Research on the Application of Multimedia Computer in News Technology

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Abstract

With the rapid development of modern information technology under the third revolution, multimedia computer technology is also widely used in many fields. For the development of modern news technology, multimedia technology is playing an irreplaceable role. Today, the Internet has become an important medium for people to consult with the outside world. Press consultation with much information and data such as graphics and images has become an important way for people to understand the outside world. On-the-basis-of analyzing the significant advantages of multimedia technology in the field of news technology, this paper discusses the more convenient method of compression and encoding of graphics and image in news technology based on the theory of wavelet transform. Through the wavelet transform, the news graphic data is decomposed and compressed by the sub-level, which is more convenient and efficient without changing the resolution of the original data.

Keywords: Multimedia Computer, News Technology, Wavelet Transform, Application.

1. RESEARCH BACKGROUND

1.1 Literature review

Under the background of continuous development of economy and the progress of society, digital information technology has matured in the context of the development of new technologies, and the continuous progress of these multimedia computer technologies has brought about a crucial breakthrough. News technology, no longer subject to the constraints of traditional media, is armed with more vivid and intuitive audio and video expressions. Many researchers also conducted continuous discussions on this topic. Liu and Luan facilitate the analysis and save storage space, deleted non-news periods in news video by detecting duplicate shots in the video stream. Compared with other similar methods, it has advantages of small amount of computation and no need for prior assumption, and the final experimental results are satisfactory (Liu and Luan, 2007). Wu and Wen believe that the news video story unit correlation analysis is a special clustering of news video segmentation story units carried out according to news stories covered. In this connection, the paper reviews the news video story unit related analysis techniques. According to the type of information, the method is divided into three categories: one is the text similarity method; the second is the multimodal information similarity method; the third is the key frame visual repetitive method; and according to the characteristics of each type, the relevant technology development trend is explored (Wu and Wen, 2010). Liu and Lao put forward a method of rapid detection and location of subtitles of news video titles in view of the characteristics of time-space distribution of news video subtitles. The final experimental results also show that the method proposed in this paper is simple and efficient, which can quickly find and locate subtitles in the news video (Liu and Lao, 2011). Wang Fengling, aiming at the status quo of online news release information management, designed a convenient and practical news release system by using PHP and MySQL dynamic website technology. Several key technologies in this technology have some commonality in the web application system, and the actual development and operation results also show that these technologies can significantly improve the efficiency and practicability of the development of the news distribution system (Wang, 2012). Meng and Chen summarized the research status of mobile news recommendation, and pointed out the difference between the traditional news recommendation and other mobile recommendations, and discussed and analyzed the challenges faced by mobile news recommendation system from two aspects of emphasis and difficulty. It is further pointed out that in order to further develop the mobile news recommendation system in the future, some research work needs to be carried out in terms of data collection, utility evaluation, integration of mobile social networks, security issues and formalized descriptions (Meng and Chen, 2016).
1.2 Research purpose

With the continuous development of modern data and information technology, the development of compression and coding of data information appearing in the middle of the last century has entered a new blue ocean. With the development of the times, the demand for various real-time communication services continues to grow. The contradiction between the capacity of news technology image communications and the communications network has become increasingly prominent. In particular, the graphic and image communications involving massive data and information are more difficult for long distance transmission and long term preservation, greatly restricting the development of news technology (Wang and Huang, 2012). As a result, compression and programming of graphics and images become the primary issue for the development of news technology to solve. The development of realistic communication technologies urgently needs a fast and efficient method for compressing and encoding graphic images to reduce the number of programs for characterizing images while maintaining the quality of original information data (Chen and Lu, 2011). Generally, the amount of image data contained in the news media is quite large. Therefore, the compression coding technology of data has become the key research object in multimedia technology. For example, a medium-resolution image with a size of about 1.1 Mb and a download speed of 8k / s would take about 130 seconds to be fully downloaded, consuming a lot of time (Zou and Feng, 2014). In general, the amount of data contained in the news media is far more than that, therefore, the development of an efficient and rapid graphic image compression algorithm using modern multimedia computer technology is of great significance to the development and application of news technologies.

