

The influence of AR + on the integration of film and television in different regions -Focusing on the perspective of Metaverse-

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Abstract

With the in-depth development of AR + (Augmented Reality +) technology, wireless communication technology and cooperative communication, the analysis of film and television integration has become a hot spot in Metaverse research, and the construction of Metaverse has become the focus of film and television culture and local culture. The original film and television fusion method cannot solve the problem of regional film and television fusion in Metaverse, and the accuracy of virtual reproduction is low. Therefore, under the condition of Metaverse, this paper uses AR + technology to analyze the fusion of movies and TV programs in different regions. Firstly, AR + is used to analyze the regional cultural data, and the behavior is classified according to the film and television conditions, and the irrelevant film and television fusion data is deleted. Then, according to the regional cultural characteristics and classification results, the fusion points are selected, and compared with the previous film and television fusion methods to verify the film and television fusion effect. Through MATLAB software analysis, from the perspective of Metaverse, it can be seen that AR + technology can promote the integration of film and television in different regions, improve the accuracy of film and television transmission, and reduce the differences of film and television integration in different regions.

Keyword : AR +; Metaverse; Regional culture; Integration

1. Introduction

AR + technology is to transform the displayed film and television culture into virtual things, promote the integration of film and television cultures in different regions, and change the traditional way of film and television integration. Many foreign AR websites attach great importance to the analysis of regional film and television integration and complete the reproduction of film and television culture. According to the survey data from Ph.D. Jolly Jose's research in 2022, the number of things reproduced in Metaverse is 53.2251 billion per day [1], but the consistency of cultural integration is low, mainly due to the low wireless transmission capacity and complex regional cultural data, resulting in poor

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accuracy of Metaverse reproduction [2]. Although the establishment of virtual database can realize the standard processing of regional cultural data, the transmission capacity and transmission capacity of cultural data are insufficient, which cannot meet the complex requirements of regional cultural scene reproduction [3].

5G (5th Generation Mobile Communication Technology) network and cooperative communication technology use narrow-wave communication to transmit, improve the data transmission rate to 100Gbps, improve the communication between different databases, and enhance the mining depth of regional movies and TV shows [4]. The results show that AR + can improve the conversion rate of real data, enhance the effect of Metaverse construction, and improve the communication frequency between different signal transmission towers. In addition, AR + combined intelligent algorithm technology can standardize virtual data, reduce data complexity by 10% [5], and enhance wireless communication and high-channel communication capabilities. AR + has the following advantages: Firstly, it virtualizes regional film and television information and marks information characteristics. Compared with traditional methods, AR + method has a larger amount of calculated data, enhances the depth of data analysis, and realizes fast virtualization of film and television data; Secondly, AR + technology is integrated with intelligent algorithm, mathematical calculation [6], computer and communication technology to realize the comprehensive virtualization of film and television culture, and calculate the satisfaction rate of different virtual results and the virtualization; Thirdly, it is integrated with cloud platform, blockchain and other technologies to enhance the ability of data wireless communication and the traffic per unit time, and complete the enhancement analysis of data [7].

AR + technology not only integrates with mathematical methods to realize multi-level data communication, but also enhances the comprehensive judgment ability of data and has strong data mining ability. AR + technology can comprehensively judge film and television data, enhance the fusion amount of film and television data, promote the multi-feature fusion of film and television content, and meet the multi-angle analysis from the perspective of Metaverse [8]. This paper uses AR + technology and wireless communication technology to calculate the regional video data, identify the key points, feature points and fusion points of regional video behavior, and reproduce the scene in Metaverse.

2. Related concepts

2.1 AR + technology model

AR + technology is an augmented reality calculation method. With the help of fuzziness analysis of

reality and interactive calculation, film and television data analysis can solve the directivity problem of different film and television data, realize unstructured processing of regional film and television, and improve the display effect of film and television fusion. Compared with other methods, AR + technology has a wider application range, and can realize massive fusion of virtual and real data. At present, AR + technology is widely used in computer, management, communication and other fields, but it is rarely used in the construction of Metaverse. In order to analyze the regional film and television fusion more objectively, the film and television enhancement of AR + technology is described quantitatively, and the results are as follows.

