Research on Degraded Video Image Recognition Based on Neural Network

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Abstract. A convolutional neural network model is a multi-layered architecture with fault tolerance, parallel computing capabilities, and efficient computational performance. This model has been widely used in pattern recognition, intelligent image analysis and other fields. The application of convolutional neural network with good application prospects is utilized to realize the detection and analysis of video image quality class.

Keywords: Convolutional Neural Network, Multi-Layered, Pattern Recognition, Intelligent Image, Video Image Quality Class

1. Introduction
Ingenious applications in computer vision, artificial intelligence and other fields have driven the development trend of Internet industrialization.

The video is composed of single-detection digital images. The detection and diagnosis of video quality is the quality of digital images. Image Quality the decline usually manifests as abnormal image sharpness (blurred image), color cast, snowflakes (noise), and picture appearance streaks, etc.

The main idea of the existing objective evaluation methods is to rely on artificial experience to extract and analyze the features of the image. Determine the impact by comparing the differences between faulty pictures and normal pictures, especially the difference analysis of pixels. During the application of these algorithms, the choice of features and the definition of the features determine the pros and cons of the test results have great limitations, and failures cannot be detected under any circumstances Image. At the same time, in the process of feature analysis, usually a certain influencing factor or feature is selected. An analysis is performed to judge that the result is a certain fault in the image. In actual application process, the cause of image failure may be multiple factors, which brings forward the robustness and portability of the algorithm more stingy requirements[1].
2. Basic framework and characteristics of curling neural network

CNN is a hierarchical, non-fully-connected architecture, which usually includes an input layer, a convolutional layer, and reduced mining. Sample layer and fully connected layer. The layer is the input layer of picture data. The national film data is simply normalized to remove the correlation between variables. Use local concatenation to perform convolution and non-linear transformation operations on image data with multiple convolution kernels. The features of these images are then acquired to form a feature map.

The data is first propagated forward, that is, the initialized data is input by the input layer, and the expected output is set value, which is processed layer by layer through multiple hidden layers to obtain the output value of each unit of the output layer. Calculate expected output and the difference between the actual outputs determines whether the difference meets the requirements. If the requirements are met, then the process ends, and the obtained weights are the optimal combination. If the difference does not satisfy the condition, the back propagation of the error stage continues. At this time, the difference is propagated through the hidden layer to the input layer, and the error value of each hidden layer unit is calculated and solved in case the error gradient to achieve the purpose of weight update[2].

3. Parametric analysis of the model

The size of the image input to the bottom layer of the network is 32x32. When an image is input to the convolutional neural network. At the time, six convolution kernels of size $5 \times 5$ are selected to convolve the image respectively to obtain six feature maps. The same constitutes the convCl layer. Each neuron is connected to a 5x5 neighborhood of the input data to obtain a size of 28x28-feature picture. Each feature map contains different feature information of the picture after convolution due to the number of Cl layer trainable parameters is $6 \times (5 \times 5 + 1) = 1\%$, then the dimension of the connected feature vector it is $156 \times 28 \times 28 = 122,304$ dimensions[3,4].

The first convolution layer uses 96 convolution kernels of size 11x11x3 to stride the 227x227x3 image is a convolution of 4. In this process, the size of the obtained feature map is $55 \times 55$, which is $(227-11) / 4 + 1 = 55$.

![Figure 1. convl Layer flow chart](Image)

The second convolution layer takes the output of the previous convolution layer as input, and first performs a $5 \times 5$-convolution check. The data is processed by volume, and the size of the data is $27 \times 27$, that is $(27-5 + 2 \times 2) / 1 + 1 = 27$, and then Relus is used. Activate draws for regression processing. Then use Max Pooling for pooling processing, at this time the data size changes is 13x13, and finally it is normalized.
proves extraction, and experimental settings, training characteristics skilled Traditional

4. feature the picture. Each convolve the CNN

This paper first takes certain measures to optimize the initial CNN model. Image data sets includes training and test sets. The optimized model changes the network hierarchy and network parameter settings, designs and implements a new convolutional neural network model. Then it is better through experimental analysis test accuracy, error loss function and verification of the modelled CNN model and the initial CNN model in the model there are H aspects of the results of image classification.

The analysis determines whether the model is optimized or not. Finally, the optimized the CNN model method is compared with the support vector machine method combined with artificial sign extraction, and the figure is verified through experimental analysis. The accuracy of slice classification proves that the method of fault video image recognition based on convolutional neural network scale other algorithms.

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