

Color Image Descriptors in an Android Environment

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Resumo

Este trabalho apoia um Projeto de Doutorado na área de Content Based Image Retrieval (CBIR). Implementa um ambiente baseado em interface Android focando em descritores de cor.

Abstract

This activity is part of a Doctoral Project that intends on continuing the implementation of a Content Based Image Retrieval (CBIR) Environment, this time aiming at developing an Android interface in which the user could input an image via camera or SD card and receive an appropriate assortment of related images, which could then be further processed. This project will be more focused on color based image descriptors and the viability of their implementation in an Android Environment.

Key words: *CBIR, Color Based Image Descriptors, Android*

Introduction

Descriptors are a way to collect low-level visual properties of images and determine a formal similarity measurement between them. To retrieve content from a database using an image as input, several visual characteristics can be examined. This project focuses on their color.

The color histogram approach is utilized by both descriptors studied at this point in the project. The GCH - Global Color Histogram consists in a pixel count across the image body to determine the frequency of each color. The BIC - Border/Interior Pixel Classification - classifies each pixel in either border or interior, then computes a color histogram for both types of pixels across the image.

At this early stage, which addresses implementation and simple functionality evaluation of the algorithms, the project is being developed with the Eclipse IDE. The project aims to develop a mobile-portable software at which point the Android Studio SDK will be used.

Results and Discussion

Both algorithms were implemented in Java, and by using samples from the COIL-100 database it was possible to consistently retrieve images of the same object used as input, analyzing the 5 most similar images retrieved. To verify the classification process applied with the BIC there were created pictures highlighting the border/interior contrast, similarly to those ones in [1].

In a future development stage, an assortment of other image databases such as Caltech, Corel, ETH80, MPEG7, MSRCORID, Pascal and Tattoo-

Image base is going to be used for testing and comparison purposes. A more formal, statistic-based methodology is going to be employed for testing which will allow appropriate evaluation of each descriptor effectiveness. Implementation adjustments to better suit the application are also expected.



Image 1. BIC pixel classification

Conclusions

The activity's development process needs to progress in order to allow meaningful conclusions. More testing among different databases and comparing different descriptors with distinct approaches - e.g. texture, shape - needs to be done in order to enable the creation of a solid Android application prototype.

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[1] R.O. Stehling, M.A. Nascimento, and A.X. Falcão, *A compact and efficient image retrieval approach based on border/interior pixel classification*. In Proc. of the Eleventh International Conference on Information and Knowledge Management, pages 102-109. ACM, 2002