Volume 5, Issue 6, June 2015 ISSN: 2277 128X
International Journal of Advanced Research in Computer Science and Software Engineering
Research Paper
Available online at: www.ijarcsse.com

Production of Dynamic Image Database from Web with High Precision in Less Time

Shradha Kirve, Prof. Sandeep Kadam
Computer Department, Dr.D.Y.Patil, Pune University,
Maharashtra, India

Abstract— The main objective of this work is to generate database automatically which consist of images of the particular class. Multimodal approach uses text, visual features to extract the perfect match images from the web. The web pages contains images are downloaded then further processing is performed on the collection, processing includes re-ranking based on text and visual features, removing noisy data (irrelevant images).The development is the combining the text and visual features to achieve the automatic ranking of the images. This work shows an approach to harvest a large number of images of a particular class automatically and to achieve this with high precision by providing training databases so that a new object model can be learned effortlessly. The existing system does not rely on high precision of top returned image. User is free to specify his query not limited to certain number of classes. Time required for gathering images from different sources is less.

Keywords— Crawler, class, image, key point, descriptor, feature

I. INTRODUCTION

Now-a-days, image processing is seen as gradually more important tool by modern business into business intelligence giving an information, advantages and also used in marketing surveillance, fraud detection. The presence image database has important for helping and testing the objects during the searching of the particular object of interest. However producing or generating such kind of data is very tedious. Image search provides easy answer set of images but with low precision and the number of images returned are also limited. Actual image processing is a process to explore data in search of consistent patterns and /or systematic relationship between variables, and then to validate the findings by applying the detected patterns to new subsets of data. The focus of this work is intended to automatically gather a large number of images of particular class and to achieve this with high precision. The harvested images are been classified into different classes such as in class and out class. The main output of system includes relevant images to the query. System remove the ir-relevant images which the client don't want. The use of the system is that it helps to remove irrelevant data and provide us images with high precision.

II. LITERATURE SURVEY

The presence of image database has proved very useful for guidance and testing of the object class model for interested object detection. Generating such database with high precision is difficult task. Vijayanarasimhan and Grauman [8], Fritz and Schiele [3] solve precision problem by employing the re-ranking on the downloaded image. The method drawn in [2] R. Fergus, P. Perona, and A. Zisserman is visual clustering of images using probabilistic Latent Semantic Analysis(pLSA) is used instead of a visual vocabulary, S. Vijayanarasimhan and K. Grauman[5] used HDP (Hierarchical Dirichlet Process) instead of pLSA,visual models can be study by multiple instance learning. Berg and Forsyth [1] beat the download restriction by web search instead of image search, this process performed in two stages first topics are exposed based on words presents on webpage using Latent Dirichlet Allocation (LDA) on text only. For each topic images are cluster, one image is selected based on the text near to that image which is at high position. Now user can differentiate the cluster into positive and negative for the class. Second image and related text from this cluster are used to prepare a classifier based on voting on image (shape, color, and texture) and text features. The classifier then used to re-rank the downloaded record set. Existing system used text and images together but in different way, they used ground truth annotate images to remove noisy data set. Berg et al. [1] uses text from internet has focus on more specific object instead of general object class.

The main objective is to automatically gather large number of images of an exacting class. Inspiration is to make available training database so that new object model can be learn smoothly. Following [1], we also use google search to achieve a great collection of images and the WebPages that contain them. The low precision does not allow us to learn a class model from such images using vision alone. The challenge then is how best to combine text, metadata, and visual information in order to achieve the best image within few second.

III. IMPLEMENTATION DETAILS

The proposed work's key research objective is that to dynamically provide the result set according to the query and to get high precision. To find new effective methods for high precision, which will helps to eliminate drawbacks of previous methods.

A. Query and download image

Users have to specify the query that is image he wants. This query is proceeds by using Google JSON. So automatically it interacts with Google search engine and provides the pool of images. This pool of image contains unwanted data such as comics, sketches, and clip art. The available data is not categorized. Image can be downloaded by using any one of following:

The first approach, named Web Search, submits the query word to Google Web search and all images that are linked within the returned Web pages are downloaded. Google limits the number of returned Web pages to 1,000, but many of the Web pages contain multiple images, images, so in this manner, thousands of images are obtained.

The second approach, Image Search, starts from Google image search (rather than Web search). Google image search limits the number of returned images to 1,000, but here, each of the returned images is treated as a "seed"—further images are downloaded from the Webpage where the seed image originated.

The third approach, Google Images includes only the images directly returned by Google image search (a subset of those returned by Image Search). The query can consist of a single word or more specific descriptions such as "penguin animal" or "penguin OR penguins." Images smaller than 120 X120 are discarded.

