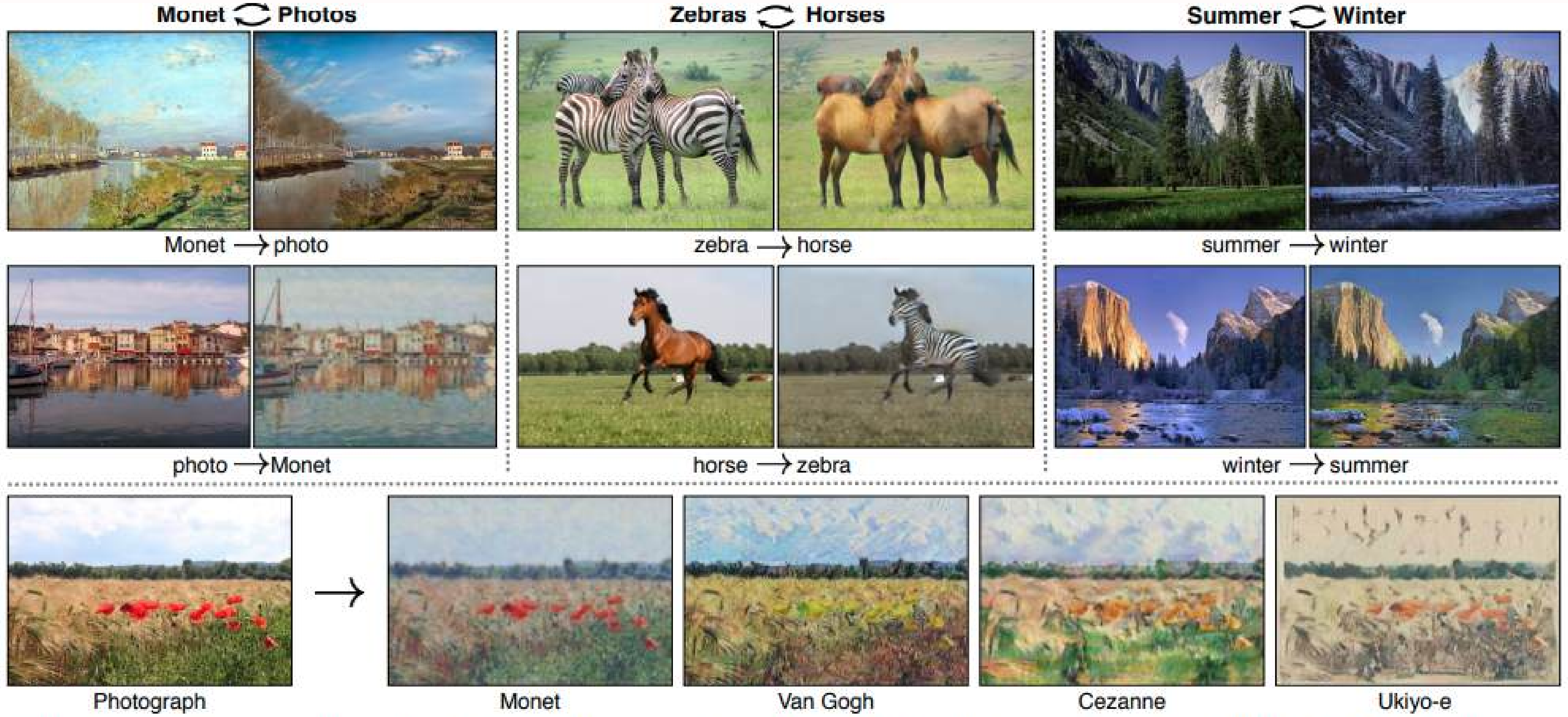


Figure 1: Given any two unordered image collections X and Y, our algorithm learns to automatically "translate" an image from one into the other and vice versa: *(left)* Monet paintings and landscape photos from Flickr; *(center)* zebras and horses from ImageNet; *(right)* summer and winter Yosemite photos from Flickr. Example application *(bottom)*: using a collection of paintings of famous artists, our method learns to render natural photographs into the respective styles.