2. SIGNIFICANT ADVANTAGES OF TECHNICAL MEANING OF NEWS AND MULTIMEDIA COMPUTER

News technology refers to a technology that integrates operations that collects, integrates, transmits and disseminates news materials through different ways, methods and modes in the process of carrying out news operations. News technology contains more accurate content, and has the characteristics of higher security, feasibility and reliability. On this basis, it is a typical representative of a new technology, as a comprehensive analysis is realized with comprehensive and accurate treatment of research news and information through the integration of instant messaging and information technology (Gao and Yang, 2016). Therefore, the key point of news technology lies in the efficiency and accurate completion of the collection and induction of the relevant news to be verified by virtue of the utility of computer information technology, so as to realize the multi-departmental hierarchical auditing. Through the effective communication and storage retrieval of these departments, the purpose of publishing and dissemination is finally achieved. Unification of process-oriented news work is realized as well as the highly respected paperless edition by media in the world (Shi and Zhao, 2017). In today's information age, what needs to be demonstrated in the news is even more vivid and intuitive. Compared with the traditional news, the news content has more prominent features as timeliness and selectivity and the big breakthrough in the editorial mode has also enhanced the efficiency and intensity of the dissemination of news and information, making the information transmission channels more diversified.

The continuous development of information technology has enabled multimedia computers to be applied in more fields of news continuously. The traditional paper version of the manuscripts and follow-up changes has achieved paperless operation, obtaining obvious advantages which greatly change the mode of operation. First, the quality of news layout system has been greatly improved. As far as computer multimedia technology is concerned, the compression and editing of news fractal graphic images have become extremely simple and convenient, and the colors are more vivid, solid and full. Second, the timeliness of news and information has been greatly prolonged. With the multimedia computer technology, all kinds of news broadcasts have achieved real-time dissemination, and the recipient can receive news in any case. Third, the repetitive feature of operations in integration of information. Multimedia news technology can achieve the unified management of information storage, and thus achieve the user's repetitive reading. Fourth, effective customer choice. The continuous development of information technology today is filled with a-large-number of various types of information resources every day. The emergence of multimedia computer technology, in turn, helps users to sort and filter information resources and is highly targeted.

3. NEWS FRACTAL IMAGE TRANSFORM COMPRESSION CODING THEORY AND METHOD BASED ON WAVELET TRANSFORM

As a technique of transform coding and fractal image compression, wavelet transform is the focus of research in the field of compression and transformation of data. It does not produce data compression, but it has laid a solid
foundation for image compression. The fractal geometry theory mainly uses the self-similarity of the graphics, and makes graphics iterate through the iterative function system (IFS) so as to approach the complex graphics to be encoded. As a time-domain processing technology, wavelet transform is widely used in various real-time transform signal processing. In simple terms, since the wavelet has the feature of automatically widening the field of view when the analysis frequency is reduced, the transform is a function cluster formed by scaling or translation of a function $\psi$ which satisfies the condition of $\int_{-\infty}^{+\infty} \psi(x)dx = 0$, and that is,

$$
\psi_{a,b}(x) = |a|^{-\frac{1}{2}} \psi \left( \frac{x-b}{a} \right), a,b \in R, a \neq 0
$$

The existence of multi-resolution wavelet transform gives users high degree of freedom while dealing with of the news information resources, therefore a clear reproduction can be provided to users with information preferences after abandoning useless information through selecting the appropriate wavelet base to achieve the initial compression of information resources. Thus, two-dimensional wavelet transform can be carried out on the original news image $f_0(x,y)$, after $N$ layers of decomposition, we can get:

$$
f_0(x,y) = f_0^N(x,y) + \sum_{i=1}^{2^n} f_i^1(x,y) + \sum_{i=1}^{2^n} f_i^2(x,y) + \sum_{i=1}^{2^n} f_i^3(x,y)
$$

