An Overview on Multimedia

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Abstract: Multimedia is merely extension method of usage to present the customer need in an attractive manner. .Multimedia generally refers to the method of applying different tools for a single outcome. The different generations of computer helped Multimedia to achieve its higher performance. Multimedia concepts are used in different application. The Multimedia content is also in collaboration with Encryption & Decryption standards (CBR).The below paper is the general study of multimedia with its application & varied usage in the day-to-day environment.

KEYWORDS: Multimedia, Characteristics of multimedia, Multimedia applications, Types, CBR, Matching Techniques

I. INTRODUCTION

Multimedia is one of the finest ways to work with any computer related activities. It provides some additional qualities which enhance the appearance .An content that uses different content forms is referred to us as "MULLTIMEDIA". They use only simple computer displays such as text only or traditional form of printed or hand produce material. A combination of text, audio, image files, animation, video or interactivity contents are used in multimedia. An multimedia file is usually played, displayed or accessed by electronic and computerized devices which are known as "PROCESSING DEVICES". Multimedia can be broadly classified into linear and non linear types. Multimedia has several characteristic features and they are used for several real time activities and for scientific purpose also. They can also be used for presentations which will improve the content. The last two decades have resulted in a substantial progress in the multimedia and storage technology that has led to building of a large repository of digital image, video, and audio data. There are a number of text-search engines on the web and incidentally, the sites hosting them are amongst the busiest sites. However, searching for a multimedia content is not as easy because the multimedia, as opposed to text, needs many stages of pre-processing to yield indices relevant for querying. Since an image or a video sequence can be interpreted in numerous ways, there is no commonly agreed-upon vocabulary. Thus, the strategy of manually assigning a set of labels to a multimedia data, storing it and matching the stored label with a query will not be effective. Besides, the large volume of video data makes any assignment of text labels a massively labour intensive effort.

Fig .1.Multimedia in various fields

II. CATEGORIES OF MULTIMEDIA

Multimedia primarily has two categories namely linear and non-linear as the name suggests in linear category the data and files are in a sequenced way, in non linear the files are not in a sequenced way. Linear Information presented in a straight pathway, a sequence of events in a specific order. Behaviouristic and traditional teachers prefer this way of presenting information, although many multimedia methods are used for presenting linear type is considered consider as the traditional methods because this method allows less real world experience.
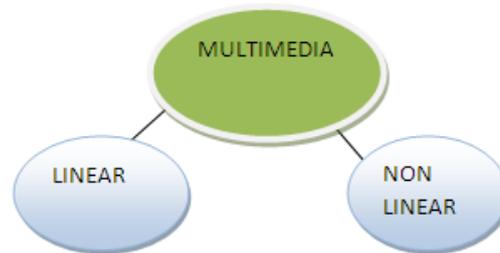
Fig.2. Categories of multimedia

Linear

In linear multimedia files, the files are presented or viewed in a linear manner without any navigation tools for the user just as cinema.

Non-linear

Non-linear content offers user interactivity to control progress as used with a computer game or used in self-paced computer based training. Hypermedia is an example of non-linear content.

Types

The two main types of linear multimedia are movie presentations, such as pre-recorded instructional videos or fictional movies recorded for entertainment purposes, and printed books and magazines. Live video feeds can also be considered linear multimedia because the viewer has no ability to speed up or slow down the presentation or skip to different segments.

Benefits

The main reason to use linear multimedia over the more interactive and fun non-linear types of multimedia is to aid in teaching or training. Linear multimedia works exceedingly well for providing information to large groups of people such as at training sessions, seminars, workplace meetings, study groups, or church gatherings.

Consideration

Multimedia ceases to be classified as linear when any interactive elements at all are introduced, such as the ability to skip to different chapters in a DVD, rewind or fast-forward a video, move a character in a game.

Multimedia presentations can be live or recorded. A recorded presentation may allow interactivity via a navigation system. A live multimedia presentation may allow interactivity via an interaction with the presenter or performer. The best example of non linear multimedia is "video games", where the user gets control over the navigation tools of multimedia.

