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Performance Art Video Action Management Oriented to 6G Wireless Transmission Technology

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Abstract

With the development of 5G communication networks, the development prospects, capability requirements and key technologies of the next-generation communication system 6G have become new hotspots. This article expands the coverage of the communication system through 6G, realizes the wireless transmission technology, builds the ideal of an intelligent mobile society everywhere, and analyzes the development trend of 6G technology, the challenges it faces, and the possible wireless transmission technology. Wireless transmission technology is widely used in various fields of production and life. Its various technical requirements and terminal energy limitations restrict the application and development of communications. This article focuses on the high-efficiency optimization scheme that combines 6G wireless transmission technology to improve the utilization efficiency of network resources. In addition, this thesis also discusses video action management in public performance art. Based on public performance art, the research on video action recognition can be summarized into three levels from simple to complex according to the content of the action, namely mobile vision, action vision and action vision. Video action vision is currently being studied. In the recognition process, most of the action frame information in the video is repetitive or has a low correlation with action recognition, which not only increases the complexity of calculation, but also affects the accuracy of action recognition. In the process of feature selection and understanding, the main methods include characterization fusion and research based on gesture features. Based on the introduction of 6G wireless transmission technology, this article introduces the technological development of 6G network, which promotes the rapid development of public performance art video action management.

Keywords: 6G, wireless transmission technology, performance art, video action

1. Introduction

The 5G communication system has been commercialized, and its development has been deeply integrated with the real economy to form a good 5G industrial ecology. In this context, international organizations and governments plan to carry out research on 6G communication systems (Chakraborty, A. & Banerjee, A., 2019). Currently, 6G does not have a unified definition, but there are several preliminary consensuses on application scenarios, technical trends, and key indicators (Egho, C., Vladimirova, T. & Sweeting, M.N., 2012). Sorted out the overall vision of 6G, 8 business application scenarios and corresponding indicator requirements, and put forward some important technical indicators of 6G (Blanes, I. & Serra-Sagristà, J., 2010). Wireless transmission technology is the main technical way to achieve the main indicators of 6G (Bravo, I., Mazo, M., Lázaro, J.L., Jiménez, P., Gardel, A. & Marrón, M., 2008). The problems of the wireless transmission technology used in the existing 5G are still significant, and the wireless transmission technology needs to be further improved (Hao, P. & Shi, Q., 2001). This paper studies energy efficiency optimization under wireless transmission technology scenarios, focusing on MTC energy consumption and wireless transmission technology, analyzes related typical processing methods, and proposes improved and innovative solutions based on future work (Mei, S., Khan, M.B., Zhang, Y. & Du, Q., 2018). In order to further solve the efficiency problem of MTC, this article will introduce the data integration strategy based on wireless transmission technology (Delaunay, X., Chabert, M., Charvillat, V., Morin, G. & Ruiloba, R., 2008). In addition, for energy consumption models with different delay requirements, this paper proposes a power selection scheme based on the maximum efficiency target, and conducts efficiency optimization research in this scheme (Delaunay, X., Chabert, M., Charvillat, V. & Morin, G., 2010). This article applies wireless transmission technology to video operation management in public performance art. The development process of video action recognition can be summarized as mobile vision, action vision and behavior vision (Chander, S., Vijaya, P. & Dhyani, P., 2016). So far, video actions are still in the stage of action vision research, that is, by extracting some features from training data, using supervised or unsupervised training to create classification models, extracting features from new data, and sending them to the model to obtain classification results (Shi, Cuiping & Wang, Liguo, 2017). From the perspective of video action recognition input under public performance art, video action recognition under the framework of public performance art has developed from action recognition in images to human action recognition in the video process (Shihab, H.S., Shafie, S., Ramli, A.R. & Ahmad, F., 2017). Recognition is the process of learning and understanding human behavior by processing and analyzing the original images or sequences collected by sensors. Generally speaking, the detection technology based on feature extraction is a technology with better comprehensive performance (Li, J., Fei X. & Zheng, Y., 2014). Obtain the human motion model, establish the projection relationship between the video content and the motion type description, and realize the computer understanding of the video (Shih, H.C., 2018). On the whole, video action recognition has evolved from simple hand or foot action interaction to the analysis and acquisition of human body movements (Wang, L., Wang, Z., Qiao, Y. & Van Gool, L., 2017). Among the subtle differences, the recognition rate of subtle movements such as facial expression recognition and gesture recognition will become higher and higher (Renò, V., Mosca, N., Nitti, M., D'Orazio, T., Guaragnella, C., Campagnoli, D., Prati, A. & Stella, E., 2017). Through the development of 6G communication system and wireless transmission technology, the analysis of video behavior in public performance art will lay the foundation for the development of public performance art in the future (Nguyen, D.T. & Jung, J.E., 2017).

2. Related Work

The literature proposes that with the continuous emergence of new multimedia services and the current research status in China, new challenges are presented to the design of future 6G mobile networks (Ravi, A., Venugopal, H., Paul, S. & Tizhoosh, H.R., 2018). Aiming at the business optimization problem in wireless transmission technology, an efficient and low-cost optimization algorithm is proposed and solved through a design algorithm (Ellappan, V. & Rajasekaran, R., 2017). The simulation results show that the cooperative multi-mode transmission strategy is feasible (Shukla P., Sadana, H., Bansal, A., Verma, D., Elmadjian, C., Raman, B. & Turk, M., 2018). The literature proposes the relationship between video service management and wireless transmission technology, and introduces the advantages of video service management and wireless transmission technology in terms of network delay, efficiency, and power consumption (Javed A., 2016). The literature puts forward the application of broadband wireless transmission technology in low and high frequency, and discusses the research direction of broadband wireless transmission technology in the future (Kolekar, M.H. & Sengupta, S., 2015). The literature introduces a recognition method that uses a computer to process and analyze the original image or sequence image data collected by the sensor so that the computer can understand the video (Baijal, A., Cho, J., Lee, W. & Ko, B.-S., 2015). The literature proposes that the form and content of the action are complementary to each other, and video movement management provides a more comprehensive strategy and method for the overall performance art arrangement innovation, and provides a theoretical reference for further research (Zhang J, Yao, J. & Wan, X., 2016; Bhalla, A., Ahuja, A., Pant, P. & Mittal, A., 2019).

