AN IMAGE BASED SEARCH ENGINE SYSTEM USING PYTHON

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ABSTRACT

In this work, we will see a scalable, integrated text-based image retrieval system (search engine) and evaluate its effectiveness. The search engine crawls and indexes all the pages in given domains, retrieves images found on the pages along with all the relevant keywords that can be used to identify the images. The keywords are loaded into a database along with several statistics indicating the location of the keywords in the page. Thumbnail versions of the images are downloaded to the server to save disk space. Several heuristics and metrics are used for identifying the images and their relevance.

In this work, we put forward a model for a search engine where an image can be uploaded from the local database of the user to retrieve information from database loaded. This is similar to the traditional keyword search used by most of the search engines with the only difference being that here an image is uploaded as a query rather than textual keywords. The fact that the image being used as query makes the search ever more complicated as the content of the image needs to be analyzed and matched to find the information corresponding to the uploaded image. This is most apt for searching information about images of historical monuments, places or any specific place or thing that is identifiable.

Image search engines that quantify the contents of an image are called Content-Based Image Retrieval (CBIR) systems. The term CBIR is commonly used in the academic literature, but in reality, it's simply a fancier way of saying "image search engine", with the added poignancy that the search engine is relying strictly on the contents of the image and not any textual annotations associated with the image.

KEYWORD: CBIR, PYTHON, DEEP LEARNING

INTRODUCTION

We use search engine regularly. When we have queries, we can use the search engine like Google to retrieve the most relevant answer.Most of the queries format is text-based. But not most of the time, From below you might know about that,For example, you want to search for a product on the internet, in this case, a t-shirt, but you don't know the name of it. How could you find them? Well, you can write the description of that shirt. The problem for using descriptions is that you will get wide varieties of products. And what makes it worse, they will be not similar with the product that you want to search, so you need a better way to retrieve them.To solve it, we can use the image of the product, extracts its features, and use those features to retrieve similar products. We call this concept as content-based image retrieval**.**Ever since the first search engine came into existence and the rise of World Wide Web, the role of a generic search algorithm has been very crucial in exploring content both online and offline. The initial use of such algorithms was limited to text documents only. Within last two decades, due to abundant use of smartphones, images and videos have become the prominent form of content. This gave rise to a different set of algorithms termed as content-based image retrieval (CBIR) query technique. The search engine is provided with a sample image which acts as a query to the system and similar images/content/web-pages are returned back as results.We build an end-to-end model that is trained on all our images to take an image as an input, and output a similarity score over all of our images. Predictions happen quickly (one forward pass), but we would need to train a new model every time we add a new image. We would also quickly reach a state with so many classes that it would be extremely hard to optimize it correctly. This approach is fast, but does not scale to large datasets. In addition, we would have to label our dataset by hand with image similarities, which could be extremely time consuming. Another approach is to build a model that takes in two images, and outputs a pairwise similarity score between 0 and 1. These models are accurate for large datasets, but lead to another scalability issue.

PROBLEM STATEMENT

While we search for an image, we may not get the appropriate results. But, on the basis of image likewise similar image we may get accurate results comparing to the text results. Our motto is to get accurate results using image as a source.

Using Deep Learning and other sources, we are going to make it in mode of offline means the results are shown from the dataset loaded on the system by the user.

The Project "Image Based Search Engine" was getting more and more reach from the coders due to its features and usefulness to the end users.

Furtherly, we may develop this to online mode, likewise that the results can be obtained from the internet.

