Multi-style Image Morphing System based on GANs and XDoG

Project Presentation

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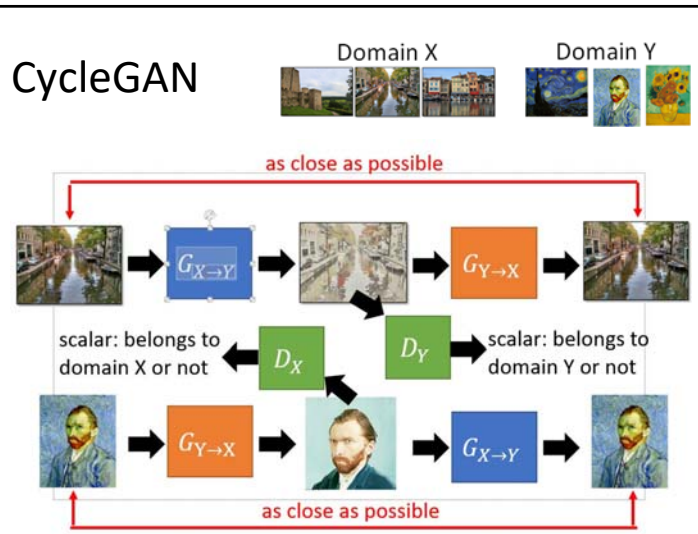
Introduction / Motivation

* **CycleGAN** is promising to transfer style from one image to another...
* But, how about such style transfer on '**video**' ???
* Cameras are everywhere, to plan style ahead that matters.

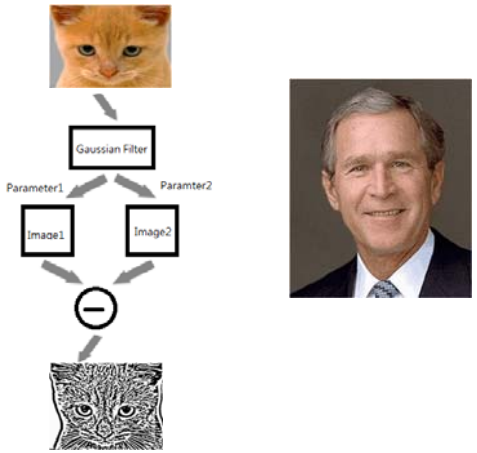
* We have **morphing** to check transfer details, and
* We also include **XDoG** to compare pros & cons of **cycleGAN**

* Let's kick-off the journey of GREAT MOVIE DIRECTOR !!!

CycleGAN



XDoG / Image Morphing



Experiment Steps

Take Few Video → Video to Frame → CycleGAN XDoG → Morphing → Pick Up → Frame to Video

1. Take few **videos** with different scenes. Ex:30 fps

2. Slice each **video** into several continuous still images.

3. Optimize parameters of **CycleGAN** or **XDoG** for each sliced still image, and transform then.

4. Set several **morphing** degree from original image to transformed image. Ex:30x10=300 images

5. Along time axis, pick up each still image with proper **morphing** degree to show continuous changes. Ex:300 pick up =30 images

6. Archive these images, and form back **video** again.

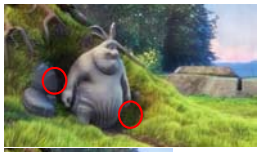
Result Discussion

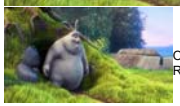
Our model was trained on the wild horse and zebra synsets of ImageNet.
So may cause some problems when the testing data are not horses.

Variety of the testing data will make different results of better performance or not.

XDoG shows better performance while comparing to the result of CycleGAN.

CycleGAN of Rat





Original Rat

CycleGAN of Island

Original Island

XDoG of Port

Conclusion

- With different **morphing** degree, movie style is easier to be inspired & planned ahead.
- Though **cycleGAN** promises us unpaired image-to-image translation during training phase, in fact, similar to input stuffs in train pool is still necessary.
- As reference, **XDoG** is simpler for preparation, yet the style is limited and transform proceeds irreversible.
- Well-trained **cycleGAN** for **video** takes efforts to widely train, yet it deserves.