

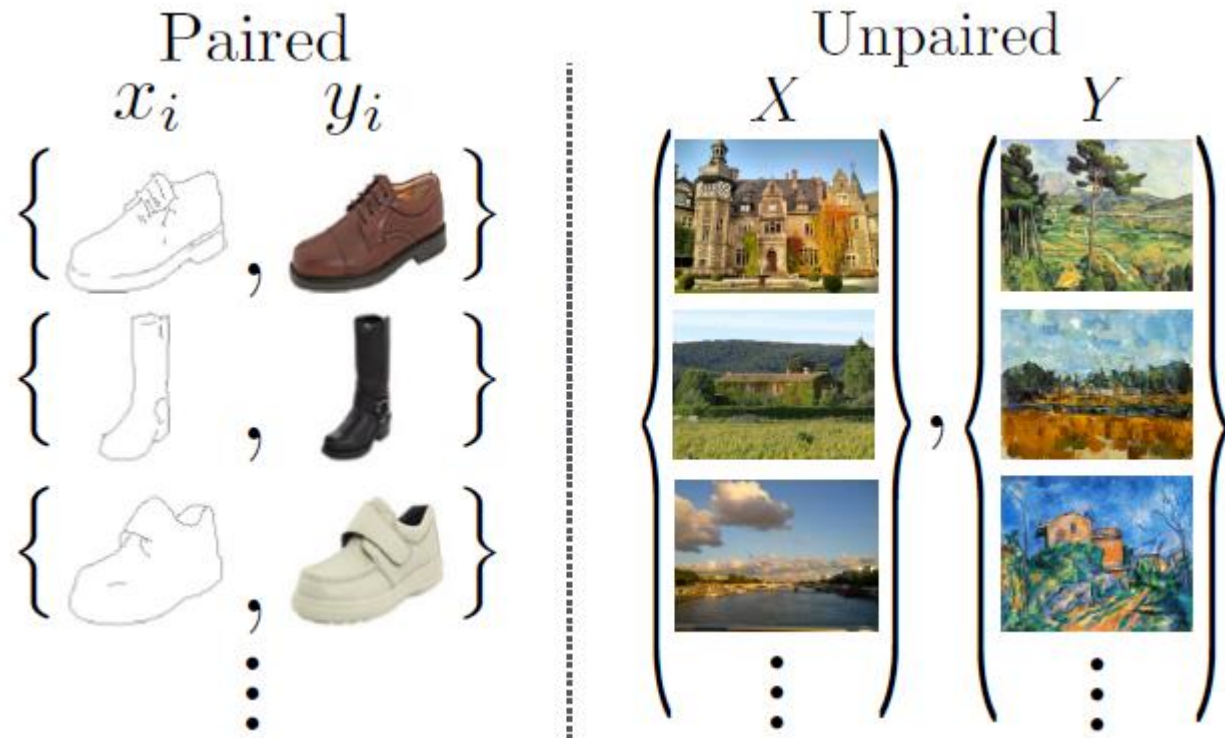
# Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks

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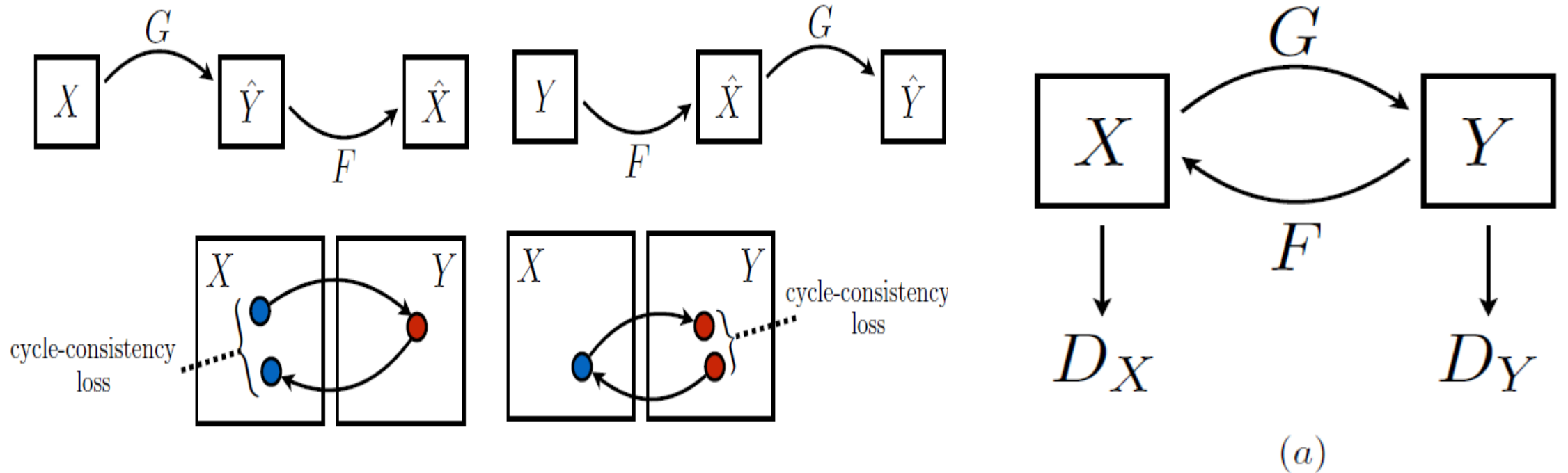
HARSHITA MANGAL

# Paired and Unpaired Image to Image Translation

- Paired Training data-  $y_i$  corresponding to each  $x_i$  is given
- Unpaired data- No information provided as to which  $x_i$  corresponds to which  $y_i$



# Why do we need Cyclic loss?



# Dataset

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## **Object Transfiguration:**

- Subset of ImageNet is used.
- Two pairs of classes- horse and zebra, orange and apple
- Around 1000 images

## **Style Transfer:**

- Experiments conducted on 3 styles-  
The Ukiyo-e, The style of Claude Monet and Vincent Van Vangogh

## **Season Transfer:**

- 854 winter photos and 1273 summer photos of Yosemite

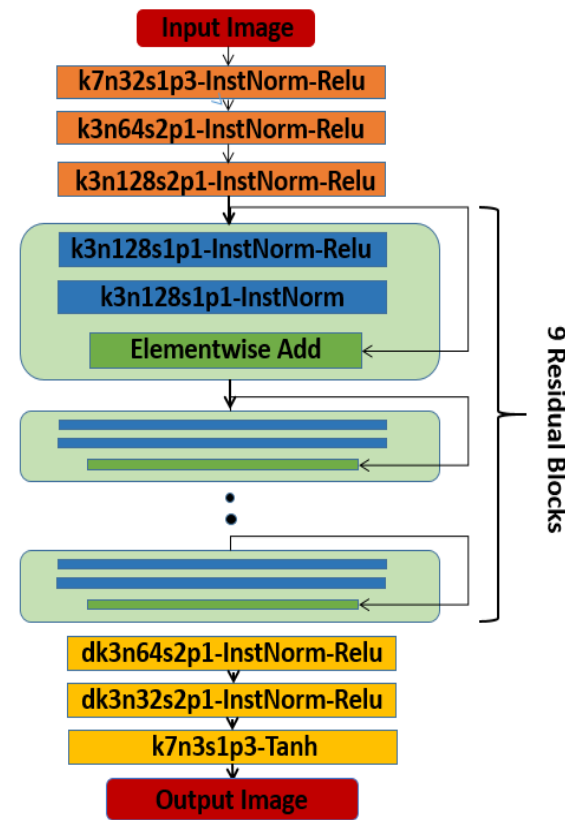


Training images- Train A-14 (left), Train B 37(right)

