Intellectualized Collection and Analysis of Multimedia Computer Teaching Based on the Fusion of Audio-visual Information

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Abstract:In the post-epidemic era, online classrooms and multimedia computers are increasingly connected. In order to efficiently conduct online teaching and answer questions after class, this paper intelligently collects and analyzes current multimedia computer teaching materials based on the latest audio-visual information fusion algorithm. First, the spatial frequency SF of the online classroom is selected as the input excitation of audio-visual information, and the direction information at the pixel is fixed as the link strength slice relationship of PCNN. Compared with traditional computer teaching, this method has many advantages. Multimedia electronic classrooms are very suitable for computer teaching, and the use of multimedia electronic classrooms can diversify the forms of computer teaching. Then, the source image is decomposed in a two-dimensional experience mode, and the obtained residual images are fused to complete the intelligent collection and analysis of the characteristics of teaching information; the function design is carried out under the framework of learning activities, and the functional upgrade of technical products requires the teaching and learning.

Keywords: Information Flow Collection, Smart Multimedia, Computer Classroom, Visual and Audio Information

1. INTRODUCTION

Compared with the traditional classroom, the multimedia electronic classroom integrates various information dissemination methods such as sound, image, and text. have an important role [1]. However, not all media technology products (hereinafter referred to as technology products) can play an indispensable and important role in teaching, and some functional configurations are redundant. The premise of rational selection of technical products is to objectively and accurately know the true teaching function of technical products [2].

In the era of informationization and digitalization, multimedia classrooms have become an indispensable teaching tool. Generally speaking, a variety of modern electronic equipment constitutes an ordinary multimedia classroom [3]. Compared with the traditional teaching method, the multimedia teaching process needs to rely on more teaching equipment, which are of various types, including audio and video equipment, graphic processing equipment, W Therefore, in order to promote the normal use of multimedia teaching in modern teaching, it is necessary to have reliable multimedia equipment management to provide the most basic guarantee [4].

Image fusion is a branch of data fusion, which is an emerging technology that integrates multiple technologies such as sensor technology, image processing, and artificial intelligence [5]. At the same time, it is a process of processing different image data and other information corresponding to the same target obtained by a multi-source sensor (such as CCB camera, infrared detector, laser detector, radar, sound, etc.). Due to the level limitation, in complex environments, the images obtained by imaging devices usually have some unavoidable defects [6]. Image preprocessing technology is to try to overcome the influence of optical systems, detectors, photoelectric conversion devices and signal processing circuits on the image, and to provide the most complete source image for the subsequent image fusion technology [7].

It mainly includes image denoising. By fusing multi-modal medical images, processing and analyzing multiple medical images, a brand-new, high-quality medical image is presented, helping medical staff to accurately understand patients. In 2002, Obraczka et al. first defined the concept of visual Internet of Things [8]. Since then, research in this field has continued to rise and deepen. The attention to this topic is also increasing. One year after the concept was proposed, the technology of the visual Internet of Things was applied to the practical field [9].

The traditional computer teaching method is too simple. The most commonly used method is that during the class, the teacher uses the computer to demonstrate, and the students observe the teacher's operation in detail [10]. After the teacher demonstrates, assign a similar task to the students. In the past, the effective media technology Sexual research often adopts the method of comparative experiment and uses teaching effect as evidence to prove the effectiveness of teaching application of media technology [11]. However, this kind of comparative research has loopholes such as mispositioning of research questions, unclear definition of comparative items, invalid evidence of validity, flaws in experimental design, and taking accurate conclusions as final conclusions [12].

Advanced multimedia equipment is installed in the multimedia classroom; it can meet the functions of multimedia teaching, and can also be used with a blackboard or ordinary whiteboard; the main layout is still the traditional lecture layout; the teaching mode still uses the traditional indoctrination model [13]. The system can provide a good resource sharing management platform for the Weifang cultural information resource sharing platform. The author uses the client/server technology and JAVA language to implement the specific coding of the Weifang cultural information resource sharing platform system [14].

Through the work of Zhao Jianxiong et al., due to the new development of wavelet transform, many scholars have been attracted to apply it to the research of image, and the defects

of wavelet have been continuously improved [15]. The mature application of wavelet algorithm in fusion was Ranchin.T. In the remote sensing image fusion experiment with Wald.L, a fusion algorithm based on DWT is proposed, which makes the result image greatly improved in the visual effect of fusion in the spatial domain [16].

2. RELATED WORK

Zhong Liang proposed terminal operation and maintenance in the design of terminal operation and maintenance management system based on open source framework, and implemented the system by using the current mature open source framework. Implementing the system through open source framework can reduce the system cost [17].

Wang Yanqiao conducted research on computer equipment management in the design and implementation of computer equipment management system based on J2EE, and realized computer equipment management system through J2EE platform, and the system has been running in actual environment [18].

