**A survey on automatic image annotation and trends of the new age**

<https://www.researchgate.net/publication/257723729_A_Survey_on_Automatic_Image_Annotation_and_Trends_of_the_New_Age>

This paper is based on automatic image annotation problem. Based on this researching problem some model was proposed which give idea how image can annotate automatically by using these model. Here discussed about three type of model which have different method for solving image annotation problem.

**Generative Model**

First of all is Generative Modelobserving data randomly from some hidden parameters. It is used in machine learning for modeling data directly or also use as an intermediate step to forming a conditional probability density function. In this model, recognition is a process of annotating image regions with words. Firstly, images are segmented into regions. Then image are classified into region using a variety of features. It is mapping with the image between region types and keywords. That region can be describes using a small vocabulary of blobs. That blobs are generated from image features using clustering. From training set of image with annotation that probabilistic models can predict the probability of generating a word given the blobs in an image. By learning the semantics of images it automatically annotate an image with keywords and to retrieve images based on text queries. Another kind of generative model is topic model, which is also widely used in automatic image annotation.

**Discriminative model**

Secondly Discriminative models are a class of models used in machine learning for modeling the dependence of an unobserved variable y on an observed variable x . Within a statistical framework, this is done by modeling the conditional probability distribution P(y|x), which can be used for predicting y from x. Discriminative model do not allow to generate samples from the joint distribution of x and y. the main idea of this model based on automatic image annotation problem to classification problem. In this paper they proposed some frame for classification image that are-**SML,** **HSVMMIL,** **Hierarchical.**

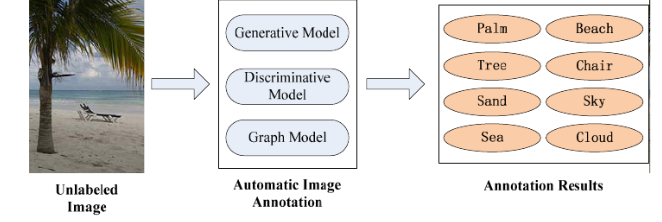
**Graph model**

Lastly proposed three types of graph model and these graph has two basic process. First annotation process which is the image-based graph learning is utilized to obtain the candidate annotations and the other is the annotation refinement process, the word based graph learning is used to refine those candidate annotations from the prior process.

First model is **BGRM**, bipartite graph reinforcement model is proposed for web image annotation. Given a web image, a set of candidate annotations is extracted from its surrounding text and other textual information in the hosting web page. As this set is often incomplete, it is extended to include more potentially relevant annotations by searching and mining a large-scale image database. All candidates are modeled as a bipartite graph. Then a reinforcement algorithm is performed on the bipartite graph to re rank the candidates. Only those with the highest ranking scores are reserved as the final annotations.

Second is an automatic image annotation approach based on **Automatic Multimedia Cross-modal Correlation Discovery**. The main idea of this work is to represent all the objects, as well as their attributes as nodes in a graph. For multimedia objects with m attributes, we obtain an (m+1)-layer graph. There are m types of nodes and one more type of nodes for the objects.

Third is a graph learning framework for image annotation. In this work, the image-based graph learning is performed to obtain the candidate annotations for each image. In order to capture the complex distribution of image data, the authors proposed a Nearest Spanning Chain (NSC) method to construct the image-based graph, whose edge-weights are derived from the chain-wise statistical information instead of the traditional pairwise similarities.



2 Author name / Procedia Engineering 00 (2011) 000–000

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[1,2]

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automatic image annotation through an example.

The rest of the paper is organized as follows. Section 2 introduces some related works about generative

model based image annotation. Section 3 presents some pioneering works about discriminative model

based image annotation in recent years. In section 4, we survey the works about graph model based image

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Fig1: Illustration of Automatic Image Annotation

All three models are for automatic image annotation. Each model are differ from another, generative models are typically more flexible than discriminative models in expressing dependencies in complex learning tasks and discriminative models differ from generative models in that they do not allow one to generate samples from the joint distribution of x and y . Lastly the graph model time complexity and space complexity are always high, and it is difficult to apply it directly in real world image annotation but we can try to graph model for parallel processing to increase computing speed.