The next graphics compression and coding can be carried out on the sub-layers after two-dimensional wavelet decomposition, and then step by step retrieval can be conducted in accordance with the various layers of sub-information resources sorting. When the media library conducts queries, the coding module of each sub-graph automatically generates the primary macro block that matches the query data of the user, and then performs the multi-level fuzzy grading search on the news media library through the coding of different frequency. However, it shall be understood that with many advantages of the traditional wavelet transform, there are also some limitations. For example, the wavelet structure that depends on the Fourier transform can only be applied to the sampling of regular data. To broaden the data sampling, analysis, transportation and other channels, a lifting algorithm that does not depend on the Fourier transform which is the biorthogonal wavelet constructions is proposed. The emergence of the algorithm broadens the algorithm that is changing in the current position, improves the performance of the original data by using the simple resolution, and gradually approaches the multi-resolution analysis with a certain characteristic. Figure 1 is a diagram of the integer wavelet transform to lift the algorithm.

![Image of integer wavelet transform diagram based on lifting algorithm](image)

**Figure 1. Integer Wavelet Transform Diagram Based on Lifting Algorithm**

Under this lifting algorithm, the transform of integer wavelet includes three phases: splitting, forecasting and updating.

In the splitting stage, the original data is transformed into a discrete detail signal $d_{j+1}$ by wavelet transform, then the detail signal is also called wavelet base. The simplest form of split means that $s_j$ can be divided into two sequences, odd and even, and that is

$$
split(s_j)= (even_{j+1}, odd_{j+1}) = (d_{j+1}, s_{j+1})
$$

In the forecasting phase, it is the even sequence with the interpolation of odd number sequence, namely:

$$
d_{j+1} = P(s_{j+1})
$$
Among them, $P$ is the relevant structural model that reflects the information data as a predicted value. It is important to understand that there is always a certain error in the predicted value, and the error directly reflects the degree of approximation of $P$. Such cycles after $n$ splits and predictions lead to:

$$s_j = [s_{j+1}, d_{j+1}, d_{j+1,1}, ..., d_{j+1,n}]$$

$$s_{j+1} = \text{even}_j + U(d_{j+1}) = s_{j+1} + U(d_{j+1})$$

Among them, for Haar’s wavelet transform, $U$ will firstly divide the nearest odd value, and the average value of updated even number sequence will be the same as the average value of the original data, which is

$$\tilde{s}_j = 2^{-j} \sum_{k=0}^{2^j-1} s_{j,k}$$

$$s_{j+1,k} = s_{j,2k} + \frac{d_{j+1,k}}{2}$$

$$d_{j+1,k} = s_{j,2k+1} - s_{j,2k}$$

At this point, sub-level $s_{j+1}$ and $d_{j+1}$ will replace the original number set $s_j$. By adding the correction and combining the interaction among operators, the integer wavelet transform can be constructed under lifting algorithm after the rounding operation. Under normal circumstances, there will be a certain degree of distortion of the wavelet transform graphics coding compression, there are also evaluation criteria for such distortions. There are two commonly used evaluation methods: objective evaluation and subjective evaluation. The objective judgment compares the compressed graph with the original graph data through quantitative calculation, and the subjective judgment is made on subjective feelings of people.

4. CONCLUSION

All in all, multimedia technology plays a very important role in terms of news technology, and its status cannot be ignored. Information and multimedia technologies are widely used in the production of news television programs and movies etc., and also have a profound impact on journalists and the like. As a technology of transform coding and fractal image compression, wavelet transform can create a special media library for different users or practitioners according to the characteristics and classification of news information resources. The adoption of wavelet technology also makes news technology possess the following features: The sub-layer system of wavelet transform realizes the decomposition match search of relevant user news graphic image information; relevant users with greater access and freedom can filter out the news they desire; Fractal coding efficiency of wavelet transform further reduces the number of iterations of the news graphics image resources, shortens the coding time and frequency and at the same time makes up for the shortcomings of asymmetric coding. Therefore, in the constant creation of news technology, we must pay more attention to the input and use of all kinds of modern technologies under the multimedia information so as to promote the continuous development of journalism.

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