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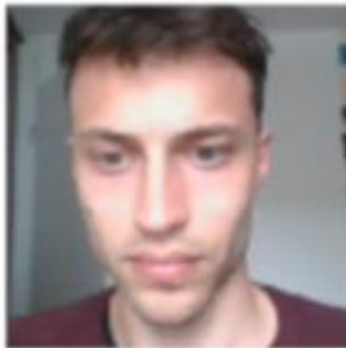
# Face to Cartoon using cycleGAN

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Advanced Topics of Machine Learning FS2019  
by Prof. Dr. Paolo Favaro

# Introduction to the Project

- **Goal:** Switch image styles from real faces to cartoon faces using unpaired data only.
- **Approach:** Use and modify CycleGAN (Jun-Yan Zhu et al.)



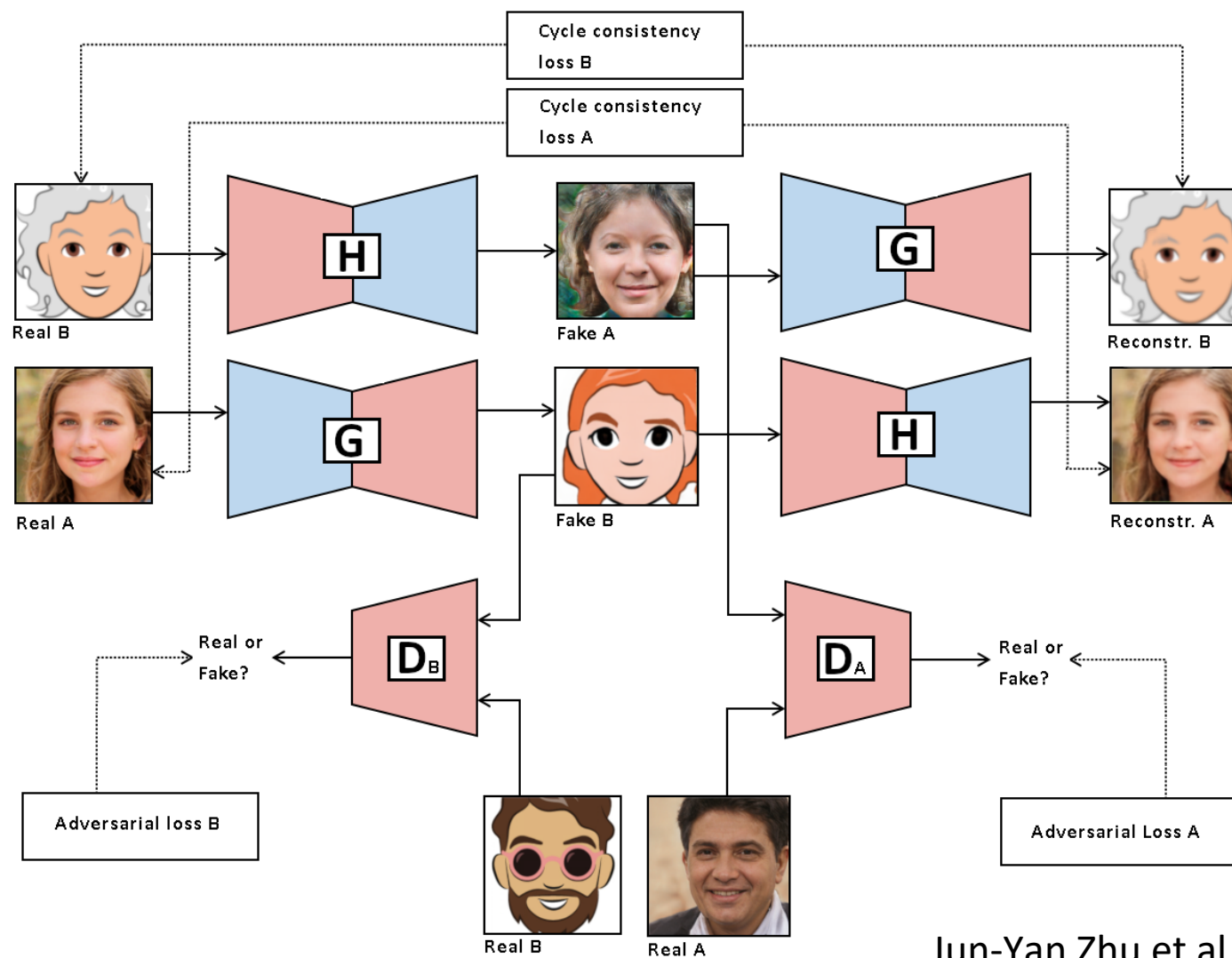
# Datasets

- **Cartoon:** These cartoons helped develop the technology behind the personalized stickers in Google Allo. Around  $10^{13}$  possible combinations of styles and colors.
- **Real Faces:** 1000 real face images from the FFHQ dataset, which is from Style GAN