LITERATURE SURVEY

S.No	Title	Author & Publication Details	Summary
1.	Image Search Engine	Aditya Mishra et al	Using today's high-speed search engines, it is easy to find out information about something we know the name of. But how can one find out about something he doesn't know of. The design of the search engine proposed here holds a possible solution to this problem: The user uploads an image from the local databases, the one about which he wishes to find some information. This is a unique functionality, which gives information to the user by extracting the content of the uploaded image to match it with that of images on the internet.
2.	Image Retrieval	MeenakshiShruti Pal, Dr. Sushil Kumar Garg	An image is a representation of a real object or scene. With the development of the internet, and the availability of image capturing devices such as digital cameras, huge amounts of images are being created every day in different areas including remote sensing, fashion, crime prevention, publishing, medicine, architecture, etc. For this purpose there are many general purpose image retrieval systems, some of them are given below: i) Text-based Image Retrieval ii) Content-based Image Retrieval iii)Hybrid Approach
3.	Search by Image: A Novel Approach to Content Based Image Retrieval System	A .F. Adrakattiet al	To overcome with the difficulties encountered in keyword based image search, the Content based image retrieval was projected in 1990s. Since then, CBIR is that the active analysis area within the laptop Sciences. Bo Luo, Xiaogang Wang, and Xiaoou Tang (2003): discussed about the proficient and practicable approach for WWW based image retrieval. They execute text-based meta-search to get an initial digital image set with relatively high recall rate and low precision rate. Then the image content based processing is employed to produce a much more relevant output.
4.	Image Re-Ranking	Prof. Prakash Gadekar, Jayshrikokare, Prof.Subhash Pingale	Image search re-ranking methods usually fail to capture the user's intention when the query term is abstruse. Therefore, active re-ranking is highly demanded to improve search performance. To select the most informative query images, the structural information based active sample selection strategy takes both the ambiguity and the representativeness into consideration.

5.	CONTENT-BASED IMAGE RETRIEVAL	Dr.Hanan Ahmed Al-Jubouri	Extensive use of digital photographic devices has resulted in large volumes of digital images being acquired and stored in databases. Whether it is for scientific research, medical or social networking, there is a growing demand for effective retrieval of digital images based on their visual content (e.g. colour and texture). Content-Based Image Retrieval systems are developed to meet this demand. However, searching for similar and relevant images from large-scale databases still poses a challenge for Content-Based Image Retrieval systems due to the gap between high-level meaning and low-level visual features.
6.	Diving Deep in Deep Convolutional Neural Network	Divya Arora, Mehak Garg, Megha Gupta	Deep Convolution Neural Network has now achieved a state-of-the-art work in the area of computer vision and image recognition. CNN is so successful because of the hidden layers which are not fully connected to the previous layers, and do multiple successive computations between convolution and pooling (subsampling layer).
7.	Deep Challenges Associated With Deep Learning	Ochin Sharma	Deep learning is a recent emerging field of research in Data science. Deep learning is essentially a combination of artificial intelligence and machine learning. Inspired by brain neurons, this has proven greater flexibility and builds more accurate models compared to machine learning. But making theoretical designs and to perform desired experiments are quite Challenging due to many aspects. In the present paper, these challenges have been discussed to provide researchers a clear vision for the futuristic research in the field of deep learning
8.	Deep Multiple Instance Learning for Image Classification and Auto-Annotation	Jiajun Wu, Yinan Yu, Chang Huang, Kai Yu	Deep learning, as a recent breakthrough in artificial intelligence, has been successfully applied to multiple fields including speech recognition and visual recognition mostly with full supervision. A typical deeplearning architecture for visual recognition builds upon convolutional neural network (CNN) .
9.	A Facial Expression Recoginition Based on CNN	Jiancheng Zou, Xiuling Cao, Sai Zhang, Balin Ge	Facial expression is an effective expression of human communication. Facial expression recognition, as the key technology of emotion computing system, is the basis of human-computer interaction. Facialexpression recognition system generally includes face detection, image preprocessing, feature extraction and expression

