The Application of Wireless Network Technology in Oral English Teaching in the Era of Mobile Internet

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Abstract. In order to improve the quality of oral English teaching, this paper applies wireless network technology to oral English teaching to improve the intelligent effect of modern English teaching. Based on the analysis of the instantaneous characteristics of commonly used digital communication signals, this paper identifies the signal modulation type based on statistical characteristics, constructs the identification parameters, and combines the identification parameters with the classification and discriminator of the decision tree structure. Moreover, this paper determines the discrimination threshold according to the characteristics of the signal, realizes the fast and accurate identification of the digital communication signal, and applies the algorithm to the oral English teaching system. In addition, this paper combines the experimental research to carry out the system verification. The experimental research shows that the oral English teaching system based on the intelligent communication algorithm proposed in this paper can effectively improve the efficiency of oral English teaching.

Keywords: mobile Internet; wireless network; English; oral language teaching.

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1 INTRODUCTION

The concept of technology determines the motivation and enthusiasm of educators to use information technology in teaching. Among the various understandings of technology, concepts such as technological revolution, technological threat and technological uselessness have affected the use of information-based teaching technology and the way it is used to a certain extent. At the same time, some educators are confident that technology will change education. For example, some people believe that information-based teaching technology will improve the teaching process, improve teaching effects, make explanations more flexible, make educational resources more accessible, help improve curriculum management, share resources, reduce costs, and create various business and strategic opportunities [1]. However, many descriptions of the advantages of information-based instructional technology are only hypotheses, and evidence shows that some of these advantages only exist in certain proprietary fields and related occasions. Moreover, the excessive publicity of the role of information-based teaching technology will ignore the active role of educators in education and teaching, so that some issues that should have been paid attention to are ignored. In addition, there are some educators with fear of new technology [2].

Because the use of new technology in teaching will constantly challenge the original teaching mode, there are still quite a few educators who are skeptical and resistant to information-based teaching technology. Even if they have an objective understanding of technology, many teachers cannot successfully use information-based teaching technology in teaching because of their own growth environment and knowledge and ability structure. Therefore, there are few teachers who can really give full play to the advantages of information-based teaching technology [3].

Much of the educational literature argues that new technologies will revolutionize education and revolutionize the way humans learn. Although this view sees the important role of new technology in educational reform, it ignores the essence of technology. Technology can only be a device forever, and it is not the device but the means that plays an educational role [4]. A technology can only become a means when it uses a specific symbolic rule, finds its place in a specific social environment, and slowly penetrates into the economic and political context. The inherent flaw of technology is that it cannot integrate information by itself. In the view of factorism, education is often just a collection of information, but the information itself does not provide how to apply, arrange and judge information [5]. This ability is only gradually acquired when students begin to understand, and based on that understanding, interpret and sequence the information gathered. Information-based instructional technologies make it easy to gather information in dizzying ways. Maybe these things improve students' literacy skills to some extent [6]. New technologies are appealing, but they do not create relationships, they do not convey the judgments and evaluations that people use to navigate everyday life, and they do not encourage the exchange and discussion of meaning [7]. If people do not reflect on the technology itself, then we will see this situation: "In this ordinary world, people are surrounded by endless and compelling technologies that neither bring people Fun, too, doesn't make people stop - it makes them constrained and even busier [8].

Information and communication technology in education and teaching refers to the educational model based on information and communication technology to support, enhance and optimize the transmission of information. According to the statistics of UNESCO's research based on this educational model worldwide, ICT can promote students' learning and teaching of courses [9]. By continuously deepening the integration of ICT into curriculum teaching, students have gained more knowledge reserves and improved their ability to express, innovate and learn independently. The application of ICT in education not only realizes the opportunity for students to access course materials anytime, anywhere, inside and outside the classroom, but also provides flexibility for students and teachers to participate in learning and teaching, education and teaching are more inclusive, and students can learn according to their own learning situation. Obtain the necessary materials from the curriculum resources to learn effectively according to their own different speeds and styles [10]. In addition, the use of ICT in education requires, for example, the ability to explain and demonstrate problem solving methods using this technology. Students need to discuss, test and speculate on various strategies they will use [11]. In this process, students' higher-order thinking ability is developed, and at the same time, cooperative learning activities are promoted, which in turn promotes the development of language ability. The use of ICT in education and teaching also stimulates interest in learning, enriches teaching modes, and makes knowledge transfer and learning process more enjoyable. Diverse online learning activities stimulate learning enthusiasm, that is, improve students' participation in the learning process. and knowledge acquisition [12].

