Similar image retrieval in e-commerce for online shopping based on color and edge

Soran Abdulkarim Pasha , Cafer Bal

Abstract—This paper presents a method based on similar image retrieval in e-commerce for online shopping based on color and edge; aiming at efficient retrieval of images from the large database for online shopping. Here, RGB (horizontal and vertical) projection is used for creating our application with a huge image database, which compares image source with the destination components. This method is proven to be one of the best techniques for online shopping product search on the Internet. In e-commerce business transactions, buying and selling products are made through the electronic system or via the Internet. In this paper, a technique is used for finding items by image search, which is convenient for buyers in order to allow them to see the products. The reason for using image search for items instead of text searches is that item searching by keywords or text has some issues such as errors in search items, expansion in search and inaccuracy in search results. This paper is an attempt to help users to choose the best options among many products and decide exactly what they want with the fast and easy search by image retrieval. This technology is providing a new search mode, searching by image, which will help buyers for finding the same or similar image retrieval in the database store. The image searching results have been made customers buy products quickly. The results of the implementation show that searching process for products in e-commerce different between search by image and search using text for buyer option.

Index Terms — color, E-commerce, image search, retrieval, online shopping, product, technique.

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1 INTRODUCTION

The development of the Internet technology has eased the increase of in-home shopping [1]. The Internet has made a powerful impact on marketing and created another type of retail transaction called e-commerce for online shopping. Electronic commerce is a term used for selling and buying on the Internet.

E-commerce contains several groups in the same platform, for example, online funds transfer, Internet marketing, electronic data interchanging, inventory network administration, online transaction preparing and data collecting. The business can get orders, sell items and get payments through the web [2]. For this reason, nowadays many businesses have begun building business websites to expand the selling and buying of products everywhere in the world.

There are some problems in online shopping transactions such as, sometimes hard to guarantee the security or protection on site exchanges because due to the lack of trust, also absence the of system safety to poor execution of e-commerce, and sometimes it gets to be hard to combine e-commerce programming or sites with the database. This paper is an attempt for solving the main problems especially Security and accuracy of image retrieval in the database of e-commerce. In addition, it creates a good database for data collection.

This project is deploying a technique that uses low-level features which are extracted automatically from images and then are used for indexing and retrieval. It combines color and texture information in a histogram, and with e-commerce for online shopping. The idea of this work is using image processing to help in shopping. Our application permits the buyer to upload a photo and then return comparable products using image retrieval systems [3].

2 BACKGROUNDS

Before developing an online business, it is important to comprehend the background, the advancement and improvement history of the web based business. This paper includes two parts explained in the following subsections.

2.1 Similar Image Retrieval

After many years of research, a little is known about the collection of features that the best describe an image with respect to the visual properties. Similar image retrieval is a new vision for image searching technology. This method is used for searching products or items online by uploading an image, and it has improved the advancement of search [4]. Normally buyers utilize the search engine to search for products [5]. The visualization of searching by image satisfies the customers with higher searching requirements, helps customers to find product information more conveniently, and improves the online shopping experience.

2.2 E-commerce Online Shopping

E-commerce refers to a broad of business on the Internet, or we can say E-commerce is the center technology of economy information. Internet business growth is an unavoidable choice to go into the global market [6] [7]. It includes a wider range of business activity. For example, retail shopping, banking service, investing and rentals [8]. It relates to kinds of trade which are conducted electronically instead of the direct physical transaction [9]. There are some types of e-commerce

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such as Business to Business (B2B), Business to consumer (B2C) and Business to Government (B2G) e-commerce. B2B e-commerce, it refers as e-commerce among enterprises and the most people are using this type of e-commerce [10]. B2C e-commerce is another type of e-commerce refers to business between enterprise and consumers [11]. B2C e-commerce is reducing deals cost; this is the most frequently used after B2B e-commerce [12]. Business-to-government or B2G is generally referring to as trade among enterprise and government, using the Internet to the public purchases actions. This type consists of two properties: The first, the public sectors assume a leadership role in the establishment of e-commerce, and the second, it is assuming that public sectors have the most important to make the purchases system more efficiently [13].

3 METHODOLOGY

3.1 Implementation

The system is made for comparative image recovery in online business. The online shopping system is used for enhancing the system clients understanding. We have designed a system which is the user can understand and use it easily for a broad e-commerce application, such as image search, and item data gathering subsystem. This system may give a direct contact between images in the database and our online shopping, on which purchasers are automatically and find directly search the same images as indicated by the images from data stage. Simultaneously, it can be utilized to give exactness of online advertising to companies. Figure 1, shows the proposed system's components.
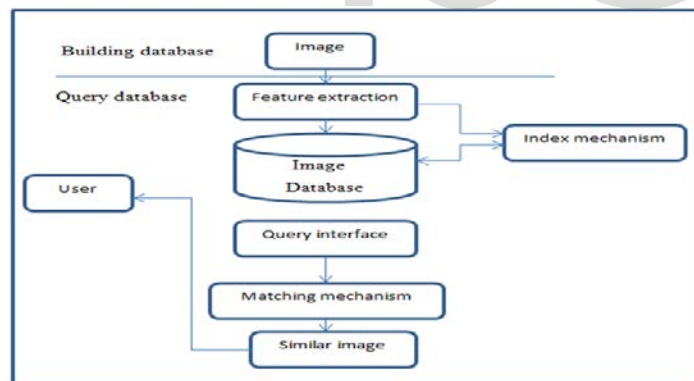

