

Research and Analysis on the Optimization of Live Streaming Path in the New Era Based on Big Data Algorithm

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Abstract. In June 2022, the "Eastern Selection" live broadcast studio became one of the hottest pop-up communication phenomena as ShakeYin fans skyrocketed from 1 million to 19.8 million in just three weeks. Starting from the aspects of communicator, communication sub-language characteristics, communication content and realistic meaning, we study and analyze the characteristics of the broken circle in its communication process, aiming to summarize the explicit characteristics and provide a case study for the explosive communication in the field of live-streaming with goods. In this paper, we study the development of information technology and computer technology in conjunction with each other based on the basis of big data. Based on previous research, we integrate big data and new media for data analysis and research. A certain pavement and foundation for new informational research is prepared. With the support of convolutional neural system applications, applying big data models to.

Keywords: Eastern Selection; Circle-breaking dissemination; Dissemination characteristics

1 Introduction

According to the data of CNNIC China Internet Development Survey, the scale of webcasting users reached 344 million in December 2016 and exceeded 560 million by March 2020, accounting for 62% of the overall Internet users [1]. Live streaming with goods has enriched the cash model of live streaming and started to be linked to capital, becoming a new Internet windfall. In November 2021 [2], Yu Minhong, the founder of New Oriental, made his first live broadcast with goods and explained that New Oriental would transform to live broadcast with goods, and in December of the same year, the new platform "Oriental Selection" was launched. After half a year of silence, the "Oriental Selection" live broadcast exploded in June 2022, with data showing that on June 10, 2022 [4], the number of viewers and the total merchandise transaction (GMV) of Oriental Selection reached 9.07 million and 14.57 million yuan [3], respectively, and the following day, the number of viewers and the total merchandise transaction reached 12.75 million and 20.14 million yuan, respectively, and at most, the number of people online at the same time in Oriental Selection live broadcast was as high as 100,000+.

The rapid development of media technology has brought about the emergence of short videos and live broadcasting. With the opening of the "first year of live e-commerce" in 2019, live streaming with goods is booming, and the scale of live e-commerce continues to grow.

According to the 45th "China Internet Development Statistics Report" released by the China Internet Network Information Center, as of March 2020, the scale of live e-commerce users in China reached 265 million, accounting for 37.2% of online shopping users. Affected by the new Crown pneumonia epidemic, the marketing environment and the consumer environment have changed dramatically, and traditional offline sales have been forced to shift to online, and live sales have soared, accelerating the digital transformation of the new e-commerce business, as well as accelerating the development of the live streaming with goods. Li Jiaqi live in just five minutes to sell 15,000 lipsticks, Viya live worth 40 million yuan "fast boat one" launch vehicle launch and brand services on sale in a few seconds after the rapid sell out. Live with goods of the broken circle effect to the unstoppable momentum to drive a new round of e-commerce economic upgrading and transformation.

2 Automatic modulation classification based on convolutional and recurrent neural network fusion

2.1 Model Structure

2.1.1 Single convolutional neural network structure.

The model is an explanation of the structure of the part of the convolutional neural network involved in the fusion scheme [4], and the subsequent introduction of the fusion network will not be disassembled to explain the structure and parameter settings, and the network model is shown in Figure 1. The purpose of using the batch normalization (BN) and dropout layers is to speed up the training of the network and to suppress overfitting [5]. The other parameters of the model containing the dimensions of the input data and the settings of the activation functions for each layer are shown in Table 1 below [6]:

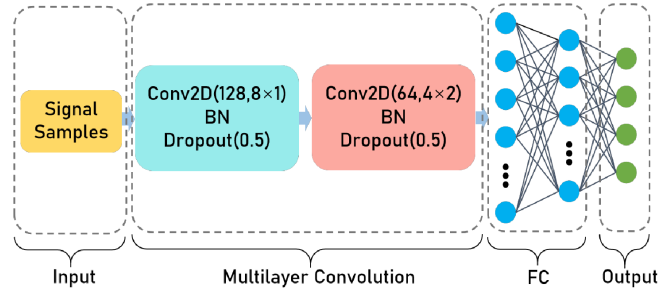


Fig. 1. Structure of CNN-based model

Table 1. Other parameter settings of CNN

Parameters	Value or Description
Input Data Size	(128, 2, 1)
Number of neurons in the three-layer fully connected layer	{256, 128, 8}

The activation function of the first two fully connected layers	ReLU
Activation function of the last fully connected layer	Softmax

2.1.2 Single recurrent neural network structure.

The model is an explanatory description of the structure of the simple cyclic unit part involved in the fusion scheme, and the structure and parameter settings will not be disassembled in the subsequent introduction of the fusion network [7], which is shown in Figure 2.

