



Research and analysis on the optimization of vocational education learning platform based on the background of artificial intelligence

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Abstract. The learning platform model of vocational education is characterized by openness and sharing. Openness is reflected in the fact that the learning platform is a collection of resources, absorbing various forms of high-quality resources, while providing universities and related institutions with better ways to cultivate talents and continuously enriching educational teaching resources. The vocational education platform is both a collector and integrator of resources, as well as a disseminator and provider of resources, constantly providing teachers and students with information resources and realizing the sharing of educational resources. New constructivism emphasizes teaching goals while paying close attention to the construction of deeper meaning. This study analyzes the optimization and creation of a new teaching platform based on the context of artificial intelligence in the new era. It explores the development of big data platforms for intelligent education and the integration of vocational education platforms in the context of big data, making certain fundamental contributions to our educational model as well as educational development, while also achieving certain breakthroughs and research results in new fields.

Keywords: learning platform; Big data; Intelligent algorithms; Artificial Intelligence

1 Introduction

In order to further implement the national education digitalization strategy, serve to better implement the work of "double reduction", deepen the integration and application of information technology and education teaching, accelerate the high-quality development of basic education and the construction of education modernization, the Ministry of Education revamped and upgraded the national primary and secondary school smart education platform to provide the majority of primary and secondary schools, teachers and students, and parents with Specialized, high-quality, systematic resource services. The platform includes 10 sections of resources for moral education, curriculum

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teaching, physical education, aesthetic education, labor education, after-school services, teacher training, family education, education reform experience and teaching materials, of which curriculum teaching resources are now online for some textbook versions, and other textbook versions will be selected and put online one after another, and basic assignments for some subject textbooks are also provided. Other types of resources will also be enriched. Similarities and differences in the functions of each teaching platform. Screen sharing, chat boxes, and lesson recording functions, as basic features of online classroom teaching platforms, were included by the examined teaching platforms and were common features of teaching platforms. For personalised platform features, the coverage rate was significantly lower than that of the basic features [1]. Sharing files, group discussions, random selection, question-answers, hand-raising, pop-ups, reward mechanisms, responses, trivia games and timers are not widely used as personalised interactive features on various teaching platforms, but in terms of online teaching needs, these features can improve classroom efficiency and facilitate classroom interaction [2] [3].

2 Physical layer data transfer process

(1) It also includes a mapping between transmission channels and physical channels, with each physical layer providing services to the upper layers as transmission channels, each physical channel relative to a time-frequency resource used to transmit a particular transmission channel, and each particular transmission channel reflected in the corresponding physical channel [4]. The processing of the NR transmission channel is shown in Figure 1.

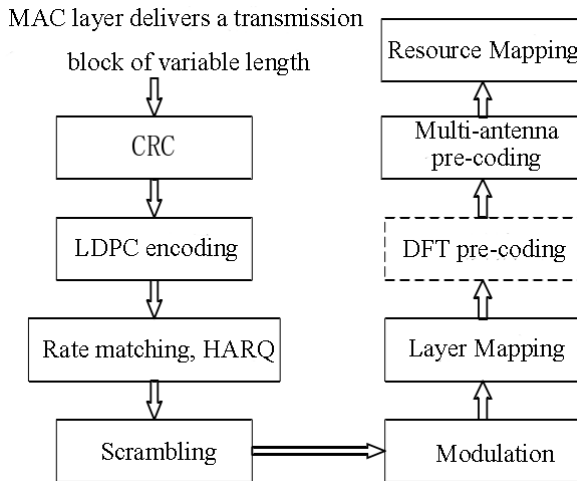


Fig. 1. 5G NR transmission channel processing flow

On each component carrier within each Transmission Time Interval (TTI), the physical layer receives up to two transmission blocks of arbitrarily variable length sent from the transmission channel and can be transmitted to the opposite end via the null port. In

the vast majority of scenarios, however, only one transmission block will be submitted on a single TTI [5]. As show in figure 2.