3. Research on Wireless Transmission Technology for 6G Multimedia Services

3.1. The Overall Frame Structure of the Wireless Transmission Network

3.1.1 6G Wireless Backhaul Network Distributed Architecture

The macro base station is located in the center of the macro cell with a radius of R, and controls the infinite backhaul of the small cell base station within the coverage of the macro cell. Due to the strong directionality of millimeter waves, the interference of adjacent nodes can be ignored. In order to realize the transmission of wireless backhaul services in 5G ultra-dense cellular networks, a distributed wireless backhaul network architecture is usually used, as shown in Figure 1:

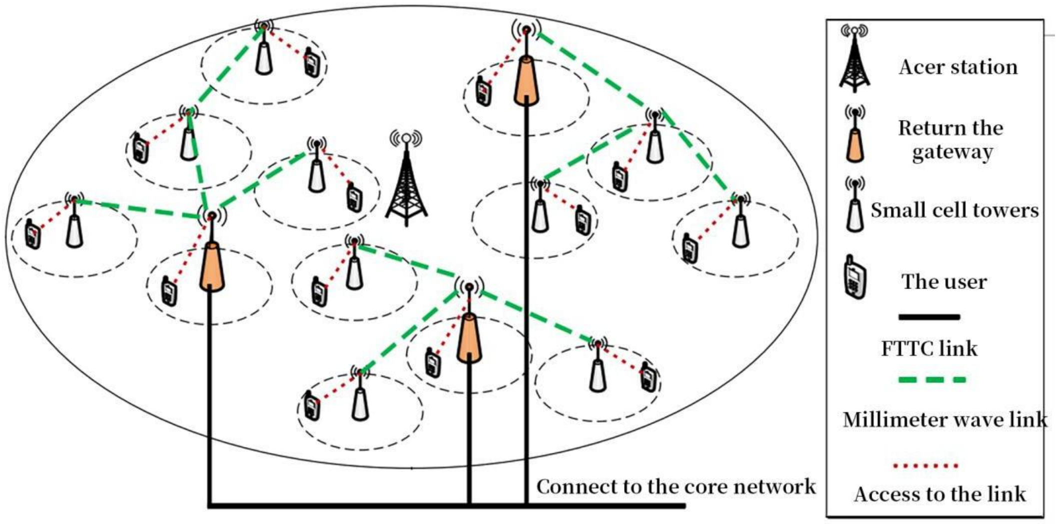

Figure 1. Distributed architecture of 5G ultra-dense cellular network

Since millimeter wave has large path loss and obvious dispersion effect, it is assumed that the hop distance of wireless transmission does not exceed D0, that is, each small cell base station can only connect to the small cell base station with the base station as the center of the circle and D0 as the radius. Because the future 5G cellular network will be dense, even ultra-compact, by correctly locating the backhaul gateway, we can assume that the normal base station of N small cells can send data to the corresponding backhaul gateway node.

3.1.2 Software-Defined Network Architecture

At present, the definition of software grid technology has already had a certain basic research. The SDN network architecture combining "backbone + access network" and satellite-borne optoelectronic hybrid switching is shown in Figure 2:

