Hindawi
Mathematical Problems in Engineering
Volume 2023, Article ID 9768741, 1 page
https://doi.org/10.1155/2023/9768741

Retraction

Retracted: Self-Study System Evaluation of Oral English Based on Limit Theory

Mathematical Problems in Engineering

Received 1 August 2023; Accepted 1 August 2023; Published 2 August 2023

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] X. Ming, X. Wang, and W. Liu, "Self-Study System Evaluation of Oral English Based on Limit Theory," *Mathematical Problems in Engineering*, vol. 2022, Article ID 2523088, 11 pages, 2022.

Hindawi
Mathematical Problems in Engineering
Volume 2022, Article ID 2523088, 11 pages
https://doi.org/10.1155/2022/2523088

Research Article

Self-Study System Evaluation of Oral English Based on Limit Theory

Xing Ming, Xihong Wang, and Wenlan Liu

School of General Education Curriculum, Sanya Institute of Technology, Sanya, Hainan 572000, China

Correspondence should be addressed to Xing Ming; 171843252@masu.edu.cn

Received 18 May 2022; Accepted 21 June 2022; Published 12 July 2022

Academic Editor: Xiantao Jiang

With the globalization of the contemporary social economy and its ever-increasing influence, it is particularly important to master a common language in the world at this stage English. For the subjects who have the opportunity to learn English, their listening, reading, writing, and other abilities are relatively good, but the speaking ability is relatively lacking. Therefore, the self-study of spoken English is particularly important for the improvement of the practical application ability of English, and an efficient self-study system will also play a better role in the self-study process. The efficiency of a system depends on the maximum and minimum magnitudes that the system can carry. Therefore, for the self-learning system of spoken English in this paper, it is necessary to calculate the maximum and minimum carrying capacity. Therefore, it is necessary to deal with the limit thinking of the maximum and minimum carrying capacity of the system. The evaluation based on limit theory in this paper is a kind of evaluation of the maximum and minimum carrying capacity of the English oral self-learning system by using the convergence and dispersion characteristics of limit thinking. In order to evaluate the performance of the oral English self-learning system, this paper implements the dynamic evaluator of the oral English self-learning system, and constructs a hardware system for the self-learning oral English. This paper also uses the hidden Markov model in the self-learning system and the application of the central limit theory. The corresponding experimental results show that the mean value of the spoken English test data is 25.1337, and the standard deviation is 2.01385, which is in line with the normal distribution. It shows that the evaluation based on the limit theory can make the operation of the spoken English self-learning system stable.

1. Introduction

Under the vigorous development of the economy, the requirements for talents are changing in both the original labor force and the all-round talent. With the deepening of reform and opening up, the exchanges between people are also accelerating and changing. The communication ability of this department is reflected in the oral mastery of a language and the skill of the language. Compared with English-speaking countries, the environment for oral English learning is lacking, so self-study of oral English is very important. In addition to the influence of the general environment, the self-learning process of spoken English is also influenced by the lack of English language thinking. This phenomenon occurs because the traditional English teaching focuses on the cultivation of English listening, reading, and writing skills, and the whole process tends to solve the problems in the test, which also aggravates the lack of oral English ability. In addition to self-study for spoken English, it is also necessary to evaluate the learning outcomes of each self-study individual. In this regard, self-study individuals need to adopt a relatively stable learning system, which can also provide help for self-study of spoken English. This paper uses the limit theory to evaluate the spoken English self-learning system, and its purpose is to realize the stable operation of the self-learning system.

The study of English has been going on continuously in recent years, among which the study of spoken English is the most important. There have been a lot of relevant studies on the content of this autonomous study. Ismail et al. used a cross-cultural approach to study the differences in spoken English to determine the choice of sojourn by people with

different spoken English [1]. Werner's research was to use assessment methods to compare the learning outcomes between research subjects [2]. The purpose of Ke's research was to improve the oral self-learning strategies of English majors [3]. Jawher and Amin's research was to study the self-learning motivation and self-control of oral English learners [4]. Chien and Valcke studied the beliefs of students' self-learning of oral English in a university and explored the constituent elements of students' learning of oral English from a deeper level [5]. The above research content provides a corresponding foundation for the realization of oral English self-study in different scenarios. They not only study the methods of self-study but also pay more attention to the deeper reasons for the students who are self-studying oral English. This has a great effect on the development of the starting power of oral English self-study. However, there is no evaluation of learning outcomes for the oral English self-learning system, which also makes the learning process of oral English very random, so as to affect the final learning results.

