

Research Article

Development and Strategy Analysis of Short Video News Dissemination under the Background of Artificial Intelligence

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With the gradual maturity of artificial intelligence (AI) technology, it is urgent to change and innovate the traditional media communication paradigm. Current research and application areas include language processing, image recognition, AI systems, intelligent video technology, and text recognition. With the rapid development of artificial intelligence technology, it is used in all walks of life in society. All sectors of society have also set off the exploration and application of artificial intelligence. In the field of news communication, artificial intelligence technology brings opportunities and challenges to the news industry in publishing news content forms and organizations. Exploring the new development trends and countermeasures of the news industry in the era of artificial intelligence has become a key topic for the news communication industry and academia. With the support of the huge communication network, the information transmission of short video news is more abundant. While people obtain information, it can also enhance the interactivity of the news. In a fast-paced society, short video news is undoubtedly closer to life. However, due to some reasons, human factors lead to incomplete access to information. In this paper, an intelligent neural network is proposed to be applied to an intelligent robot or intelligent system so that it can better obtain information to edit short video news and disseminate it, and compare it with the existing such machines or systems on the market today. This paper analyzes the development of short video news dissemination based on artificial intelligence and proposes improvement strategies based on specific examples.

1. Introduction

With the spread of mobile Internet technology and smart terminals all over the world, more and more people are getting used to using mobile phone software to get news. However, people are no longer satisfied with the simple dissemination of text and picture information, and mobile short video news has developed rapidly along with this state [1–3]. This method of using short video platforms as an information dissemination medium for information dissemination has various forms, accurate and timely dissemination, and distinct social attributes, which is very in line with the needs of people in the era of fragmented consumption and people's effective acquisition habits of information [4–7]. Since the launch of short videos in 2016, news media such as the Beijing News, People's Daily, and

CCTV News have sprung up to major short video platforms and opened official accounts, and a new state of mobile short video news industry is gradually taking shape [8, 9]. And short videos on the mobile Internet are also known and used by more and more people. Short videos are very convenient to publish due to their simple production. The rapid development of short video has become an important means for people to pass the boring time and meet the needs of self-expression in daily life [10–12]. The current introduction of artificial intelligence (AI) into the news industry has strengthened the dissemination of news and the speed of reprinting. This article uses a short video news dissemination robot as an example, based on batch standardization technology, neural network technology, and long-term memory unit, to improve the topic enhancement network (CBNN), and based on this, put forward to improve the

efficiency of short video news dissemination and countermeasures [13–15]. A series of scientific methods are used to experimentally judge the operation effect of the short video news dissemination robot.

I think it should be added that in the era of smart media, the changes brought about by 5G technology have provided strong support and guarantee for the development of short videos. More and more mainstream media are entering the field of news short video development. With the diversified development of short videos, mainstream media have ushered in new opportunities for development through the information dissemination advantages of short news videos.

2. Research Background and Application of the Thesis

2.1. Discussion on the Concept of Artificial Intelligence. Artificial intelligence (AI) is one of the new technologies in artificial intelligence (AI) systems that try to mimic human reasoning [16, 17]. Under the background of big data, the economy and society are developing rapidly. With the advent of the Internet economy era, computers and smartphones are affecting people's lives. At this time, artificial intelligence is often more capable of collecting and processing this information and data than people [18–20].

2.1.1. The Efficiency of Artificial Intelligence. AI is good at increasing efficiency and reducing unnecessary errors. A trained algorithm is able to find trends that humans might miss. Plus, it can process data much faster than it can do it alone.

2.1.2. The Predictive Power of Artificial Intelligence. Predictions are largely based on empirical effort. When predicting customer preferences or website traffic levels, predictors will use what they have learned in the past to influence their judgments about the future [21, 22].

2.1.3. Artificial Intelligence Has the Ability to Accelerate Innovation. The application of artificial intelligence technology will further promote innovation [23, 24]. "Innovation" is the continuous development and achievement of good results. An indispensable part of an enterprise is "innovation," and "innovation" is an important foundation for the green and sustainable development of an enterprise [25].

2.2. Discussion on Short Video News Concept. Generally speaking, in short video platforms, the longest time is no more than 5 minutes. The intelligent system is used to collect data, edit videos, and put them on many short video platforms.

2.2.1. Short Video News to Satisfy the Audience. The use of user big data collection and machine algorithms can help short video audiences quickly discover short video content

of interest. The short video platform is established based on intelligent algorithms. Short video playback content is delivered through the distribution system, and the delivery system recommends short videos that users are interested in short videos can effectively increase the playback rate to 85%. "This can enhance the relationship between short video news media and viewers, meet the needs of public participation, and promote the dissemination of media information content."

2.2.2. The Content of Short Video News Is Available for Selection. At present, the development of mobile short video news is booming, and more and more people are beginning to accept the concise and popular news style of mobile short video news. However, short video news is still in the initial stage of exploration, and there are still many problems in the content production of short video news, such as the problem of content homogeneity and vulgarity, which needs to be solved urgently. In order to solve one type of problem, we researched and collected information on the short video platform, and used network technology to collect many types of short video news spread in the recent period, such as technology news, education news, cultural news, health news, social news, and political news. According to the survey, it can be seen that everyone's attention is mainly focused on entertainment news and social hot news. By recording the news in trivial life, it can provide users of short video platforms with a sense of familiarity and psychological closeness, and can resonate with the public more.