			classification. Feature extraction and classification of facial expressions is an important part of facial expression technology research, which is related to the final recognition results of facial expressions. It has Broad Application Prospects.
10.	Some Theoretical Studies on Learning theory with Samples Corrupted by Noise	Jun-Huali, Ming-Hu Ha, Yun-Chao Bai, Jing Tian	Statistical learning theory or SLT is a small-samplestatistics proposed by Vapnik et al., and it is becoming a new hot area in the field of machine learning. At present,scholars mostly pay attention to the applied field of SLT such as pattern recognition, neural network and SVM,but not to the theoretical research. Moreover, the theoretical parts of SLT are aimed to the noise-free case. But this is not always the case because of the influence of human and environment etc
11.	A Study and Application on Machine Learning of Artificail Intelligence	Ming Xue, Changjun Zhu	Along with the development of Internet technology and multimedia technical, Artificial Intelligence (AI) research has emerged a number of new issues. AI has attracted increasing attention in many disciplines, which is an edge of disciplines that is used to simulate human thought. Scientists who in many different professional backgrounds get some new thoughts and new methods **in t**he fields of AI.
12.	An Approach for Non-PhotoRealistic Rendering that is Appealing to Human Viewers	J.B.de O. ALencar Junior, J.E.R. de Queiroz, H.M. Gomes	Some authors argue that since the 1990s an extensive Research has been produced concerning non photorealisticrendering (NPR), in opposition to traditional forms of photorealistic representation. According to Gooch, photorealistic rendering approaches are in general based on physical effects and properties of surfaces and materials, whereas NPR involves stylization and communication, by combining science and art. In photorealistic rendering, the effectiveness of the process is measured by the similarity between the resultant image and the original scene.
13.	Informed Machine Learning –A Taxonomy and Survey of Integrating Prior Knowledge	Laura von Rueden, Sebastian Mayer et al	Conventional machine learning starts with a specific problem for which there is training data. These are fed into the machine learning pipeline, which elivers a solution.Problems can typically be formulated as regression tasks where inputs X have to be mapped to outputs Y. Trainingdata is generated or collected and then processed by algorithms, which try to approximate the unknown mapping. This pipeline comprises four main

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	into Learning Systems		components, namely theTraining data, the hypothesis set, the learning algorithm, andthe final hypothesis.
14.	Reasearch on Application of Deep Learning Algortihm in Image Classification	Zhiping Wang, Cundong Tang, XiuxiuSima, LingXiao Zhang	I mage classification involves many technologies, such asimage pre-processing, image feature extraction, image category labelling, and image classifier construction, all of which will have a certain impact on the image classification effect. In the process of RBM training, with the increase of training times, the network model gradually converges. When the error increment is getting smaller, it shows that the current learning rate is more appropriate. If the learning rate is blindly increased, the error may increase again, thus causing the network to oscillate. If the deep learning technology can be applied in remote sensing image classification.
15	Proposing Solution to XOR problem using minimum configuration MLP	V.K. Singh	Author Proposed an ANN Model
16	Minimum Configuration MLP for Solving XOR problem	V.K. Singh and S. Pandey	Authors Proposed a Novel Model for ANN
17	Proposing an Ex-NOR Solution using ANN	V.K. Singh and S. Pandey	Authors Proposed an Ex-NOR Model
18	Mathematical Explanation To Solution For Ex-NOR Problem Using MLFFN	V.K. Singh	Mathematics behind ANN in LSP is conveyed by Author
19	Mathematical Analysis for Training	V.K. Singh	General Mathematics in ANN is portrayed

	ANNs Using Basic Learning Algorithms		
20	Vector Space Model : An Information Retrieval System	V.K. Singh and V.K. Singh	An Information retrieval system is discussed in the article.
21	Minimizing Space Time Complexity in Frequent Pattern Mining by Reducing Database Scanning and Using Pattern Growth Method	V.K. Singh and V Shah	Data Mining is discussed by the Authors
22	The Huge Potential of Information Technology	V.K. Singh and V.K. Singh	Information Technology Landscape is discussed
23	Proposing pattern growth methods for frequent pattern mining on account of its comparison made with the candidate generation and test approach for a given data set	V.K. Singh	Frequent Pattern Mining is discussed by the Author
24	RSTDB & Cache Conscious Techniques for Frequent Pattern Mining	V.K. Singh	RSTDB Algorithm is discussed by the Author