Difference between linear and non-linear interactivity

Linear interactivity

In linear interactivity the user cannot interact with multimedia application without controlling the progress of the content in the application .In other words in linear interactivity the user is just a passive recipient of contents most of the time. As the name suggests in linear the contents are arranged in a sequential manner. A stand out example is a movie, although a movie is a sequential combination of audio, video and graphics and animations the user has no control over the sequence of events.

Non-linear interactivity

Non linear interactivity allows can   interactivity allow user to interact with the content according to the requirements of the user from the content. Here user is an active recipient of content non linear interactivity is a two way communication. The user can control the progress and sequence of multimedia content by using buttons or links. Non linear interactivity uses tools like "hypertext" to connect a word or phrase to another screen. An electric book with links to another screen is considered as having non-linear multimedia content. Hypermedia is also used in non-linear interactivity. Hypermedia uses different media elements such as audio and vide

III. MULTIMEDIA CHARACTERISTICS

Multimedia has different characteristics in which presentation and games & simulation play a predominant role in the characteristics of multimedia

Multimedia presentation

Multimedia presentation is similar to that of power point presentation; one can add pictures and other multimedia content like graphical images and videos in a multimedia presentation. The main difference between power point presentation and multimedia presentation is that in multimedia videos that are added can be of recorded type or it can be streamed live from a video recorder. Depending on the demand of the customer multimedia presentation can live or recorded. Multimedia presentation makes use of digital signals. The videos that are to be added on the multimedia presentation must be of digital electronic media technology

Multimedia games and simulation

Multimedia Games makes it easier for the user to experience the virtual world atmosphere to the content real world system. The special effects for the corresponding games can be added by the user to make the gaming environment more real. By using multimedia technique in gaming user can get connected to the internet and play with multiple users in online .As technologies grow day by day when each day passes off some additional corrections or effects are added to the technology used which enhance the quality and allow for the improvement of technology.

Stimulation in multimedia helps in higher level of interaction between user and the processing unit and also between users which can be enabled using the web technologies. Different forms of multimedia helps the user in such a way that the tasks accompanied are likely to be data driven or object oriented. The multimedia technologies are likely to be marked by an update or change which enable the multimedia application to be in collaboration with the stimulated programs...Multimedia allows changes during the working of a stimulated   program or of an application. Each application can be of multiple forms ,it can serve a single purpose or multiple purpose can be solved using a single application .The best example is a photo gallery with a text editor , each photo in the gallery can be given a caption or some other changes can be done depending on the needs of the user .Multimedia with stimulated technology can be well understood with the help of FLIGHT STIMULATOR which are used in pilot training operation. The trainee pilot experiences the real cabin atmosphere with the help of multimedia which enables the training pilot to cherish in the training .(images of flight stimulator).The experience level of multimedia technology keeps on updating which attracts more number of users. The technology can be viewed or heard and in addition to that using the technology, the virtual objects that appear on the screen can be made to be felt by the user. Even the presence of smoke, taste or odour of a particular thing can be made to exist with the help of stimulated technology.
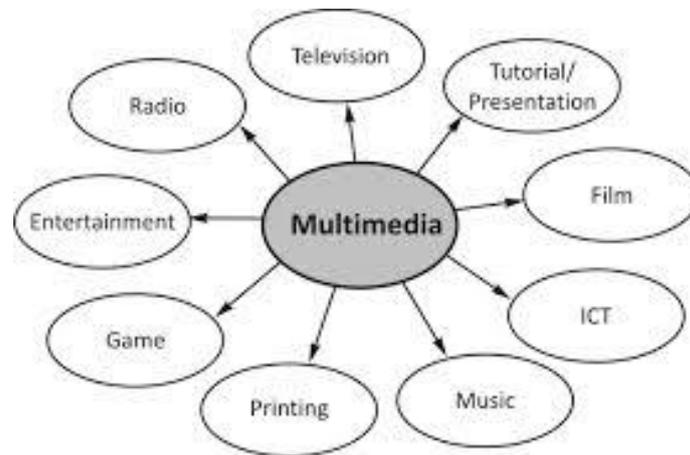
IV. APPLICATIONS OF MULTIMEDIA