In addition to the images, text surrounding the image HTML tag is downloaded, together with other metadata such as the image filename. Image Search gives a very low precision (only about 4 percent) and is not used for the harvesting experiments. This low precision is probably due to the fact that Google selects many images from Web gallery pages which contain images of all sorts. Google is able to select the in class images from those pages, e.g., the ones with the object-class in the filename; however, if we use those Web pages as seeds, the overall precision greatly decreases. Therefore, we only use Web Search and Google Images, which are merged into one data set per object class. The result of these different search methods is shown in table 1

Table I Result after search Technique

SERVICE	IN-CLASS	NON-CLASS	PRECISION
WEB-SEARCH	8773	25252	26%
IMAGE SEARCH	5963	135432	4%
GOOGLE-SEARCH	4416	6766	39%

B. Classification

In this step the sketches and comics, drawings are get separated in to IN class and Out Class. In class contain the actual image whereas Out class contain the irrelevant such as drawing or sketches having query name.

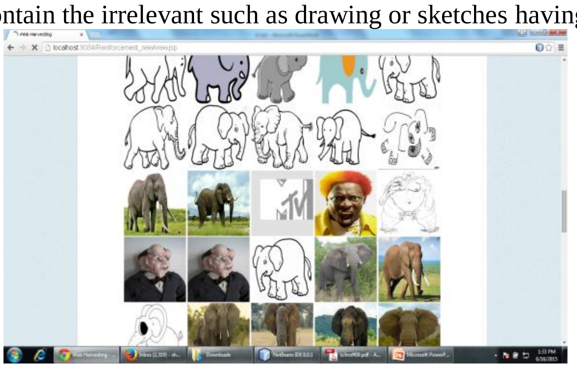

Fig.1 Drawing and symbolic images

Fig2 Classified result (In class)

Fig.3 Classified result (Out Class)

Table 2 Image Class Statistics of the Original Downloaded Images Using Web Search and Google Images Only, and After Applying the Drawing and Symbolic Images Removal Filter

	downloaded images			after drawing&symbolic filtering			
Class	in-cl.	non-cl.	prec.	in-cl.	non-cl.	prec.	false pos.
airplane (ap)	904	1659	35.27%	635	1007	38.67%	91
beaver (bv)	236	3121	7.03%	160	2195	6.79%	4
bikes (bk)	1268	1931	39.64%	983	1082	47.60%	111
boat (bt)	856	2175	28.24%	726	1354	34.90%	70
camel (cm)	594	1808	24.73%	485	1274	27.57%	46
car (cr)	1128	1042	51.98%	938	568	62.28%	92
dolphin (dp)	791	1416	35.84%	533	906	37.04%	81
elephant (ep)	937	1558	37.56%	763	1007	43.11%	11
giraffe (gf)	945	1267	42.72%	802	763	51.25%	32
guitar (gr)	1219	2035	37.46%	873	832	51.20%	248
horse (hs)	1229	1720	41.68%	975	1043	48.32%	78
kangaroo (kg)	418	1763	19.17%	329	1161	22.08%	14
motorbikes (mb)	732	953	43.44%	607	582	51.05%	86
penguin (pg)	748	1400	34.82%	447	794	36.02%	33
shark (sk)	583	1710	25.43%	413	1089	27.50%	60
tiger (tr)	379	2068	15.49%	311	1274	19.62%	17
wristwatch (ww)	941	957	49.58%	710	549	56.39%	220
zebra (zb)	483	1662	22.52%	416	987	29.65%	19
total	14391	30245	32.24%	11106	18467	37.55%	1313

C. Key point detection

Decaying an image into local regions of interest or 'features' is a widely applied technique in Computer Vision used to improve complexity while exploit local form properties. The ideal key point detector finds salient image regions such that they are repeatedly detected despite change of viewpoint; more generally it is robust to all possible image transformations. Similarly, the ideal key point descriptor captures the most important and distinctive information content enclosed in the detected salient regions, such that the same structure can be recognized if encountered. Generating key point from an image by key point detection in this point of interest are identified across both the image and scale dimensions using a saliency criterion. In order to boost efficiency of computation, key points are detected in octave layers of the image pyramid as well as in layers in-between. Key point description A sampling pattern consisting of points lying on appropriately scaled concentric circles is applied at the neighbourhood of each key point to retrieve gray values: processing local intensity gradients, the feature characteristic direction is determined. The key points are matched efficiently because of binary nature of the descriptor. As the number of key points matched with query image and the images present in the database the number of key points match calculated and key point descriptor is also computed by using SURF, it uses the blob detector for detection while the description is done by summing Haar wavelet responses at the regions of interest.

Whatever the value get after computation by calculating the mean by adding low and high values of all images present in the dataset. Threshold will be computed, this is different for each query. If quality wants to improve the threshold should be minimum.

IV. MATHEMATICAL MODEL

Let S be a system that work dynamically for any type of image query and which improves or gives high precision of top returned images.

S= {….

Identify input as Ti

S= {Ti . . .