02 CycleGAN

2.1 Architecture

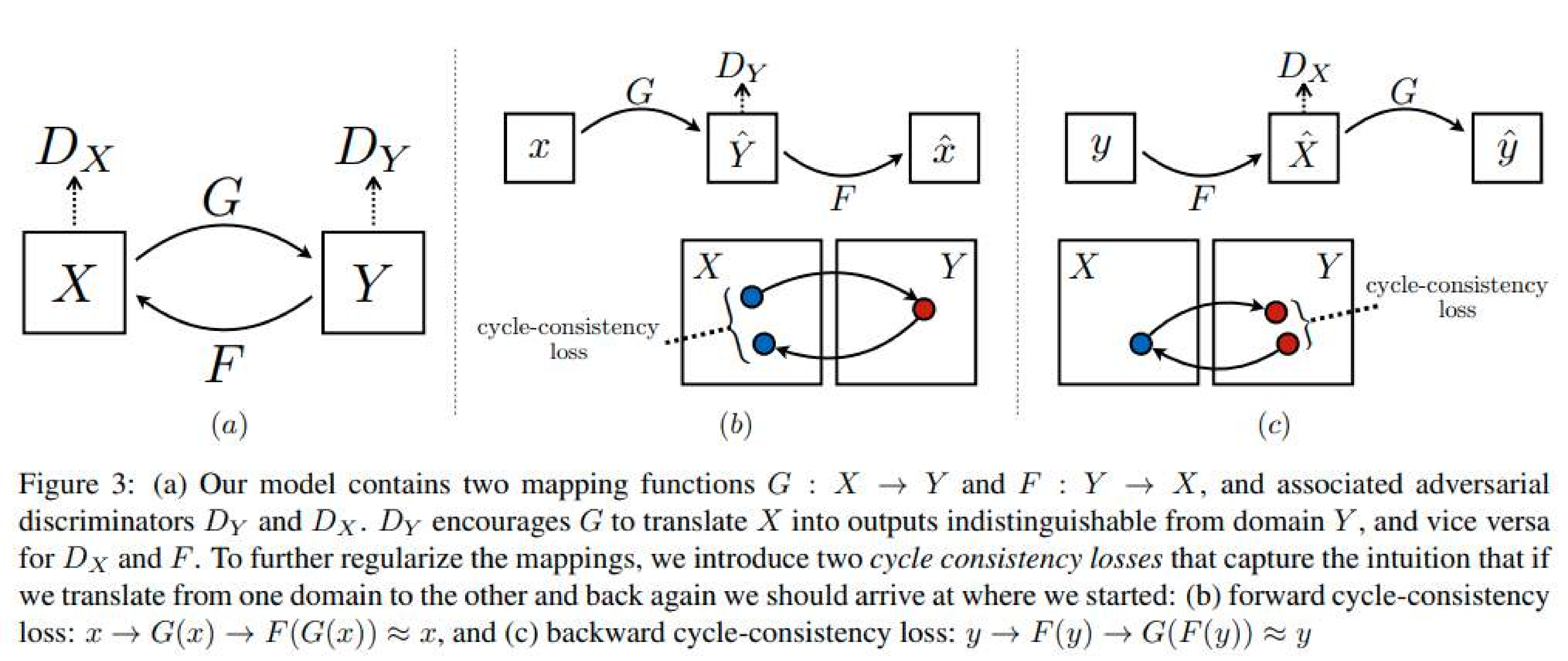
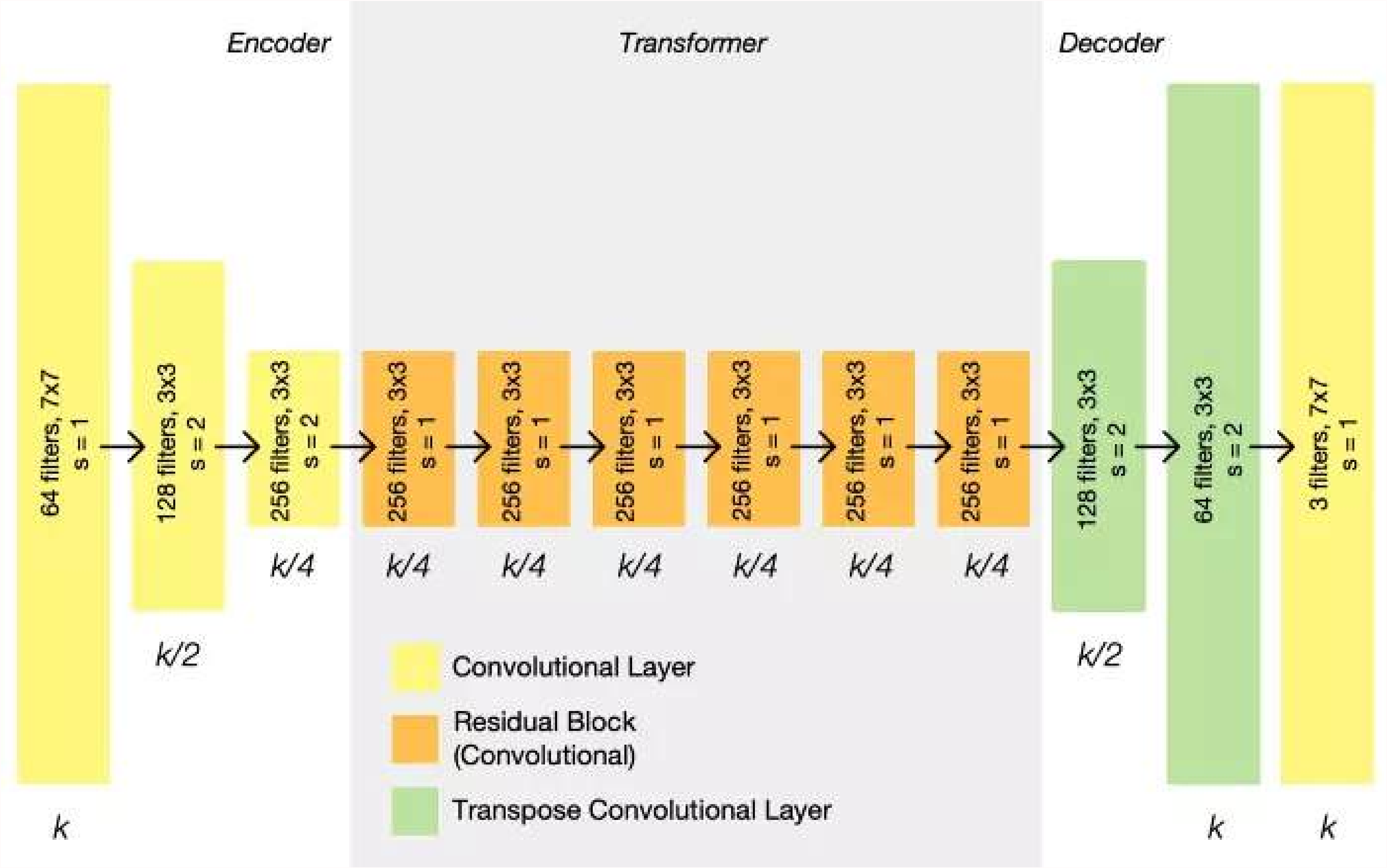


Figure 3: (a) Our model contains two mapping functions $G : X \to Y$ and $F : Y \to X$, and associated adversarial discriminators D_Y and D_X. D_Y encourages G to translate X into outputs indistinguishable from domain Y, and vice versa for D_X and F. To further regularize the mappings, we introduce two *cycle consistency losses* that capture the intuition that if we translate from one domain to the other and back again we should arrive at where we started: (b) forward cycle-consistency loss: $x \to G(x) \to F(G(x)) \approx x$, and (c) backward cycle-consistency loss: $y \to F(y) \to G(F(y)) \approx y$