Fig.3.Multimedia Applications

Multimedia has a wide range of applications it is not only used in the field of entertainment it also finds many applications in scientific research, mathematics, business and so on... there are no limitations specified for the application of multimedia in to-days modern world the application of multimedia is very wide here is a list of few examples are given below

Creative industry

Creative industries use multimedia for a wide range of purposes ranging from entertainment to software they are used for a wide range of purposes. They are mainly used in the field of fine arts where presenting the art plays an important role in which multimedia is used as another one primary field in which multimedia is used is journalism and for media purposes to convey the message in an attractive manner and in a understandable way An individual multimedia designer will cover the whole spectrum of multimedia through his career to excel in his technical, analytical and creative field.

Commercial uses

Most of the electronics goods used in our home or by the artists in theatre are multimedia (a form of multimedia) they may be a old or a new one yet they are a form of multimedia commercially multimedia is used mainly in business prospective to catch the attention of the customer to increase the profit simply commercially they are used to improve the gains in a firm. Formally presentations were done through slideshows but today slideshows have become the older format new multimedia techniques are adopted by different companies to catch the attention of customers and many firms use multimedia for interoffice and business to business communication. In many firms persons specialised in multimedia are recruited to improve the company's standard.

Environment and fine arts

In addition to commercial and creative industries multimedia is mainly used in entertainment. In entertainment games and editing portion in movies have a very important role for multimedia. In films editing and mostly all primary editing packages have multimedia as its primary content. The screenplay of movies are made efficient with the help of multimedia. 3-D animations are effective with the help of multimedia. In games multimedia is useful in creating an "interactive multimedia" in which the user can interact with the game in a lively manner without sitting as a passive recipient. "interactive multimedia" is the most successfully developed multimedia application. In fine arts multimedia is useful in creating art arenas and art gallery which attracts people to look into it. Traditional forms of many arts can be recreated with the help of multimedia. Even though the contents of multimedia are volatile the durability of the content is as far as any other material. Digital recording facility in multimedia can be used to produce perfect copies of every time.

Education

In education multimedia is mainly useful in providing the users with computer-based training commonly known as (CBT), through CBT multimedia has gained a huge amount of importance in education field. A CBT allows users to go through a number of presentations, texts about a particular domain and it provides various illustrations for each and every domain these examples are unique and they are in an easily attractable and understandable way. EDUTAINMENT which is a combination of education and entertainment is the main use of multimedia in the field of education. Learning theory in the last decade has been expanded because of the use of multimedia in the presenting information to students. By using multimedia theory contents are illustrated with real time examples .The idea of media convergence has also become very important in education particularly in higher education, more complex concepts are explained in an easily understandable way with multimedia. Media convergence is mainly done using him audio and video that share resources in a faster way .By using media convergence in multimedia students are thought with real time examples and the teaching is thoroughly application oriented which is very much useful in two days competitive world.

Journalism

Paper companies all over are also trying to squeeze the new trend by implementing its practices in their work. While some have been slow to come around, other major newspapers like "The New York Times", "USA Today" and "The Washington Post" are setting the precedent for the positioning of the newspaper trade in a globalized world. News coverage is not limited to conventional media outlets. Self-employed journalists can make use of like chalk and cheese new media to make multimedia pieces for their news stories. It engages global audiences and tells stories with expertise which develops new communiqué methods for both media producers and clients Common Language Project is an example of this type of multimedia journalism production Multimedia journalists who are transportable (usually driving around a community with cameras, audio and video recorders from mobile press officer.

Engineering

Software engineers use computer simulations in many possible ways for guiding such as military or industrial teaching. Multimedia for software interfaces are often done as collaboration between creative professionals and software engineers.

Industry

In the Industrial area multimedia is used as a technique to facilitate and to present data to shareholders, superiors and co workers. Besides, other applications also include into this but not limited to entertainment and business. Multimedia is also helpful for providing employee guidance advertising and trading products all over the world thorough virtually limitless web-based technology.

