Proposal Sample

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1 Abstract

With the continuous improvement of people's living standards, people's personalized demand for consumer goods has also continuously improved. So people hope to buy different combinations of styles and clothing styles. But the relatively small amount of clothing make it difficult to meet all our needs. To solve that problem we want to create a method to transfer the clothing style to counter the different preference of people. We assume all clothes we use is sampled from several predefined style, like plan, flowers, trips and etc.

2 Background

With the continuous improvement of people's living standards, people's personalized demand for consumer goods has also continuously improved. So people hope to buy different combinations of styles and clothing styles. But the relatively small amount of clothing make it difficult to meet all our needs. To solve that problem we want to create a method to transfer the clothing style to counter the different preference of people. We assume all clothes we use is sampled from several predefined style, like plan, flowers, trips and etc.

3 Related Research

In this paper, Fashion++: Mini mal Edits for Outfit Improvement(You could check details at 2.4.1 Reference [2]), the model would try to give improvement advice based on your current clothes. The algorithm is based on cGAN(Conditional Generative Adversarial Network). It first decodes the clothing into several parts, transform them into 2-D segmentation mask and get implicit features. Then, the edits would range from swapping in a new

garment to tweaking its color, how it is worn(e.g., rolling up sleeves), or its fit(e.g., making pants baggier). Generally speaking, this model wont completely change the outfits. It only slightly modify some parts from the original ones. The dataset of this model is in 2.4.1 Reference[5].

Another interesting research comes from two researchers at MIT. They developed an AI model which could design unique styles of black dress. The idea is inspired by CoCo Chanels work at 1920s. It also uses GAN to train some vintage style dress images as the training dataset. You could check the details at 2.4.1 Reference[6].

The last paper is using vector. Just like the language model, they introduced a fashion vector model, called Style2Vec. They selected over 300, 000 various match of clothing on Polyvore.com. After obtaining the samples, they use a 16-layer VGGNet framework to map the image into 1024-dimension vectors. They also use MGBD(Mini-batch Gradient Descent) and Adam for optimization. After that, they use t-SNE algorithm to embed the 1024-dimension vectors to a 2-D space and divide them into different parts of fashion style.

4 What we do

Based on those datasets and other available resources, what we want to do is to design and train a fashion style detector. In the demo, you can choose a random fashion picture as the input, it would determine which style this is based on the probability. You could also input another style and ask it to change the clothing match to the new ones.

We would define several unique fashion styles, and put it as a tag for all training samples. (The fashion styles we currently want to use could be found at 2.1.2) After training, the classifier could understand several unique styles. At the test and validation period, it would detect each samples most likely fashion style. For the second analysis function, given the new fashion style as the order, it would search from the dataset to find the potential match clothes.

5 Methodology

First we use a labeled dataset to train several fine classification models, which can specify a certain kind of clothing style well. We combine the existing google net and reinforcement learning method to boost the model accuracy. Also by object detection we will only focus on the clothing part to get rid of

the distraction parts, like background.

Second, We crawlered the labeled dataset which contains around 15000 pictures. It contains around 15 categories of clothing style. We use it to train our classification models. Since the size of dataset above is too small to fit a generative model, we apply these models on deep fashion2 to enlarge our datasets. The DeepFashion2 is a comprehensive fashion dataset. It contains 491K diverse images from both commercial shopping stores and consumer. We hope to get around 10000 pictures for each category.

Thirdly, to first imply our job, we did it on two rather simple style plane and flower. We apply a cycle GAN structure to transfer the style of a giving clothing picture. Like form a plane skirt to a red flower skirt. To evaluate the quality of the generated picture, we first use the FID Score. Further we hired some volunteer to manually distinguish the artificial clothes and the real ones. In the end we hope to create a model by which the client can input an original clothing and a demanded style label then get a new transferred clothing.

And after that we want combine a existing 3-D changing cloth model with ours. By this model users can have a directly feeling about their looking on the new style cloth.

References

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