<https://google.github.io/cartoonset/index.html>

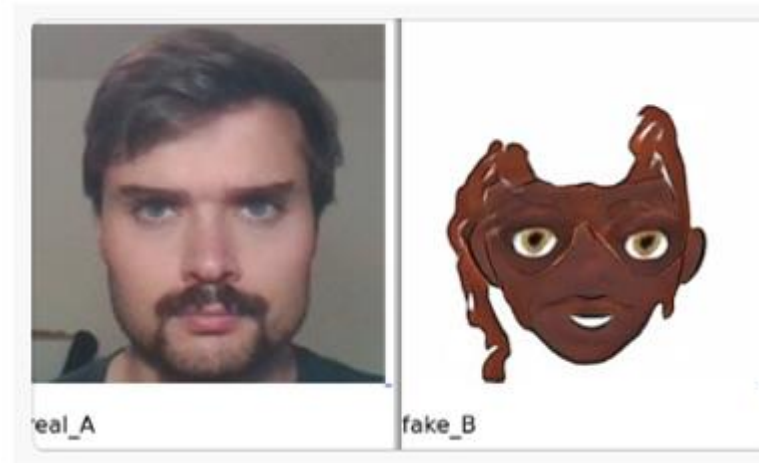
# Approach: CycleGAN



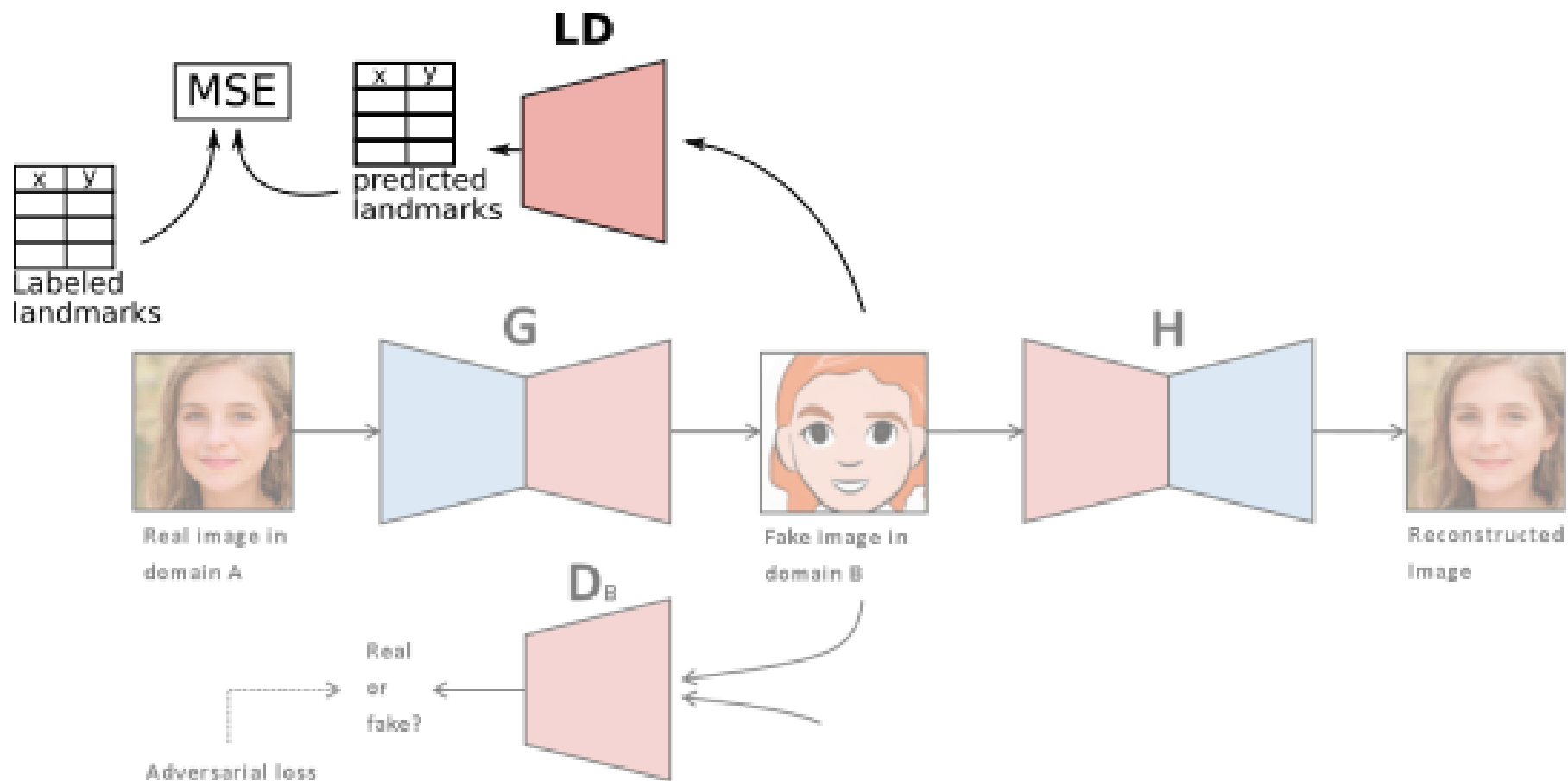
Jun-Yan Zhu et al.