(2) YouTube DNN

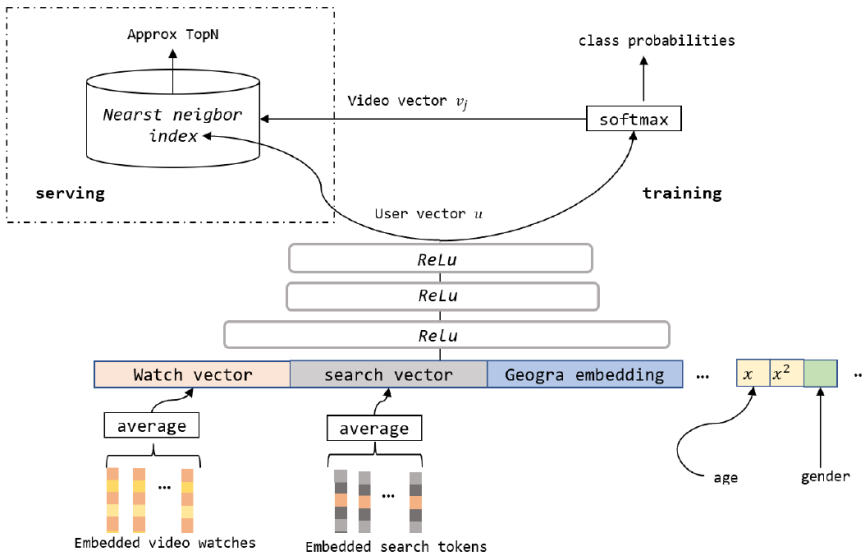


Fig. 2. YouTube DNN network structure

YouTube is the world's largest video sharing site, with the vast majority of content coming from UGC. YouTube DNN serves the task of personalised recall of YouTube's million-strong video base.

YouTube DNN separates offline TRAINING from online SERVING, which is the essence of this recall model. YouTube DNN converts the recommendation problem into a multi-classification problem by softmax. The probability of watching each video is then taken as the TopN for recall, as shown in Equation 1.

$$\rho \left(w_t = \frac{i}{U}, C \right) = \frac{e^{v_i}}{\sum_{j \in v} e^{v_j}} \tag{1}$$

If 100W videos are available at training time, the recall model becomes a 100W classification problem, so negative sampling is engineered to speed up training.

The embedding vector of videos does not change when SERVING online and can be stored in the database. The user vector changes as the user behaves differently on the video site, so it has to be generated by the model in real time.

2.1 Data Scrambling

This is mainly due to the characteristics of NR, which requires more agile quality of service and resource scheduling solutions, and will also face more complex deployment and impact environmental conditions [6]. The time parameter is removed from the data scrambling initialisation of NR and the cell ID used during LTE scrambling

initialisation can be replaced by a configurable ID, is to improve the interference situation between UEs and is defined in a scrambling initialisation manner as:

$$C_{init} = n_{PNTI} \cdot 2^{15} + q \cdot 2^{14} + n_{ID} \tag{2}$$

2.2 Data modulation

The modulation modes supported in the NR standard for uplink and downlink transmission include QPSK modulation and QAM modulation, and the QAM modulation order is variable from 16 to 256. The data modulation can also improve the amplifier efficiency and therefore the coverage [7]. However, if the Discrete Fourier Transform (DFT) precoding is not configured [8], there is no need to support $\pi/2 - BPSK$.

2.3 Order Instruction

Rank Indicates (RI) is used to indicate the number of transmission layers valid at both the transmitting and receiving ends of the PDSCCH, and is also used by the user side to inform the base station side of the number of code words that can currently be supported.

(1) Algorithm based on maximum capacity

The Shannon formula can be expressed as follows:

$$C(H) = \log_2 \det \left(I_{N_r} + \frac{\varepsilon_s}{N_t N_o} H H^H \right) \tag{3}$$

It is first assumed that the total signal power is constant and that equal power distribution is taken on each antenna. where H denotes the channel matrix, I denotes the unit matrix, N_r denotes the number of receive antennas, N_t denotes the number of transmit antennas, N_o denotes the noise generation power level and ε_s denotes the signal generation power.