2.3. Application of Artificial Intelligence in News Communication. Artificial intelligence (AI) is one of the new technologies in artificial intelligence (AI) systems that try to mimic human reasoning. Under the background of big data, the economy and society are developing rapidly. With the advent of the Internet economy era, computers and smartphones are affecting people's lives. At this time, artificial intelligence is often more capable of collecting and processing this information and data than people.

However, the generation of news information is closely related to artificial intelligence. Now several authoritative companies and media have used artificial intelligence machines in news writing and dissemination. Since 2012, developed countries such as the United States have begun to use related machines in editing news. Although my country has developed this industry relatively late, due to the rapid development of the short video industry in my country, many media have introduced artificial intelligence robots. For news writing and short video dissemination, the method and process of artificial intelligence information collection are shown in Figure 1.

Advent of AlphaGo has brought people's views and ideas about Go to a whole new level, and in some cases, AlphaGo has surpassed all professional players in the field of Go. With the advancement of artificial intelligence (AI) technology, the writing of news by robots and AI and the production of news short videos have appeared in many scenarios.

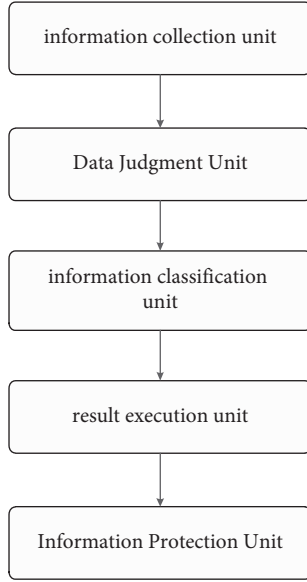


FIGURE 1: AI information collection.

The robot edits the natural language efficiently and quickly based on the information it collects, and automatically generates press releases or short videos to be released with the support of Internet big data. Before writing code for robots, AI, the following techniques or patterns should be introduced: batch normalization techniques, recurrent neural networks, long short-term memory units, and gated recurrent units.

2.3.1. Batch Normalization: The Introduction of BN. Batch normalization technique (also called batch normalization) is a technique used to improve the stability and performance of neural networks.

First, we enter the data for the smallest batch:

$$B = \{x_{1,m}\}. \quad (1)$$

Learnable parameters are r, β .

The output is as follows:

$$\{y_i = BN_{r,\beta}(x_i)\}. \quad (2)$$

Algorithm. Enter the mean of the data, and the calculation is as follows:

$$\mu_B \leftarrow \frac{1}{m} \sum_{i=1}^m x_i. \quad (3)$$

Least squared difference of input data is calculated as follows:

$$\sigma_B^2 \leftarrow \frac{1}{m} \sum_{i=1}^m (x_i - \mu_B)^2. \quad (4)$$

By normalizing the input data, we get

$$\widehat{x}_i \leftarrow \frac{(x_i - \mu_B)}{\sqrt{\sigma_B^2 + \varepsilon}}. \quad (5)$$

By processing the results of the batch normalization technique operation, we get

$$y_i \leftarrow r\widehat{x}_i + \beta = BN_{r,\beta}(x_i). \quad (6)$$

In the neural network training of robots, batch normalization technology can perfectly solve the problem of internal covariance caused by data changes.

2.3.2. Recurrent Neural Network (RNN). Recurrent neural network can process data with large variability in input sequence, and it is mainly used for time series data. However, some serialized data or language text cannot be handled well, because they are not independent, but have dependencies.

For these data, the use of recurrent neural networks can solve the problem of variable time series length and the dependencies between words, making the extraction, processing, and publishing of short videos by artificial intelligence smoother. In response to this situation, we can use shared parameters to solve the problem of variable length. In each time step, the words in the sequence in this time step use the same parameters so that the neural network model can be extended to variable length time series data. For the nature of the dependency between sequences, the output obtained at the previous time step is used as the input of the next time step so that the content of the previous time step can be obtained by the next time step, thus affecting the next time step, so that each there is a dependency relationship between time steps. The structure of the recurrent neural network model is shown in Figure 2.

Yes, in the editing process of the machine or AI system, the words in the vocabulary list may be selected as the editing part, which is very important. However, there is a dependency problem in this. In order to balance the memory level of the machine or system, bidirectional modeling is used to establish a bidirectional recurrent neural network, which can solve the dependency problem of the recurrent neural network to a certain extent.

2.3.3. Long Short-Term Memory Unit (LSTM). The long short-term memory unit is similar to the recurrent neural network process, both of which disseminate and process information. The difference is that there are four internal network state layers in LSTM (Figure 3).