The traditional offline teaching mode has its advantages, but the original syllabus is no longer applicable in the new blended teaching mode. If we want to give full play to the advantages of online and offline blended teaching, we must revise the original syllabus and introduce online teaching [13]. In terms of teaching content, we can put the content of memorization and practice in the online teaching class to complete, and students have more freedom in learning [14]; To teach in the offline classroom, this part of the content can often achieve better learning effects by using face-to-face intuitive teaching. Taking the communication technology application training course as an example, the analysis of the experimental principle and the development of the expansion experiment are basically completed in the offline classroom. When encountering difficulties, students can have face-to-face communication with teachers, while the experimental preview, review, self-contained training are completed. Testing and other content are unified on the online platform. In the actual teaching process, it is not necessary to strictly adhere to the division of the above teaching links, and appropriate adjustments can be made according to specific teaching needs [15].

After the online and offline blended teaching is carried out, the original performance evaluation scheme must also be changed. The assessment and evaluation method of traditional offline teaching usually emphasizes the end of the term and ignores the usual, and the usual grades account for a small part, and the final exam is finalized. This assessment method lacks the evaluation of the learning process [16]. The final result after improvement will include check-in, online platform Q&A, experimental operation, group discussion and other links. The reformed grades not only include teachers' evaluation of students' learning, but also add a part of students' self-evaluation and mutual evaluation, and students in the same group can rate the performance of others, effectively preventing the occurrence of situations where only individual students in a group fully participate. situation and mobilize the enthusiasm of each student [17].

At present, when using information-based teaching technology to teach, there is a phenomenon that cannot be ignored is that the teaching plan is incomplete, and the consideration of technology exceeds the consideration of teaching and learning. Although some schools have technical research institutes, most of these research institutes operate independently, without integrating the viewpoints of researchers and educators from the overall perspective, and without forming a systematic teaching plan, which makes many teachers rely on their own Education and teaching understanding to use information-based instructional technology [18]. One consequence of this phenomenon is the absence of evaluation criteria. No one knows who has successfully used information-based teaching technology in teaching and is worthy of promotion, and it is impossible to judge the actual effect of using information-based teaching technology in teaching, whether it has effectively improved the quality of teaching and learning. In addition to the incomplete teaching plan, there is also a messy service system [19]. Information technology teaching technology service is a systematic project that requires the participation and feedback of librarians, technical experts, teachers and students. In most campuses, teachers and students do not receive timely and necessary services. Various technical services There is also a lack of communication and coordination among personnel [20].

This paper applies wireless network technology to oral English teaching to improve the intelligent effect of modern English teaching and promote the efficiency of oral English teaching.

2 IDENTIFICATION OF MODULATION TYPES OF DIGITAL COMMUNICATION SIGNALS BASED ON STATISTICAL FEATURES

The methods of signal instantaneous feature extraction mainly include the following methods:

(1) Instantaneous feature extraction based on Hilbert transform

The analytical expression of the narrowband signal is constructed by Hilbert transform, and the relationship between the real part and the imaginary part of the analytical expression of the signal is used to express the instantaneous characteristics of the signal at any time, and the instantaneous parameters are extracted.

The intelligent teaching communication signal is expressed as:

$$x(t) = m(t)\cos(\varphi(t)) \tag{2.1}$$

The analytical expression of the signal is obtained by Hilbert transform:

$$z(t) = x(t) + jH[x(t)] = a(t)e^{j\varphi(t)} \tag{2.2}$$

By extracting the real and imaginary parts of formula (2), its instantaneous amplitude $a(t)$ and instantaneous phase $\varphi(t)$ can be obtained through analytical expressions.

$$\begin{cases} a(t) = \sqrt{x^2(t) + H^2[x(t)]} \\ \varphi(t) = \arctan\left\{\dfrac{H[x(t)]}{x(t)}\right\} \end{cases} \tag{2.3}$$

From the first-order differential relationship between the instantaneous phase and the instantaneous frequency, the function expression of the instantaneous frequency $f(t)$ of the signal is obtained.

$$f(t) = \frac{1}{2\pi}\frac{d\varphi(t)}{dt} \tag{2.4}$$

After sampling the signal $x(t)$, the discrete time series $x(n)(n = 1, 2, \cdots, N)$ is obtained. The functional expression of its instantaneous amplitude $a(n)$ is:

$$a(n) = \sqrt{x^2(n) + H^2[x(n)]} \tag{2.5}$$

According to formula (5), the time domain envelope of the digital intelligent teaching communication signal is obtained through Matlab simulation, as shown in Figure 1.

For the discrete time series signal $x(n)$, because the value range of the phase $\varphi(n)$ is $[0, 2\pi]$, the direct calculation will produce phase convolution. Therefore, only after the instantaneous phase sequence of the signal is corrected, the accurate instantaneous linear phase information of the received signal can be obtained.

$$\varphi_w(n) = \varphi(n) + G_k(n) \tag{2.6}$$

In formula (6), $G_k(n)$ is the correction phase sequence, and the function expression is:

$$G_k(n) = \begin{cases} G_k(n-1) - 2\pi, \varphi(n+1) - \varphi(n) > \pi \\ G_k(n-1) + 2\pi, \varphi(n) - \varphi(n+1) > \pi \\ G_k(n-1), \text{other} \end{cases} \tag{2.7}$$

By eliminating the linear component caused by frequency in the linear phase, the nonlinear phase component can be obtained, that is, the initial phase of the signal. The initial phase of the signal is usually used for the calculation of signal characteristics.