# First results with CycleGAN

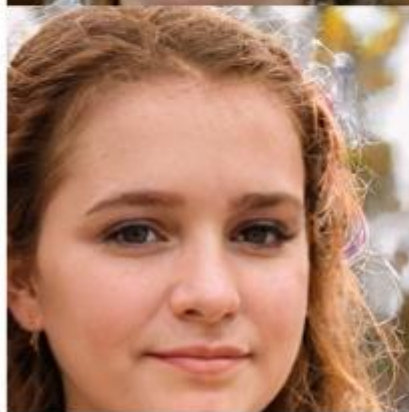
- There is no real correspondence between the faces
- We have no control over the generation of e.g. the color



# Landmarks Loss

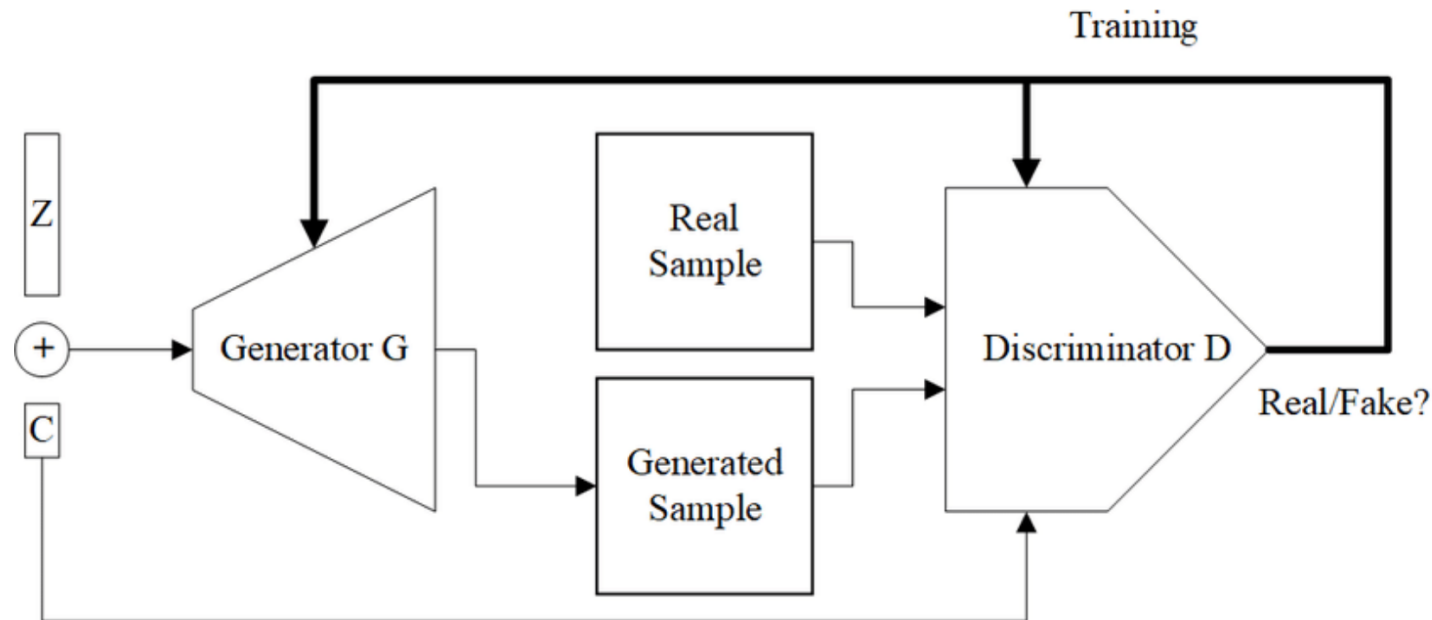