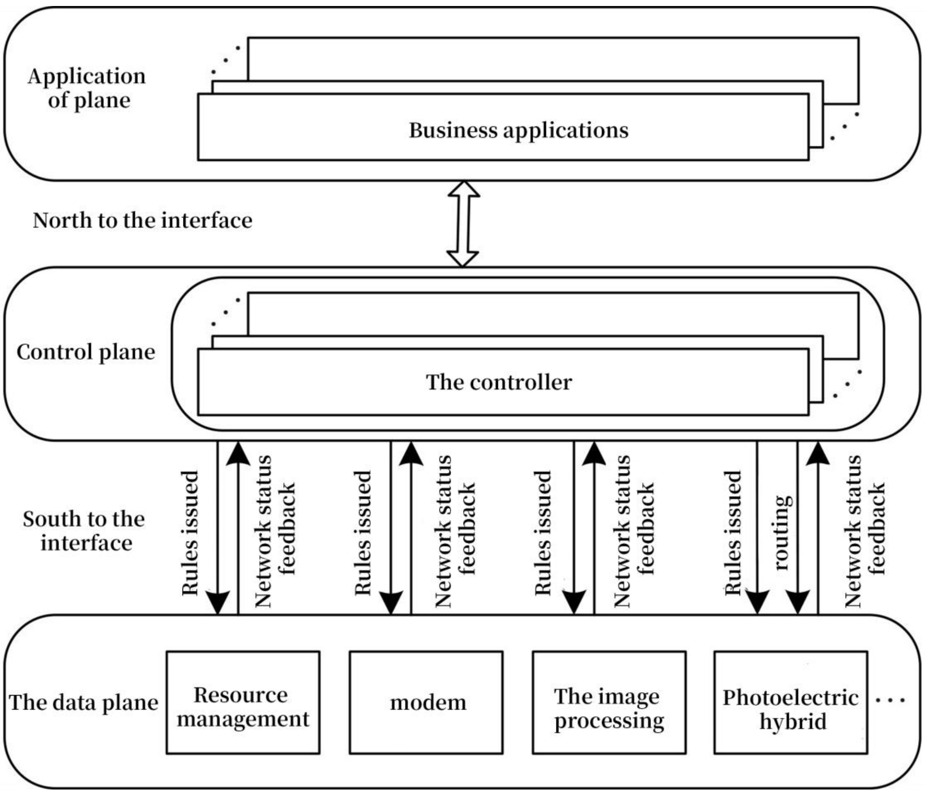

Figure 2. Architecture of 6G Software Defined Network

Through the control plane sending rules, the various modules of the plane data network can be programmed by collecting topology information and status feedback of the plane data network nodes. The controller serves as the data plane management module, including the use of photoelectric hybrid switches to adapt to changes in the network scene. Here, the data plane management module is mainly responsible for the configuration of the satellite orbit height.

3.2. Heuristic Energy Efficiency Optimization Algorithm for Different Time Delay Scenarios

3.2.1 Energy Consumption Model

Since the power consumption of the MTC terminal is mainly in data transmission, this article considers the power consumption of the MTC terminal in data transmission. Therefore, when the terminal transmits bit data and transmit power, the following power consumption formula is used to evaluate the power consumption:

$$E_T(l, p) = p \times \frac{l}{B \times \log_2(1+SNR)} \tag{1}$$

Among them, l represents the data packet size, p represents the terminal transmission power, B represents the wireless resource transmission bandwidth, and SNR represents the signal-to-noise ratio at the receiver. The specific calculation formula is as follows:

$$SNR = \frac{p \times h_d^2}{N_0 B} \tag{2}$$

$$p \leq p_{max} \tag{3}$$

$$SNR \geq r_0 \tag{4}$$

N_0 represents the noise power spectral density, r_0 represents the received signal-to-noise ratio threshold, and h_d^2 represents the limit range of the communication distance of the MTC remote communication terminal. Under the constraints of the maximum transmission power p_{max} and the signal-to-noise ratio r_0, the expression for the communication range d_{max} of the MTC terminal is obtained:

$$d_{max} = \left(\frac{10^{-3.06} p_{max}}{r_0 N_0 B}\right)^{\frac{1}{7.52}} \tag{5}$$

In the current network environment, the MTC terminal is fixed and has no mobility. In this case, only other MTC terminals within the communication range d_{max} can directly communicate with it. The expression is as follows:

$$DCDS_i = \{MD_r \mid r = 1,2,\dots,n_i, \text{且} \quad d_{ij} \leq d_{max}\} \tag{6}$$

$$D_i = \{dcd_{ir} \mid r = 1,2,\dots,n_i\} \tag{7}$$

Among them, $DCDS_i$ is MDi is the corresponding set of direct communication terminals, representing the Euclidean distance from MD_j to MD_i, n_i is the total number of MTC terminals contained in $DCDS_i$, and dcd_{ir} is the communication distance between MD_i and the r-th MTC in $DCDS_i$.

Therefore, under the current scenario energy consumption model, this article refers to the set of all possible transmission powers as the transmission power selection set, and its set expression is as follows:

$$TPS_i = \{p_{ir} \mid r = 1,2,\dots,n_i\} \tag{8}$$

Among them, p_{ir} is MD_i, which is the transmission power corresponding to the data sent to the rth terminal of its direct communication terminals set under the current energy consumption model based on the maximum energy efficiency target of one hop. Combining equation (1), the communication energy consumption CEC_i corresponding to MD_i when the transmission power is p_{ir} is:

$$CEC_i = p_{ir} \times \frac{l}{B \times \log_2(1+q_{ir} \times p_{ir})}, p_{ir} \in TPS_i, r \in \{1,2,\dots,n_i\} \tag{9}$$

Among them, q_{ir} is the ratio of channel gain squared to noise power, and its calculation formula is:

$$q_{ir} = \frac{h_d^2(dcd_{ir})}{N_0 B} \tag{10}$$

3.2.2 The Problem of Wireless Resource Allocation

This article defines the concept of equivalent rate v_i, and proposes the ratio of the equivalent rate to MD_i delay in the sense of MD_i delay, which reflects the speed at which data reaches the sink node from MD_i at the beginning of network communication, and its specific calculation formula as follows:

$$v_i = \frac{l}{wt_i + ct_i} \tag{11}$$

Among them, l is the amount of data sent, wt_i is the waiting delay from the start of network communication to its data transmission, and the transmission delay of data sent and relayed from other terminals to the receiver node. This article converts the transmission sequence of the terminal corresponding to the wireless resource allocation scheme into its numbered sequence vector, which is recorded as A, and the specific form is as follows:

$$A = (a_1, a_2, \dots, a_i, \dots, a_N), a_i \in \varphi \tag{12}$$

Among them, a_i represents the terminal number corresponding to the MTC terminal, and its expression is as follows:

$$B = (b_1, b_2, \dots, b_i, \dots, b_N), i \in \varphi \tag{13}$$

Among them, b_i indicates that the i-th MTC terminal in the number arrangement sequence vector A uses RB resources to transmit its own data. The expression of b_i is:

$$b_i = (b_{i1}, b_{i2}, \dots, b_{ij}, \dots, b_{ih_i}), h_i - 1 < H \tag{14}$$

In this article, the number of sink nodes is recorded as zero. For $1<j<h_i$, b_{ij} in b_i indicates that the data of MD_{ai} is at the j-1th hop, and the relay responsible by MD_{bij} is sent at the second hop. Therefore, the b_{ij} expression is:

$$b_{ij} \begin{cases} = a_i, j = 1 \\ \in \{\{1,2, \dots ,N\} - \{a_i\}\}, 1 < j < h_i \\ = 0, j = h_i \end{cases} \tag{15}$$