Film and television enhancement of AR+ data: regional film and television data is ear_i , the enhancement of virtual and reality is add_i , the correlation between different regions is I_{ij} , the enhancement degree of virtual data is $realth$ and the enhancement of film and television data is shown in Equation (1).

$$I_{ij}(ear) = \sum ear_{ij} \rightarrow add_{ij} | realth \quad (1)$$

When, $ear_{ij} \geq add_{ij}$ it indicates that the enhancement effect of AR+ data is better; Otherwise, the dummy data needs to be validated.

2.2 Integration of regional film and television

Regional film and television integration: The integration function is $\phi(ear \cdot realth)$ and $f(ear) \in realth \cdot add$ belongs to the regional culture, and the process of regional film and television integration is shown in Equation (2):

$$\int_{i=1}^n add \cdot f(ear) < \sum realth \quad (2)$$

Wireless network transmission: The wireless network transmission standard is Sta_i , the coordinated network transmission parameter adjustment function is $cs(ear)$, and the wireless network transmission is shown in Equation (3).

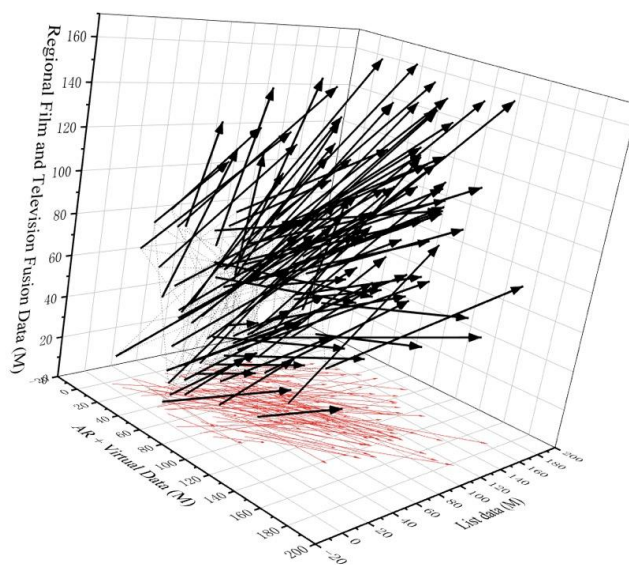
$$cs(ear|add) = \sum \lim realth_i \quad (3)$$

where p represents the collection point of AR+ virtual data, and the range of change $cs(ear)$ is $[0, k]$.

3. Preprocessing of regional film and television fusion data

3.1 Initialization of regional film and television fusion data

The initial data of regional film and television fusion data mainly eliminates the attributes of data, judges the distribution of data and estimates the randomness of data, so it is necessary to carry out standard mapping processing on data to provide support for AR + technology processing. In addition, AR + data will be different in the construction of Metaverse, so it is necessary to map the video fusion data to AR + list, and the specific process is shown in [Fig. 1].



[Fig. 1] AR+ processing process of regional film and television integration

It can be seen from [Fig. 1] that the distribution of regional film and television fusion data is relatively messy and has no directionality, mainly due to the existence of complex physical relationships and a large number of interference changes. Among them, regional film and television data is evenly distributed in the Metaverse space, and the distribution of AR+ data is also discrete, indicating that the standardized data is reasonable and there is no big difference between it and the objective reality.

3.2 Wireless transmission of regional film and television data

Wireless transmission mainly involves channels, transmission distances and transmission volumes, so

the above content should be quantitatively analyzed, as follows.