02

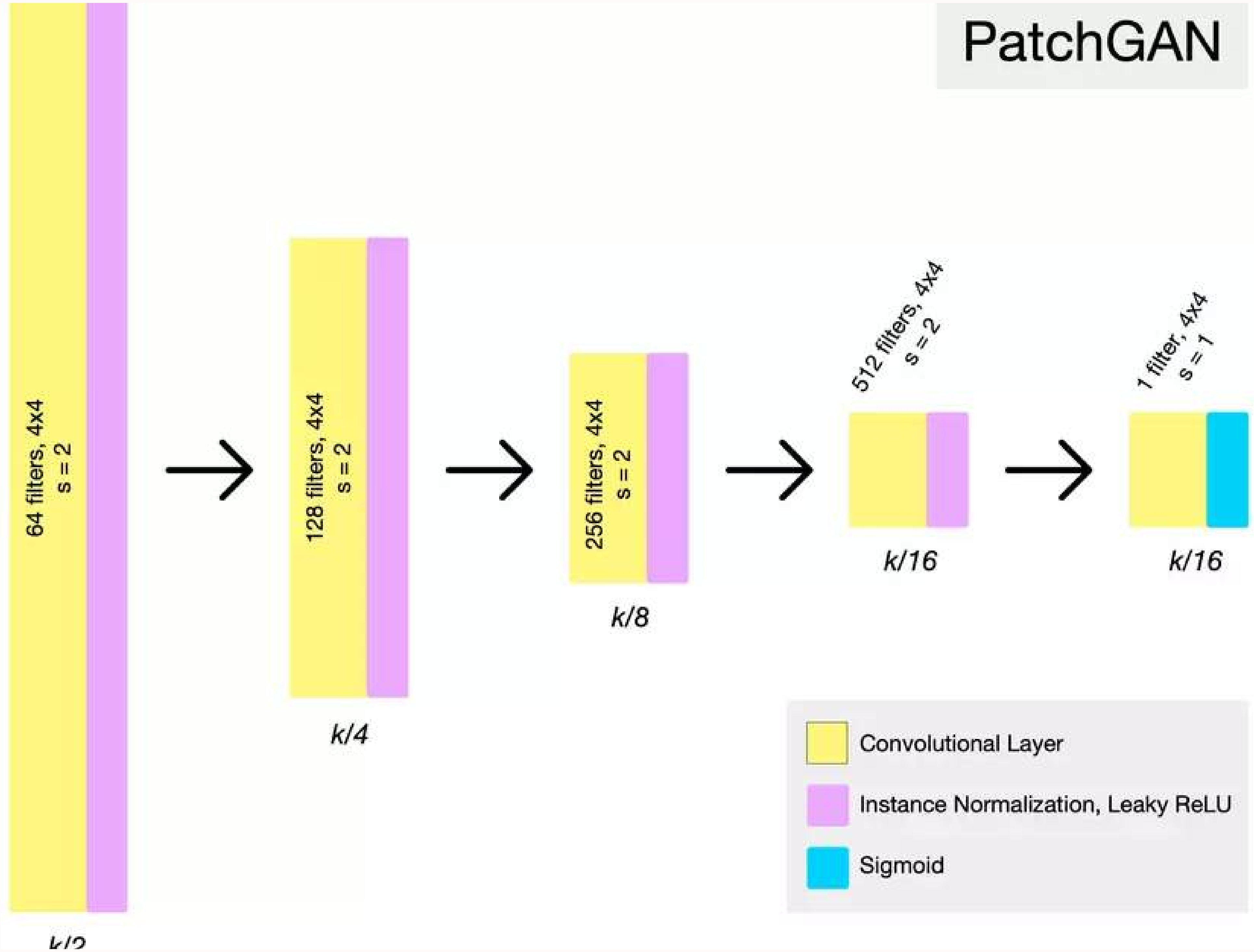
CycleGAN

2.2 Generator



02 CycleGAN

2.3 Discriminator



02 CycleGAN

2.4 Object function

$$L_{adv}(G, D_Y, X, Y) = \tfrac{1}{n}[log D_Y(y)] + \tfrac{1}{n}[log(1 - D_Y(G(x))]$$

$$L_{adv}(F, D_X, Y, X) = \tfrac{1}{n}[log D_X(x)] + \tfrac{1}{n}[log(1 - D_X(F(y))]$$

Adversarial Loss

$$x \rightarrow G(x) \rightarrow F(G(x)) \approx x$$

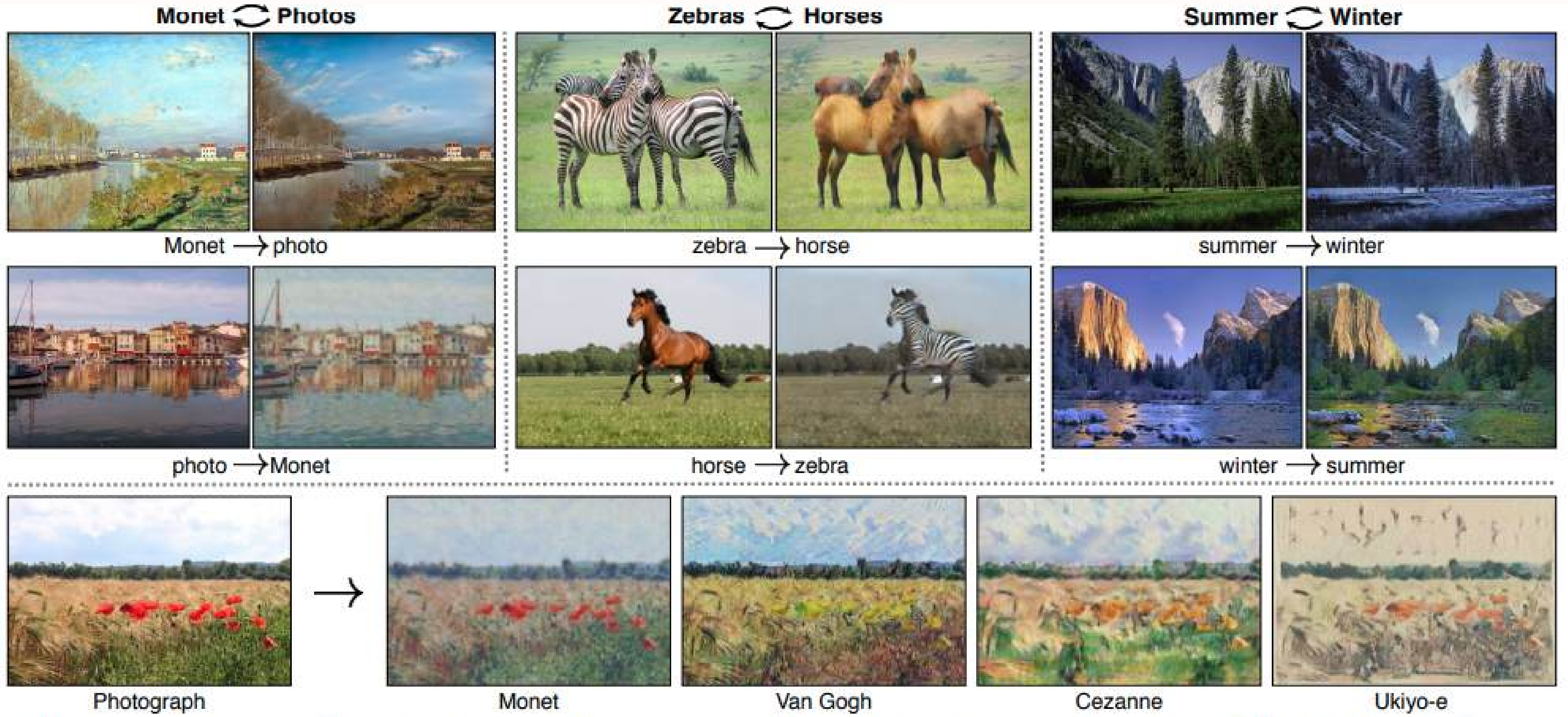
$$L_{cycle}(G, F) = \tfrac{1}{n}\sum |F(G(x_i)) - x_i| + |G(F(y_i)) - y_i|$$

