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LITERATURE SURVEY ON VARIOUS CLUSTERING TECHNIQUES USING VIDEO DATA IMAGE

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ABSTRACT

The amount of information produced every year is rapidly growing due to many factor among all media, video is a particular media embedding visual, motion, audio and textual information. Given this huge amount of information the researchers need effective clustering techniques for the video data. The similarity is obtained from the attribute values of the objects. The basic attributes are distance, pixel value, and other common factor if any. The goal of this research on different clustering techniques is to achieve image segmentation. Clustering can be termed here as a grouping of similar images. The purpose of clustering is to get meaningful result, effective storage and fast retrieval in various areas. The goal is to provide a self-contained review of the concepts and the mathematics underlying clustering techniques. Then the clustering methods are presented, divided into: hierarchical, partitioning, density-based, model-based and grid-based methods. The goal of this survey is to provide a comprehensive review of different clustering techniques. Due to the importance of clustering a number of algorithms have been proposed but based on the image that is inputted the algorithm should be chosen to get the best results.

INTRODUCTION

The availability of digital video contents over the web is growing at an exceptional speed due to the advances in networking and multimedia technologies and to the wide use of multimedia applications: videos can be downloaded and played out from almost everywhere using many different devices (e.g., cellphones, palms, laptops) and networking technologies. The large popularity is highlighted by the enormous success of web sites like Google-Video, YouTube and iTunes Video, where people can upload/download videos. In such a scenario, a tool for performing video browsing would be really appreciated. To handle the enormous quantity of video contents, many proposals have been presented for indexing, retrieving and categorizing digital video contents. Considering the limited man-power, it is much expected to develop retrieval methods which use features automatically extracted from videos. However, since features only represent physical contents (e.g. color, edge, motion, etc.), retrieval methods require knowledge of how to use/integrate features for retrieving relevant videos to a query. To obtain such knowledge, this dissertation concentrates on *video data mining* where videos are analyzed using data mining techniques which extract previously unknown, interesting patterns in underlying data. Thereby, patterns for retrieving relevant videos are extracted as explicit knowledge.

Classification is a way to categorize or sassing class labels to a pattern set under the supervision. Decision boundaries are generated to discriminate between patterns belonging to different classes. The data set is initially partitioned into segments and the classifier is trained on the former. A framework to enable semantic video classification and indexing in a specific video domain was proposed. A method for classification of different kinds of videos that uses the output of a concise video summarization technique that forms a list of key frames was present.

Clustering is useful technique for the discovery of some knowledge from data set. It maps a data item into one of several clusters, where clusters are natural grouping for data items based on similarity metrics or probability density models. Clustering consists of partitioning data into homogeneous granules or groups, based on some objective function that maximizes the inter-cluster distance. Video clustering has some differences with convential clustering algorithms, As mentioned earlier, due to the unstructured nature do video data, preprocessing of video data by using image processing g or computer vision techniques is required to get structured format features, Another difference in video clustering is that the time factor should be considered while the video data is processed.

LITERATURE SURVEY

1.Title: A Survey on Multimodal Content Based Video Retrieval,Author: Tamizharasan.C, Dr.S.Chandrakala

Problem Formulation

In recent years, the multimedia storage grows and the cost for storing multimedia data is cheaper. So there is huge number of videos available in the video repositories. It is difficult to retrieve the relevant videos from large

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video repository as per user interest. It is urgently required to make the unstructured multimedia data accessible and searchable with great ease and flexibility.

Finding

Substantial increase in videos with very similar con-tents (near duplicate videos) .The near-duplicate videos may be uploaded many times from many different users. So the problem of efficient identification of near duplicate videos on the web is an important issue for video management. Watching a large number of videos to grasp important information quickly is a big challenge. The evolution of the entire event is not directly observable by simply watching these videos. Even worse, some videos are indeed weakly or not relevant to the query. This research offers an overview of the different existing techniques in multimodal content based video retrieval and different approaches to search with in long videos.

Conclusion

This research covers the following tasks: Video segmentation including shot boundary detection, key frame ex-traction, scene segmentation and audio segmentation , extraction of features of static key frames, objects ,audio features and motions, video data mining, video classification and annotation, video search including interface, similarity measure, video retrieval and relevance feed-back.

2. Label Me video: Building a Video Database with Human Annotations,Authors: Jenny Yuen .Bryan Russe, Ce Liu, Antonio Torralba

Problem Formulation:

Currently, video analysis algorithms suffer from lack of information regarding the objects present, their interactions, as well as from missing comprehensive annotated video databases for benchmarking. We designed an online and openly accessible video annotation system that allows anyone with a browser and internet access to efficiently annotate object category, shape, motion, and activity information in real-world videos. The annotations are also complemented with knowledge from static image databases to infer occlusion and depth information.

