**AN ATTRIBUTE-ASSISTED RERANKING MODEL FOR WEB IMAGE SEARCH**

**INTRODUCTION**

Dramatic increase of online images, image retrieval has attracted significant attention in both academia and industry .Many image search engines such as Google and Bing have relied on matching textual information of the images against queries given by users. However, text-based image retrieval suffers from essential difficulties that are caused mainly by the incapability of the associated text to appropriately describe the image content. Recently, visual reranking has been proposed to refine text-based search results by exploiting the visual information contained in the images. The existing visual reranking methods can be typically categorized into three categories as the clustering based, classification based and graph based methods. The clustering based reranking methods stem from the key observation that a wealth of visual characteristics can be shared by relevant images. With intelligent clustering algorithms initial search results from text-based retrieval can be grouped by visual closeness. However, for queries that return highly diverse results or without clear visual patterns, the performance of the clustering-based methods is not guaranteed. In the classification based methods, visual reranking is formulated as binary classification problem aiming to identify whether each search result is relevant or not. Pseudo Relevance Feedback (PRF) is applied to select training images to learn a classifier or a ranking model. However, in many real scenarios, representative examples obtained via PRF for the training dataset are very noisy and might not be adequate for constructing effective classifiers. Graph based methods have been proposed recently and received increasing attention as demonstrated to be effective. The multimedia entities in top ranks and their visual relationship can be represented as a collection of nodes and edges. The local patterns or salient features discovered using graph analysis are very powerful to improve the effectiveness of rank lists. Nevertheless, the reranking algorithms mentioned above are purely based on low-level visual features while generally do not consider any semantic relationship among initial ranked list. The high level Semantic concepts which are crucial to capture property of images could deliver more clear semantic messages between various nodes in the graph. Thus, in this paper, we propose to exploit stronger semantic relationship in the graph for image search reranking.

**SCOPE OF THE PROJECT**

The Scope of the project is online image re-ranking which limits users effort to just one-click feedback, is an effective way to improve search results and its interaction is simple enough. Major web image search engines have adopted this strategy. To achieve high efficiency, the visual feature vectors need to be short and their matching needs to be fast. The semantic signatures are very short and online image re-ranking becomes extremely efficient.

**LITERATURE SURVEY**

**Title :** Multimedia search reranking: A literature survey

**Author :** T. Mei, Y. Rui, S. Li, and Q. Tian

**Year :** 2014

**Description :** The proliferation of capture devices and the explosive growth of online social media have led to the countless private image and video collections on local computing devices such as personal computers, cell phones, and personal digital assistants, as well as the huge yet increasing public media collections on the Internet. For example, the most popular photo sharing site—Flickr, reached five billion photos uploads in 2011, as well as 3-5 million new photos uploaded daily [Kennedy et al. 2007]. Facebook held more than 60 billion photos shared by its communities as of 2011 Facebook, while YouTube streams more than one billion videos per day worldwide [YouTube]. Such explosive growth and widespread accessibility of visual content have led to a surge of research activity in visual search. The key problem is retrieving visual documents (such as images, video clips, and Web pages containing images or videos) that are relevant to a given query or user search intention from a large-scale database.

**Title :** Igroup: Web image search results clustering

**Author :** F. Jing, C. Wang, Y. Yao, K. Deng, L. Zhang, and W.-Y. Ma

**Year :** 2006

**Description :** IGroup, an efficient and effective algorithm that organizes Web image search results into clusters. IGroup is different from all existing Web image search results clustering algorithms that only cluster the top few images using visual or textual features. Our proposed algorithm first identifies several query-related semantic clusters based on a key phrases extraction algorithm originally proposed for clustering general Web search results. Then, all the resulting images are separated and assigned to corresponding clusters. As a result, all the resulting images are organized into a clustering structure with semantic level. To make the best use of the clustering results, a new user interface (UI) is proposed. Different from existing Web image search interfaces, which show only a limited number of suggested query terms or representative image thumbnails of some clusters, the proposed interface displays both representative thumbnails and appropriate titles of semantically coherent image clusters. Comprehensive user studies have been completed to evaluate both the clustering algorithm and the new UI.