25	Designing simulators for various VLSI designs using the proposed artificial neural network model TRIVENI	V.K. Singh	TRIVENI Model is discussed by Author
26	Analysis of Stability and Convergence on Perceptron Convergence Algorithm	V.K. Singh	Convergence is given a look by the Author
27	Machine Learning approach to detect Breast Cancer	V.K. Singh, A. Baghel, N.D. Yadav, M. Sahu and M. Jaiswal	Breast Cancer and Machine Learning Discussed by the authors
28	SVM using rbf as kernel for Diagnosis of Breast Cancer	V.K. Singh	RBF Kernel is Discussed by the author
29	Support Vector Machine using rbf, polynomial, linear and sigmoid as kernel to detect Diabetes Cases and to make a Comparative Analysis of the Models	V.K. Singh	Diabetes is Discussed by the Author
30	Colorization of old gray scale images and videos using deep learning	V.K. Singh	Deep learning is used as Idea in the paper by the authors

31	Dual Secured Data Transmission using Armstrong Number and Color Coding	V.K. Singh	Security aspect is discussed in the paper by the author
32	Finding New Framework for Resolving Problems in Various Dimensions by the use of ES : An Efficient and Effective Computer Oriented Artificial Intelligence Approach	V.K. Singh, A. Baghel and S.K. Negi	Expert System is discussed by the Authors
33	Twitter Sentiment Analysis	Chandrashekhar, R. Chauhan and V.K. Singh	The authors did ML Technology for Twitter Sentiment Analysis
34	ML Approach for Detection of Lung Cancer	P. Kumari, R. Gupta, S. Kumar and V.K. Singh	ML is utilized in the area of Lung Cancer
35	Automatic Number Plate Recognition	P. Sailokesh, S. Jupudi, I.K. Vamsi and V.K. Singh	Authors implemented Automatic Number Plate Recognition System
36	Human Activity Recognition	Nikhil Reddy, K.M. Yadav and V.K. Singh	Authors Proposed Human Activity Recognition
37	Text Summarization	R.N.R.K. Prasad, P.S.S.R Ram, S. Dinesh and	Authors Proposed Text Summarization System

		V.K. Singh	
3 8	Diagnosis of Breast Cancer using SVM taking polynomial as Kernel	V.K. Singh, N.D. Yadav and R.K. Singh	Detection of Breast Cancer is discussed

