Project Proposal - ECE 285

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Abstract

Implementation of cycle GAN-based model capable transforming a person's clothing style based on user-specified attributes. The aim is to create a versatile tool for virtual style transformations, enabling users to explore different looks and experiment with fashion choices in a digital environment.

1 Problem Definition

Traditional methods of trying on different clothing styles involve physically trying on multiple outfits, which can be time-consuming and impractical. Additionally, individuals may struggle to visualize how certain styles will look on them without actually trying them on. By developing a system that digitally alters a person's style based on user input, this project aims to address these challenges and provide a convenient and interactive platform for exploring fashion choices.

2 Tentative Method

We plan on using a Cycle GAN [2] to transform the input image into one of a different style. Figure 1 shows the flow of the Cycle GAN. The Cycle GANS work by using a generator to transform an input image x from domain D_x, into image y from domain D_y. Then another generator transforms this generated image y back into a new image $\hat{x}$ from the original domain D_x. The goal is to minimize the difference of x and $\hat{x}$ in addition to normal GAN loss. This helps ensure that the generated image y is still similar to image x, which is our goal.

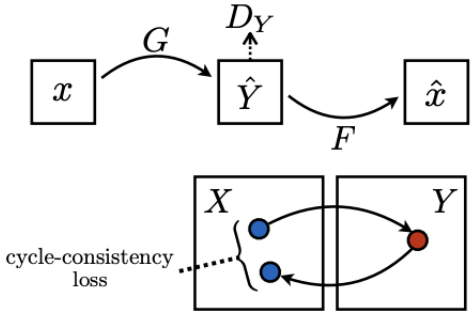

Figure 1: Caption

We choose this method as it is shown as an effective way to do image-to-image translation. In addition, it only requires images with labels for domains, not specific image-to-image pairings; which allows us access to many more datasets.

3 Experiments

We plan on using the DeepFashion [1] dataset. DeepFashion contains over 800,000 fashion images ranging from well-posed shop images to unconstrained consumer photos, constituting the largest visual fashion analysis database. We plan on having a dataset of images paired with their domain. For example one datapoint in our dataset would be $< x, D_x >$ whe D_x is the style for image x. For instance style could be $punk$ or $chiche$. DeepFashion contains a style category for each image that we plan on using.

References

[1] Ziwei Liu et al. "DeepFashion: Powering Robust Clothes Recognition and Retrieval with Rich Annotations". In: *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. June 2016.

[2] Jun-Yan Zhu et al. "Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks". In: (2020). arXiv: 1703.10593 [cs.CV].