Cycle Consistency Loss

$$L = L_{adv}(G, D_Y, X, Y) + L_{adv}(F, D_X, Y, X) + \lambda L_{cycle}(G, F)$$

02 CycleGAN

2.5 Result



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02 CycleGAN

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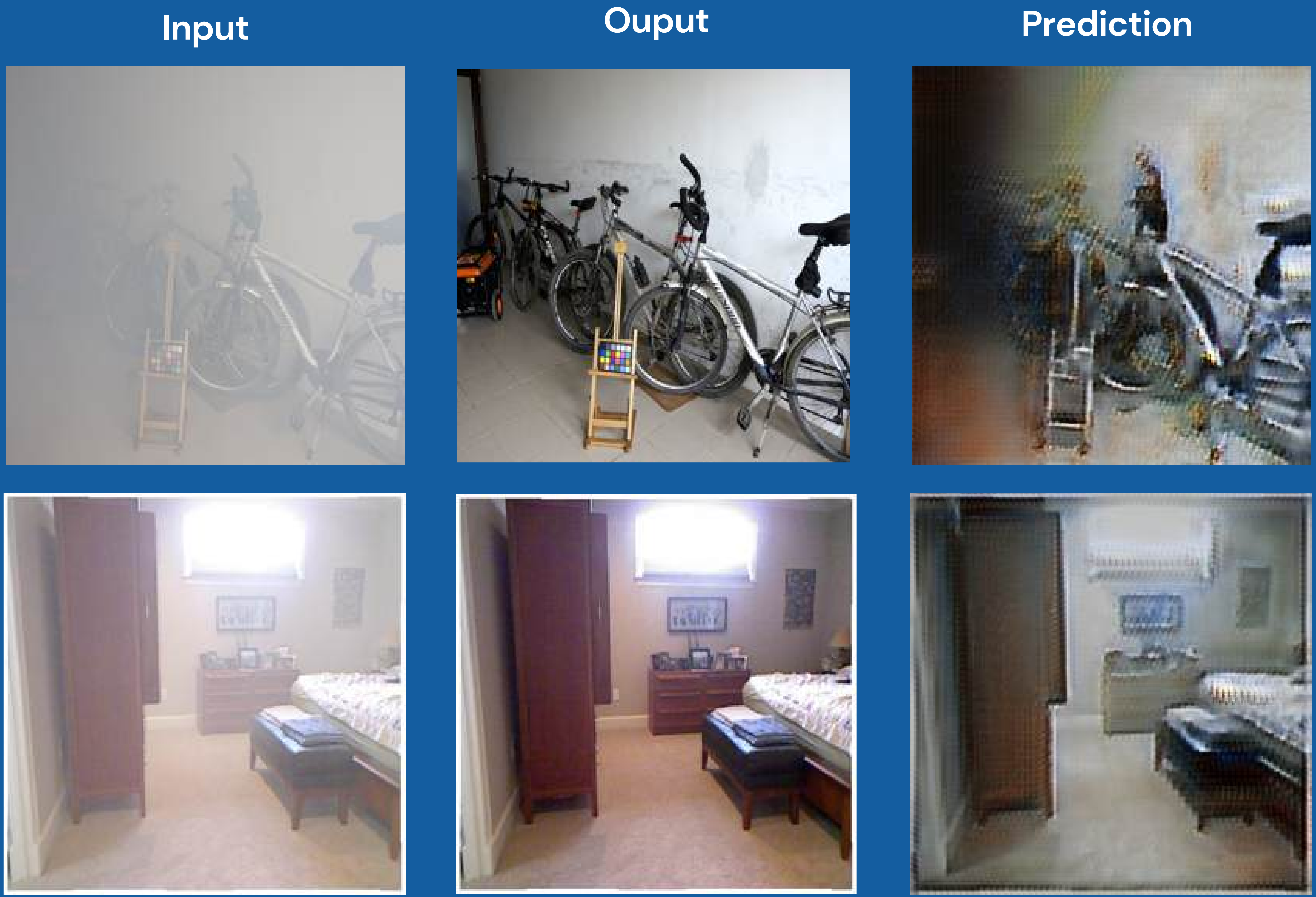
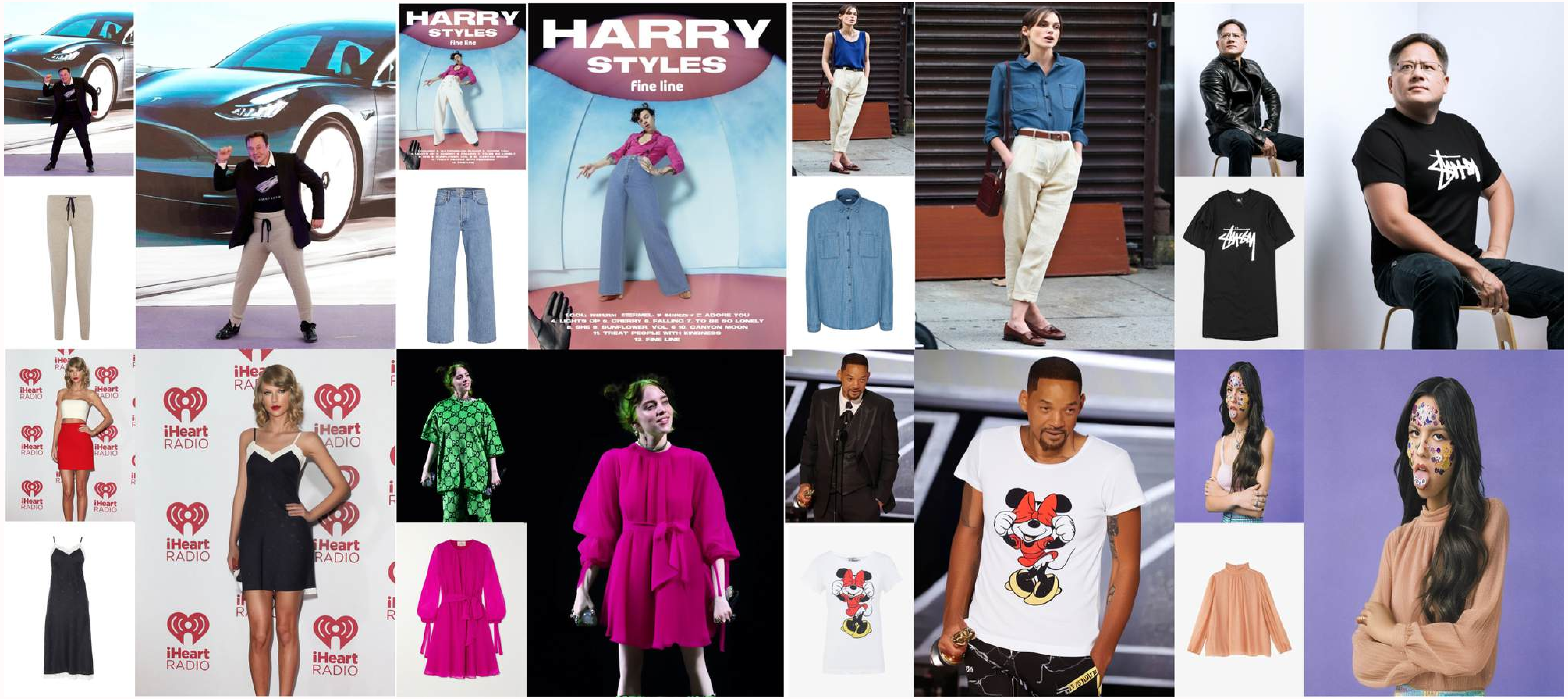