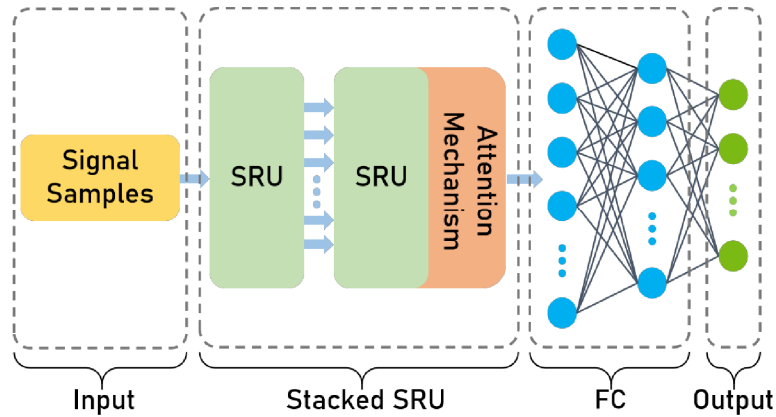


Fig. 2. Structure of SRU-based model

2.1.3 Convolutional neural network parallel recurrent neural network structure.

This structure is the third form of fusion of convolutional and recurrent neural networks used in parallel [8], where the convolutional and recurrent neural networks are not set up sequentially but side by side (CNN Parallel SRU: CPS), and the network model is shown in Figure 3. The second part contains a stacked SRU and two fully connected layers that are also the first two layers of the classifier of the single recurrent neural network, i.e., the last layer of the two single structures is eliminated and the two are trained in parallel [9]. The third part contains an operation and a fully connected layer. The operation is the connection operation (Concatenate), which splices the parameter weights trained in the left and right parts [10], in the vertical direction, and can be represented by the following equation:

$$[W_{CNN}]_{Len} + [W_{SRU}]_{Len} = \begin{bmatrix} W_{CNN} \\ W_{SRU} \end{bmatrix}_{Len} \quad (1)$$

where Len represents the dimensionality of the tensor. Finally, the combined weight parameters are sent to the fully connected layer for the final classification.

The mean squared loss function uses least squares to measure how similar the predicted values of a single batch input model are to the true labels. The function focuses only on the average size of the Euclidean distance between the sample points and the target fit line, and not on the

dimensionality and direction of the distance. A The expression of the mean squared loss function for one batch input is:

$$loss = \frac{1}{2m} \sum_{i=1}^m (a_i - y_i)^2 \quad (2)$$

where m denotes the input sample size, y_i and a_i denote the model predicted and true labels of input sample i , respectively.

2.1.4 Accuracy analysis

The convolutional neural network tandem recurrent neural network algorithm has the highest classification accuracy values at all signal-to-noise ratios, with the best performance at high signal-to-noise ratios of over 99% probability of correct classification [10]. As is shown in Figure 3.