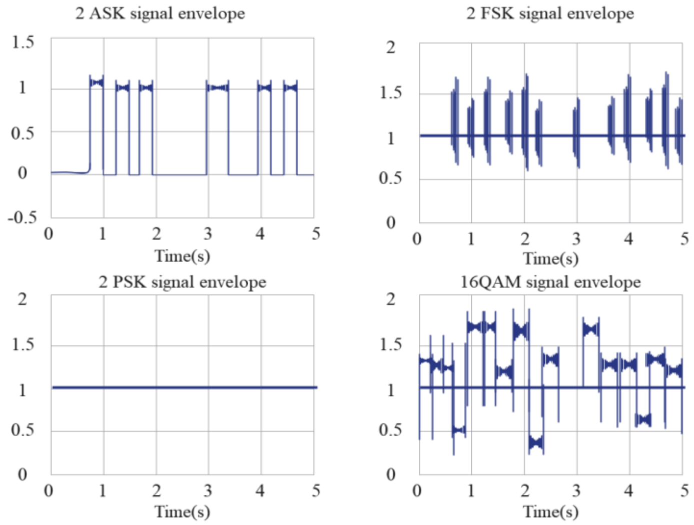

Figure 1: Time-domain envelope diagram of digital signal.

$$\varphi_0(n) = \varphi_w(n) - 2\pi f_c n T_s \tag{2.8}$$

Among them, $G_K(0) = 0$, f_c is the carrier frequency of the signal, and T_s is the signal sampling time interval. The nonlinear phase obtained by direct rejection has a relatively large error. Under the condition of high signal-to-noise ratio, the instantaneous phase of BPSK and QPSK signals is simulated by Matlab, and the results are shown in Figure 2.

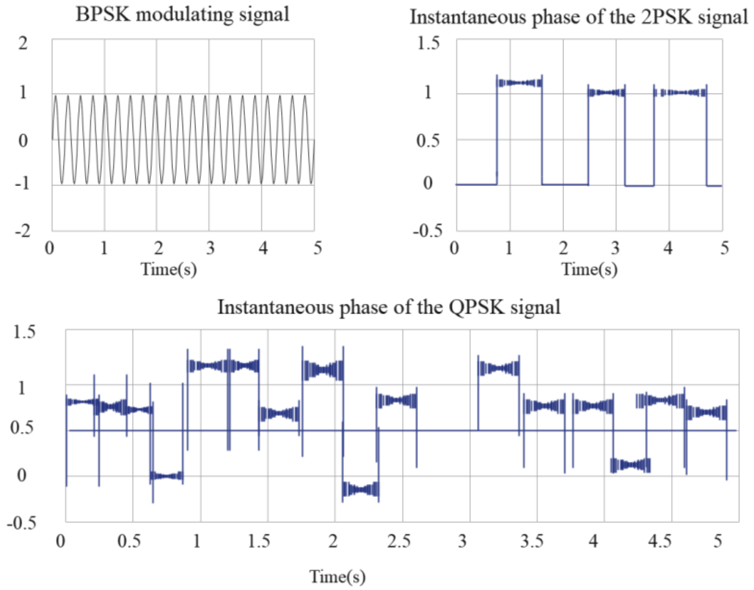

Figure 2: Instantaneous phase of digital signal.

The instantaneous frequency of the signal can be expressed as:

$$f(n)=\frac{\varphi_w(n+1)-\varphi_w(n)}{2\pi},\ f_s \tag{2.9}$$

Therefore, the problem of obtaining the instantaneous amplitude and instantaneous phase of a narrowband signal $x(t)$ becomes the problem of obtaining $H[x(t)]$.

(2) EMD decomposition of complex digital intelligent teaching communication signals

The Fourier transform of the function $z(t)$ is parsed:

$$Z(\omega)=\int_{-\infty}^{+\infty} a(t)e^{j\varphi(t)}e^{j\omega t}dt=\int_{-\infty}^{+\infty} a(t)e^{j[\varphi(t)-\omega t]}dt \tag{2.10}$$

It can be seen that when $\frac{d[\varphi(t)-\omega t]}{dt}=0$, $Z(\omega)$ takes the maximum value. The function is only meaningful based on the instantaneous frequency of the natural mode. Therefore, in order to obtain the instantaneous frequency, the signal must be decomposed into a series of combinations of IMFs. The specific steps of EMD decomposition are as follows:

1. The algorithm calculates all extreme points of the signal. The maximum value points form the upper envelope $e_{up}(t)$ of the signal, and the minimum value points form the lower envelope $e_{low}(t)$ of the signal, and the average value $m_1(t)$ is calculated.

$$m_1(t)=\frac{e_{up}(t)+e_{low}(t)}{2} \tag{2.11}$$

2. The algorithm finds $h_1(t)=x(t)-m_1(t)$. If $h_1(t)$ is not the basic IMF component, the algorithm repeats the above steps until $h_{1,k}(t)$ satisfies the basic IMF component.