**Title :** Relative attributes

**Author :** D. Parikh and K. Grauman

**Year :** 2011

**Description :** Human-nameable visual “attributes” can benefit various recognition tasks. However, existing techniques restrict these properties to categorical labels (for example, a person

is ‘smiling’ or not, a scene is ‘dry’ or not), and thus fail to capture more general semantic relationships. We propose to model relative attributes. Given training data stating how object/scene categories relate according to different attributes, we learn a ranking function per attribute. The learned ranking functions predict the relative strength of each property in novel images. We then build a generative model over the joint space of attribute ranking outputs, and propose a novel form of zero-shot learning in which the supervisor relates the unseen object category to previously seen objects via attributes (for example, ‘bears are furrier than giraffes’). We further show how the proposed relative attributes enable richer textual descriptions for new images, which in practice are more precise for human interpretation. We demonstrate the approach on datasets of faces and natural scenes, and show its clear advantages over traditional binary attribute prediction for these new tasks.

**Title :** Learning with hypergraphs: Clustering, classification, and embedding

**Author :** D. Zhou, J. Huang, and B. Schölkopf

**Year :** 2006

**Description :** In machine learning problem settings, we generally assume pairwise relationships among the objects of our interest. An object set endowed with pairwise relationships can be naturally illustrated as a graph, in which the vertices represent the objects, and any two vertices that have some kind of relationship are joined together by an edge. The graph can be undirected or directed. It depends on whether the pairwise relationships among objects are symmetric or not. Anite set of points in Euclidean space associated with a kernel matrix is a typical example of undirected graphs. As to directed graphs, a well-known instance is the World Wide Web. A hyperlink can be thought of as a directed edge because given an arbitrary hyperlink we cannot expect that there certainly exists an inverse one, that is, the hyperlink based relationships are asymmetric. However, in many real-world problems, representing a set of complex relational objects as undirected or directed graphs is not complete. For illustrating this point of view, let us consider a problem of grouping a collection of articles into deferent topics. Given an article, assume the only information that we have is who wrote this article.

**Title :** Weak attributes for large-scale image retrieval

**Author :** F. X. Yu, R. Ji, M.-H. Tsai, G. Ye, and S.-F. Chang

**Year :** 2012

**Description :**Attribute-based query offers an intuitive way of image retrieval, in which users can describe the intended search targets with understandable attributes. In this paper, we develop a general and powerful framework to solve this problem by leveraging a large pool of weak attributes comprised of automatic classifier scores or other mid-level representations that can be easily acquired with little or no human labor. We extend the existing retrieval model of modeling

Dependency within query attributes to modeling dependency of query attributes on a large pool of weak attributes, which is more expressive and scalable. To efficiently learn such a large dependency model without over fitting, we further propose a semi-supervised graphical model to map each multi-attribute query to a subset of weak attributes. Through extensive experiments over several attribute benchmarks, we demonstrate consistent and significant performance improvements over the state-of-the-art techniques. In addition, we compile the largest multi-attribute image retrieval dataset to date, including 126 fully labeled query attributes and 6,000 weak attributes of 0.26 million images.

**Title :** Multimedia search with pseudo relevance feedback

**Author :** R. Yan, A. Hauptmann, and R. Jin

**Year :** 2003

**Description :** We present an algorithm for video retrieval that fuses the decisions of multiple retrieval agents in both text and image modalities. While the normalization and combination of evidence is novel, this paper emphasizes the successful use of negative pseudo-relevance feedback to improve image retrieval performance. Although we have not solved all problems in video information retrieval, the results are encouraging, indicating that pseudo-relevance feedback shows great promise for multimedia retrieval with very varied and errorful data.

**Title :** Learning to detect unseen object classes by between-class attribute transfer

**Author :** C. H. Lampert, H. Nickisch, and S. Harmeling

**Year :** 2009

**Description :** We study the problem of object classification when training and test classes are disjoint, i.e. no training examples of the target classes are available. This setup has hardly been studied in computer vision research, but it is the rule rather than the exception, because the world contains tens of thousands of different object classes and for only a very few of them image, collections have been formed and annotated with suitable class labels. In this paper, we tackle the problem by introducing attribute-based classification. It performs object detection based on a human-specified high-level description of the target objects instead of training images. The description consists of arbitrary semantic attributes, like shape, color or even geographic information. Because such properties transcend the specific learning task at hand, they can be pre-learned, e.g. from image datasets unrelated to the current task. Afterwards, new classes can be detected based on their attribute representation, without the need for a new training phase. In order to evaluate our method and to facilitate research in this area, we have assembled a new largescale dataset, “Animals with Attributes”, of over 30,000 animal images that match the 50 classes in Osherson’s classic table of how strongly humans associate 85 semantic attributes with animal classes. Our experiments show that by using an attribute layer it is indeed possible to build a learning object detection system that does not require any training images of the target classes.