Ti= {q1. | q1 any query to system}

Identify output as O S= Ti, O . . .

O= {O1, O2…. | O gives images which are perfect match to query.}

Identify the processes as P.

S= {Ti,O,P . . .

P= {Pr (Fi |O)} Where Fi =Field on which process works

Pr =keypoint detection and description.

O= { R | Result obtained after applying algorithm}

Identify failure cases as F S = {Ti,O,P,F. . .

Failure occurs when

. Computer System failure

. No back up of data

. Identify Success cases as s

S= {Ti,O,P,F,s }

MATHEMATICAL REPRESENTATION

Let S be the system:

S= {Ti, O, P,Ss,F} Where

Ti= input to the form

O= Output is set of images that gives high precision.

F= Set of failure state

Ss= Set of success state

V. RESULT

DataSet

- Drawings & Abstract Images Databases
- 18 Object-Class Databases (manually annotated)

Existing system is working only for 18 object class where as current system work on any query.

Result

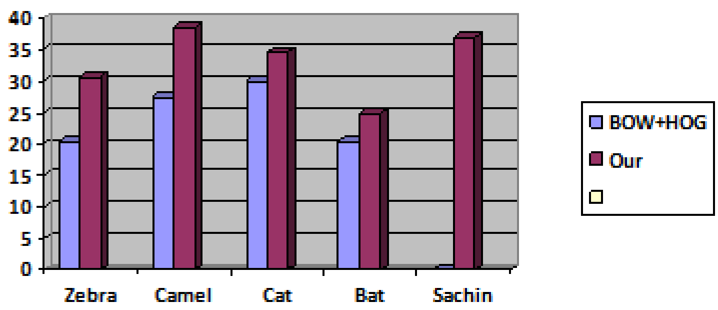

Fig.4 For specific class high precision

From the graph the y axis shows precision where as x axis shows the different categories. By detecting and computing the key point between query image and images in data set it shows high precision. Whereas existing system is not working with new query it works only for static dataset.

VI. CONCLUSION AND FUTURE SCOPE

This should be observed that we will get high precision by removing irrelevant data by detection and computation of key point descriptor and detection. The system able to work for dynamic query. The existing system does not rely on the high precision. Whatever time required for collecting the data or images from different sources is quite less than existing approach. In future work will be done poly meaning query such as tiger. This is name of animal and name of person also. so system able to understand wether user want to search for animal or for person.

REFERENCES

[1] D.A.Forsyth and, T.L. Berg "Animals on the Web," Proc. IEEEConf .Computer Vision and Pattern Recognition, 2006.

[2] B. Schiele and M. Fritz, "Decomposition, Discovery and Detection of Visual Categories Using Topic Models," Proc. IEEE Conf.Computer Vision and Pattern Recognition, 2008.

[3] T.Joachims,"SVMlight,"http://svmlight.joachims.org/, 2010.

[4] A. Zisserman, M. Brady and, T. Kadir "An Affine Invariant Salient Region Detector," Proc. Eighth European Conf. Computer Vision, May 2004.

[5] G. Wang, L. Fei-Fei and J. Li, "OPTIMOL: Automatic Object Picture Collection via Incremental Model Learning," Proc. IEE Conf. Computer Vision and Pattern Recognition, 2007.

[6] D. Lowe, "Object Recognition from Local Scale-Invariant Features, Proc. Seventh IEEE Int'l Conf. Computer Vision, pp. 1150 -1157, Sept. 1999.

[7] C. Schmid, K. Mikolajczyk, and A. Zisserman, "Human Detection Based on a Probabilistic Assembly of Robust Part Detectors," Proc. Eighth European Conf. Computer Vision, May 2004.

[8] K. Grauman and, S. Vijayanarasimhan "Keywords to Visual Categories: Multiple-Instance Learning for Weakly Supervised Object Categorization," Proc. IEEE Conf. Computer Vision and Pattern Recognition, 2008.

[9] D. Forsyth and G. Wang, "Object Image Retrieval by Exploiting Online Knowledge Resources," Proc. IEEE Conf. Computer Vision And Pattern Recognition, pp. 1-8, 2008.

[10] Torralba. Contextual priming for object detection. International Journal of Computer Vision, 53(2):153–167, 2003

[11] L. Berg and D. A. Forsyth. Animals on the web. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, New York, 2006.

[12] Blei, A. Ng, and M. Jordan. Latent Dirichlet allocation. Journal of Machine Learning Research, 3:993–1022, January 2003.

[13] Fergus, L. Fei-Fei, P. Perona, and A. Zisserman. Learning object categories from Google's image search. In Proceedings of the 10th International Conference on Computer Vision, Beijing, China, 2005a.

[14] Li, G.Wang, and L. Fei-Fei. OPTIMOL: automatic Object Picture collecTion via Incrementalv MOdel Learning. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, Minneapolis, 2007s