3. The algorithm defines $c_1(t)=h_{1,k}(t)$ and separates it from the original signal, and $r_1(t)=x(t)-c_1(t)$. At this point, $r_1(t)$ is used as a new signal and processed according to the above steps, and x(t) is finally expressed as:

$$x(t)=\sum_{i=1}^{N}c_i(t)+r_N(t) \tag{2.12}$$

After the signal $x(t)$ is decomposed, the algorithm obtains N IMF components $c_1(t)$ and residual term $r_N(t)$. Since the residual term function $r_N(t)$ is a monotonic function or constant, it can be ignored. Therefore, the signal $x(t)$ can be represented by its components as:

$$x(t)=\mathrm{Re}\left[\sum_{i=1}^{N}a_i(t)e^{j\int\omega_i(t)dt}\right] \tag{2.13}$$

Any signal can be decomposed into different and independent IMF components as long as it has at least one maximum point and minimum point. For signals without extreme points and only inflection points, it can also be obtained by differentiating and integrating the signal data.

Signal type recognition based on instantaneous features includes two parts: feature parameter construction and judgment decision. The feature parameter construction is to extract the effective features that can best reflect the difference of the signal from the time domain or transform domain of the signal, and use it as the main basis for the decision of the signal type. Judgment decision-making is to compare the effective characteristic parameters with the preset thresholds according to certain judgment rules, and make accurate judgments according to the results.

(1) Feature parameter structure and error analysis

This paper mainly introduces the identification of commonly used modulation types in digital modulation signals 2ASK, 2FSK, 2PSK, 4ASK, 4FSK, 4PSK, 8PSK and 16QAM signals using five characteristic parameters $\gamma_{\max}$, μ_f, μ_{f^2}, σ_{ap} and σ_{af}, which are based on instantaneous information.

1. The amplitude spectrum peak $\gamma_{\max}$ is:

$$\gamma_{\max} = \frac{1}{N_s} \max \left| FFT\left(a_{cn}\left(i\right)\right) \right|^2 \tag{2.14}$$

In formula (13), N_s is the number of signal sampling points, $a_{cn}(i)$ is the normalized instantaneous amplitude of the zero center of the signal, and the function expression is:

$$a_{cn}\left(i\right) = a_n\left(i\right) - 1 \tag{2.15}$$

$$a_n\left(i\right) = \frac{a\left(i\right)}{m_a} \tag{2.16}$$

$$m_a = \frac{1}{N_s} \sum_{i=1}^{N_s} a\left(i\right) \tag{2.17}$$

In formula (15), $a_n(i)$ is the normalized instantaneous amplitude of the signal, and m_a is the average value of the instantaneous amplitude of the signal corresponding to N_s sampling points of the signal. The purpose of this processing is to eliminate the influence of the channel gain on the peak value of the amplitude spectrum, and to make the threshold not change with the signal power, thereby enhancing the applicability and stability of the algorithm.

$\gamma_{\max}$ differentiates the constant envelope modulation signal and the non-constant envelope modulation signal by reflecting the change degree of the signal in the amplitude. By reflecting the change degree of the signal amplitude, the constant envelope modulation signal and the non-constant envelope modulation signal are distinguished. According to the analysis of the instantaneous characteristics of the digital modulated signal, the digital modulated signals with constant envelope include MFSK and MPSK. The envelope of the MFSK signal is constant 1, so its mean value is 0. Although the MPSK signal is limited by the channel bandwidth, there will be a sudden change when the phase changes, but the average amplitude is close to zero. The digital intelligent teaching communication signals with non-constant envelope include MASK and 16QAM, their instantaneous amplitude is not constant, and the average amplitude is not 0. Therefore, the distinction can be made by choosing an appropriate threshold $t_1\left(\gamma_{\max}\right)$.

By calculating the amplitude spectrum peak value $\gamma_{\max}$ of the digital intelligent teaching communication signal, the correlation curve between the signal $\gamma_{\max}$ value and the signal-to-noise ratio (SNR) is obtained respectively, and Matlab simulation is carried out, as shown in Figure 3.

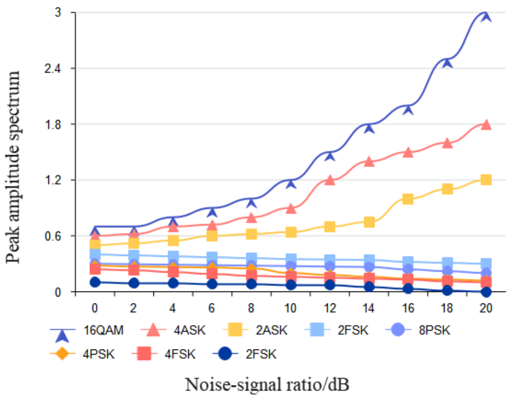

Figure 3: Correlation curve between $\gamma_{\max}$ and SNR.