**Title :** Image retrieval via probabilistic hypergraph ranking

**Author :** Y. Huang, Q. Liu, S. Zhang, and D. N. Metaxas

**Year :** 2010

**Description :** In content-based image retrieval (CBIR) visual information instead of keywords is used to search images in large image databases. Typically in a CBIR system a query image is provided by the user and the closest images are returned according to a decision rule. In order to learn a better representation of the query concept, a lot of CBIR frameworks make use of an online learning technique called relevance feedback users are asked to label images in the returned results as ‘relevant’ and/or ‘not relevant’, and then the search procedure is repeated with

The new information. Previous work on relevance feedback often aims at learning discriminative models to classify the relevant and irrelevant images, such as, RF methods based on support vector machines decision trees boosting Bayesian classifiers and graph-cut. Because the user-labeled images are far from sufficient for supervised learning methods in a CBIR system, recent work in this category attempts to apply transductive or semi-supervised learning to image retrieval. For example, presents an active learning framework, in which a fusion of semi-supervised techniques (based on Gaussian fields and harmonic functions) and SVM are comprised. In and, a pairwise graph based manifold ranking algorithm is adopted to build an image retrieval system. Caiet al. put forward semi-supervised discriminant analysis and active subspace learning to relevance feedback based image retrieval. The common ground of and is that they all use a pairwise graph (for simplicity, we denote the pairwise graph as a simple graph) to model relationship between images. In a simple graph both labeled and unlabeled images are

Taken as vertices; two similar images are connected by an edge and the edge weight is computed as image-to-image affinities. Depending on the affinity relationship of a simple graph, semi-supervised learning techniques could be utilized to boost the image retrieval performance.

**PROJECT IMPLEMENTATION**

**MODULES**

* **ADMIN**
* Authentication
* Upload images
* View images
* **USER**
* Authentication
* Text based Image search
* Attribute Search
* Attribute-Hyperedge
* Upload Image

**ADMIN**

**Authentication:**

An Administrator wants to access their page means they have to Login in with providing User id and password. If Administrator’s user id and password are exists means access was granted.

Validate

Administrator page

Database

YES

NO

**Upload Image:**

In this scheme data owner upload the image files in the database. Each service has different set of files. Data owner collect several file from the local path and stored in the database. This database has collection of server cluster which uniquely connected with the search engine.

Image

Find Server Path

File Upload

Database

**View Images:**

Admin textually enter the image name in the search engine. If the query specified text is present inside the index means then that category image will displayed in the browser or else it can match the text with an entire database.

Search Image Result

Search Image

DB

**USER**

**Authentication:**

If you are the new user going to login into the application then you have to register first by providing necessary details. After successful completion of sign up process, the user has to login into the application by providing username and exact password. The user has to provide exact username and password which was provided at the time of registration, if login success means it will take up to main page else it will remain in the login page itself.

LOGIN

CHECK

STATUS

Proceed To next

Page

DB

Yes

No

**Text-based Image Search:**

Our search engine first searches the pages and then gets the result searching for the metadata to get the trusted results search engines require searching for pages that maintain such information at some place. Here propose the intelligent semantic text based search engine.

Text based Search Engine

Database

Search Image

View Image Result

**Attribute Search:**

Users want to view the image from search results means they choose a image from result and it will be previewed with Augmented image descriptions. The Preview will not be a normal one; it will be shown with the tree structured with its augmented information.

User

Cloud DB

Search with attribute name

View image with attribute

**Attribute-** **Hyperedge:**

In this module, user collects the descriptions of a particular image which want to extend from existing descriptions which adds some more additional information about that image.

User

Collects the augments of image

Database

View Result

**Upload Image:**

After augmenting image description and semantic process an image want to be uploading into database. In this uploading module the Image path will be provide by admin and click the upload button means image will be stored in the particular directory of database.