From equations (13) and (14), combined with the rate formula (2), this paper gives the expression of the transmission delay ct_{ai} of MD_{ai} as follows:

$$ct_{a_i} = \sum_{j=1}^{h_i-1} \frac{l}{v\left(p_{b_{ij}}, d_{b_{ij}, b_{i(j+1)}}\right)}, p_{b_{ij}} \in TPS_{b_{ij}}, d_{b_{ij}, b_{i(j+1)}} \in D \tag{16}$$

If the total number of RBs in the current network is M, the MTC terminal corresponding to the first M number in the numbering vector. A has no waiting time delay in terms of delay composition. Therefore, the last MTC terminal among the corresponding MTC terminals has a waiting time delay. For the MTC terminal with waiting time delay, the M currently using RB resources is the minimum time delay of the terminal currently using resources. Therefore, for MD_{ai}, the expression of its waiting time delay wt_{ai} is:

$$wt_{a_i} = \begin{cases} 0, \ 1 \le i \le M, \\ \min\limits_{a_j \in \{\forall i - M \le j < i\}} \left(wt_{a_j} + ct_{a_j}\right), \ M < i \le N. \end{cases} \tag{17}$$

In the current network scenario, the delay calculation of the MTC station is measured by the corresponding delay index. This article uses the time index of each station multiplied by the corresponding equivalent rate data as the utility function. The function form is as follows:

$$v_{all} = \sum_{i=1}^{N} \left(\theta_{a_i} \times v_{a_i}\right) = \sum_{i=1}^{N} \left(\frac{\theta_{a_i} \times l}{wt_{a_i} + ct_{a_i}}\right) \tag{18}$$

Among them, θ_{ai} is the delay index corresponding to the i-th terminal in the number sequence vector that uses the resource to transmit its own data, and v_{ai} is the equivalent rate of the corresponding terminal. Combined with the definition of equivalent rate, the corresponding equivalent rate is also required to be larger.

3.2.3 Energy Consumption Issues

The above discussion is about wireless resource allocation in current network scenarios. Next, analyze the energy consumption in the current network scenario. For MD_i, the number of communications is unknown. For ease of expression, it can be recorded as cn_i. Using the above energy consumption model and Eq. (8), this paper gives the expression of MD_i energy consumption EC_i as follows:

$$EC_i = \sum_{g=1}^{cn_i} \left(p_{ig} \times \frac{1}{v(p_{ig}, d_{ig})}\right), p_{ig} \in TPS_i, d_{ig} \in D_i \tag{19}$$

Among them, TPS_i is the transmission power selection set, D_i is the direct communication distance set, p_{ig} and d_{ig} are the transmission power and corresponding communication distance during the gth communication, respectively. Therefore, the total energy consumption of all terminals of MTC is:

$$E_{all} = \sum_{i=1}^{N} EC_i = \sum_{i=1}^{N} \left(\sum_{g=1}^{cn_i} \left(p_{ig} \times \frac{1}{v(p_{ig}, d_{ig})}\right)\right) \tag{20}$$

It can be seen from the above analysis that in the current scenario, the relay selection will affect the energy consumption and wireless resource allocation of the MTC terminal at the same time. Therefore, this article considers the two together, the smaller the energy consumption, the better, and the larger the weighted equivalent interest rate sum, the better. Therefore, this paper adopts the weighted equivalent rate and the ratio of v_{all} to the total energy consumption E_{all} as the final energy efficiency index. The overall energy efficiency expression is as follows:

$$EE_{all} = \frac{v_{all}}{E_{all}} = \frac{\sum_{i=1}^{N} \left(\theta_{a_i} \times v_{a_i}\right)}{\sum_{i=1}^{N} EC_i} \tag{21}$$

It can be seen from this formula that the smaller the total energy consumption, the higher the corresponding weighted equivalent rate, and the higher the total energy efficiency of the network. Therefore, the maximum energy efficiency index can be used to deal with the energy consumption of the network. It is related to the wireless power consumption and resource allocation in the current scenario. In summary, the final energy efficiency optimization problem in this article can be specifically expressed as:

$$\max_{a_i \in A, b_i \in B} \frac{\sum_{i=1}^{N} \left(\frac{\theta_{a_i} \times 1}{wt_{a_i} + \sum_{j=1}^{h_i - 1} \frac{1}{v\left(p_{b_{ij}}, d_{b_{ij}, b_{i(j+1)}}\right)}}\right)}{\sum_{i=1}^{N} \left(\sum_{g=1}^{cn_i} \left(p_{ig} \times \frac{1}{v(p_{ig}, d_{ig})}\right)\right)} \tag{22}$$

The constraint condition of this optimization problem is that the number of MTC terminals in equation (11) is arranged according to the sequence vector in equation (16) and the corresponding communication path vector, and the transmission power corresponds to the transmission data. In the denominator, one group is selected from the corresponding transmission power equation (7), and the number of relays is determined by multi-hop communication in actual communication.