It can be seen that with the increase of the signal-to-noise ratio (SNR), the identification effectiveness of the peak $\gamma_{\max}$ of the amplitude spectrum of the modulated signal is significantly improved. When the signal-to-noise ratio of the signal is greater than 10dB, the 2ASK, 4ASK and 16QAM signals can be completely distinguished from other signals by selecting appropriate threshold parameters.

2. Frequency peak μ_f

$$\mu_f = \frac{E\left[f^4(i)\right]}{\left\{E\left[f^2(i)\right]\right\}^2} \tag{2.18}$$

Among them, $f(i)$ is the instantaneous frequency of the signal and the symbol $E\{\cdot\}$ is the statistical average of the function. The frequency keying signal (2FSK, 4FSK) and the phase keying signal (2PSK, 4PSK, 8PSK) can be distinguished by calculating the value of the frequency peak parameter μ_f of the signal to be identified and comparing it with the decision threshold.

By calculating the frequency peak μ_f, the correlation curve between the frequency peak μ_f of the signal MPSK and MFSK and the signal-to-noise ratio SNR is obtained, and Matlab simulation is performed, as shown in Figure 4.

It can be seen that the frequency peaks μ_f of the signals MPSK and MPSK have obvious differences, and the difference becomes larger as the signal-to-noise ratio increases. MPSK and MFSK can be effectively distinguished by selecting appropriate parameters for different modulated signals.

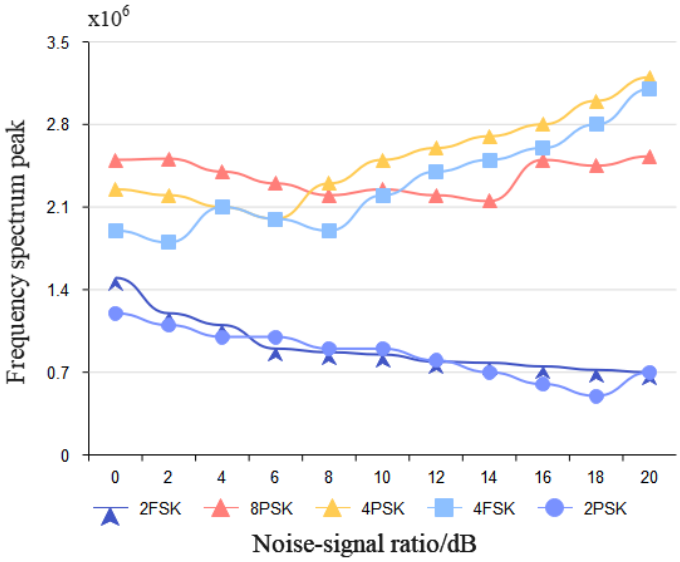

Figure 4: Correlation curve between μ_f and SNR.

3. Frequency square mean μ_{f^2}

$$\mu_{f^2} = \frac{1}{N_s} \sum_{i=1}^{N_s} f_n^2(i) \tag{2.19}$$

In formula (18), $f_n(i)$ is the modification of the instantaneous frequency $f(i)$, and the relationship between it and the signal frequency $f(i)$ is:

$$f_n(i) = \frac{F_s / f_d}{40} \cdot f(i) \tag{2.20}$$

The frequency square mean value μ_{f^2} mainly realizes the distinction between the frequency keying signals 2FSK and 4FSK signals. The 2FSK signal has two carrier frequencies, and the 4FSK signal has four carrier frequencies. By comparing the instantaneous frequency square mean of these two signals, it can be seen that the frequency square mean of the 4PSK signal is relatively large. The two signals can be differentiated by choosing an appropriate feature threshold $t(\mu_{f^2})$.

By calculating the frequency square mean μ_{f^2}, the correlation curve between the frequency square mean μ_{f^2} of the signals 2FSK and 4FSK and the signal-to-noise ratio SNR is obtained, and Matlab simulation is performed, as shown in Figure 5.

