Classification of Clothing Images using Convolutional Neural Network

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Abstract

There are two traditional methods for apparel image retrieval: one is text-based apparel image retrieval and the other is content-based image retrieval, both of which have certain limitations: manual semantic annotation by text description is tedious and subjective; and content features cannot fully reflect the rich visual features of images (Chen et al. 2019). Deep learning-based methods have unique advantages in image classification and image retrieval. CNN features have some advantages in clothing classification. (Li Z et al. 2016). Deep convolutional neural networks can automatically extract and learn local attribute features of clothing from a dataset, and applying these features to clothing recognition can achieve higher efficiency. The project will be developed using deep learning for the project, the VGG16 convolutional neural network selected in this paper for feature extraction subsequently using classifier to make it get the recognition of the image

Introduction

Garments are mainly distinguished by conditions such as the shape and length contour of the object. The enhancement of Internet technology has brought about a continuous increase in image resolution, and with the rapid development of clothing e-commerce, the amount of clothing image data on the Internet has increased dramatically (Xu Xudong, Liu Xin. 2020). The drawbacks of low efficiency and large errors of manual distinction are also more frequently found, so image recognition techniques are developing rapidly under these influences. (Chen et al. 2019).

Method

The first step is to collect appropriate datasets in a public repository and train them accordingly. The second part is to select a suitable neural network, such as the VGG16 convolutional neural network selected in this paper for feature extraction. The third step is to perform the classification process using a high-performance SVM classifier to obtain the category set and hash codes. In the fourth step, the hash index database and similarity metric are used to obtain the final retrieval results.

Figure1: VGG network structure diagram

ConvNet Configuration					
A	A-LRN	B	C	D	E
11 weight layers	11 weight layers	13 weight layers	16 weight layers	16 weight layers	19 weight layers
input (224 × 224 RGB image)					
conv3-64	conv3-64 **LRN**	conv3-64 **conv3-64**	conv3-64 conv3-64	conv3-64 conv3-64	conv3-64 conv3-64
maxpool					
conv3-128	conv3-128	conv3-128 **conv3-128**	conv3-128 conv3-128	conv3-128 conv3-128	conv3-128 conv3-128
maxpool					
conv3-256 conv3-256	conv3-256 conv3-256	conv3-256 conv3-256	conv3-256 conv3-256 **conv1-256**	conv3-256 conv3-256 **conv3-256**	conv3-256 conv3-256 **conv3-256**
maxpool					
conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512 **conv1-512**	conv3-512 conv3-512 **conv3-512**	conv3-512 conv3-512 **conv3-512**
maxpool					
conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512 **conv1-512**	conv3-512 conv3-512 **conv3-512**	conv3-512 conv3-512 **conv3-512**
maxpool					
FC-4096					
FC-4096					
FC-1000					
soft-max					

GUI

Gui is designed using pyqt5.

After executing the program, the user can first click on the select image button to select the image, and after confirming the selection of the corresponding clothing image in the computer, the image will be displayed from the window on the left, and then click on start execution to recognize and classify the clothing image, and then the final result will be displayed in the right window.

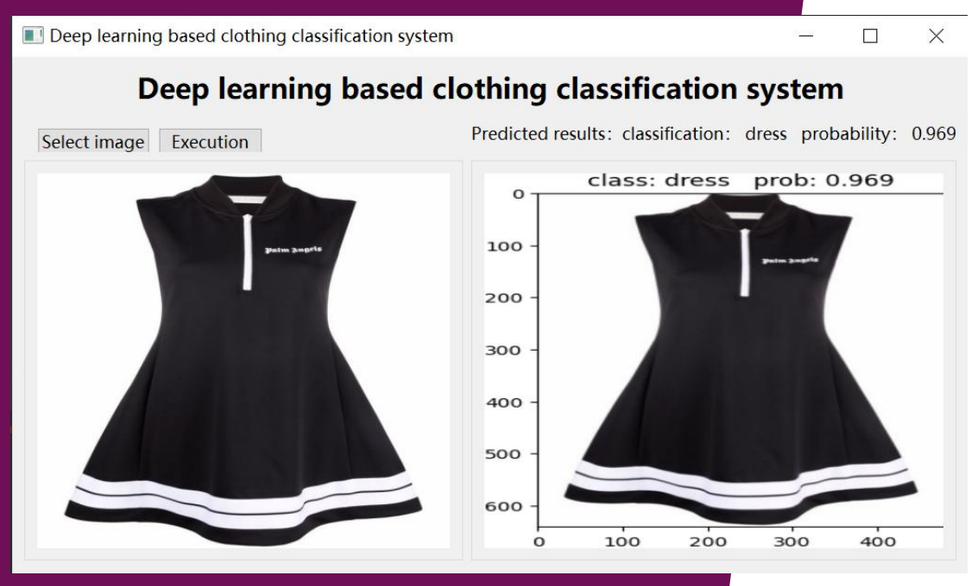

Figure2: For the presentation of specific image classification gui