3.2.4. Heuristic Optimization Scheme

In the above efficiency optimization problem, for any one of the MTC terminals, different transmission destination nodes choose to determine different transmission powers. The set expression of D_{toSN} and E_{res} is:

$$D_{toSN} = \{d_i \mid d_i = d(SN, MD_i), i \in \varphi\} \tag{23}$$

$$E_{res} = \{E_i \mid i \in \varphi\} \tag{24}$$

Among them, the Euclidean distance from the aggregation node SN represents the current remaining energy. If you want to register the currently selected relay node, relayi must meet the following conditions:

$$\left\{ \text{relay}_i = \text{relay}_i \in DCDS_i \rightarrow \min_{r=1,2,\dots,n_i} \left(\frac{E_{ave}}{E_r} + d_r \right) \right\} \tag{25}$$

Among them, the corresponding group of direct communication terminals is the residual current power of the i-th terminal, and the calculation formula is as follows

$$E_{ave} = \frac{\sum_{i=1}^{N} E_i}{N} \tag{26}$$

Among them, E_i is the current remaining energy of the i-th MTC terminal among all current MTC terminals.

3.3 Simulation Experiment Results and Performance Analysis

Based on the system delay model proposed under the multimodal transmission strategy, the influence of system parameters on the delay is compared through numerical simulation analysis.

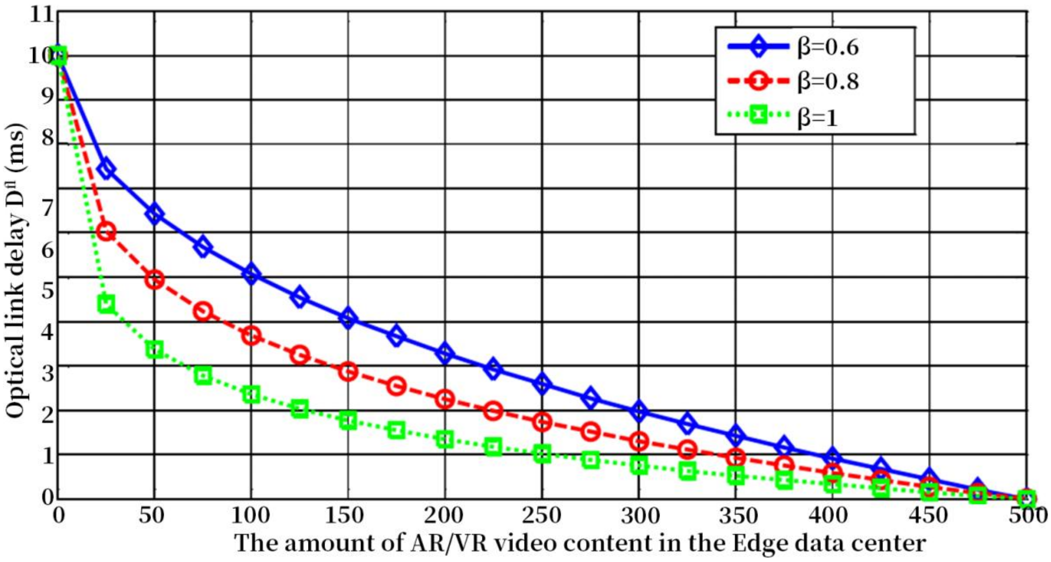

Figure 3. The relationship between the optical fiber link delay and the AR/VR video content of the edge data center under different popular deviation parameters

Figure 3 Under different popular deviations, the relationship between the delay of the optical fiber link and the AR/VR video content of the edge data center is consistent.

The impact of the size of the small cell base station buffer on the return delay under different edge densities of the data center is shown in Figure 4:

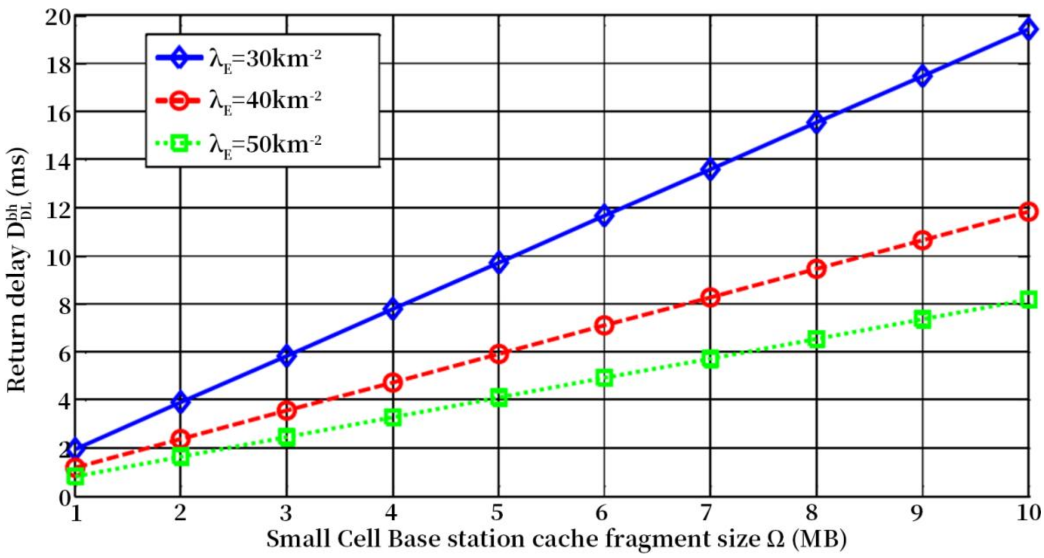

Figure 4. shows the impact of the size of the base station buffer on the return delay under different edge densities of the data center

Figure 4 studies the impact of the size of the small cell base station buffer on the return delay of data centers with different edge densities. Due to the increase in storage capacity, more data needs to be sent to each data center. When the size of the small cell base station cache segment changes, for the edge data center, more data needs to be transmitted, so as to avoid the increase of backhaul delay caused by playing video.

