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Content based image retrieval: Approaches, challenges and future directions

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Image retrieval and classification is the major field of research in the area of image processing and computer vision. Early image retrieval systems search the images based on keyword found in their surrounding text. These Text Based Image Retrieval Systems (TBIRs) require manual annotation of images in advance. However, annotation of images is a very tedious task that requires a lot of time and often produces misleading results. To overcome this limitation of TBIR, visual content of the images is employed to search the image. System utilizing this concept for searching, navigating and browsing images from large image databases is termed as Content Based Image Retrieval (CBIR) system. A CBIR system is more successful and close to the human perception as it can search the similar images based on 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 into the various tools and techniques used in CBIR system. The conceptualization and implementation of each of the CBIR task together with the implementation of complete system, starting from simple to most complex ones, will be discussed in detail. Further, my contribution in the field of image retrieval and classification with verified results and example query will be presented and compared with the existing state-of-the-art techniques. Finally, future work, problems and challenges in developing an efficient CBIR system will be discussed with their suggested solutions. The main goal of the presentation is to arouse the interest of audience and attract the potential researchers towards the fascinating field of image retrieval.

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Exploring the trade-off between accuracy and observational latency in action recognition

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An important aspect in designing interactive, action-based interfaces is reliably recognizing actions with minimal latency. High latency causes the system's feedback to lag behind user actions and thus significantly degrades the interactivity of the user experience. This talk presents algorithms for reducing latency when recognizing actions. We use a latency-aware learning formulation to train a logistic regression-based classifier that automatically determines distinctive canonical poses from the data and uses these to robustly recognize actions in the presence of ambiguous poses. We introduce a novel (publicly released) data-set for the purpose of our experiments. Comparisons of our method against both a Bag of Words and a Conditional Random Field (CRF) classifier show improved recognition performance for both pre-segmented and online classification tasks. Additionally, we employ GentleBoost to reduce our feature set and further improve our results. We then present experiments that explore the accuracy/latency trade-off over.

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