Mathematical and scientific research

In mathematical and scientific research, multimedia is mainly used for modelling and simulation. For example, a scientist can look at a molecular model of a particular substance and manipulate it to arrive at a new substance. Representative research can be found in journals such as the Journal of Multimedia.

Medicine

In Medicine, doctors can get skilled by looking at a virtual surgery or they can simulate how the human body is exaggerated by diseases which multiply by viruses and bacteria and then build up techniques to avoid it.

Document imaging

Document imaging is a method that takes hard copy of an image/document and transfers it into a digital format (for example, scanners).

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Disabilities

Ability Media allows those with disabilities to put on credentials in the multimedia field so they can follow careers that give them the way in to a wide group of dominant communication forms.

V. CONTENT BASED RETRIVRAL

Content-Based Retrieval (CBR) systems operating at semantic level would identify motion-features as the key besides other features like colour, objects etc., because motion (either of camera motion or shot editing) adds to the meaning of the content. The focus of present motion based systems had been mainly in identifying the principal object and performing retrieval based on cues derived from such motion. With the objective of deriving semantic level indices, it becomes important to deal with the learning tools. The learning phase followed by the classification phase is two common envisioned steps in CBR systems. Rather than the user mapping the features with semantic categories, the task could be shifted to the system to perform learning (or training) with samples and determine the patterns in an effective manner .Some of the content based   retrieval as discussed below

Structure in multimedia content

Most multimedia data are viewed as part of a casual activity, for example, people customarily watch news over breakfast, watch movies while talking on the phone, and listen to radio while driving .This requires only a share of the viewer's cognitive resources and therefore, the message is generally laid out in a way that minimizes the effort required to decode it. Furthermore, to achieve effective in content-production and due to the limited number of available resources, standard techniques are employed. While there are clear incentives for innovation, content production evolves by building on previously developed formulae that have sustained the testing of time and market. Thus, it can be naturally assumed that most of the video content exhibits a amount of structure in its ele-352 Information 30 (2006) 347–356 A The structures are present as a result of the s table nature of the world and the ways in which the viewers perceive and interact with the world. For a perceiver to develop the inferential leverage necessary to disambiguate among several conflicting configuration of the world, the world must behave regularly In other words, these structures embody the relationship of the observers with the world or in this case, the virtual world presented by the video. Movie picture viewing or communication is possible due to constancies of these relationships. These patterns of interaction also make it possible to represent the events or movie theme.

Matching techniques

In this section, why and how the video classes are generally structure are considered from two angles: from the producer's end and from the nature of the content itself. Some relevant works have been done founded around the observation that the media has structure. In the work done by Fan et al. the hierarchical structure of the semantics-sensitive video classifier is derived from the domain-dependent concept hierarchy of video contents in the database. Relevance analysis is used to shorten the semantic gap by selecting the discriminating visual features and suitable importance. The EM algorithm is used to determine the classification rule for each visual concept node. In this section, matching techniques used in the popular CBR systems are examined. By matching technique, we mean the method of finding similarity between the two sets of multimedia data, which can either be images or videos.