Wireless transmission mainly adopts ultra-wideband and wireless self-organization forms for Metaverse construction, and attribute calls are made according to the characteristics of regional film and television fusion data, and its calculation is shown in Equation (4).

$$sx(ear) = \sum_{i=1}^n ear_i \cdot realth_i \quad (4)$$

The construction of Metaverse requires high-speed data transmission, reducing transmission bandwidth, and increasing self-organization points to receive AR+ virtual data, combined with regional film and television reproduction characteristics, to complete the transmission of numerical values, which is calculated as shown in Equation (5).

$$js(ear) = \sum_{i=1}^n ear_i \cdot add \quad (5)$$

The construction of each virtual thing in the metaverse should be combined with the virtual attributes of regional film and television to achieve virtual reproduction mining, and its calculation is shown in Equation (6).

$$wj(ear) = \sum \sum ear_i \cdot realth_{i \rightarrow n} \quad (6)$$

Among them, n is the metaverse attribute of film and television fusion data; $sx(ear)$ is the transfer condition between the attributes in $\{-1,1\}$, and the associated transport condition between the attributes in $js(ear)$ is $\{-2,2\}$; $wj(ear)$ is the mapping transmission condition for each attribute and AR+ data is $\{-3,3\}$.

3.3 Metaverse reproduction verification of regional film and television integration

AR+ is related to the scenario reproduction of regional film and television fusion data, so the scale call should be made for regional film and television integration, and the application content includes virtual thing scene reproduction, non-virtual thing scene reproduction, uncertainty reproduction, and regional film and television integration feature reproduction, the specific calculation is as follows.

- 1) The scene reproduction of virtual things in regional film and television integration is calculated as shown in Equation (7).

$$y_{ij}(ear \cdot add) = \sum_1^n ear_i \rightarrow add_i \quad (7)$$

The relevant programming is:

```
IF ear>>=n,
then sum(ear);
IF ear*add<<mean(ear),
then sum(ear*add)
```

- 2) The scenario reproduction of non-virtual things in regional film and television fusion data is calculated as shown in Equation (8).

$$y_{ij}(n-ear) = \sum n - \sum (ear_i) \quad (8)$$

The relevant programming as follows:

```
IF n-ear>>=n,
then n-sum(ear);
IF ear*add<<sum(ear),
then n-sum(ear*add)
```

- 3) The uncertainty reproduction in the regional film and television fusion data is calculated as shown in Equation (9).

$$y_{ij}(ear) = 1 - \frac{ear_i}{add_i} \rightarrow realth_i \quad (9)$$

The relevant programming as follows:

```
IF 1-ear/add>>=n,
then n-sum(realth);
IF ear/add<<sum(realth),
then n-sum(ear/add)
```

- 4) Regional film and television integration characteristics scene reproduction, calculated as shown in Equation (10).

$$y_{ij}(ear \cup add) = mean(real_i) \rightarrow \frac{\sum ear_i}{\sum add_i} \quad (10)$$