The first step of LSTM is to judge whether various types of information are discarded or retained through the forget gate, and pass the hidden information h_{t-1} and input information x_t through the sigmoid function, such as “if the output is 0, discard the data.” If the output is 1, then retain. The second step is to determine whether the newly generated information is stored in the cell state C_t (the cell state can be

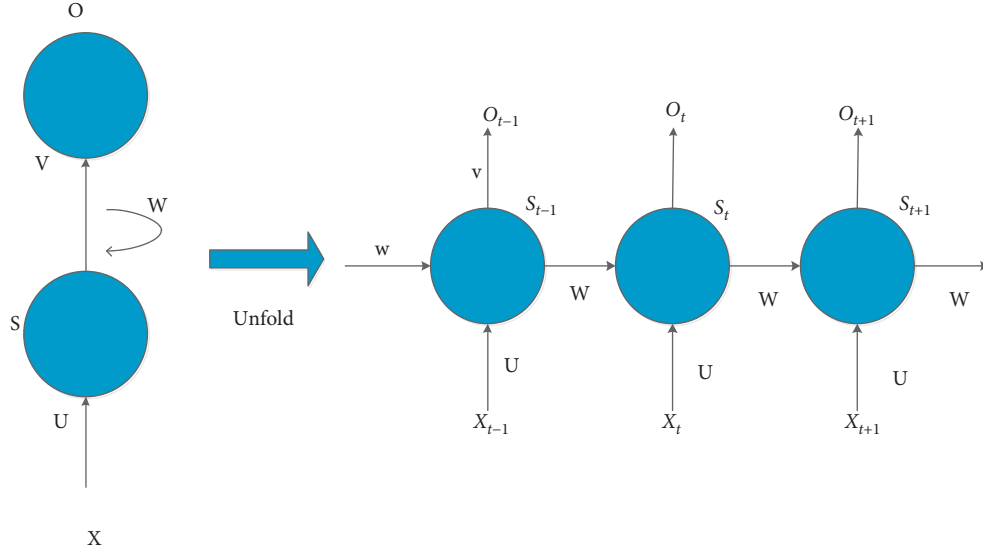


FIGURE 2: Model structure of recurrent neural networks.

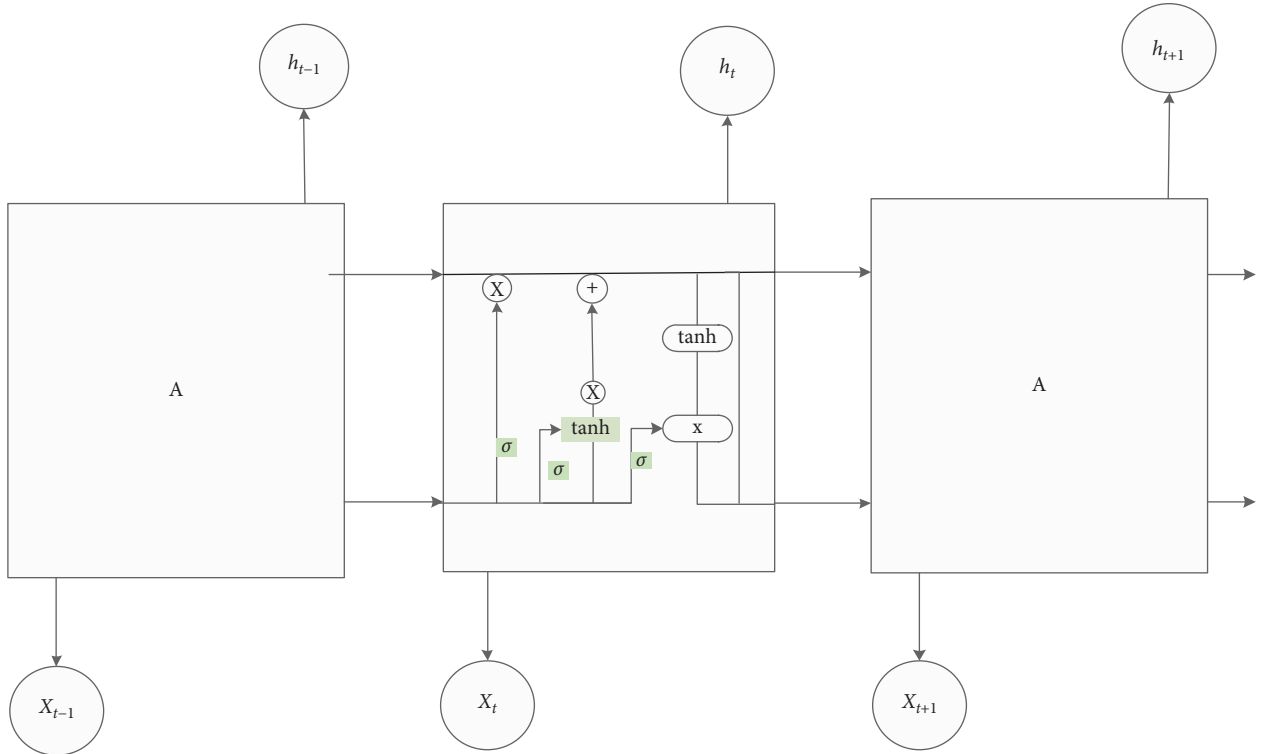


FIGURE 3: Four network state layers.