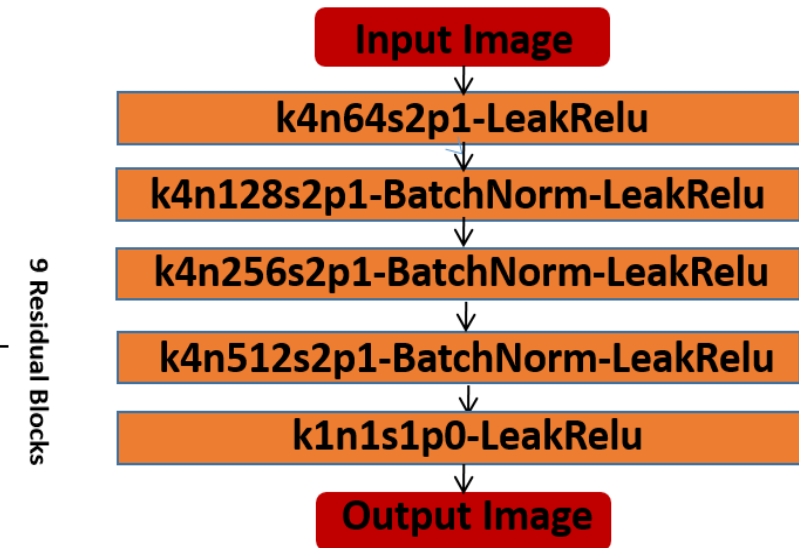
# Training Details

$$L(G, F, D_x, D_y) = L_{GAN}(G, D_y, X, Y) + L_{GAN}(F, D_x, X, Y) + \lambda L_{cyc}(G, F)$$

- Control parameter  $\lambda=10$
- We are using Adam Solver with Batch size=1
- No. of Epochs=200
  - First 100 Epochs- Learning rate=0.0002
  - Next 100 Epochs- Learning rate decays linearly



The Network Architecture of Generator





# Experimental Results

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**horse → zebra**



**zebra → horse**

# Experimental Results

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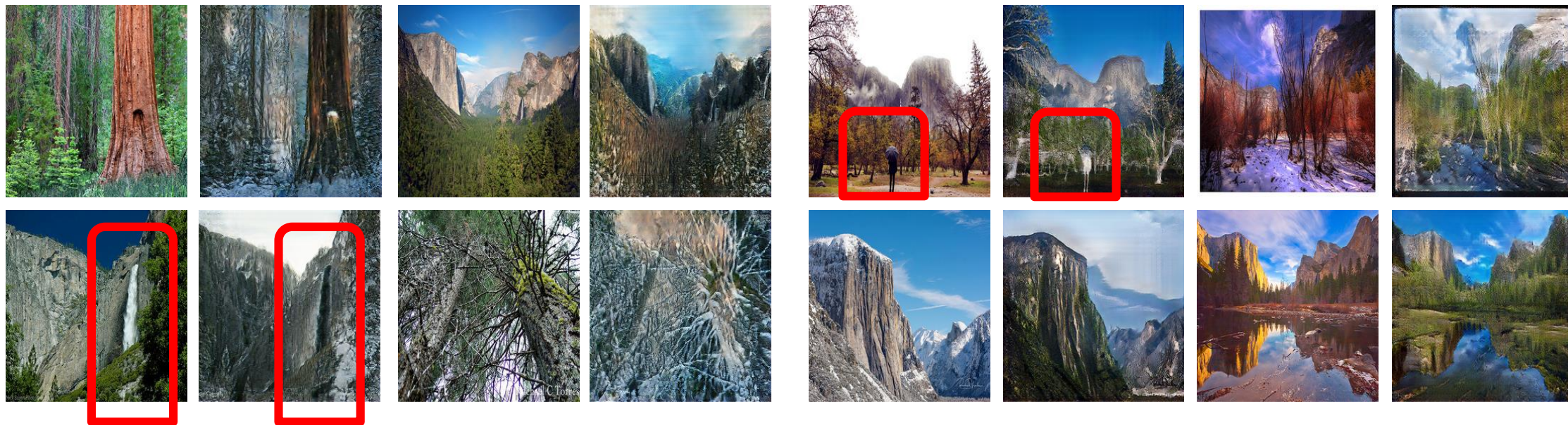
**apple → orange**

**orange → apple**



# Experimental Results

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**summer → winter**

**winter → summer**



# Automatic Labelling for Imaging Plane Estimation

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Marker Detection and  
Clustering



Labelling



Direct Linear Transform for  
Imaging plane Estimation

# Statistical shape and Appearance model

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- Procrustes Analysis- Align shapes
- PCA to find mean shape
- Deform mean shape