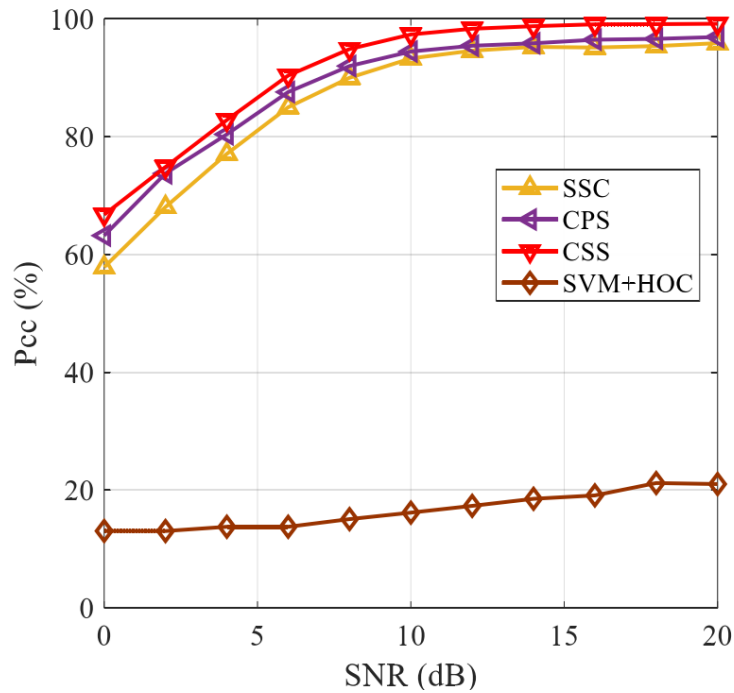


Figure 3 Probability of correct classification for the 4 algorithms

Table 2 Average accuracy of the 4 methods

Network	Average accuracy
SVM+HOC	16.55%
SSC	86.14%
CPS	88.43%
CSS	91.05%

Table 2 above gives a clearer picture of the average accuracy of each method, with CSS performing best with an average accuracy of over 90%, SSC and CPS with an average accuracy difference of more than 2 percentage points, and the traditional algorithm performing worst with an average accuracy of less than 20%.

3 Conclusion

This paper combines big data in the way of analyzing new media based on the convolutional algorithm of neural network. It has made some new breakthroughs in the field of new combined research, and also provided new analytical ideas and thoughts for the later new media research. Although "Oriental Selection" did not join the industry at the beginning of its formation, it is like a group of dark horses, successfully killing a bloody road in the live-streaming industry. The popularity of "Oriental Selection" is both unexpected and justified. From the initial agricultural products no one asked for, the effect of the knowledge output type of carrying goods is very little, to the later out of the circle burst fire, has experienced a certain accumulation and update process. For the time being, the frenzy of live bandwagoning has not yet dissipated, and the industry bubble has emerged, which is a rather dangerous phenomenon and needs to cause sufficient vigilance. As far as the current development is concerned, although the live broadcast of traditional media is mainly based on the dissemination of public welfare, the live broadcast of goods as an emerging business model can promote the new integration between traditional media and new media, help traditional media effectively revitalize the advertising resources, expand the service model, and achieve win-win situation for all parties, which is a useful exploration of the traditional media for the future integration of the development of a new model.

Live streaming with goods highlights the new value of socialization. The biggest flaw in the traditional e-commerce shopping scene is the lack of social behavior. In fact, shopping is not only a consumer behavior, but also a social behavior and lifestyle. In the era of material scarcity, people's purchasing behavior is to solve the basic material survival needs, the actual function of the product in the consumer's purchase weight occupies an absolute proportion. Today, the sense of experience and enjoyment of services has become an important factor in consumers' purchasing decisions, and the key to the sense of shopping experience lies in the interaction and socialization between people, and socialization has become the entrance to the new era of transactions.

Live streaming with goods as an emerging e-commerce marketing model reflects the commercial value of online socialization. Whether it is a social platform, a content platform or a live platform, live carry is essentially based on the emotional dependence of the consumer on the anchor, and the strong interactivity in the consumption process is exactly what traditional e-commerce lacks.

References

- [1] Yao, Lin-Qing, Yu, Hai-Man. The prosperity and chaos of live-streaming with goods[J]. People's Forum, 2020(25):85-87. doi:10.3969/j.issn.1004-3381.2020.25.025.
- [2] Li Yang. Bilingualism brings goods out of the circle and the education industry "embraces" live streaming [N]. China High-Tech Industry Herald, 2022-06-27(013).

- [3] Luo Lan. Problems faced by anchors in live e-commerce and solutions [J]. *Business Intelligence*,2021(16):66. doi:10.12243/j.1673-4041.2021.16.050.
- [4] Ouyang Juan. Analysis of the humor of TV hosts' live broadcast from the perspective of discursive presupposition: the case of "CCTV boys"[J]. *Communication Power Research*,2021,5(26):93-94.
- [5] Yu Ying. The change and reshaping of teachers' image in the context of the new era[J]. *Modern Vocational Education*,2022(12):160-162.
- [6] Long Zhenni. Experimental discussion on the use of paralanguage in live-streaming with anchors[J]. *Audiovisual*,2022(06):167-169.DOI:10.19395/j.cnki.1674-246x.2022.06.039.
- [7] Liu Yuanquan. Research on the characteristics and discourse of live webcasting with goods [J]. *China Press*,2022(08):104-105.DOI:10.13854/j.cnki.cni.2022.08.028.
- [8] Joseph, Loren. The educational role of body language in classroom teaching [J]. *Decision and Information (Lower Journal)*, 2010(9):49-50. doi:10.3969/j.issn.1002-8129-B.2010.09.035.
- [9] Caleb, Charles. Introduction to communication science [M]. Beijing: Higher Education Press,201708.133.
- [10] Alfred. Research on the humanistic orientation in live streaming of mainstream media with goods [D]. Zhejiang University of Technology and Business, 2022.