Input

Ouput

Prediction

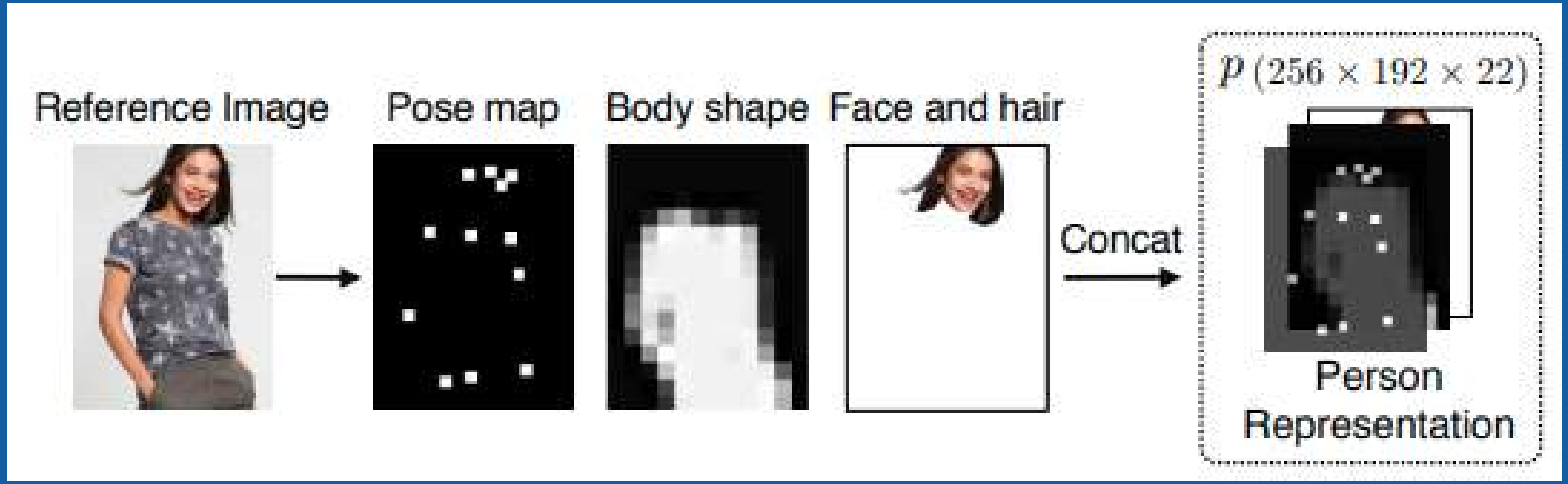
03 Virtual Try On

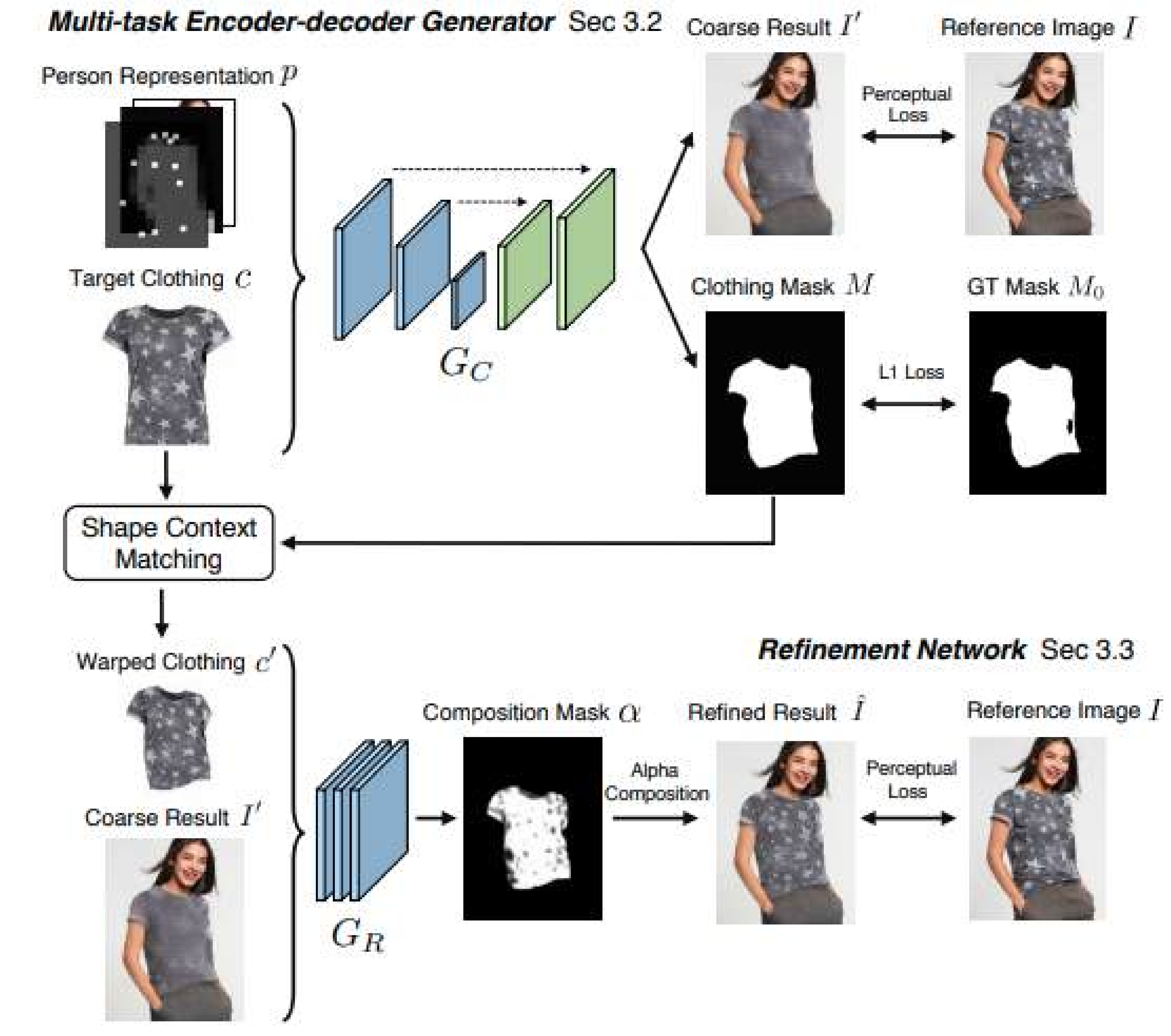


04

VITON

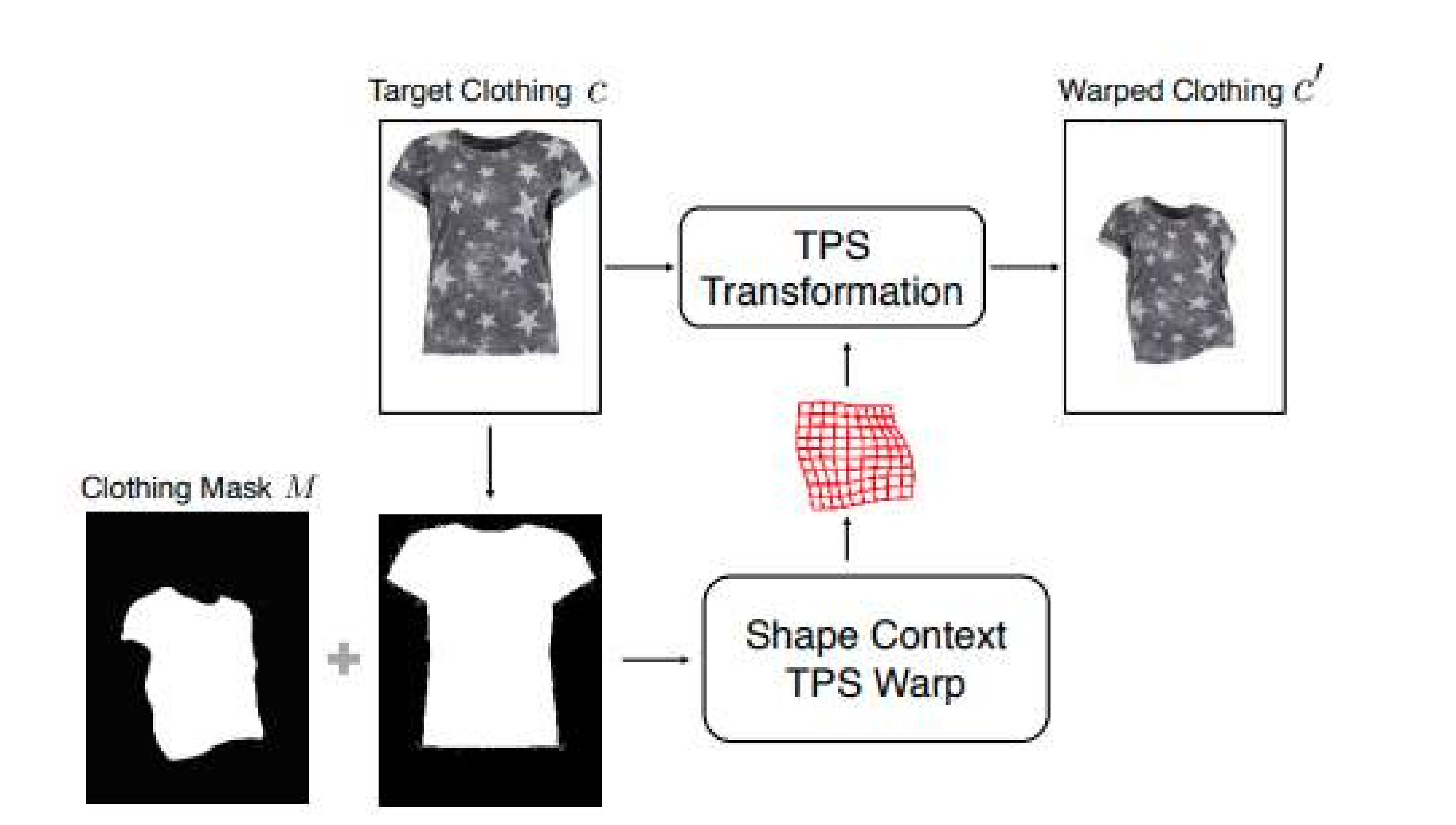