Fig.1. the basic components of similar image retrieval system

3.2 Mechanism

In this paper, the implementation is based on some programming languages and techniques, which are explained as follows: ASP.NET MVC is used for the web application structure that is supported by Microsoft that executes the model-view-controller (MVC) design. The programming depends on ASP.NET and ASP.NET MVC permits software designers to fabricate a web application as a composition of three parts: Model, View, and Controller. The MVC model characterizes web applications with 3 rationale layers:

- Model (business layer)
- View (display layer)
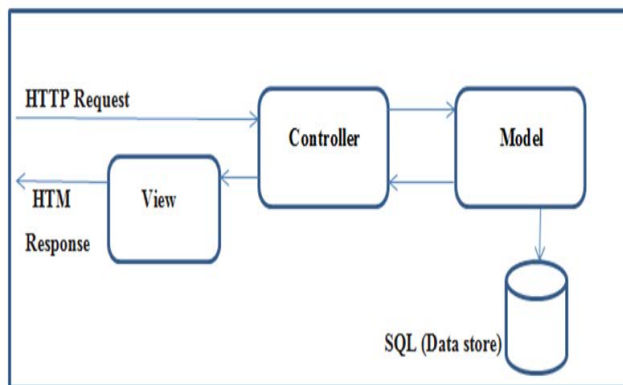- Controller (input control)

Fig.2. MVC structure query

Figure 2, displays that how MVC works together. An MS SQL Server is used to implement a database in this project because it is secure and it can process many users at the same time.

Search image in this system will depend on ASP.Net framework and also it can be used on visual programs either, but because this work has been created for images, that is why visual C#.Net; it has more compatibility for such things, because of security and flexibly. The system coding consists of four class for each searching images inside the database for comparing Red, Green, and Blue (RGB). If the image which has been searched for was existed in the database or had the most similarities there by 90% or more, then the result will be shown it takes the top on the searching results. The researcher of this paper has used a method which is called process image (fileinfo[ ]files, fileinfo target):

- FileInfo[] files: This parameter is the list of all of the images that have been sent to the database.

-    FileInfo target: This parameter is the image which is compared with the list of the images in the database i.e. FileInfo[] files. Thus, it will retrieve all those images in the database which resembles 90% of the image which has been used in the search engine.

There is a class which is called ComparableImage to calculate the matching by passing each one of them through the calculation.

4 RESULTS AND DISCUSSION

This application uses image processing to aid shopping. The developed system is allowing the user to submit an image and will then return similar items using image retrieval techniques that exist in the database. The main results in this project are represented by retrieved image displaying accuracy. The retrieval results are not only one image but could be a group of images displayed by their similarities to the image that exists in the database. The retrieval results find

the most similar images in the database directly to the website and show the result at the same time. On the other hand, this work has made the system convenient to the user and it doesn't need to waste too much time for searching products. This is realized by the fact that is only needed to upload any item, and then the results will display similar images in a fast way as the system a fast connection to the database.

The system has been developed based on the experience gained throw our investigation to other system similar methods to this system. It is important to mention some drawbacks of other papers that differ this paper from. Which are; slow image search in e-commerce, lack of retrieving identical or desired results in many cases, retrieving single examples when a product is searched for and inaccurate. The researchers of this study have endeavored to overcome these problems or at least mitigate those [14], [15], [16]. In this paper, all those problems have been tried to be solved with an improved speed. In result, users' satisfaction can be achieved meanwhile users meet their searched products easily. As well as, this approach leads in showing identical items in the
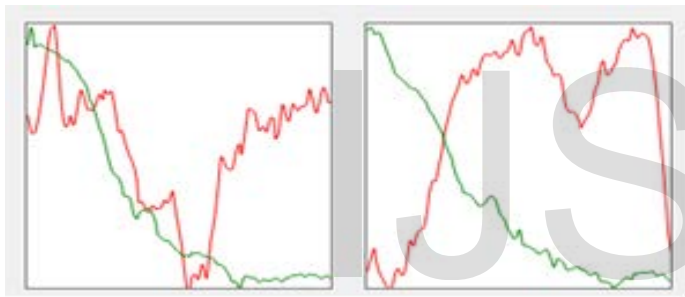
database and suggest them to the users.
Explained in the following features:

1. Search speed and efficient: This paper has an active retrieval scheme. Since the image database has a large number of images that the images retrieval need at the same time.

   Search accuracy: In this paper, the process of image retrieval in the database is Produced and shown exactly.

2. Improved data security and accuracy.

Fig.3. the result of image search from source to destination

Figure 3, shows source image RGB components and destination image RGB components.

Fig.4. product retrieval by image search

Figure 4, shows an example in image retrieval in online shopping when the buyer wants to find.

5 CONCLUSION

We live in a world which is full of technological applications usage that is developed every day. In recent years, an image search for finding products appeared as an important research field. This paper is combining both online shopping and image retrieval together to help users to choose the best product. This work has improved the implementation of image search engines by building a re-arrange method which re-arranges the original results of any query. The purpose of using the re-arrange is to show the most similar images. This work also takes advantages of similar image retrieval for online shopping, which is an image getting in a computer system for searching and recovering image from a huge database that computerizes image and it helps the user to choose the best type of products to submit image search engine on the website. The results of this work enhance the understanding of different techniques for feature extraction and similarity measurement which help image recovery in e-commerce. In future, it is aimed to improve the current system, fix all bugs and test more datasets such as oracle in order to compare the results with the previous database. Due to the prompt response of the system, hence more users can access the system at the same time. In addition, more search buttons will be added for users so more search options will be available for the user.

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