3. THE PROPOSED METHODOLOGY

3.1 The Fusion Of Visual And Audio Information

The teaching system is a system of information flow among the three information processing subjects: teachers, students and media with information processing capabilities (hereinafter collectively referred to as technical products). The language analysis area will mark the syntactic structure and chunks of the sentence, which saves the user time for group division and syntactic analysis, but only needs to follow the identification result to understand the sentence. When the mouse hovers over the block area, the translation result of the block will be displayed in the left area for user reference. Therefore, the specific performance of the information processing subject in the teaching system can be judged by the teaching information it contributes, and the specific teaching characteristics need to be analyzed with the help of the teaching analysis method based on information flow.

The Laplacian Pyramid Transform is a clever decomposition method for multi-resolution images. It is used in the process of image frequency domain decomposition. It can decompose low-frequency components well, but it has no directionality. The decomposition of each layer of LP is layer-by-layer decomposition in the low-pass part, and the decomposition of the iV layer originates from the Gaussian pyramid transformation, and the spectral characteristics of night sky low light are more complex. The figure shows the spectral distribution of the night sky. The radiance of clear starlight is only one percent of the brightness of moonlight. The spectral curve of starlight rises rapidly in between. The brightness of the moonlight varies regularly with geographic location, season and moon phase. The weighted average uses the redundant information provided by the two source images to improve the signal-to-noise ratio of the fused image and enhance the reliability of the fusion result. Blur the important content (such as edges, contours, etc.) in the source image, and there will also be obvious splicing phenomenon, and the subjective visual effect is generally not ideal, so it is not suitable to use when the fusion image requires high quality.

This provides an objective handle for the judgment and measurement of the teaching effect of technical products. Specifically, we preliminarily formulated four indicators of knowledge activation, activation contribution, media diversity contribution and function utilization to characterize the

teaching characteristics of technical products. The directional filter bank is directional because of its directionality. The direction details of the image can be well captured by it, so it has a good decomposition ability on the high-frequency components of the image. The first layer of the frequency domain is decomposed into 2 fork number decomposition, and the sub-band after LP decomposition of each layer is decomposed into 2' modes in the frequency domain. As shown in 3.3, the third-level frequency domain decomposition direction has 8. Toea et al. first applied the contrast pyramid algorithm to image fusion. The contrast pyramid image fusion algorithm is similar to the Laplacian pyramid fusion. It is mainly that the human visual system is more sensitive to the local gray level of the image, and the image fusion algorithm is higher in the source image. The image information of the local contrast is preserved and fused into the fused image.

3.2 The Smart Multimedia Computer Classroom

In computer teaching, it is also a very common teaching method to let students operate first, and then teachers practice exercises, and has achieved good teaching results, so it should be properly promoted. Before the teaching starts, it is much simpler than the smart classroom. It is generally composed of a variety of common multimedia equipment such as computers, projectors, projection screens, central control systems, and audio equipment. The classroom computers and central control systems are connected to the campus network. The multimedia intelligent management system can realize semi-intelligent management.

Therefore, in order to detect a signal of a certain waveform, it is necessary to select a very similar waveform before making judgment and analysis. With the help of multimedia electronic teachers, many teachers often use courseware to complete corresponding teaching in computer teaching, which will lead teachers to be too formalistic in the teaching process, thus ignoring the misunderstandings in the teaching content, and many teaching courseware The production does not highlight the key content involved in teaching. Smarter classroom is a whole new set of intelligent and modern teaching systems, mainly relying on emerging network information technologies such as cloud computing and the Internet of Things, and specifically using wireless projection technology. The business process is specifically divided into configuration change application, configuration change approval, and configuration change acceptance. The optimized business flow must be strictly applied for configuration changes before it can be changed.

3.3 The Collection and Analysis of Information Flow in Computer Classroom

The best way to verify students' learning outcomes is to often see the completion of tasks assigned by students to teachers, but through a period of practice, it is found that many tasks set by teachers in the teaching process have a certain deviation from the actual knowledge points. . The sample is selected from a real collaborative learning activity in the form of micro-teaching. This collaborative learning is based on the comprehensive application activities on the morning and evening lines carried out in "Section 3 Earth Movement" in High School Geography Compulsory I by People's Education Press.

NSP transform is similar to LP transform, in image processing, the decomposition of frequency domain h can be decomposed for M times. The two-channel non-subsampling

filter bank (NSFB) can be decomposed twice in succession to realize the effect of NSP on image decomposition. The amplitude and scale of the grayscale information in the image are random and irregular in the spatial domain. Therefore, it can be regarded as a non-stationary, nonlinear and multi-scale two-dimensional signal. For signals, the most critical aspects of time-frequency analysis methods are locality and adaptability. For the human visual system, black and white images are often sensitive to the local contrast of the image grayscale. The contrast of the local gray level of the image not only reflects the sharpness of the image, but also is related to the characteristics of the target, which can indicate the richness of the salient features contained in the target. The image fusion method based on the maximum absolute value of contrast combines the above characteristics.