4.1 Architecture

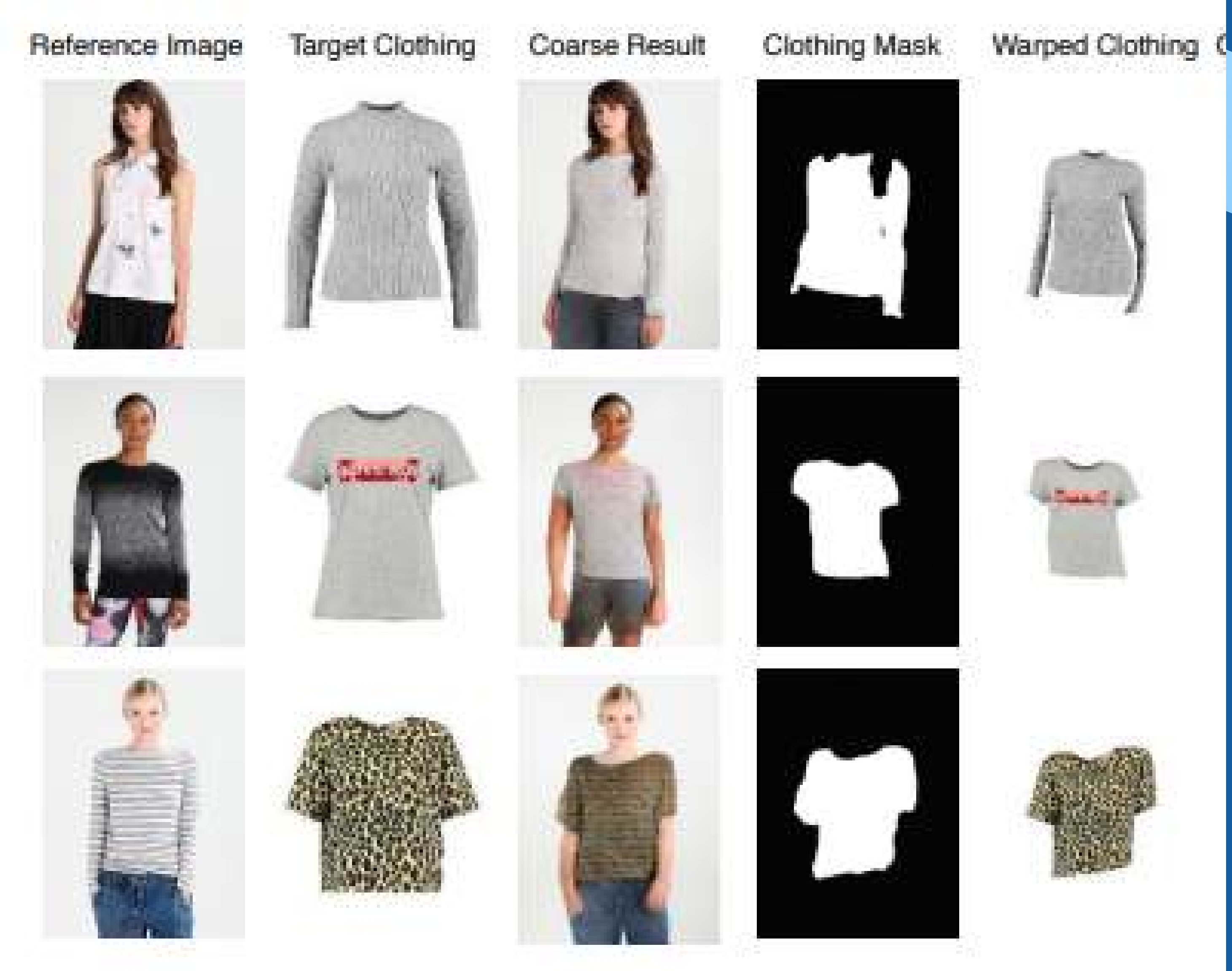




04 VITON

4.2 TPS Transformation



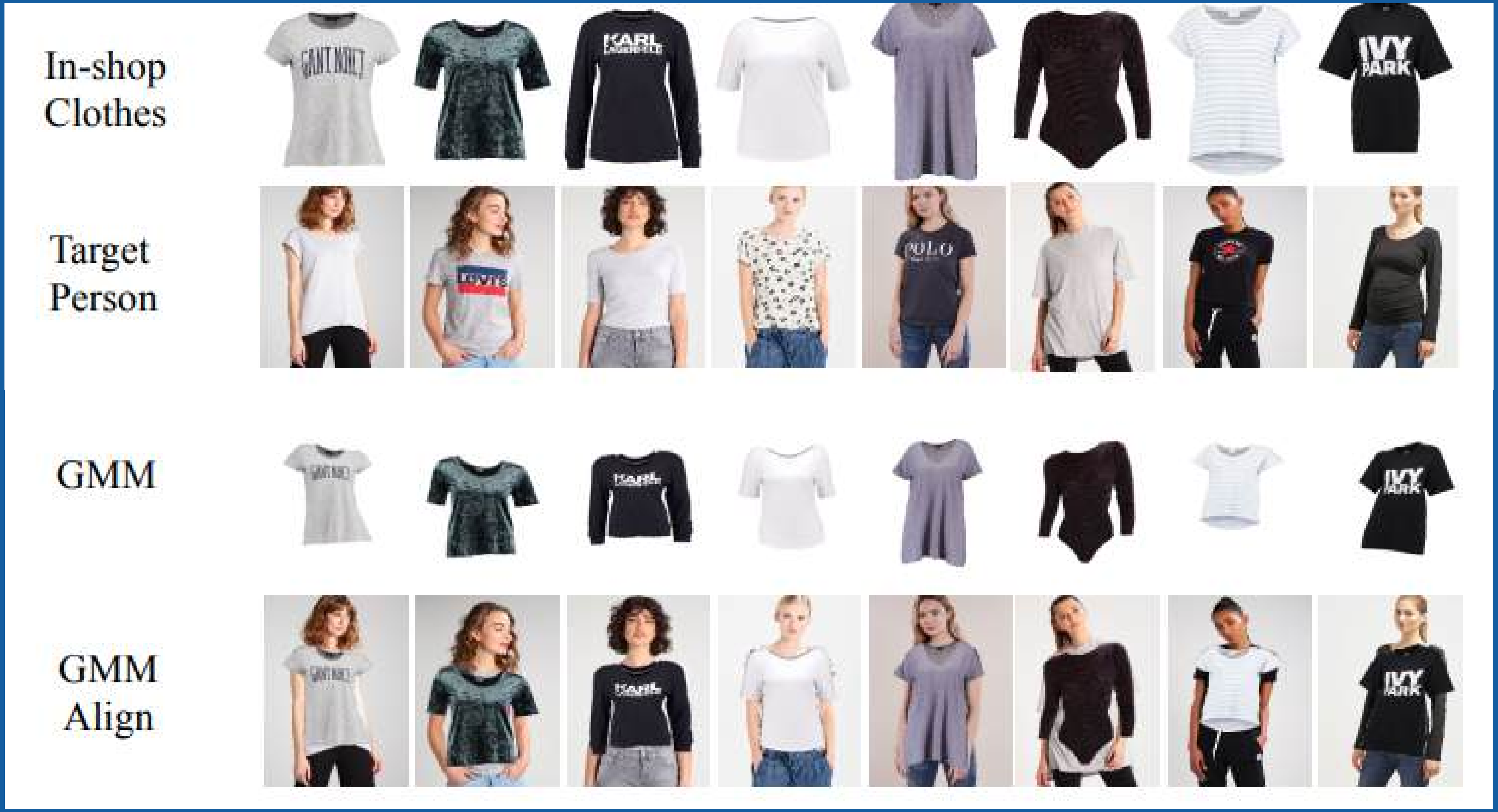


$$\sum_i \|f(P_i) - Q_i\|^2 + \lambda \iint \left(\frac{\partial^2 f}{\partial x^2} + 2\frac{\partial^2 f}{\partial x \partial y} + \frac{\partial^2 f}{\partial y^2}\right)^2 dx\, dy$$

$$I_o = M \odot \hat{c} + (1 - M) \odot I_r$$

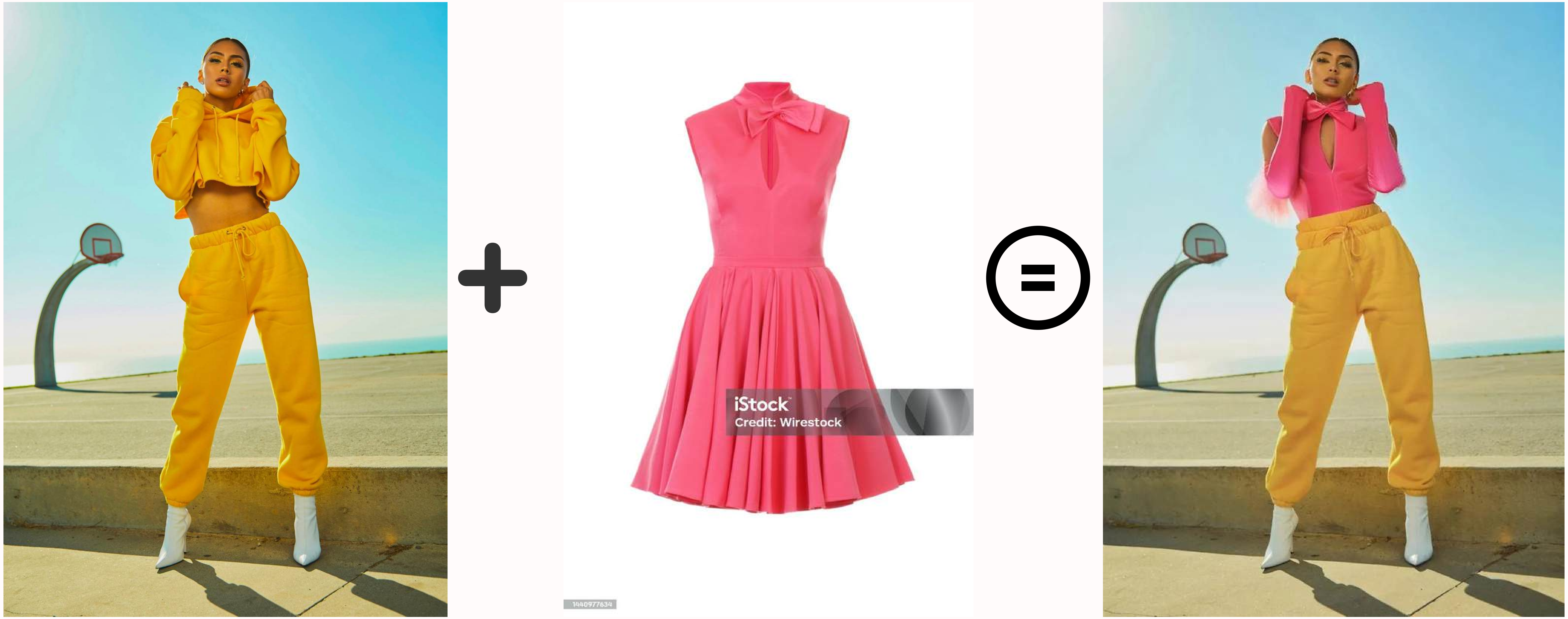
04 VITON

4.3 Result



04 VITON

4.5 Result



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Thank's For Watching