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# A survey on: Image auto-annotation by visual features

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**Abstract -** *In recent Internet age, tremendous demand has been increased for geo-location information for the knowledge discovery and geospatial mapping. It is known that each day large amount of data is being generated on Internet in the form of photo-images. If we consider images of any location to give information about it, it may not give proper result due to the different angles in which the image has been captured. Due to this difference there maybe ambiguity in the place name or exact location. It is therefore hard to extract features directly from images. In geospatial information science geographic knowledge discovery tasks and image categorization are the most crucial work. To carry out this image categorization local scale-invariant features and bag-of-keypoints methods are used. The bag-of-keypoints methods are used to construct a visual vocabulary* and *generate feature vector to support image categorization and annotation. This annotated images can be classified using geographic nouns. If this process includes the name–entity recognition then the ambiguity of places name will be reduced and the result will be more precise.*

***Key Words***: **Geographic knowledge discovery, Image annotation, Name-Entity recognition, Text mining, Image processing.**

## 1.INTRODUCTION

The popularity of digital cameras and online community has led to a flourish of web images. It has become a serious challenge to manage such an overwhelming amount of images. Currently, commercial search engines and web albums rely on the text annotation associated with each image for indexing and retrieval tasks. Richer and more accurate semantic annotation would benefit many applications including image search, sharing, organization, and management. Besides the typical semantic tags, geo-tags that relate to the geographic location of the images have become more and more popular. In particular, a huge of geographic information are utilized and generated by various technologies, such as location-based services and location-aware technologies, and are represented in the forms of images or texts on the internet. Geographic knowledge discovery is emerging as a novel and broad application research topic, covering fields of geospatial information science, environment management, national security, and applications of location-based services, etc. Examples of geospatial data include data that describe the evolution of natural phenomena, earth science data that describe spatiotemporal phenomena in the atmosphere, or data that describe the location of individuals in the geographic space as a function of time. In addition, since the web images are typically labeled by different users in different languages and culture backgrounds, it is common that they may use different words to describe the same scene content even in the same language. For example, given the same image, one user may annotate it as "Hill" while another may annotate it as "Mountain". It is unrealistic to expect the annotation to be consistent. For geo-tags, it is not available for the majority of web images. Without rich and accurate annotation, web images cannot be indexed by search engines correctly, and consequently, cannot be easily accessed by other users. The location references include not only photos/images, but also texts. To process the resources of location information for exploring the document-to-location relationships, it is often considered using a hybrid solution involving text and image resources to tackle the issue. Clearly, it is necessary to develop a combination of features such as geo-location, text tags, and image content as geographic references for image annotation. The extraction of geographic information from images is a challenging work. The major difficulties encountered are that the geographic objects, unrelated characters, and cluttered background may occur in the image simultaneously. In addition, the illumination of images, image clarity, and the angles of geographic objects in the image may also influence the performance of extraction of geographic information from time to time. Initially the collected geographic image sets were divided into two parts: labeled and unlabeled images. Subsequently the images were processed to generate keypoints by utilizing Difference of Gaussian (DoG) and Scale-invariant Feature Transform (SIFT) approaches. Furthermore, we used the Affinity Propagation (AP) clustering technique, and constructed a visual vocabulary to enable similar keypoints of the images to be aggregated together. The resulting clustered keypoints in the geographic images can be calculated to generate feature vectors. By utilizing Fuzzy ARTMAP (FAM), these feature vectors will be

employed as training and test samples for classifying images by using geographic nouns.

### 1.1 MOTIVATION

The information on the world wide web is being difficult to locate and track most relevant topic due to the diverse and distributed nature of information. As the search engines reduced the redundancy of topics searched still there is scope to improve the accuracy as well as reduction of ambiguity of retrieved documents. If the image categorization and image annotation is considered then it is more appropriate solution for this problem. Users which targets the regional advertisements, spreading business information to local customers looks for the knowledge discovery of the particular location . An Image-Text association will help to collect more precise information. Name-Entity recognition will avoid the collision of retrieved result.

## 2. EXISTING SYSTEMS

In this section, we first review some related AIA techniques that also addressed key issues presented in Section I, i.e. image annotation and its different level of approaches. Automatic image annotation is very important to image retrieval and image understanding. The Structured visual feature selection and the implementation of hierarchical correlated structures among multiple tags to boost the performance of image annotation. Yahong Han, Fei Wu,Qi Tian et al. proposed approach in which framework simultaneously introduces an input and output structural grouping sparsity into a regularized regression model for image annotation[1]. For input high-dimensional heterogeneous features such as color, texture, and shape, different kinds (groups) of features have different intrinsic discriminative power for the recognition of certain concepts. With input output sparsity technique problem could not be easily solved due to the nonsmoothness and nonconvexity of the objective function. Tianxia Gong, Shimiao Li, Chew Lim Tan et al. proposed A Semantic Similarity Language Model to Improve Automatic Image Annotation. In this approach word-to-word relation and thus to improve the performance of existing image annotation approaches utilizing probabilistic models. Semantic similarity language model to estimate the semantic similarity among the annotation words[2]. A novel method of Logistic Canonical Correlation Regression (LCCR)exploits the canonical correlation between heterogeneous visual and tag features and an annotation lexicon, and builds a generalized annotation engine based on canonical correlation in order to produce enhanced annotation for web images[3]. Probabilistic latent space models for automatic image annotation called PLSA words. The model constrains the latent space by focusing on the textual features .The model consist of two steps learning parameters and annotation by inference respectively. This PLSA based annotation model is shown to outperform previous latent space models[4]. Automatic Linguistic Indexing of Pictures by a Statistical Modeling Approach is the feature extraction process, the multiresolution statistical modeling process, and the statistical linguistic indexing process[5]. Then A new inductive algorithm for image annotation by integrating label correlation mining and visual similarity mining into a joint framework[6]. Automatic Image Annotation Using Growing Hierarchical Self-Organizing Map (GHSOM) to help discovering the concealed relations between image data and annotation data, and annotate image according to such relations. GHSOM was first applied to cluster and generate hierarchies for images and annotations individually [7].

## 3. CONCLUSION

The goal of proposed system is to produce enhanced annotation for web images. The enhancements can be in the form of new and enriched annotation, or more accurate annotation. The enhancement in the identification of location plays vital role in current internet age. One of the challenges in our work is that geospatial data or geographical data specifically, image data available in different format obtained from various data sources may have different projections which produces variable perceptions, different accuracy and preciseness levels, and variable inconsistencies. The proposed approaches integrate information from various geospatial/geographical data, images, and text information sources do provide a feasible and reliable solution to partially overcome these inconsistencies and uncertainty of resulting retrieval for such real-world applications up to some extent.

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