Image uploading process

Admin

Database

**GIVEN INPUT AND EXPECTED OUTPUT**

**ADMIN**

**Input:** Provide User id and password.

**Output:** Authentication success means they will get access.

**IMAGE UPLOAD**

**Input:** Choose the image path.

**Output:** Image will be uploaded to database successfully

**View Files:**

**Input:** User Search Query image is mapped with DB

O**utput**: Mapped Query image is viewed in the browser

**USER**

**Authentication:**

**Input:** Provide username and password to get permission for access.

**Output:** Became authenticated person to request and process the request.

**Text-based Image Search:**

**Input:** Enter the name of searching image.

**Output:** Search results will be appears based upon availability.

**Attribute Search:**

**Input:** Choose a picture and collect the description.

**Output:** Description will be stored into dataset.

**Attribute-Augmented:**

**Input:** Choose the particular image which you want to preview details.

**Output:** The Image will be shown with augmented information.

**Image Upload:**

**Input:** Choose the image path.

**Output:** Image will be uploaded to database successfully

**TECHNIQUE OR ALGORITHMS USED**

**RERANKING ALGORITHMS**

Web image search reranking is emerging as one of the promising techniques for automotive boosting of retrieval precision. The basic functionality is to reorder the retrieved multimedia entities to achieve the optimal rank list by exploiting visual content. To search for images, a user may provide query terms such as keyword, image file/link, or click on some image, and the system will return images "similar" to the query. The similarity used for search criteria could be Meta tags, color distribution in images, region/shape attributes, etc. Unfortunately, image retrieval systems have not kept pace with the collections they are searching. The shortcomings of these systems are due both to the image representations they use and to their methods of accessing those representations to find images. The problems of image retrieval are becoming widely recognized, and the search for solutions an increasingly active area for research and development.

**HARDWARE & SOFTWARE REQUIREMENTS**

**SOFTWARE REQUIREMENTS**

The Software requirements document is the specification of the system. It should include both a definition and a specification of requirements. It is a set of what the system should do rather than how it should do it. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating cost, planning team activities, performing tasks and tracking the teams and tracking the team’s progress throughout the development activity.

* Operating system : Windows8
* IDE : Microsoft Visual Studio .Net 2013
* Front End : ASP.NET
* Coding Language : C#
* Backend : SQL Server 2012

**HARDWARE REQUIREMENTS**

The Hardware requirements may serve as the basis for a contract for the implementation of the system and should therefore be a complete and consistent specification of the whole system. They are used by software engineers as the starting point for the system design. It should what the system do and not how it should be implemented.

* Processor : Pentium Dual Core 2.00GHZ
* Hard disk : 40 GB
* Mouse : Logitech.
* RAM : 2GB(minimum)
* Keyboard : 110 keys enhanced.

**SYSTEM DESIGN**

**USE CASE DIAGRAM:**

A use case diagram is a type of behavioral diagram created from a Use-case analysis. The purpose of use case is to present overview of the functionality provided by the system in terms of actors, their goals and any dependencies between those use cases.



**CLASS DIAGRAM**

A class diagram in the UML is a type of static structure diagram that describes the structure of a system by showing the system’s classes, their attributes, and the relationships between the classes. Private visibility hides information from anything outside the class partition. Public visibility allows all other classes to view the marked information. Protected visibility allows child classes to access information they inherited from a parent class.



**OBJECT DIAGRAM**

An **object diagram** in the Unified Modeling Language (UML) is a diagram that shows a complete or partial view of the structure of a modeled system at a specific time. An Object diagram focuses on some particular set of object instances and attributes, and the links between the instances. A correlated set of object diagrams provides insight into how an arbitrary view of a system is expected to evolve over time. Object diagrams are more concrete than class diagrams, and are often used to provide examples, or act as test cases for the class diagrams. Only those aspects of a model that are of current interest need be shown on an object diagram.

UserName=Admin

PassWord=\*\*\*\*\*

Authentication

Search engine = xxx

View images = yyy

Salary= 1000

File\_name=xx

Size=yyy

View Result=xzxz

Resource-id = R01

File\_name=xx

Size=yyy

Type=zzz

File name=xxx

View image result=yyy

File\_name=xx

Size=yyy

Type=zzz

Upload images

View images

Attribute search

Attribute-augmented

Text based search

**STATE DIAGRAM**

A state diagram is a type of diagram used in computer science and related fields to describe the behavior of systems. There are many forms of state diagrams, which differ slightly and have different semantics. A state diagram, also called a state machine diagram or state chart diagram, is an illustration of the states an object can attain as well as the transitions between those states in the Unified Modeling Language (UML).