regarded as memory), and the sigmoid activation function is used to determine whether there is useful information. Then, according to the h_{t-1} sum x_t as the output, new information is generated by the tanh function, and finally generated by the combination method. The formula is as follows:

$$\begin{aligned} i_t &= \sigma(W_i[h_{t-1}, x_t] + b_i), \\ \tilde{C}_t &= \tanh(W_c[h_{t-1}, x_t] + b_c), \end{aligned} \quad (7)$$

where w and b are the weight matrix and bias term of the system; now, it is necessary to C_{t-1} process the information that needs to be forgotten at the previous moment by updating the previous moment to C_t , and multiplying the previous moment's C_{t-1} point-by-point multiplication method with the forget gate f_t . Finally, it is obtained by the point-by-point multiplication of \tilde{C} the AND input gate i_t (* represents point-by-point multiplication), and the formula is as follows:

$$C_t = f_t * C_{t-1} + i_t * \tilde{C}_t. \quad (8)$$

After the output information is determined, we use the sigmoid function to determine whether the function can be output, and then use the candidate information activated by the tanh function C_t . The final output is obtained by multiplying the h_t candidate information and the output gate o_t point by point. The formula is as follows:

$$\begin{aligned} o_t &= \sigma(W_o[h_{t-1}, x_t] + b_o), \\ h_t &= o_t \tanh(C_t). \end{aligned} \quad (9)$$

2.3.4. Gated Recurrent Unit (GRU). LSTM uses the gating mechanism to realize whether to retain the corresponding information or discard the useless information, so as to model the long-term context. GRU is based on this situation, effectively reducing the problem of gradient disappearance. The gated recurrent unit still uses the gating mechanism, and the difference is that the GRU has only two gates: the reset gate and the update gate. The new information recognized by the reset gate is combined with the previously accumulated information, and the update gate merges the cell state and the hidden state. The update gate formula is as follows:

$$h_t = (1 - z_t)h_{t-1} + z_t \tilde{h}_t. \quad (10)$$

Because the update gate needs to control whether the information of the previous hidden state is discarded or retained, and which of the new hidden information needs to be added, z_t is the formula of the update gate () and the current new hidden information state () is as follows:

$$\begin{aligned} z_t &= \sigma(W_z[h_{t-1}, x_t]), \\ \tilde{h}_t &= \tanh(W_\alpha[r_t h_{t-1}, x_t]). \end{aligned} \quad (11)$$

Update gate combines the new hidden information with the updated information and puts it into the sigmoid function, which can compare the result between 0 and 1. We calculate the Hadamard product of the reset gate r_t sum h_{t-1} , to determine which information can be retained or forgotten. The reset gate formula is as follows:

$$r_t = \sigma(W_r[r_t h_{t-1}, x_t]). \quad (12)$$

We build the Seq2Seq model, which was proposed in 2014 and is mostly used for text generation, and breaks the limit of fixed sequence in the past, so that the sequence length is not fixed. The model consists of an encoder and a decoder (typically, the encoder and decoder consist of a recurrent neural network). It is of great significance to the field of text generation.

3. Integration and Optimization of Technology

Artificial intelligence (AI) technology has developed rapidly and gradually entered the news industry. The “short video” craze has hit in recent years, and people’s access to outside news not only comes from the “news industry” but also from

the “short video.” When remote areas in the event of an accident, short video bloggers can send videos to short video platforms in a short period of time, allowing other short-video audiences to obtain this information. What the news industry needs is to conduct field research on news in this area to determine its veracity. We report on the area. When certain entertainment news appears, “short video artificial intelligence” will be used to obtain copyright and be re-edited and reprinted. Information collection is the first step in news release. Using neural network technology can increase information sources on the one hand and enable machines to better analyze and integrate news into more news. Artificial intelligence writing robots use neural networks, templates set by “people” and information collected from short videos to write.

Topic Enhanced Writing Network and Topic Enhanced Editing Network. The topic-enhanced writing network adopts a model with an attention mechanism, and on this basis, an enhancement network is added, in which the decoder can apply the attention mechanism to the hidden state of the decoder through the attention distribution during the decoding process. The theme enhances the idea of editing network simulations, combines the editing mechanism, and considers not only the theme information but also all the important information of the draft content.

3.1. AI Automatic Release Mechanism. In the automatic publishing task of short video news, SEO optimization needs to persevere and insist on sending high-quality original articles, and it is appropriate to publish them at the same time, but manual publishing cannot be done due to many uncertain factors such as work arrangements and holidays. *Continuous work and dissemination of short video news.* In this regard, another design of AI automatic release has been carried out. This mechanism can improve the efficiency of automatic release and the efficiency of short video news dissemination. SEO optimization requires manual publishing, and because of many uncertain factors such as work arrangements and holidays, it is impossible to achieve continuous work. AI automatic release mechanism can solve this problem, which is different from SED optimization as shown below in Figure 4.