To sum up, the functions of smart classrooms are very powerful and can realize fully automated and intelligent management, but ordinary multimedia classrooms are still relatively popular and practical. It is about ten times higher than the construction of ordinary multimedia classrooms. At the same time, the later operation and maintenance of smart classrooms is also much more complicated than that of ordinary multimedia classrooms.

4. CONCLUSIONS

In this paper, the images that have achieved accurate registration of various modalitiesare fused according to their principles and characteristics, and through a certain fusion algorithm. Redundancy, outline, texture details and other aspects are relatively clear. The functions of ordinary multimedia classrooms are basically sufficient, while many functions of smart classrooms cannot be used effectively for the time being, which is prone to waste of resources. Furthermore, most teachers and students are accustomed to the original multimedia teaching methods, and large-capacity multimedia classrooms can be used for large-scale teaching. This paper first proposes an image fusion algorithm based on improved Laplace pyramid transform. Pyramid transform decomposes the image at multiple scales, and the fusion process is performed at different decomposition layers, which is more similar to the visual system characteristics of the human eye, so a better fusion effect can be obtained.

5. REFERENCES

[1] Wu Yongzhen. Research on intelligent management technology of tunnel construction based on information integration [J]. Construction Mechanization, 2022, 43(3):3.

[2] Zhu Jialin, Zhang Min, Li Kai, et al. Research on key technologies of QoS differentiated services based on 4/5G converged network [J]. Application of Electronic Technology, 2022, 48(6):5.

[3] Sheng Yukun. Research on knowledge reasoning based on fusion information [D]. Wuhan Academy of Posts and Telecommunications, 2020.

[4] Zeng Benyou, Zeng Maolin. Research on the Cross-Fusion Mechanism of Integrated Innovative Smart Teaching Software——Based on the Perspective of the Integration of Knowledge Sociology and Embodied Cognition [J]. China Education Informatization, 2022(2):8.

[5] Li Lijun, Zhao Qiao. Research on Idiom Translation Strategies from the Perspective of Frame Theory: Taking Idiom Translation in the Report of the 19th National Congress of the Communist Party of China as an example [J]. Forest Area Teaching, 2019(3):4.

[6] Jiang Linping, Liu Wei. A Study on Literary Themes in English-Chinese Translation of Ancient Chinese Poems [J]. 2021.

[7] Chu Xingjun. The Enlightenment of Semantic Field Theory on the Translation of Scientific and Technological Terms: From the English-Chinese Translation of "Water Resources Management" [J]. Journal of Southwest Petroleum University: Social Science Edition, 2019, 21(4) :5.

[8] Wang Jiehua, Liu Guangyuan. Feasibility study of English blended precision teaching based on data fusion [J]. Science and Education Wenhui, 2020(36):2.

[9] Wang Teng. A study on the translation of Chinese and Western fast food names—taking KFC and Panda restaurants as examples [J]. Information Weekly, 2019(28):1.

[10] Gong Yifan. Research on the "Trinity" Practical Curriculum System of Translation and Simultaneous Interpretation Based on Interdisciplinary Integration [J]. Journal of Hubei Second Normal University, 2021.

[11] Cui Xinyue, Fan Lijun. Research on the differences of English and Chinese idioms and translation practice based on cross-cultural communication [J]. Modern English, 2021.

[12] Liang Di, Zhao Yinuo, Xue Jian. Research on intelligent detection of worker fatigue based on dual-kinect data fusion technology [J]. Value Engineering, 2021, 40(33):4.

[13] Jiang Linping, Liu Wei. A Study of Literary Themes in English-Chinese Translation of Ancient Chinese Poems [J]. Modern English, 2021(17):3.

[14] Feng Cong. Research on English film translation based on the comparison of Chinese and English film corpora. East China Normal University, 2020.

[15] Qi Yanli. Analysis of cultural cognitive differences in English-Chinese metaphor translation from a cross-cultural perspective based on "Modern English-Chinese Metaphor Exploration and Cross-Cultural Translation Strategies" [J]. Journalism and Writing, 2021.

[16] Yu Li. Research on the Reconstruction of Evaluation Meaning in Novel Translation [J]. 2021(2019-1):57-62.

[17] Ge Xiaohua. Translation and Language Development: A Theoretical Perspective of "Lexical Triggering" and Its Analysis [J]. 2021(2014-4):15-20.

[18] Ma Xiujie. A Review of "Research on Constraints of Omission in English and Chinese from a Cross-Lingual Perspective" [J]. Foreign Languages and Translation, 2020, 27(3):3.