The parameters of such a technique, which we discuss and analyze herein, are

1. Level of abstraction of features

2. Distance measures

3. Normalization of features, if supported, or else the method of relatively weighing the features.

In Visual SEEK a query is specified by the colours, sizes and arbitrary spatial layouts of the colour regions, which include both absolute and relative spatial locations. A query specified by the user is translated directly into pruning operations on intrinsic parameters. For example, given the single region query: to find the region the best matches, the query is processed by computing the individual queries for colour, location, size and spatial extent. Each of the colour, size and location measures from different modules with each module utilizing a specific distance measure.
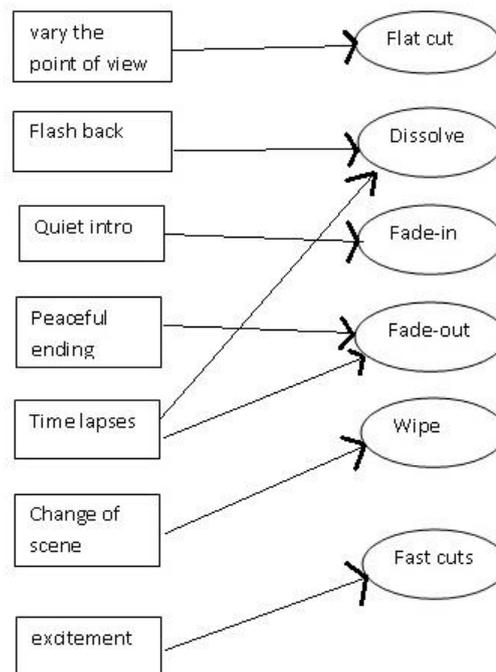

Fig.4.Naming convention

The intersection of the region match lists is then computed to obtain a set of common images. Finally, the single region distance is given by the weighted sum of the colour set location area and spatial extent distances The best match minimizes the total distance. In JACOB, queries are based on colour and texture measures. The user chooses a value between 0 and 1 to indicate the relative importance of a set of features over each other. Apart from this naive procedure no other technique for normalization is implemented. In QBIC (Query by Image Content) , the query is built on either colour, texture, or shape of image objects and regions. QBIC computes each of the features by separate distance measures. The distance measure used for each feature is the weighted Euclidean measure where the weights the importance of components of each feature. CHABOT facilitates image search based on features like location, colours and concepts, examples of which are 'mostly red', 'sunset', 'yellow'...etc. Equal weight age is assigned in this system to all the features in retrieving the image. A common strategy can be discerned in these different CBR systems: they employ only low level features with distance measures similar to Euclidean distance, with no method to automatically generate the weights of the features. None of the indexing schemes discussed so far is capable of dealing with multimodal distribution. Another problem which may arise is that the probability distribution may not be Gaussian, even though it may be a modal. The distance measures used by these systems inherently assume that with increasing distance from the mean vector, the probability decreases. Thus, some sort of Gaussian assumption is implicitly accepted. This is the case for the Bayesian Network employed in which may turn out to be ineffective. Identifying the meaningful set of features for a given domain is important yet unexplored. Many systems (like JACOB) either resort to having the user specify the relative weights to the features or like CHABOT they assign equal weight age to all the features in retrieving the image or video shot. By asking the user to specify the weight of various features, an injudicious assumption is made that the user is knowledgeable enough to ascertain these to a degree. To rely upon human experience is not a pragmatic approach when the aim is to build an integrated system with quite a few classes and many features. Different researchers (like

Doulamis et al. Pang et al., and Sheikholeslami et al. Have identified the importance of automatically identifying the relevance of the features. They have used different variations of neural network approaches in trying to achieve this task. A technique is required by which the relevant features for a class are automatically extracted and a higher relevance is assigned to them as compared to the other features. Moreover, the issue of dealing with diverse feature measures by normalization or otherwise has not been properly dealt with.

VI. CONCLUSION

Multimedia is the powerful weapon in today's world, with its uses and application in various fields as mentioned above. It is also involved in our day-today activity and the visual appearance of the ideas, contents and imagination in different views is the biggest advantage. The different category that it has makes us to use in almost all formats. Multimedia has been in use for various events held in schools, colleges and other private organization. The message / content is very well reached to the people through multimedia. It also extends it uses in the field of Medicine, journalism, fine arts, research purposes, engineering and also for industrial purposes. The use of multimedia has made a huge development in various fields. Gaming had move to an all new level with the help of multimedia, the user interaction is given as input to the game stimulator and different matching techniques are adapted to get the input signals which results in output, to which the user interacts. This technique is used in various fields which lead to further development. Content Based Retrieval (CBR) is mainly based on the motion or activity of the user, which can be retrieved with the help of its action (in terms of gaming) or by matching techniques. Thus, it has been a major source of information and a method to convey and analysis information in all fields. As a result, various colleges include MULTIMEDIA in their curriculum and students also take up multimedia as an undergraduate program in their studies.

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