AI automatic release mechanism is as follows:
Input data for the smallest value are as follows:

$$X = \{X_1, \dots, X_{Tx}\}. \quad (13)$$

Output data are as follows:

$$Y = \{y_1, \dots, y_{Ty}\}. \quad (14)$$

Algorithm. The encoder side accepts the analysis of each video content and the content after the decay of the cell state at the previous time point.

$$h_t = \text{RNN}_{\text{enc}}(x_t, h_{t-1}). \quad (15)$$

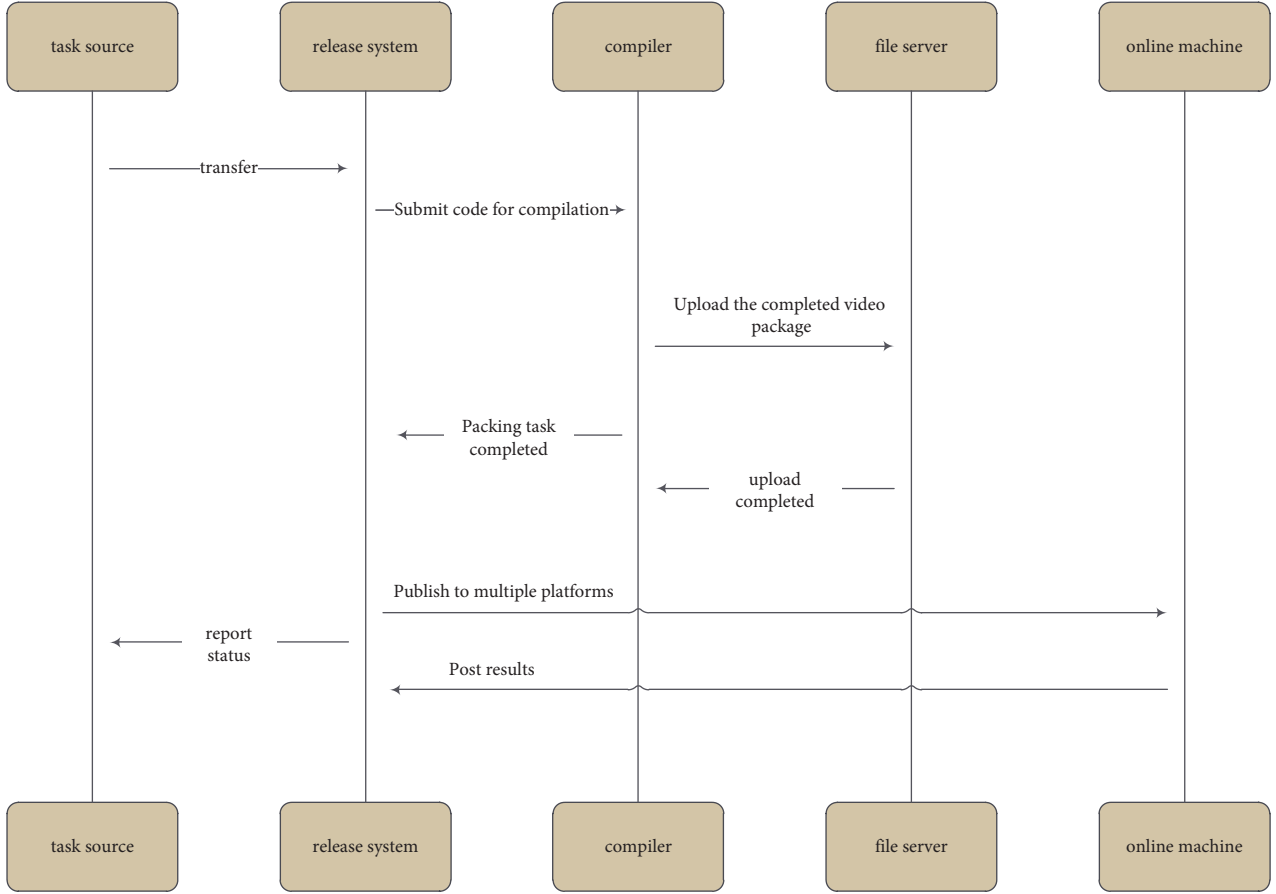


FIGURE 4: Publishing system flow chart.

Decoder in this regard receives special sentence tone recognition relative to the subject word and the content after the decay of the cell state at the previous point in time.

$$s_i = \text{RNN}_{\text{dec}}(y_{i-1}, s_{i-1}). \quad (16)$$

The context vector is a weighted average of the decayed content of the cell state output by the encoder.

$$c_i = \sum_{t=1}^{T_x} a_{it} h_t. \quad (17)$$

To the weight corresponding to the content after the decay of the cell state of each encoder,

$$a_{it} = \frac{\exp(e_{it})}{\sum_{k=1}^{T_x} \exp(e_{ik})}, \quad (18)$$

where e refers to a score calculated by the hidden states of the decoder plus the hidden states of the encoder, and this score is used to calculate the weight in the following equation.

$$e_{it} = \text{score}(s_i, h_t). \quad (19)$$

S refers to concatenating the content of the context vector and the cell state of the decoder after attenuation.

$$\hat{s}_i = \tanh W_c [c_i; s_i], \quad (20)$$

where $p_{\text{vocab}}(y)$ refers to the probability distribution of the text table during automatic speech recognition, that is, the final output probability before $p_{\text{vocab}}(y)$ automatic release, and $= p(y_i | y < i, x)$

$$p(y_i | y < i, x) = \text{soft max}(w_i, \hat{s}_i), \quad (21)$$

where W_{te} refers to the topic enhancement weight, which can selectively enhance the ratio of short video news topics in short videos.