**ACTIVITY DIAGRAM**

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.



**SEQUENCE DIAGRAM**

A sequence diagram in UML is a kind of interaction diagram that shows how processes operate with one another and in what order. A sequence Diagram in Unified Modeling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams typically are associated with use case realizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.



**COLLABORATION DIAGRAM**

The collaboration diagram shows messages being sent between classes and object (instances). A diagram is created for each system operation that relates to the current development cycle (iteration). The concept is more than a decade old although it has been refined as modeling paradigms have evolved. A collaboration diagram resembles a flowchart that portrays the roles, functionality and behavior of individual objects as well as the overall operation of the system in real time. Objects are shown as rectangles with naming labels inside. These labels are preceded by colons and may be underlined.



**COMPONENT DIAGRAM**

Components are wired together by using an assemblyconnector to connect the required interface of one component with the provided interface of another component. This illustrates the service consumer - service provider relationship between the two components. When using a component diagram to show the internal structure of a component, the provided and required interfaces of the encompassing component can delegate to the corresponding interfaces of the contained components.



An assembly connector is a "connector between two components that defines that one component provides the services that another component requires. An assembly connector is a connector that is defined from a required interface or port to a provided interface or port."

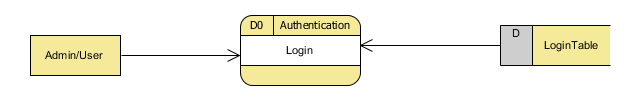
**DATAFLOW DIAGRAM**

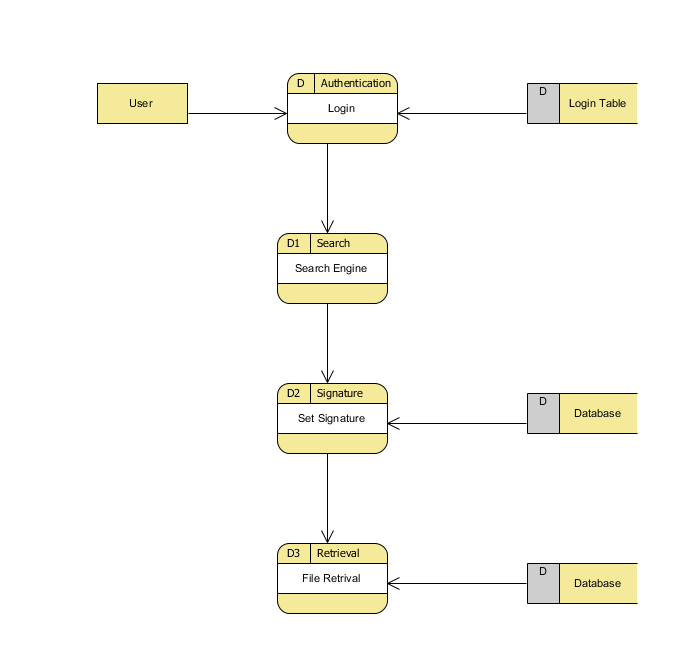
**Description**:

A data flow diagram (DFD) is a graphical representation of the “flow” of data through an information system. It differs from the flowchart as it shows the data flow instead of the control flow of the program. A data flow diagram can also be used for the visualization of data processing. The DFD is designed to show how a system is divided into smaller portions and to highlight the flow of data between those parts.

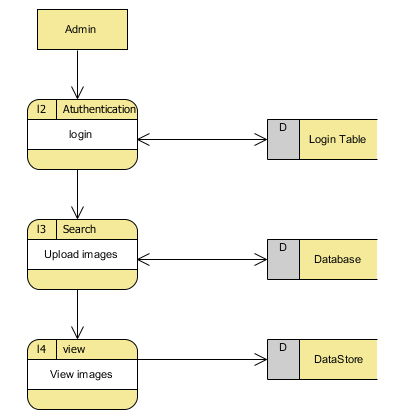
Data Flow Diagram (DFD) is an important technique for modeling a system’s high-level detail by showing how input data is transformed to output results through a sequence of functional transformations. DFDs reveal relationships among and between the various components in a program or system. DFDs consist of four major components: entities, processes, data stores and data flow.