# Landmarks Loss



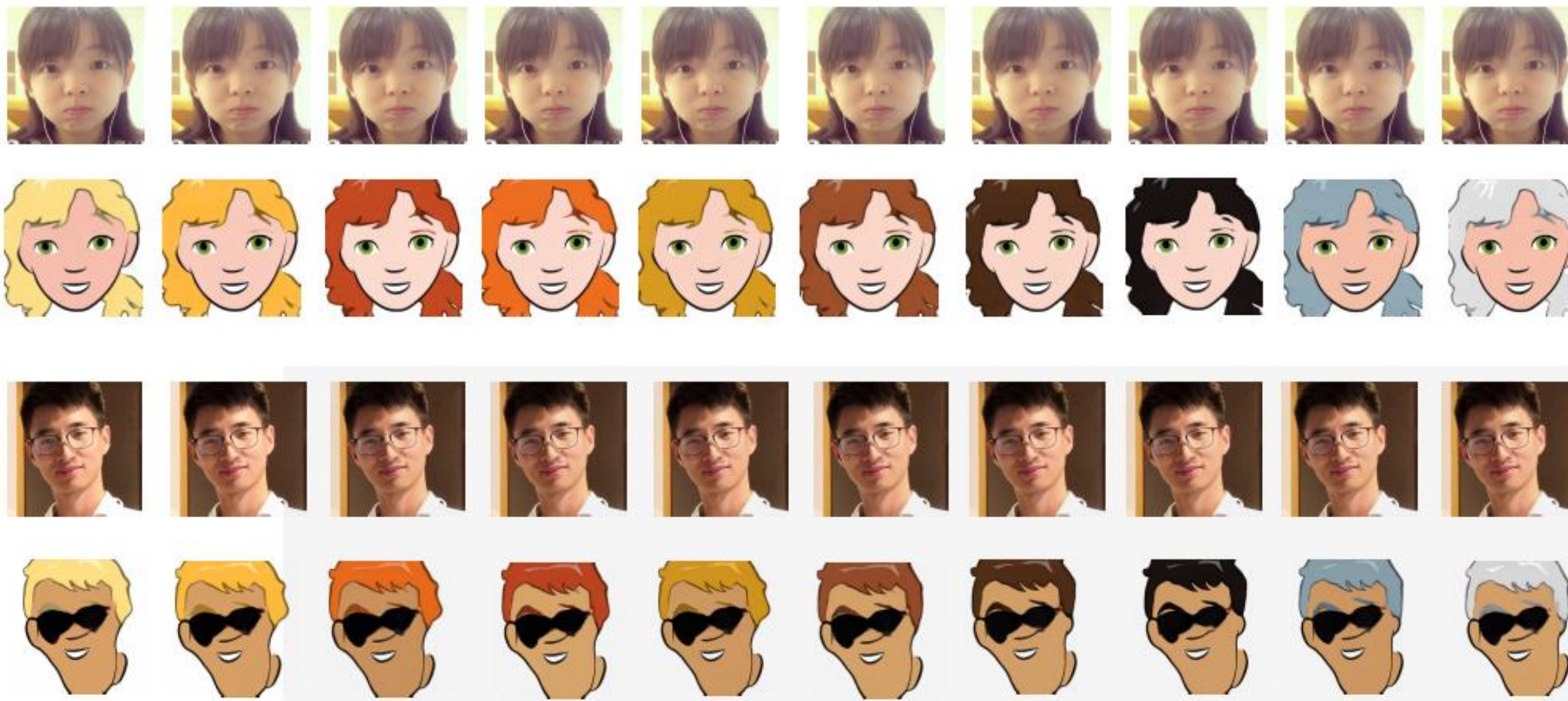
# Conditional CycleGAN

- Conditional GAN uses a class label to condition on to both the generator and discriminator, which shows that the model can generate MNIST digits conditioned on class labels.