$$W = 1 - \sigma(W_y y_{i-1} + W_s s_i + W_c c_i + b_{\text{ptr}}), \quad (22)$$

where $p_{\text{vocab}}^*(y)$ refers to the probability distribution of the vocabulary after auto-publishing, that is, calculating the final output probability.

$$p_{\text{vocab}}^*(y) = (1 - W_{te}) p_{\text{vocab}}(y) + W_{te} p_{\text{title}}(y), \quad (23)$$

where $p_{\text{title}}(y)$ refers to the probability distribution.

$$p_{\text{title}}(y) = \sum_{t:xt=y} a_t. \quad (24)$$

Using the AI automatic publishing mechanism, you can efficiently publish short video news to make it widely disseminated. AI edits and publishes videos by itself to improve video quality. AI processes and outputs videos by automatically recognizing videos and editing videos for sending mosaic for illegal and prohibited videos. We disseminate accurate news more quickly and efficiently in line with popular tastes.

The encoder converts the input original text into a context vector c . The input sequence of the model is $x = [x_1, x_2, \dots, x_{T_x}]$, which is the length of the input sequence. The output of the encoded hidden state is obtained by encoding through the recurrent neural network. The calculation formula is as follows:

$$h_t = f(h_{t-1}, x_t). \quad (25)$$

By encoding the hidden state at the previous moment and the input encoding at the current moment, the output of the hidden state at the current moment can be obtained, and the context vector c obtained for the input sequence can be obtained by the following formula:

$$c = q([h_1, \dots, h_{T_x}]). \quad (26)$$

In the basic sequence-to-sequence model, the decoder mainly uses the context vector c obtained by the encoder and the text sequence previously generated by the decoder to generate the vocabulary at the current moment. The decoder calculates the joint probability of the current word y , which can be decomposed into the conditional probability of all previously generated words.

The joint probability formula for calculating the current vocabulary y is as follows:

$$p(y) = \prod_{i=1}^{T_y} p(y_i | y_1, \dots, y_{i-1}, c). \quad (27)$$

Then, through the vector c , the hidden state of the decoding output and the current decoding input are calculated to obtain the probability distribution at a certain moment. The calculation formula is as follows:

$$P(y_i | y_1, \dots, y_{i-1}, c) = g(y_{i-1}, s_i, c). \quad (28)$$

There is a topic enhancement gate in the topic enhancement network, which has a special part called topic enhancement weight, through which the topic enhancement weight enables the decoder to select the proportion of topic enhancement in the information when generating a certain word.

The formula for calculating the topic enhancement weight is as follows:

$$W_{te} = 1 - \sigma(W_y y_{i-1} + W_s s_i + W_c c_i + b_{ptr}). \quad (29)$$

4. Experimental Analysis

4.1. The Effect of Neurons and Encoding Direction on Image Recognition Performance. This paper compares and analyzes the influence of neurons and coding direction on image

recognition performance, and compares the video editing intelligent robot (representative model) with other four models of other robots in the market on three evaluation indicators precision 1, precision 2, and precision 3.

4.2. Experimental Comparative Analysis. First of all, we use precision, an evaluation method for machine image recognition, to evaluate the results of video image recognition. The P-R curve is the precision vs recall curve, with recall as the abscissa axis and precision as the ordinate axis. First, we explain precision and recall as shown in Table 1.

Correctly classifying a positive example as a positive example represents TP (true positive), classifying a positive example incorrectly as a negative example represents FN (false negative), and classifying a negative example correctly as a negative example represents TN (true negative). Misidentifying a negative example as a positive example represents FP (false positive).

It refers to the comparison between the image recognition generated by the evaluation model and the representative model and other video editing robots on the market. If the PR curve is closer to the upper right corner, the better the representative model is. The precision method is used to evaluate the bending degree of the video editing generated by the model compared with the bending degree of other robots on the market. The experiment is shown in Figures 5–7.

This paper further proves that the performance of the Bi-GRU model is the most outstanding by comparing the above three models on the PR method. The PR method is often used to compare the performance of machine video editing models. The experiment is shown in Figures 5–7. The experiment shows that the curve of the representative model and other models in the PR method is closer to the upper right corner, and the comprehensive analysis of the editing video generated by the representative model of GRU neurons has the best performance.

4.3. The Impact of AI Automatic Release Mechanism on Model Performance. In Figures 8–10, the performance of the representative model is compared with other models in the market. We add the AI automatic publishing mechanism to the representative model and compare it with the other three common models in the market, and put the four kinds of machines into the model training for a period of 10 days to publish short video news ratings to get an efficient graph.

As shown in Table 2, the data were collected through a 10-day simulation, and the following data were obtained as shown in the table below.

According to the observation of Figures 8–10, the model performance of the representative model is compared with other models in the market. We add the AI automatic release mechanism to the representative model and compare it with the other three common models in the market. We put the four types of machines into the model training for a period of 10 days to publish short video news and compare the ratings to get an efficient graph. It can be concluded that adding AI the No. 1 machine (representative model) of the

TABLE 1: Precision and recall.