The relevant programming as follows:

```
IF ear+add>>=n,
then n-sum(rear+add);
IF ear/add<<sum(ear+add),
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then $\text{sum}(\text{ear}) - \text{sum}(\text{ear} + \text{add})$

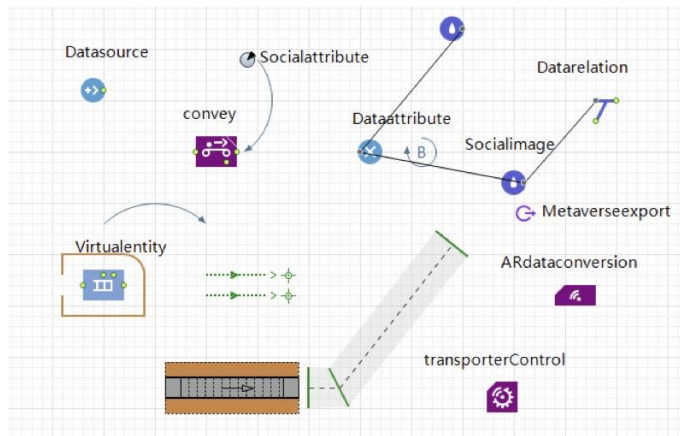
In terms of AR+ technology for the construction of the meta-universe, on the one hand, wireless network technology is used to calculate AR+ virtual data on natural language data and semi-structured data, compare the scope of regional film and television integration, and realize the numerical calculation of regional film and television integration. On the other hand, the change direction and change process of the metaverse are calculated to form AR+ virtual data attributes, as well as film and television collections, to complete the reproduction of virtual data. In order to improve the accuracy of Metaverse construction, virtual data in AR+ should be restricted. Among them, the AR+ limitation coefficient is α and the reconstruction coefficient is β , and the specific calculation is shown in Equation (11).

$$\alpha \rightarrow \beta = \left(\int \text{add}_i - \sum \text{ear}_i \right) \cdot \text{realth}_i \quad (11)$$

Among them, e is the conversion coefficient between AR+ technology and Metaverse, T is the largest film and television fusion data in the wireless network, d is the number of Metaverse scenario reproductions, and D is the reproduction result of the wireless network.

3.4 The integration process of wireless network to regional film and television

AR+ technology uses virtual technology and cloud data technology to virtualize regional film and television convergence data, and calculates it in the metaverse to realize the reproduction of film and television scenarios, the specific selection process is shown in [Fig. 2].



[Fig. 2] AR+ technology reproduces the scenario of regional film and television fusion data

Step 1: Determine the AR+ data collection, regional film and television fusion data collection, and

Metaverse data collection, classify regional film and television according to film and television characteristics, and determine the set of AR+ analysis. At the same time, the regional film and television fusion data is standardized, constraints are set, and the coefficient conversion processing is completed to map to the metaverse list.

Step 2: Transmit regional film and television fusion data, and set the bandwidth and communication node of the film and television data. The transmission conditions are replaced by vectors.

Step 3: Metaverse scenario reproduction function. AR+ technology is used to set regional film and television attribute data and structure, calculate wireless transmission equipment and transmission parameters, and combine constraints to reproduce scenarios in the metaverse.

Step 4: The maximum probability scenario reproduction of regional film and television fusion data, and the judgment of the result of the correlation data. According to the amount of regional film and television integration data and data structure, select the film and television integration with the highest probability.