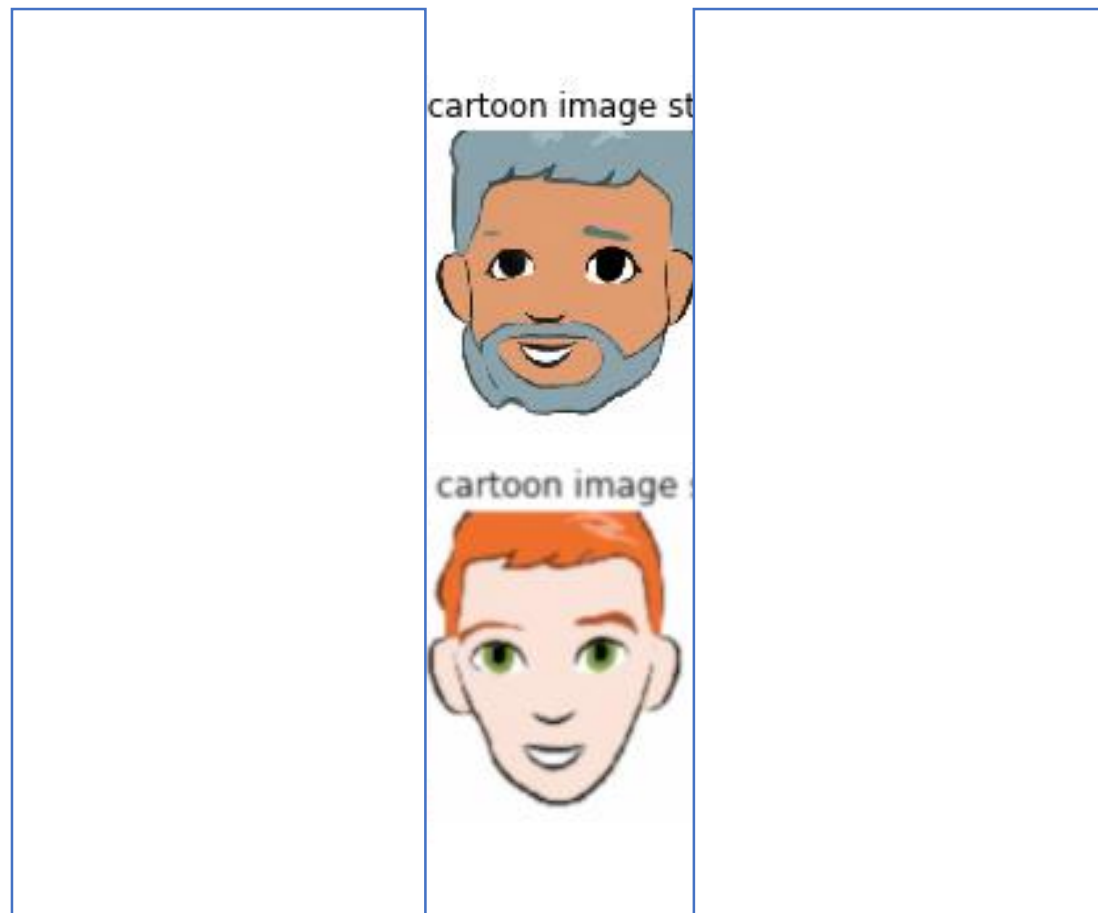




# Conditional CycleGAN Results



# Results: Ben or Jan?



# Results: Ben or Jan?

Generated cartoon image style 8 and 9



Generated cartoon image style 2 and 3



# Conclusion and Outlook

- Preserved some important features
- CycleGAN can be extended in a natural way
- Problems with:
  - Background (identify and neglect background)
  - Illumination
  - Viewpoint (augmentation on cartoonset)

Questions?