The relationship between edge data center power consumption and edge data center density under different AR/VR video content is shown in Figure 5:

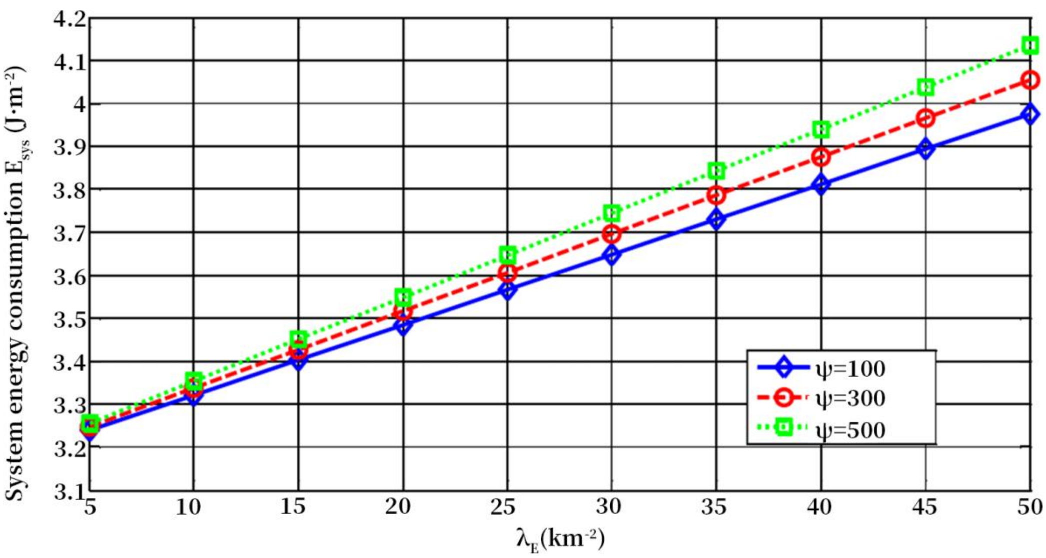

Figure 5. The relationship between edge data center power consumption and edge data center density under different video content

Figure 5 points out that the power density of edge data centers increases with the increase of edge data center density, and the power density of edge data centers increases with the increase of edge data center density. In the case of constant edge data center density, as the edge data center density increases, the greater the edge data center density, the greater the power consumption.

The relationship between edge data center power consumption efficiency and edge density under different video content is shown in Figure 6:

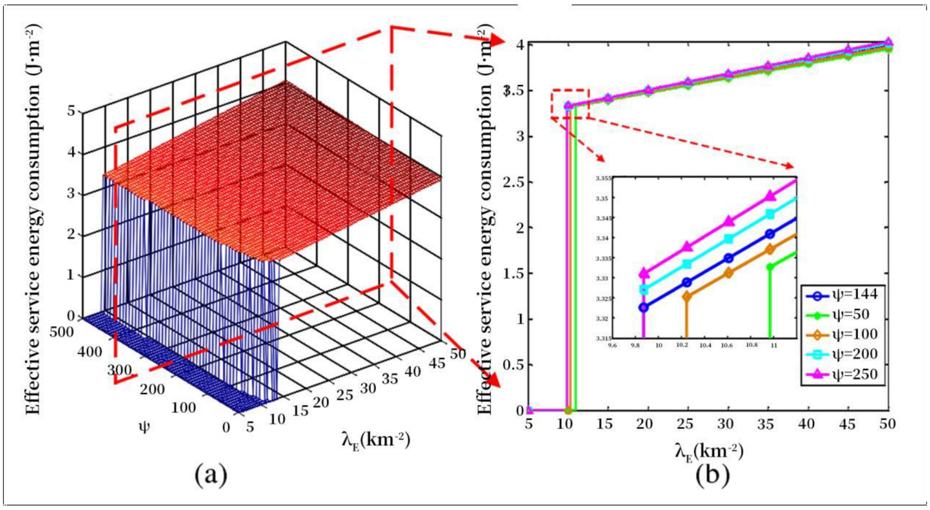

Figure 6. The relationship between effective service energy consumption and edge data center density when the amount of AR/VR video content at the edge data center is different

a: Effective service energy consumption, edge data center density, and AR/VR stored in the edge data center. The relationship between the amount of video content; b: the relationship between effective service energy consumption, edge data center density, and the amount of AR/VR video content stored in edge data centers

Based on the efficient energy consumption optimization algorithm, Figure 6 describes the relationship between the energy consumption efficiency of the edge data center and the service density when the amount of AR/VR video content in the edge data center is different. Figure 6a is a three-dimensional image that describes the relationship between energy consumption efficiency, edge strength of the data center, and the amount of video content stored at the edge of the data center.

4. Realization of Performance Art Video Action Management System Under Computer Technology

4.1 The Overall Structure of the Video Action Management System Database

When designing a database table, you must first specify the E-R diagram stored in the entire database as shown in Figure 7:

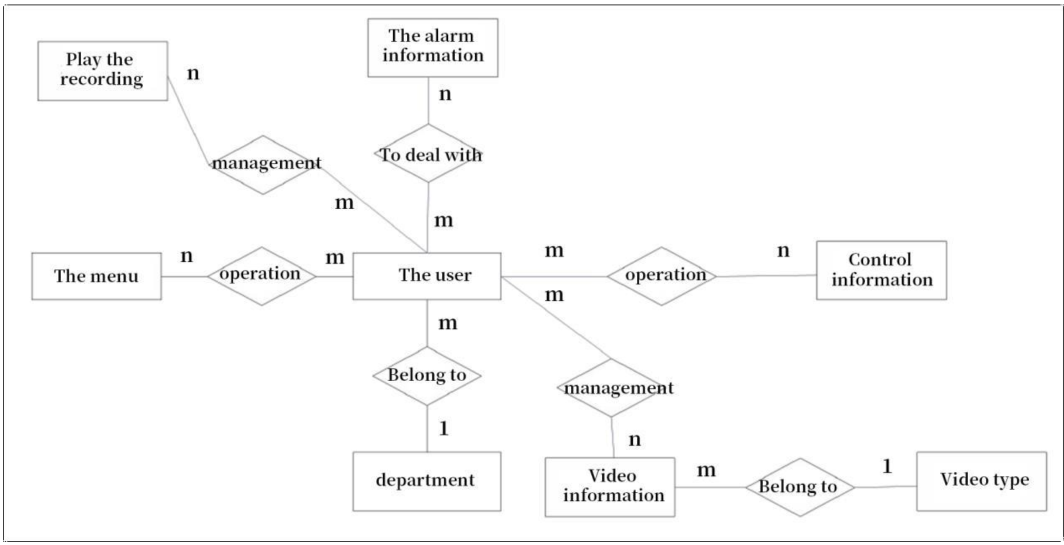

Figure 7. Database E-R diagram

From Figure 7 in the ER diagram database, we can see that there are many main entities in the database, such as playing and recording alarm information, control information, users, management, and types. After analyzing the flow chart of the ER system, the next step is mainly Store information for each database entity. The user information table is responsible for the content of user information related to the operation of the video information management system. The detailed table is shown in Table 1:

Table 1. User table

Field Name	Field Type	Can it be empty	Restrictions
user_ id	int	Not null	Primary key constraint
user_ name	Varchar (20)	Not null	Unconstrained
user_ password	Varchar (20)	Not null	Unconstrained
user_ registeddate	date	Not null	Unconstrained
user_ lastlogindate	date	Not null	Unconstrained
user_ point	bigint	Null	Unconstrained
user_ account	Varchar (20)	Null	Unconstrained
user_ email	Varchar (30)	Not null	Unconstrained
user_ state	int	Null	Unconstrained
user_ telephone	Varchar (11)	Null	Unconstrained
user_ money	Float (8,2)	Null	Unconstrained

From Table 1, we can see the field name, field type, whether it is empty or restricted and other related information. The video information table is mainly responsible for the content management of video information. The detailed table is shown in Table 2:

Table 2. Video information table

Field Name	Field Type	Can it be empty	Restrictions
video_ id	int	Not null	Primary key constraint
type_ id	int	Not null	Foreign key constraint
user_ id	int	Not null	Foreign key constraint
video_ title	varchar2	Not null	Unconstrained
video_ desc	varchar2	Null	Unconstrained
video_ point	long	Not null	Unconstrained
video_ playcount	long	Null	Unconstrained
video_ uploadtime	date	Null	Unconstrained
video_ lastplaytime	date	Null	Unconstrained
video_ url	string	Not null	Unconstrained
video_ size	int	Not null	Unconstrained
video_ keywords	string	Null	Unconstrained
video_ checkstate	int	Not null	Unconstrained
video_ money	float	Null	Unconstrained

From the video information table in Table 2, we can see the field name, field type, whether it is blank, and the corresponding data constraint information.

The video type table is responsible for content information related to the video type in the video information management system. The detailed table is shown in Table 3:

Table 3. Video type table

Field Name	Field Type	Can it be empty	Restrictions
type_ id	Int	Not null	Primary key constraint
type_ name	String	Not null	Unconstrained
type_ createtime	Date	Not null	Unconstrained
type_updatetime	Date	Not null	Unconstrained
type_ desc	String	Null	Unconstrained
type_ creater	varchar (100)	Not null	Unconstrained
type_ updater	varchar (100)	Null	Unconstrained

From the video type table in Table 3, we can see the field name, field type, whether it is blank or restricted, and so on.

The user play record table is mainly responsible for the video operation information of the video content management system. The detailed table is shown in Table 4:

Table 4. User play record table

Field Name	Field Type	Can it be empty	Restrictions
play_ id	int	Not null	Primary key constraint
video_ id	int	Not null	Foreign key constraint
use_ id	int	Not null	Foreign key constraint
play_ time	date	Not null	Unconstrained

From the user playback record table in Table 4, we can see that the corresponding data information includes the field name, field type, whether it is empty, and restricted conditions.

4.2 Recognition and Analysis of Performance Art Video Action Sequence

The experiment uses a certain song and dance action in a motion capture device as the data set, and selects the combination of the 11th group of dance action steps as the sample data. By manually dividing and removing the initial preparation action and the final end action, 4 combinations of similar actions were confirmed.

As can be seen from the table below, the first segmentation position is located in the 105th frame. During the preparation of the sequence of action frames, no action information will be lost. The movements between frames 105 and 218 are obvious. Under normal circumstances, they are mistaken for simple movements. Usually, small staggers and raising of the hind legs belong to a sequence of dance movements. As shown in Table 5:

Table 5. Comparison of manual segmentation and automatic segmentation position

Motion segment	Start frame	End frame	Auto segmentation result	Movement description
1	1	121	105	Preparatory action
2	122	291	218	Irrelevant movement of raising the leg after a small stagger
	292	351	357	
3	352	421	498	Irrelevant movement of raising the leg after a small stagger
	422	491		
4	492	555	621	Irrelevant movement of raising the leg after a small stagger
	556	607		
5	608	676	708	Raise your leg after a small stagger
	677	741	726	Irrelevant actions

The difference between other automatic segmentation positions and unrelated actions or manual segmentation is small, so the correct segmentation result will be obtained. Since there are many misdivision positions in the initial division position, the difference limit between frame sequences and the difference limit between adjacent minimum and maximum values are added.

The comparison of the segmentation position after adding the constraint conditions is shown in Table 6.