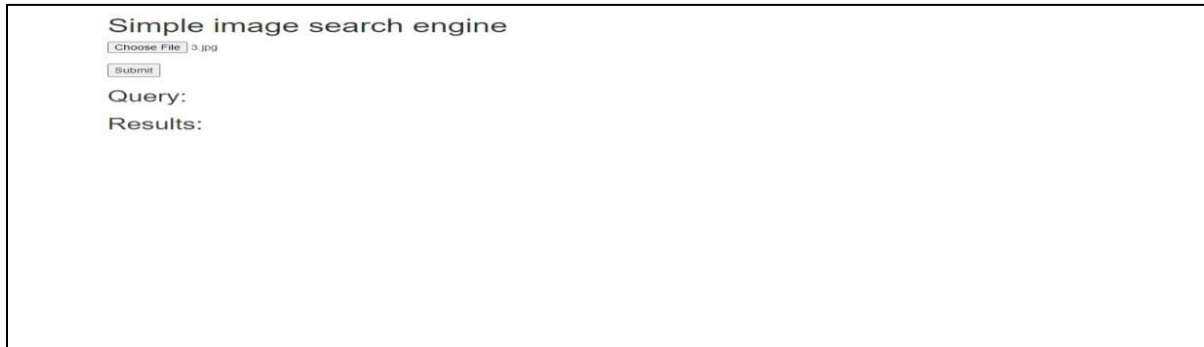## PROPOSED WORK
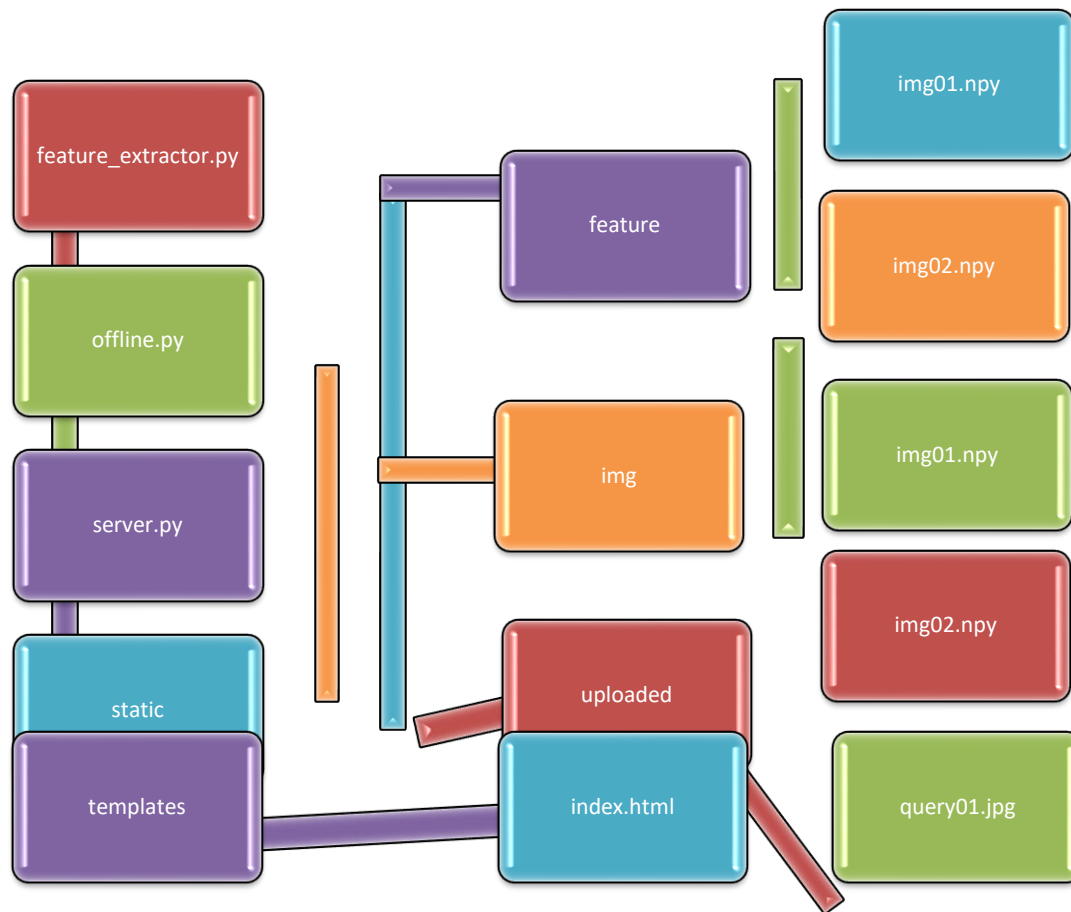
RESULT

Figure 1 – User Interface Input

We need to make an Input that is an image, then it loads the similar images according to the input from the database loaded on the system.

Dataset:

Figure 2- DataSet

Figure 3 – User Interface Output

CONCLUSION

The problem of searching by images is very urgent. An analysis of image estimation methods shows that the problem is complex, but solvable. At the moment there are several services that offer different solutions. Some of the services use user search history to find image, so the search result will be different for different users. Also, all services work badly with modified images. To find a way out of this situation, a model of service for searching by the image is suggested, which can allow to achieve a sufficient reliability of image search.

By this study, I can prove that we can get results from image as input not only by the text.

Furtherly, I can proceed to implement in online mode to get the search results from online mode.

At present Situation, I am making it on offline mode, where the results will be obtained from dataset loaded by the user.

The project is done by taking a lot of time with free of cost of money, only the spending was time and efforts.

FUTURE WORK

The next step of this project is experimental approval of the proposed model efficiency and improvement of existing feature extraction algorithms. The final aim is creating of efficient search engine.

Furtherly, wegoing to take this project to the next step by making results more accurate and the results will be obtained from internet.

By making this online might be useful to everyone who uses search engine frequently.

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