1. Content-based Image Retrieval using Deep Convolution Neural Network

Image databases containing millions of images are now cost effective to create and maintain. Earlier image retrieval systems are text-based; in which images are manually annotated and then indexed according to the annotation. However, with the exponential increase in the volume of images database, the task of user-based annotation becomes very cumbersome. Major Limitations of text annotation-based image search are:

a. Image annotation is subjective
b. Image annotation may fail to convey the complete

Content based Image Retrieval (CBIR) system extract and represents the visual features of images like color, shape, texture and uses these features to discover visually similar images. Color histogram is one of the important and widely used feature to describe the content of image. It represents the proportion of specific colors in an image.
CNN is a Feed-Forward Neural Network that can extract topological properties from an image. It can recognize patterns with extreme variability as a result many researchers have used Convolution Neural Network for image feature extraction & representation for CBIR.
This paper presents a Content based Image Retrieval system using Deep Convolution Neural Network. Experiments are performed on Gray images, RGB color space, YCbCr color space images grouped into different clusters. Precision-recall crossover point is used as performance measurement criteria.

2. A Single Filter CNN Performance for Basic Shape Classification

In this paper, we analyze a single-filter CNN model to optimize for IoT implementation. Our model comprises an input layer, an affine transform layer, a single convolution layer with the specified filter, a pooling layer, a fully connected layer, and a soft-max output layer. As our model is smaller than other CNN models that comprise only a few thousand nodes and connections, we can evaluate the lower bound of the CNN facility. We evaluate the performances of our model with four primary filters by feeding into it the eleven basic shapes of 28 × 28 pixels, such as a circle, a triangle, a square, a star, etc., and examining two kinds of verification test data. The data from one test are the three different size basic shapes scaled from ×1.0 to ×0.80 and from the other test are the three different added basic shapes from 0% to 13%.
We evaluated a single-filter CNN model for IoT implementation. Our single-filter CNN model is based on a minimal configuration of CNN with an affine transformation layer, a convolution layer, a pooling layer, and a fully connection layer. It is found that the classification accuracy of the reduced shape and the noise added shape verification results depend on the type of filters. Thus, if we select the appropriate filters, the combination of them could classify the specific shapes; thus, through their combination, it could be possible to make the smallest CNN for IoT.