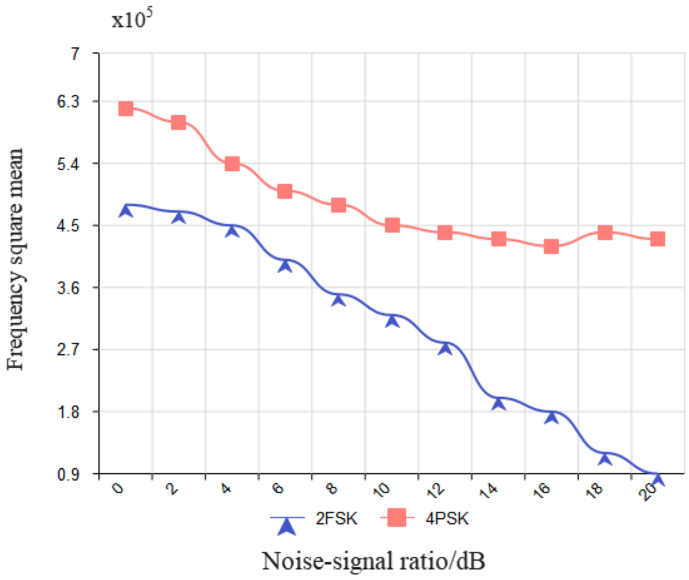

Figure 5: Correlation curve between μ_{f^2} and SNR.

It can be seen that the frequency square mean μ_{f^2} of the signals 2FSK and 4FSK is significantly different, and has different values with the difference of the signal-to-noise ratio. MPSK and MFSK can be effectively differentiated by selecting appropriate parameters.

4. Absolute phase standard deviation σ_{ap}

$$\sigma_{ap} = \sqrt{\frac{1}{c}\left[\sum_{a_n(i)>a_t} \varphi^2{}_{NL}(i) - \sum_{a_n(i)>a_t} \left|\varphi_{NL}(i)\right|^2\right]} \tag{2.21}$$

In formula (17), a_t is the strong signal judgment threshold, c is the number of strong signals in the sampling sequence, and $\varphi_{NL}(i)$ is the nonlinear instantaneous phase sequence normalized by the zero-crossing center. $\varphi_{NL}(i)$ can be expressed as:

$$\varphi_{NL}(i) = \varphi(i) - \frac{1}{N_s}\sum_{i=1}^{N_s}\varphi(i) \tag{2.22}$$

The absolute phase standard deviation σ_{ap} is mainly used to filter the 2PSK signal from other phase keying signals. The signal 2PSK has two phase values. Ideally, after subtracting the mean value from the instantaneous phase and taking the absolute value, it takes the value $\sigma_{ap} \approx 0$, which does not contain phase information. However, for the 4PSK and 8PSK signals, the instantaneous phase values are four or eight respectively, and the absolute value of the normalized phase at the zero center is $\sigma_{ap} \neq 0$, so choosing the appropriate threshold value $t(\sigma_{ap})$ can realize the distinction between 2PSK signals.

By calculating the absolute phase standard deviation σ_{ap}, the correlation curve between the absolute phase standard deviation σ_{ap} of the signals 2PSK, 4PSK and 8PSK and the signal-to-noise ratio SMR is obtained, and the Matlab simulation is performed, as shown in Figure 6.

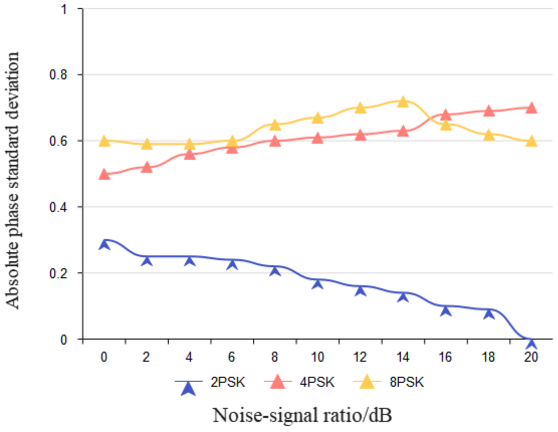

Figure 6: Correlation curve between σ_{ap} and SNR.

As shown in the figure, the absolute phase standard deviation σ_{ap} of the signals 2PSK, 4PSK and 8PSK has different values with different signal-to-noise ratios. By choosing appropriate parameters, the signal 2PSK can be effectively distinguished from it.

5. Corrected absolute phase standard deviation σ_{ap2}

$$\sigma_{ap2} = \sqrt{\frac{1}{N_s}\left[\sum_{i=1}^{N_s}\varphi_2^{\,2}(i) - \sum_{i=1}^{N_s}\left|\varphi_2(i)\right|^2\right]} \tag{2.23}$$

The corrected absolute phase standard deviation is a parameter that reflects the absolute phase change. Among them,

$$\varphi_1(i) = \varphi(i) - E(\varphi(i)) \tag{2.24}$$

$$\varphi_2(i) = \left|\varphi_1(i)\right| - E\left|\varphi_1(i)\right| \tag{2.25}$$

The corrected absolute phase standard deviation σ_{ap2} is mainly used to distinguish 4PSK and 8PSK signals. The 4PSK signal has four instantaneous phases. After processing, two $\varphi_2(i)$ values with equal magnitude and opposite sign are obtained, and the corrected absolute phase standard deviation is $\sigma_{ap2} = 0$. The 8PSK signal has eight instantaneous phases, and after processing, four $\varphi_2(i)$ values are obtained, of which the magnitudes are equal and the signs are opposite, and the corrected absolute phase standard deviation is $\sigma_{ap2} \neq 0$. By choosing an appropriate threshold $t(\sigma_{ap2})$, the two signals can be differentiated.