Table 6. Comparison of segmentation positions with constraints added

Motion segment	Start frame	End frame	Auto segmentation result	Movement description
1	1	121	105	Preparatory action
2	122	291	220	Irrelevant movement of raising the leg after a

	292	351	359	small stagger
3	352	421	500	Irrelevant movement of raising the leg after a small stagger
	422	491		
4	492	555	623	Irrelevant movement of raising the leg after a small stagger
	556	609		
5	610	678	726	Irrelevant movement of raising the leg after a small stagger

Video frame sequence segmentation algorithm is mainly composed of PCA algorithm and clustering algorithm. Compared with other algorithms, the algorithm in this paper requires two measurement parameters, which can be divided into precision rate and recall rate. The segmentation effect of the algorithm in this paper is compared with other algorithms, as shown in Table 7:

Table 7. Action sequence distance

Action sequence	A0	A1	A2	A3	A4	A5
A0	0	320.7388	1903.5752	1610.4045	2586.0451	1197.0756
A1	562.2396	0	467.2324	363.5521	784.8847	233.9011
A2	3509.3267	534.9003	0	1 08.0586	50.6611	233.3638
A3	2773.5538	278.5315	70.5508	0	138.3108	233.3244
A4	4638.3942	898.7725	79.6685	219.3547	0	423.8952
A5	1878.3055	313.7522	108.2244	1 65.9044	170.7065	0

In the action sequence, A0 is a preparatory action and does not contain clear action information. In the table, we can see that the regular distance between A0 and other action sequences is very large, while the regular distance is relatively between other action sequences. Smaller, it is certain that similar actions will occur in other action sequences.

4.3 Strategic Analysis of Innovation in the Arrangement of Performance Art Works

4.3.1 The Theme Style Center Is Prominent

In the performance of art works, it is important to choose what theme and how to run through the theme of the whole work. The style of the theme must be clear. When choosing the theme, we can choose hot issues. Contemporary society reflects social phenomena. Art comes from life. It can determine the theme of the work according to what people see, hear, feel and perceive life. When determining the theme of the work, it determines the cultural connotation that the theme wants to convey. The works are passed on from generation to generation, which not only fully interprets the works, but also has profound connotations, which are worthy of promotion, exploration and learning.

4.3.2 Characters Are Vividly Created

In general performance art works, characters are the main part of the work. Whether it is a work describing characters or things, or the performer's own certain temperament and skills, it requires the choreographer and performer to deeply experience the character to be expressed. So as to create a rich and vivid image in the work. For example, express emotions, characters and thoughts in stories, understand and embody the inner spirit of the work, have a high degree of mastery of dance skills, are complex and changeable, and have strong expressive power.

4.3.3 The Concentration of Special Features Is Obvious

Public performance art works have a strong particularity. The operation, difficulty, and transition of each special event have obvious style characteristics and technical skills. For example, rhythmic gymnastics is softer, and cheerleaders can show more momentum. Choreographers need to make full use of these characteristics to display their works and maximize the performers' own technical advantages.

4.3.4 Musical Works Are Integrated

In the public performance art works of the Graduate School of Sports, music is not an accessory. That occupies an important position in the choreography structure. It is an important part of the compilation of works. Music is a work that is felt from another organ (ear) of the human body. In the choice of music, make full use of the theme, thoughts and feelings of the work, use music to describe the characters deeply, make the image of the dance emerge, shape the stage environment, express the dance scene, and make full use of the music to express the emotional communication between the characters. It must not only conform to the characteristics of the selection method of the work, but also perfectly show a series of action content.

4.3.5 The Stage Beauty Effect Is Wonderful and Dazzling

In public art works, the beauty of dance can help you organize the creativity of your work. The exquisite stage design can instantly attract the attention of the audience. As a material means, it allows people to intuitively feel the status of the work, while allowing the audience to intuitively feel the context of the work, while also giving the work more space. Therefore, choreography can render the atmosphere of the stage, set off the performance of the work, promote the development and completion of the plot of the work, and simulate and reproduce the image of specific objective things.

4.3.6 Technology Embellished Fashion and Cool

With the development of science and technology, modern science and technology have penetrated into various fields. In the field of dance, the form of the stage pays more and more attention to the integration of science and technology. This not only diversifies the form of expression of the work, but also gives the work more space. Although science and technology are the products of modernization, when combined with history and the movements of classical characters, the audience can more fully enter the artistic conception and deepen the theme. For example, making full use of the combination of LED technology and the story of the work can provide a powerful means for the narrative of the story. The combination of light and shadow technology and work clothes can enrich dance performance. The combination of lighting technology and the content of the work creates a stage atmosphere of different atmospheres.

5. Conclusion

Wireless transmission is about to enter the 6G era. Large-scale wireless transmission technology, as one of its three application scenarios, has a very broad application prospect in production and life. For wireless transmission technology, communication requirements are different in different application fields. The problem of energy consumption optimization for high-efficiency services of wireless transmission technology is proposed. It uses two-step solution and related algorithms to solve the problem. The performance of the system model is analyzed through numerical simulation, and the solution and optimization problem of multi-path common transmission strategy is analyzed. As people's demand for wireless transmission technology increases, the professional action correction of video actions that are closely related to human life and the application of action recording under public performance art have promoted the development of video action recognition research from simple action recognition to complex video actions. The current goal is to identify the specific target in the video, and the next stage is to identify the purpose of the human body for certain types of actions. The application of static features cannot stably guarantee the positive effect of target recognition in various databases. Looking forward to the development of wireless transmission technology under 6G network technology, it can bring certain development to the video action management under the public performance art in the future.

Declarations

Conflict of Interest

The authors declare that they have no competing interests.

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