Step 5: AR+ constraints, obtain subjective film and television scene reproduction, objective film and television scene reproduction, comprehensive scene reproduction, and verify the reproduction results.

Step 6: Comprehensive scenario reproduction of regional film and television fusion data volume. After determining the set of changes, select the change with the highest probability, and mine the reproduction of the scenario with the artist database to verify the accuracy of the associated data and the compliance of the AR+ constraints.

Step 7: Whether the data collection and regional film and television fusion data collection are all applied. If all data sets are applied, repeat steps 2~6, otherwise output the best scenario reproduction, constraints.

4. Practical examples of Metaverse construction

4.1 Data of regional film and television integration data

In this paper, based on AR + virtual and cloud platform, wireless transmission network and sub-organization structure, Metaverse construction of regional film and television fusion data is carried out, and AR + virtual film and television data of 6 regional films and television are classified, with 12 wireless endpoints and a transmission speed of 8.9 Gpics. The nearby transmission tower is used as interference, and the interference frequency is 3 times/minute. The total transmission data is 1,232 T, of which 23.3% is structured data, 52.8% is unstructured data and 19.54% is natural data. The contents of

virtual data include film and television changes, regional characteristics, film and television forms, data transmission volume, and interaction volume. The specific data situation is shown in [Table 1].

[Table 1] Regional film and television integration data

Data structure	Data content	Amount of data	Wireless transmission error	Data fitting
Metaverse requirements	Physical reproduction	26.51	76.23	59.03
	Virtual property rendition	25.34	42.52	94.42
AR+ virtual platform	image	60.31	92.32	47.40
	color	26.59	34.00	87.79
	structure	51.50	90.34	51.92
	attribute	60.31	89.97	86.38
Wireless communication method	Transmission volume	33.88	46.00	36.42
	Transport broadband	27.73	13.49	1.06
	Launch node	38.73	65.40	63.22
	Interference rate	94.23	88.13	7.70
	The signal is stable	47.99	67.91	8.22

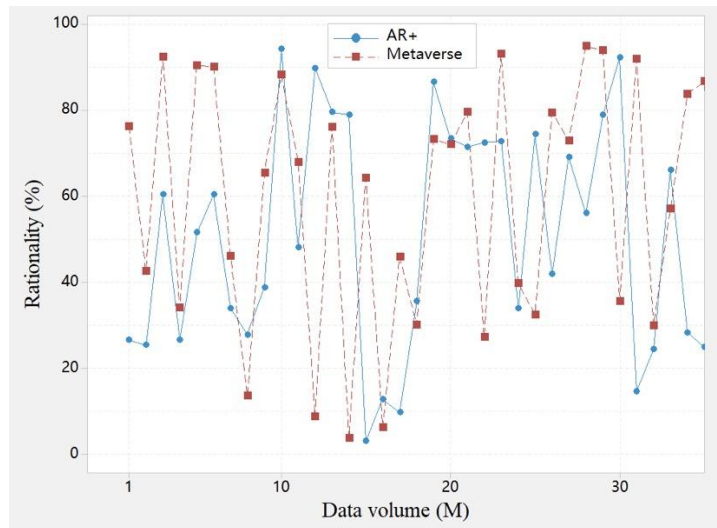
4.2 Relevance of Metaverse construction

Relevance is an important content of Metaverse construction. This paper mines the content of Metaverse 12 times, compares the relationship between different data, and verifies the relevance of data. In order to improve the authenticity of scene reproduction, 10 random results in scene reproduction are taken, and the specific calculation results of scene reproduction are shown in [Table 2].

[Table 2] Correlation of regional film and television fusion data

content	parameter	Virtual environment association	Constraint associations	Reproduce associations
