Computer Graphics 2015: Content Based Image Retrieval: Approaches, Challenges & Future Directions

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Image retrieval and classification is that the major field of research within the area of image processing and computer vision. Early image retrieval systems search the pictures supported keyword found in their surrounding text. These Text Based Image Retrieval Systems (TBIRs) require manual annotation of images beforehand. However, annotation of images may be a very tedious task that needs tons of your time and sometimes produces misleading results. To beat this limitation of TBIR, visual content of the pictures is used to look the image. System utilizing this idea for searching, navigating and browsing images from large image databases is termed as Content Based Image Retrieval; system. A CBIR system is more successful and shut to the human perception because it can search the similar images supported the visual content of a given query, image or sketch. Inherently, a typical CBIR system involves task like query formulation, pre-processing, feature extraction, multidimensional indexing, similarity computation, relevance feedback and output similar images as per user requirement. This presentation will provide a deep insight in to the varied tools and techniques utilized in CBIR system. The conceptualization and implementation of every of the CBIR task alongside the implementation of complete system, ranging from simple to most complex ones, are going to be discussed intimately . Further, my contribution within the field of image retrieval and classification with verified results and example query are going to be presented and compared with the prevailing state-of-the-art techniques. Finally, future work, problems and challenges in developing an efficient CBIR system are going to be discussed with their suggested solutions. The most goal of the presentation is to arouse the interest of audience and attract the potential researchers towards the fascinating field of image retrieval.

This paper attempts to debate the evolution of the retrieval approaches that specialize in development, challenges and future direction of the image retrieval. It highlights both the already addressed and outstanding issues. The explosive growth of image data results in the necessity of research and development of Image Retrieval. However, Image retrieval researches are moving from keyword, to low level features and to semantic features. Drive towards semantic features is thanks to the matter of the keywords which may be very subjective and time consuming while low level features cannot always describe high level concepts within the users' mind. Hence, introducing an interpretation inconsistency between image descriptors and high level semantics that referred to as the semantic gap. This paper also discusses the semantic gap issues, user query mechanisms also as common ways wont to bridge the gap in image retrieval. The purpose of a picture database is to store and re-trieve a picture or image sequences that are relevant to a question. There are spreads of domains like information retrieval, special effects, management and user behavior which have evolved separately but are in-terrelated and supply a valuable contribution to the present re-search subject. As more and more visual information is out there in digital archives, the necessity for effective image retrieval has become clear. In image retrieval re-search, researchers are moving from keyword based, to content based then towards semantic based image re-trieval and therefore the main problem encountered within the

content-based image retrieval research is that the semantic gap be-tween the low-level feature representing and high-level semantics within the images. Neither one features nor a mixture of multiple visual features could fully capture high level concept of images. Besides, thanks to the performance of Image retriev-al supported low level features aren't satisfactory, there's a requirement for the mainstream of the research converges to retrieval supported semantic meaning by trying to extract the cognitive concept of a person's to map the low level image features to high level concept (semantic gap). Additionally, representing image content with semantic terms allows users to access images through text query which is more intuitive, easier and preferred by the front users to precise their mind compare with using images. For instance, users' queries could also be 'Find a picture of sunset instead of 'find me a picture contains red and yellow colors'. General Framework of Semantic based Image Re-trieval.

As conclusion, this paper provides a study of image re-trieval work towards narrowing down the 'semantic gap'. Recent works are mostly lack of semantic features extrac-tion and user behavior consideration. Therefore, there's a requirement of image retrieval system that's capable to interpret the user query and automatically extract the semantic feature which will make the retrieval more efficient and ac-curate. Image retrieval researches are moving from keyword toward semantic based image retrieval. However, exist-ing image retrieval researches are still lack of meaningful semantic image description and user behavior considera-tion. For user query, textual queries are usually can pro-vide more accurate description of users' information needs. Therefore, there's a requirement to supply maximum support towards bridging the semantic gap between low level visual features and high level concepts for better image understanding between human and machine and also contribute to possess more intelligent, user friendly be-sides accuracy and efficiency image retrieval.