Finding

Video processing and understanding are very important problems in computer vision. Researchers have studied motion estimation and object tracking to analyze temporal correspondences of pixels or objects across the frames. The motion information of a static scene with a moving camera can further help to infer the 3D geometry of the scene. In some video segmentation approaches, pixels that move together are grouped into layers or objects. Higher level information, such as object identities, events and activities, has also been widely used for video retrieval, surveillance and advanced video editing.

3. Conclusion

We designed an open, easily accessible, and scalable annotation system to allow online users to label a database of real-world videos. Using our labeling tool, we created a video database that is diverse in samples and accurate, with humanguided annotations. Based on this database, we studied motion statistics and cause-effect relationships between movingobjects to demonstrate examples of the wide array of applications for our database. Furthermore, we enriched our annotations by propagating depth information from a static and densely annotated image database.

3. Title: An Iterative Image Registration Algorithm by Optimizing Similarity Measurement, Author: Wei Chu, Li Ma, John Song, and Theodore Vorburger

Problem Formulation

Image registration is a process of determining the point-by-point correspondence between two or more images taken of a scene at different times, by different sensors, or from different points of view. The images are aligned with one another so that differences between them can be detected. The method has applications in many areas such as remote sensing, medical imaging, computer vision, image similarity measurement, etc. Based on different criteria, registration methods and applications can be classified differently. Over the years, a broad range of techniques has been developed for registration of various types of data and images

Finding

An appropriate image registration method is needed to align two casing images before the similarity between them is calculated. For the practical requirement of determining the reproducibility of the topography signatures of bullets or cases, a new image registration method based on Newton-Raphson iteration is developed, and this is directly associated with the signature difference parameter.

Conclusion

The automatic algorithm proposed in this research solves the 2D image registration problem for rigid body transformation consisting of *x*- and *y*-translation and *z*-rotation. Furthermore, for an affine transformation of

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images with different magnification scales,in case, for example, two images were measured with different lateral magnifications, this algorithm can be further expanded by adding a scaling factor *l*.

4. Title: Data Clustering Using Data Mining TechniquesAuthor: S.R.Pande, Ms. S.S.Sambare, V.M.Thakre

Problem Formulation

Cluster analysis divides data into meaningful or useful groups (clusters). If meaningful clusters are the goal, then the resulting clusters should capture the "natural" structure of the data. For example, cluster analysis has been used to group related documents for browsing, to find genes and proteins that have similar functionality, and to provide a grouping of spatial locations prone to earthquakes. However, in other cases, cluster analysis is only a useful starting point for other purposes, e.g., data compression or efficiently finding the nearest neighbors of points. Whether for understanding or utility, cluster analysis has long been used in a wide variety of fields: psychology and other social sciences, biology, statistics, pattern recognition, information retrieval, machine learning, and data mining.

Finding

In this research, a survey of several clustering techniques that are being used in Data Mining is presented. Data mining adds to clustering the complications of very large datasets with very many attributes of different types. This imposes unique computational requirements on relevant clustering algorithms. A variety of algorithms have recently emerged that meet these requirements and were successfully applied to real-life data mining problems.

Conclusion

Clustering lies at the heart of data analysis and data mining applications. The ability to discover highly correlated regions of objects when their number becomes very large is highly desirable, as data sets grow and their properties and data interrelationships change. In this paper we described the process of clustering from the data mining point of view. We gave the properties of a "good" clustering technique and the methods used to find meaningful partitioning.

5. Title: Joint Audio-Visual Bi-Modal Codewords for Video Event Detection,Author: Guangnan Ye, I-Hong Jhuo, Dong Liu, Yu-Gang Jiang, D. T. Lee, Shih-Fu Chang

Problem Formulation

Joint audio-visual patterns often exist in videos and provide strong multi-modal cues for detecting multimedia events. However, conventional methods generally fuse the visual and audio information only at a superficial level, without adequately exploring deep intrinsic joint patterns.

Finding

In this research, we propose a joint audio-visual bi-modal representation, called bi-modal words. We first build a bipartite graph to model relation across the quantized words extracted from the visual and audio modalities. Partitioning over the bipartite graph is then applied to construct the bi-modal words that reveal the joint patterns across modalities. Finally, different pooling strategies are employed to re-quantize the visual and audio words into the bi-modal words and form bimodal Bag-of-Words representations that are fed to subsequent multimedia event classifiers.

Conclusion

We have introduced an audio-visual bi-modal representation for video event detection. The proposed method discovers the joint audio-visual patterns in the videos by the bipartite graph partitioning. Different pooling strategies are employed to re-quantize the audio and visual BoW representations into the bi-modal words, where average pooling is found to be most suitable for bi-modal BoW generation.

In this research work we have presented a framework for analyze the performance of various clustering mechanisms like Hierarchical, Density based, Grid Based, Model Based, Partition clustering mechanisms. The proposed framework based on the analysis, we utilized RGB values to describe video frames. Initially, the number of frames is extracted from a video by using RGB value for each frame. Then, the extracted frames are clustered by using various clustering mechanism. If a user gives a query image, the corresponding image was searched in all the respected clusters. Based on the result, we can identify the better performance cluster.

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