Physical relevance	Thing data	12.73	6.20	Strong association
	Relational data	9.71	45.91	
	Evolution data	35.51	30.03	
Property affinity	Social attributes	86.59	73.21	Strong association
	Condition properties	73.30	72.10	
	Dynamic properties	71.39	79.52	
The metaverse reproduces relevance	figure	72.45	27.16	Strong association
	nature	72.72	92.99	
	society	33.83	39.73	

The correlation calculation process of regional film and television integration is shown in [Fig. 3].

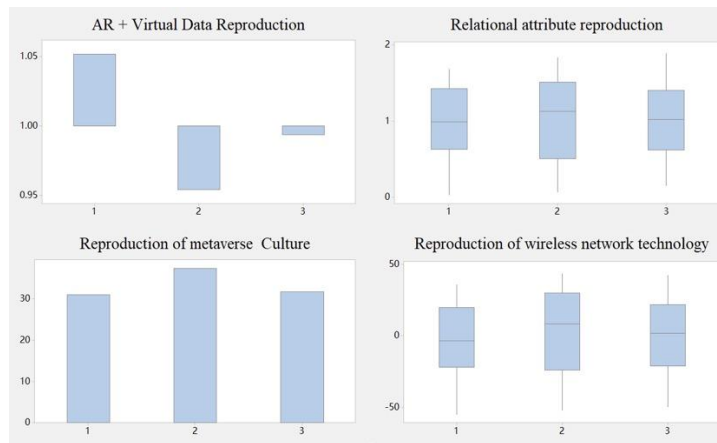


[Fig. 3] Rationality of film and television fusion data

It can be seen from [Fig. 3] that film and television integration has high correlation and is in the intensity correlation, which can realize the construction of the metaverse.

4.3 Reproduction rate of film and television integration in different regions

Film and television fusion is affected by disturbing data, and the reproduction level of the metaverse is relatively low, and the specific reproduction results are shown in [Fig. 4].



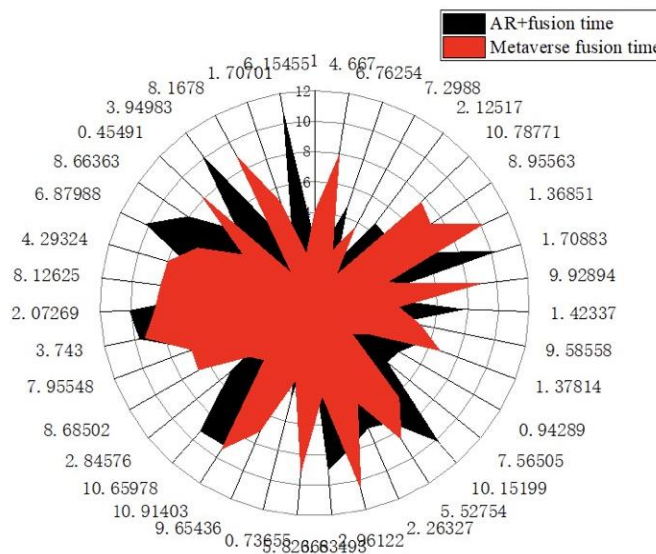
[Fig. 4] Reproduction of regional film and television fusion data

(1 represents structural data; 2 stands for natural language; 3 stands for complex data)

As can be seen from [Fig 4], AR+ technology has a greater impact on film and television data, which can improve the reproduction rate of Metaverse data. AR+ technology realizes the calculation of virtual data and increases the degree of regional film and television integration, so as to ensure the effective reproduction of the metaverse and improve the reproduction rate. The reconstruction of the metaverse requires correction of noisy data to reduce the impact of natural language on virtual data.

4.4 Metaverse construction time

The scene reproduction time is also an important content of regional film and television integration, and the AR+ virtual data should be calculated and compared with the cloud platform calculation method, and the scenario reproduction results are shown in [Fig. 5].

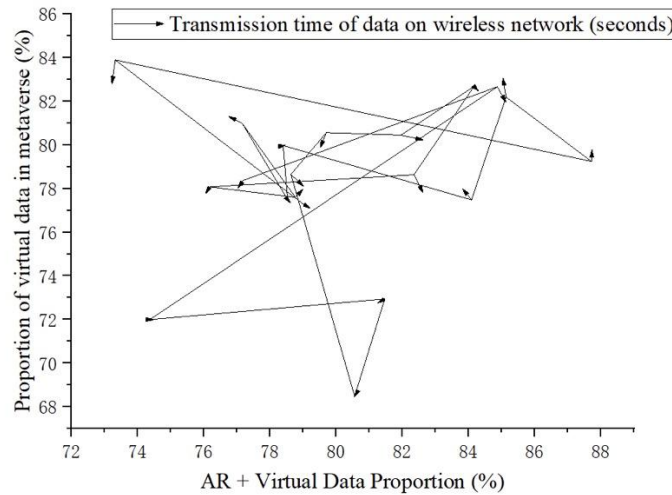


[Fig. 5] Scenario reproduction time of regional film and television fusion data

It can be seen from [Fig. 5] that AR+ technology has a shorter scenario reproduction time for regional film and television fusion data, and in terms of processing cloud platform data, AR+ technology achieves shorter computing scenario reproduction and the time is controlled within 3 to 5 seconds. The reason is that AR+ technology realizes the virtualization of massive natural language data, reasonable setting of wireless network output and transmission bandwidth, promotes the transformation of regional film and television integration data, and increases the frequency of data interaction.

5. Data transmission accuracy for Metaverse construction

Metaverse data construction is an interactive construction process, to achieve real-time transmission of data, and the accuracy of the transmission process is an important indicator of film and television integration in different regions, and the transmission accuracy is shown in [Fig. 6].