	Burden	Just
Burden	TN	FP
Just	FN	TP

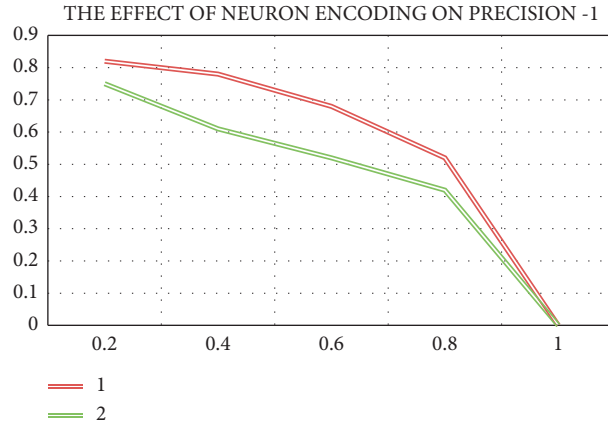


FIGURE 5: The effect of neuron coding on precision 1.

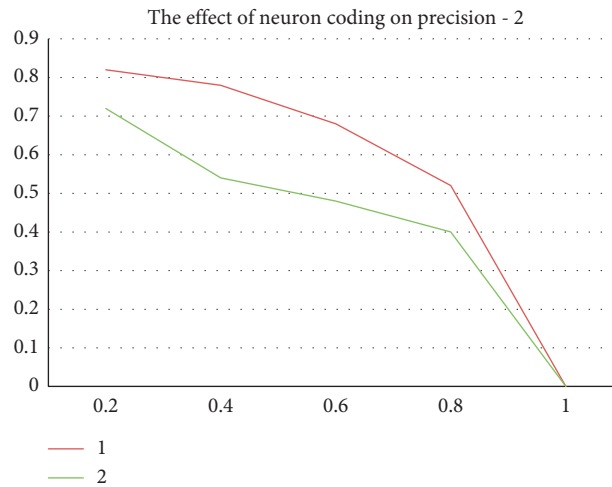


FIGURE 6: The effect of neuron coding on precision 2.

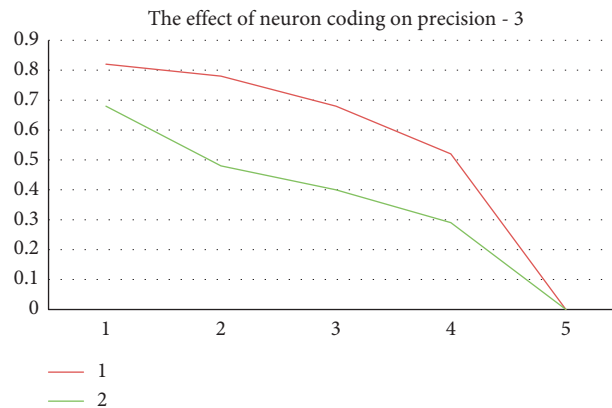


FIGURE 7: The effect of neuron coding on precision 3.

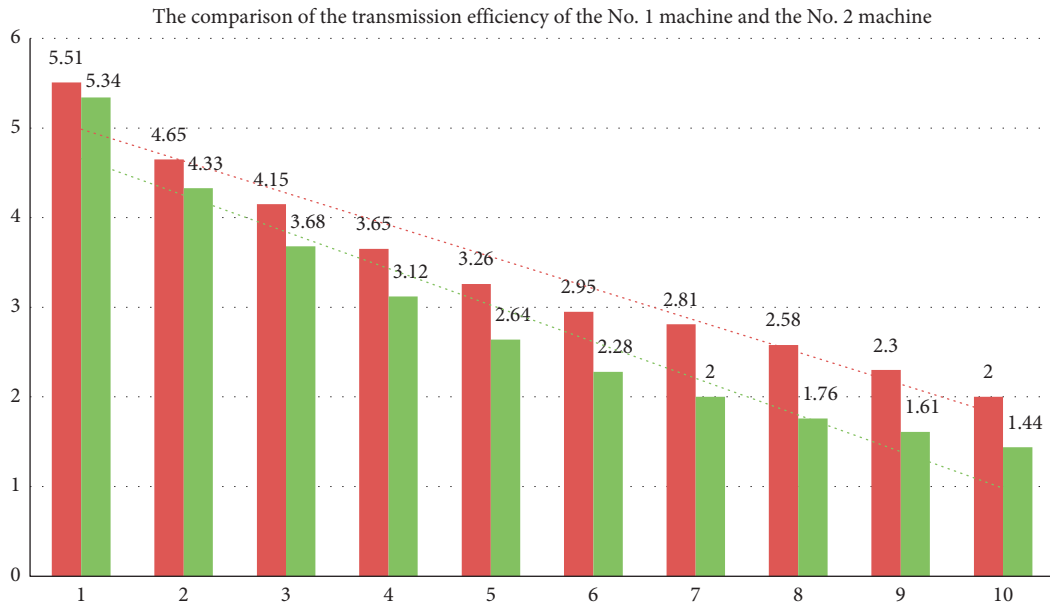


FIGURE 8: Comparison of the propagation efficiency of the No. 1 and No. 2 machines.