By calculating the corrected absolute phase standard deviation σ_{ap2}, the correlation curve between the corrected absolute phase standard deviation σ_{ap2} of the signals 4PSK and 8PSK and the signal-to-noise ratio SNR is obtained, and the Matlab simulation is performed, as shown in Figure 7.

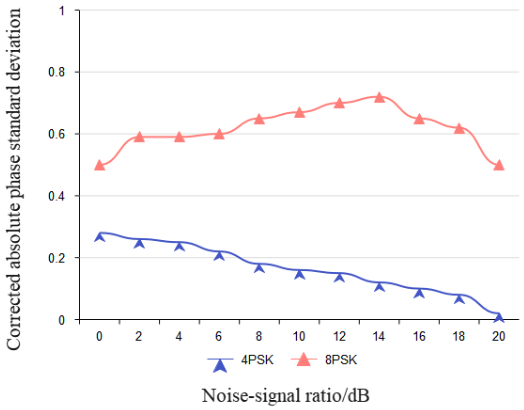

Figure 7: Correlation curve between σ_{ap2} and SNR.

As shown in the figure, the values of the corrected absolute phase standard deviation σ_{ap2} of the signals 4PSK and 8PSK are quite different in the case of different signal-to-noise ratios. Signals can be effectively distinguished by selecting appropriate parameters.

By analyzing the instantaneous phase of the MPSK signal, for any phase shift keying modulation signal in 2^M-ary system, as long as its instantaneous phase is processed M times, its 2^M instantaneous phases can always be changed into two instantaneous phase values with opposite signs and equal probability, so that $\sigma_{ap2} = 0$ can be distinguished by selecting appropriate parameters.

(2) Modulation type classifier

1. The amplitude spectrum peak $\gamma_{\max}$ of the signal is calculated and compared to a threshold $t_1(\gamma_{\max})$. The first type of signal (MPSK, MFSK) and the second type of signal (2ASK, 4ASK, 16QAM) can be distinguished according to whether the instantaneous amplitude of the signal is constant or not. The instantaneous amplitude of the first type of signal is basically constant $(\gamma_{\max} < t_1(\gamma_{\max}))$, while the instantaneous amplitude of the second type of signal varies greatly $(\gamma_{\max} > t_1(\gamma_{\max}))$.

2. As to the method for judging the second type of signals (2ASK, 4ASK, 16QAM), it compares the peak value $\gamma_{\max}$ of the amplitude spectrum of each signal with the set threshold value $t_2(\gamma_{\max})$

through calculation. By comparing the results, the 2ASK signal can be further screened out from other signals.

3. The judging method of 4ASK and 16QAM signals is the same as the screening method of 2ASK signal, but the threshold value is different, and the signal amplitude spectrum peak value $\gamma_{\max}$ is compared with the threshold value $t_3\left(\gamma_{\max}\right)$.

4. For the judgment of the first type of signal (MPSK, MFSK), because the signal amplitude is a constant envelope, the frequency peak value μ_f can be compared with the threshold $t\left(\mu_f\right)$ to distinguish.

5. For the judgment of the modulation type of the MFSK signal, because it belongs to the internal judgment of the frequency keying signal, the frequency square mean μ_{f^2} and the threshold $t\left(\mu_{f^2}\right)$ can be used to compare the 2FSK and 4FSK signals.

6. For the phase modulation signals 2PSK, 4PSK and 8PSK of the decision type, by comparing the absolute phase standard deviation σ_{ap} with the threshold $t\left(\sigma_{ap}\right)$, the 2PSK signal can be screened out from the 4PSK and 8PSK signals.

7. For the phase modulation signals 4PSK and 8PSK of the decision type, the corrected absolute phase standard deviation σ_{ap2} is compared with the threshold $t\left(\sigma_{ap2}\right)$.

The modulation type discrimination process of the decision tree structure is shown in Figure 8.

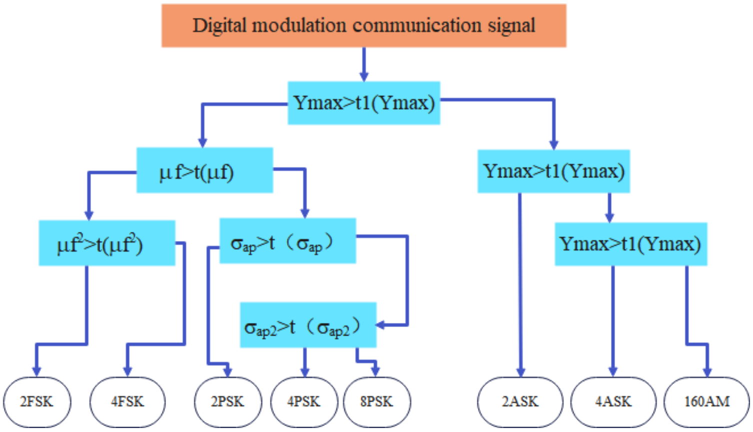

Figure 8: Digital modulated signal classifier based on decision theory.