[Fig. 6] Real-time transmission accuracy at different times

It can be seen from [Fig. 6] that the computational accuracy of wireless network mode for Metaverse reproduction is higher than that of cloud platform computing method, and the change range of film and television integration in different regions is relatively small, indicating that wireless network technology has relatively stable results for AR+ virtual data processing, and the results are shown in [Table 3].

[Table 3] Summary of accuracy of film and television fusion data in different regions

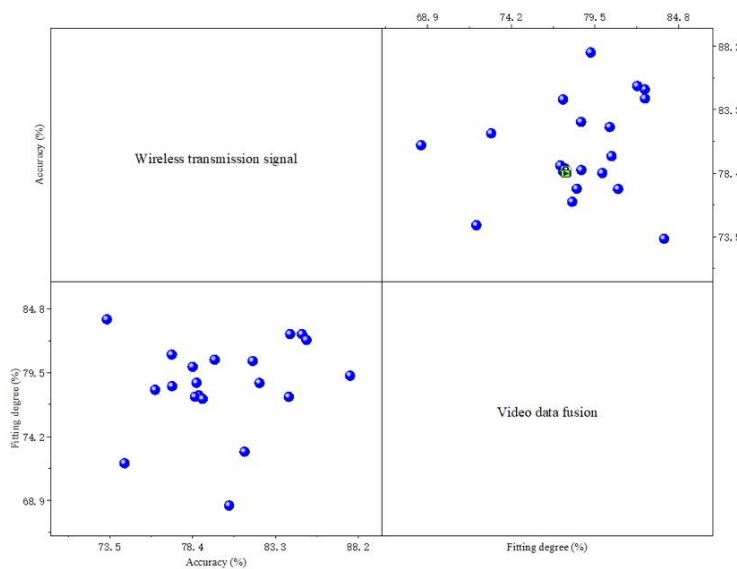
	Channel utilization	Wireless transmission frequency	The accuracy of convergence in the metaverse
Ethno-territorial	77.19	1.38	79.54
	84.87	11.61	86.90
	74.38	9.18	81.63
	81.47	0.14	85.33
Coastal areas	80.56	9.95	85.87
	78.64	0.33	87.21
	79.71	12.62	73.45
	81.96	14.51	81.47

Remote areas	84.17	5.52	74.60
	82.35	7.02	80.58
	76.18	7.96	73.27
	78.77	8.19	76.20

It can be seen from [Table 3] that the transmission of film and television cultural data in different regions is relatively stable, the channel utilization rate and wireless transmission rate are high, and the accuracy of fusion is greater than 90%.

6. Stability of film and television fusion data in different regions

The results of the changes of wireless network transmission signal and film and television fusion data are shown in [Fig. 7].



[Fig. 7] Changes in wireless network signals and converged data

[Fig. 7] shows that during the construction of the metaverse, the changes in wireless network signals and converged data are small, indicating that the virtual data structure processed by AR+ technology is simple, and the virtual data fits well with the metaverse. In addition, during the transmission of AR+ virtual data, the synergy coefficient and weight of scenario reproduction are increased in the wireless network, and the influence of local maximum probability scenario reproduction on scenario reproduction results is reduced.

7. Conclusion

Aiming at the problem of regional film and television integration, this paper proposes an AR+ virtual data analysis method based on wireless transmission from the perspective of Metaverse. This method analyzes AR+ virtual data, simplifies data complexity and constraints, and realizes the effective integration of regional film and television data to improve the accuracy of scene reproduction in the metaverse. The results show that wireless network technology can analyze AR+ virtual data, show regional film and television integration in the metaverse, improve the accuracy of Metaverse construction, and shorten the selection time of scenario reproduction. Moreover, it obtains good correlation and reproducibility. However, there are also certain limitations when constructing the metaverse, mainly in terms of parameter settings for wireless network transmission and consistency in scenario reproduction.

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