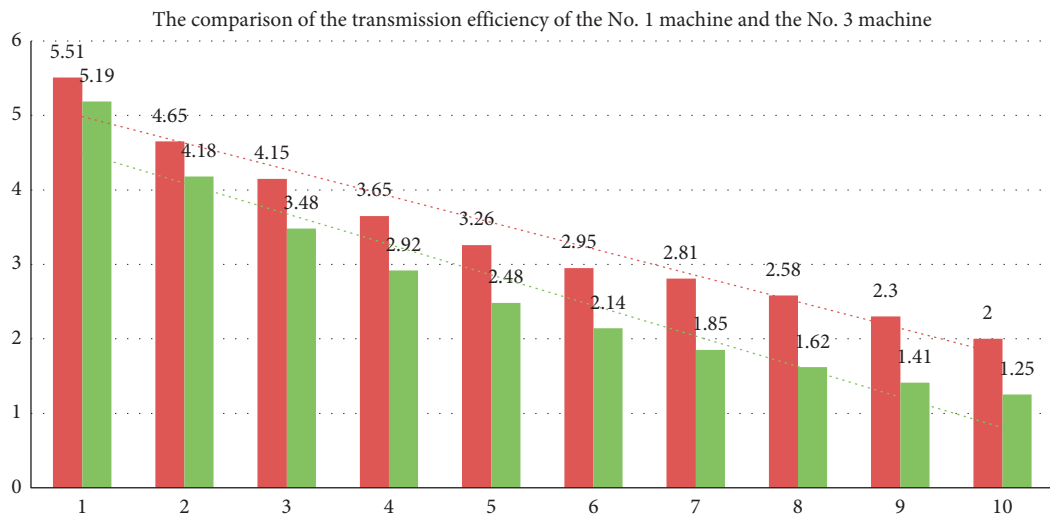


FIGURE 9: Comparison of the propagation efficiency of the No. 1 and No. 3 machines.

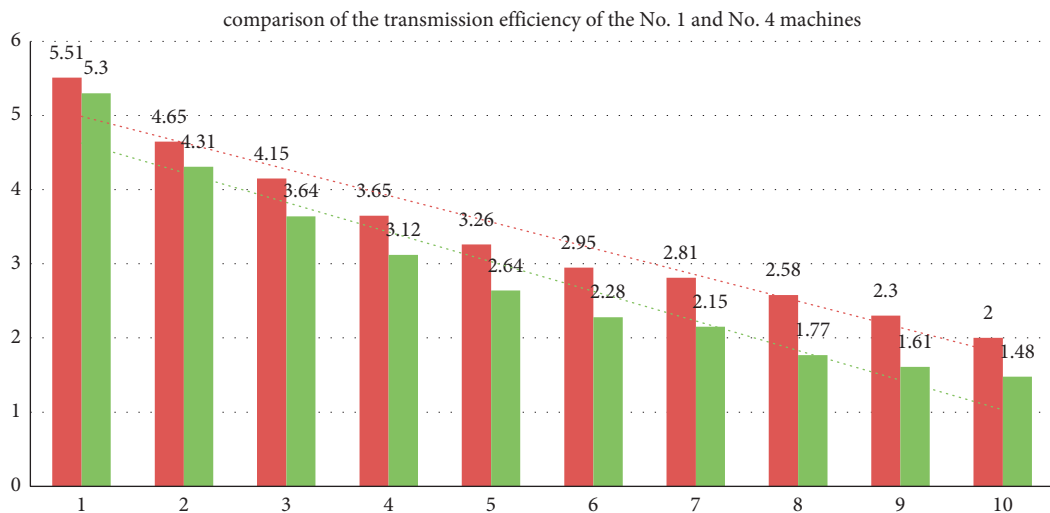


FIGURE 10: Comparison of the propagation efficiency of the No. 1 unit and the No. 2 unit.

TABLE 2: Analog data sheet.

Efficient	1	2	3	4	5	6	7	8	9	10
1	5.51	4.65	4.15	3.65	3.26	2.95	2.81	2.58	2.3	2
2	5.34	4.33	3.68	3.12	2.64	2.28	2	1.76	1.61	1.44

automatic release mechanism is more popular than other models, and it can more attract users of short video platforms and increase short video news dissemination.

Through example analysis, it can be seen that the video editing generated by the method proposed in this paper is insufficient. In some editing processes, there are still situations where important information does not appear in the video news. In the next work, we can consider introducing more many technologies conduct more in-depth research on artificial intelligence (AI) video editing models to further improve the quality of generated short video news.

5. Conclusion

This experiment is based on the development of short video news under the background of artificial intelligence to make a “short video editing robot” using batch standard technology, recurrent neural network, long short-term memory unit, and gated recurrent unit to make the shortcomings of other robots. Improving and then by adding the enhanced theme mechanism, the robot is sublimated, so that it can increase the theme of video clips by entering keywords.

- (1) By using precision, the representative model is compared with other models to obtain the degree of curvature of the PR curve. It is concluded through experiments that the representative model and other models are closer to the upper right corner of the curve of the representative model in the PR method. The comprehensive analysis uses the representative of GRU neurons. The edited video generated by the model has the best performance.
- (2) By comparing the ratings of short video news released for a period of 10 days to obtain an efficient graph, it can be concluded that the No. 1 machine (representative model) that joins the AI automatic release mechanism has better ratings than other models and is more attractive to short video platform users, to increase short video news dissemination.

Data Availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest regarding this work.

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