3 ORAL ENGLISH TEACHING SYSTEM BASED ON INTELLIGENT CMMUNICATION TECHNOLOGY

This paper combines the intelligent communication algorithm of the second part to construct the oral English teaching system, and obtains the results shown in Figure 9.

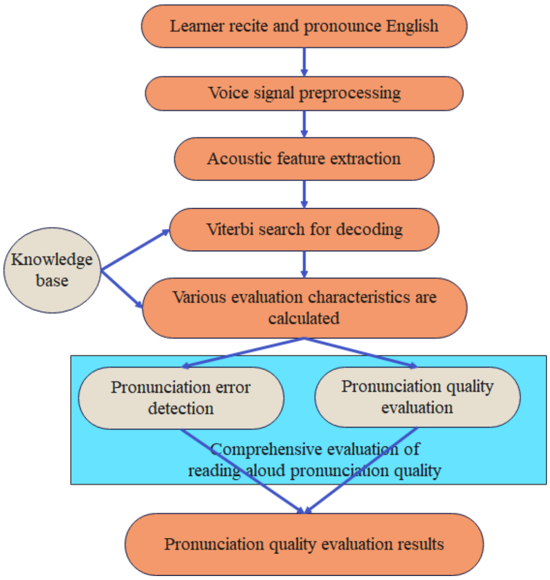

Figure 9: Oral English teaching system.

In the intonation evaluation, the method of feature comparison is adopted in this paper, that is, the quality of the learner's pronunciation intonation is measured by comparing the difference in intonation features between the learner's speech and the corresponding reference standard speech. The specific evaluation process is as follows. First, it extracts the pitch feature Pitch, which represents the intonation feature, from the learner's speech and the reference standard speech, and simultaneously extracts the respective MFCC acoustic features. Then, it performs Viterbi alignment of the learner's voice and the reference standard voice with the given reading text, respectively, to segment out the phoneme boundary information, as shown in Figure 10.

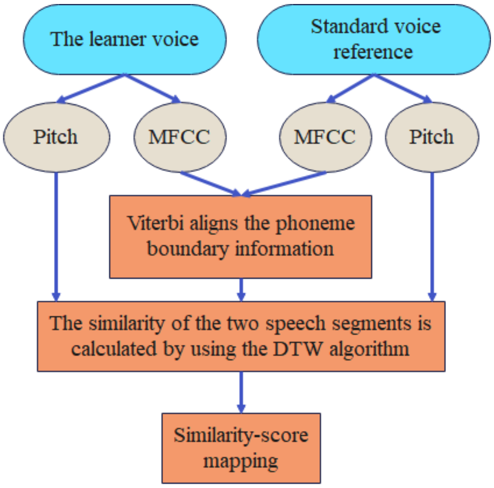

Figure 10: Intonation evaluation block diagram.

The effect of the oral English teaching system based on the intelligent communication algorithm proposed in this paper is verified, and the effect of oral English teaching is counted, and the results shown in Table 1 are obtained.

Number	Oral teaching	Number	Oral teaching	Number	Oral teaching
1	82.961	13	86.143	25	83.056
2	80.294	14	81.014	26	86.079
3	82.867	15	83.929	27	84.307
4	80.870	16	81.528	28	84.582
5	82.250	17	86.046	29	81.282
6	80.267	18	84.819	30	86.685
7	86.456	19	82.434	31	83.585
8	81.203	20	82.716	32	80.566
9	83.042	21	86.391	33	86.081
10	83.346	22	80.826	34	83.243
11	82.212	23	82.290	35	80.587
12	82.018	24	80.617	36	82.655

Table 1: Effect verification of oral English teaching system based on intelligent communication algorithm.

Through the above research, we can see that the oral English teaching system based on the intelligent communication algorithm proposed in this paper can effectively improve the efficiency of oral English teaching.

4 CONCLUSION

To realize the classification and identification of the modulation type of digital intelligent teaching communication signal, it is necessary to transform the signal to be identified, extract the parameters that can reflect the characteristics of the signal, and perform differential processing on each modulation signal. These signal features will directly affect the construction of decision parameters and the selection of classifiers. In theory, there are very high requirements for the signal parameters to be extracted, and it is hoped that these parameters can more intuitively reflect the obvious characteristics between different modulation types of the signal, but the actual situation is more complicated. This paper applies wireless network technology to oral English teaching, improves the intelligent effect of modern English teaching, and promotes the efficiency of oral English teaching. The experimental research shows that the oral English teaching system based on the intelligent communication algorithm proposed in this paper can effectively improve the efficiency of oral English teaching.

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