Begin by performing a singular value decomposition of the channel matrix H:

$$H = U \Sigma V^H \tag{4}$$

where, U and V are You matrices, Σ matrices are zero except for the other elements on the main diagonal, and all elements of the main diagonal are singular values, $\Sigma = \text{diag}(\lambda_1, \lambda_2, \dots, \lambda_N)$. At this point the Shannon formula can be expressed as:

$$C(H) = \sum_{i=1}^N \log_2 \left(1 + \frac{\varepsilon_s \lambda_i^2}{N_t N_o} \right) \tag{5}$$

(2) Algorithm based on the selection of the precoding matrix

With the influence of the precoding matrix, the Shannon formula should be rewritten as:

$$C(HW) = \log_2 \det \left(I_{N_r} + \frac{\varepsilon_s}{N_t N_o} H W W^H H^H \right) \tag{6}$$

Where W is the pre-coding matrix, first calculate the appropriate pre-coding matrix under different ranks, traverse the codebook to select the appropriate capacity, and then inverse select the rank that makes the maximum capacity.

(3) Selection algorithm using long-term statistical properties of the channel

3 Conclusion

In accordance with the spirit of the Opinions of the Central Committee of the Communist Party of China and the State Council on Deepening the Reform of Education and Teaching and Comprehensively Improving the Quality of Compulsory Education, the Ministry of Education, in response to the sudden outbreak of the epidemic in 2020, urgently developed and constructed the "National Primary and Secondary Schools Network Cloud Platform", which mainly provides high-quality resources of two major categories, namely, thematic education and curricula, and plays an important role in supporting the "suspension of classes and non-stop learning" and students' independent learning during normal times and teachers' improvement of classroom teaching. During the epidemic period, it played an important role in supporting the "suspension of classes and non-stop schooling" and students' independent learning and teachers' improvement of classroom teaching, with a total of 6.4 billion views so far, especially since the implementation of the "double-reduced" policy in July last year, the average daily number of views has increased significantly, and it has been widely praised by teachers, students, parents and the society, It has been widely praised by teachers, students, parents and the society.

At present, the rapid development of information technology has created favorable conditions for building a networked, personalized, digital and lifelong education system. We need to make full use of technological empowerment to accelerate the process of education informatization. In particular, with the in-depth implementation of the "double-decrease" work and the promotion of the high-quality development of basic education, the sharing of high-quality educational resources, information technology to help modernize education puts forward urgent requirements, there is an urgent need to further strengthen the construction and application of expanding the platform functions, enriching the platform resources, and to better serve the independent learning of students and teachers to improve teaching, It is urgent to further strengthen the construction and application of the platform to expand its functions and enrich its resources, so as to better serve students' independent learning, teachers' teaching improvement, sharing of quality education resources in rural areas, collaborative education between home and school, and emergency "suspension of classes without stopping school". In accordance with the overall deployment of the Ministry of Education's strategic action to promote the digitization of education, and to adapt to the new situation and new needs, the National Wisdom Education Platform for Primary and Secondary Schools has been further upgraded to become an important driving force and a powerful support for the modernization of basic education. Not every lesson has been taught in this way, and the advantages and disadvantages of this model have been felt. After a long period of practice, the author reflects on the following aspects: for students, the integration of modern

intelligent education technology into daily mathematics teaching activities and the creation of an information-based learning environment can largely improve the dullness of traditional teaching and give more interest to the mathematics classroom, making teachers' teaching more imaginative and vivid and students' learning more diverse and interesting. For parents, smart education can better monitor their children's learning process. Parents can also understand the status of their children's learning by viewing the classroom exercises, homework and examinations on the cloud platform, without having to keep a daily watch. The children are taught to learn and the parents are relieved of the burden.

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