**Level 0**

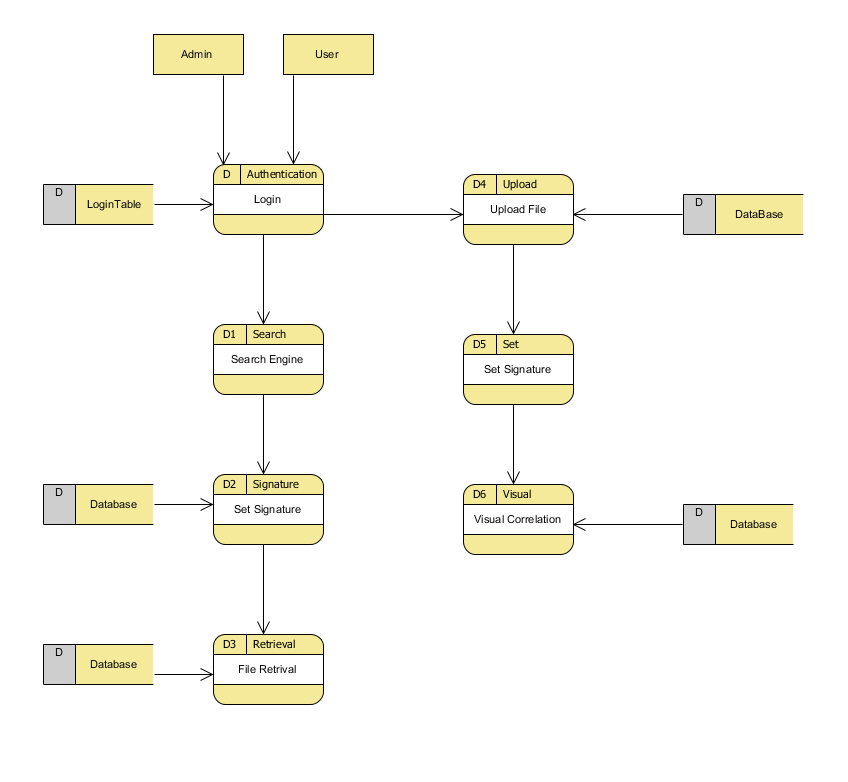


**Level1** 

**Level 2**



**All Level DFD**

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**E-R DIAGRAM**

In software engineering, an entity-relationship model (ERM) is an abstract and conceptual representation of data. Entity-relationship modeling is a database method, used to produce a type of conceptual schema or semantic data model of a system, often a relational database, and its requirements in a top-down fashion. Diagrams created by this process are called entity-relationship diagrams, ER diagrams, or ERDs.

An entity-relationship (ER) diagram is a specialized graphic that illustrates the relationships between entities in a database. ER diagrams often use symbols to represent three different types of information. Boxes are commonly used to represent entities. Diamonds are normally used to represent relationships and ovals are used to represent attributes.

Image Upload

Attribute search

DB Contains

User

Text-based Reranking

**SYSTEM ARCHITECTURE**

Architecture diagram shows the relationship between different components of system. This diagram is very important to understand the overall concept of system. Architecture diagram is a diagram of a system, in which the principal parts or functions are represented by blocks connected by lines that show the relationships of the blocks. They are heavily used in the engineering world in hardware design, electronic design, software design, and process flow diagrams.



o Admin

User 

Admin

Image Upload

Database

View Image

SEARCH ENGINE



Attribute Image search

Attribute Augmented search

**FUTURE ENHANCEMENT**

In Future, We further extends the more suitable and appropriate image descriptions as per the images appear. In this module, collected augmented descriptions are all arrange in the basis of Tree structured semantic units. The units are all stored into the dataset in the structured format.

Tree structured Semantic unit

Admin

Dataset

**GIVEN INPUT AND EXPECTED OUTPUT**

**STRUCTURED DATASET**

**Input:** Choose the image

**Output:** Based upon image category Augmentation is stored.

**ADVANTAGES**

* This method is more appropriate augmentation of image descriptions and this gives more useful accurate information about image.

**APPLICATION**

Image-Net.org URL: <http://image-net.org/challenges/LSVRC/2014/>

**CONCLUSION**

Structured image description method could jointly output the class, subclass and attributes for images, resulting in more informative structured image descriptions. Our method augmented structured SVM to solve the problem of image descriptions prediction.

We propose a novel framework, which learns query-specific semantic spaces to significantly improve the effectiveness and efficiency of online image re-ranking.

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