In order to solve a series of problems arising from the possible randomness of the English oral self-study system, the limit theory will be used to evaluate it. In previous studies, a large number of researchers have carried out related work. Rodriguez and his team realized the walk detection of the random phase of dynamic bond percolation through the demonstration of the limit theory [6]. Vuckovic et al. studied the potential energy exchanged between different particles by means of density-dependent function theory combined with limit theory [7]. Pawlas et al. established an asymptotic normal distribution for the sample data when using limit theory for research [8]. Through the application of limit theory, Buhl and Kluppelberg finally obtained sequence models used in various time spaces [9]. Baszczyszyn et al. realized the definition of the central limit theory through research and extended the probabilistic problems he studied [10]. The above research on limit theory has greatly improved the practicality of this theory in mathematics. Among them, the above research directions involve the solution of physical particles, sequence problems in time and space, and probability problems. The main application is still in the category of science and engineering, with a lack of application in the study of Chinese language. In this regard, this paper uses this mathematical theory to evaluate the self-learning system of spoken English in order to increase the stability of the self-learning system of spoken English, so that the learners of spoken English can obtain better learning results.

The purpose of this study is to evaluate the stability of the self-learning system in order to assist the learners of oral English self-study. Because, for self-learning individuals, in addition to dealing with changes in various factors, the most important thing is to obtain the final learning results, and the self-learning system plays an important role in this process. Therefore, this article will adopt the limit theory to evaluate the oral English self-learning system, so as to realize the auxiliary role for individual learners. In this paper, the hardware system experiment of oral English self-learning and the system evaluation experiment based on the central limit theory is carried out. The corresponding result is that the former has a probability of 1.4% misjudgment of English phonetic elements. The latter reflects the normal distribution of the English phonetic data of the experimental subjects in this paper, thus indicating that the application of the limit theory in the self-learning system of spoken English is effective. The innovation of this paper include (1) Evaluating the self-study system of spoken English, rather than one aspect that affects the results of self-study; (2) Applying limit theory in mathematics to evaluation research, which can provide some ideas for scientific research on language.

2. Method of Establishing a Self-Learning System for Oral English Based on Limit Theory

2.1. Method of Establishing a Self-Learning System for Spoken English. The importance of spoken English has gradually emerged. In the traditional English education model, most of the English writing and listening and reading abilities are involved. However, the communication ability of the English language it cultivates is relatively weak. In addition, the traditional English learning method is difficult to correct the learning direction of self-learning for oral language learning. Therefore, it is very important to establish the corresponding system before carrying out the evaluation of the oral English self-study system.

2.1.1. Methods of Learning Spoken English. For the learning of English, most people start from a very young age, which is also a method based on the English test. The learning method of spoken English is quite different from the traditional English learning method. The former pays more attention to the language application scenarios of learners and has higher requirements for English thinking [11]. There are five ways to learn spoken English, the contents of which are shown in Figure 1:

As can be seen in Figure 1, there are five methods for oral English training, which are mainly aimed at the practical application of English, but the premise is that a certain knowledge of English is required to achieve this. For the application of spoken English in real scenarios, it is necessary to have a certain ability to understand, and the other is the use of English in various situations. To a certain extent, the training of spoken English should be the result of the improvement of reading ability. Speaking English also requires the cultivation of English thinking, which is of great help in achieving high-quality learning.

2.1.2. Dynamic Evaluation Method of Oral English Self-Study System. For the self-study of spoken English, the most important thing is to test the learning results of the learners, so adopting a good evaluation method can make the learners grasp their own learning results in a timely and effective manner. To solve this problem, this paper will adopt a dynamic mode-based assessment system for spoken English, which is built on the prevailing online learning [12]. Compared with traditional classroom learning, it is more

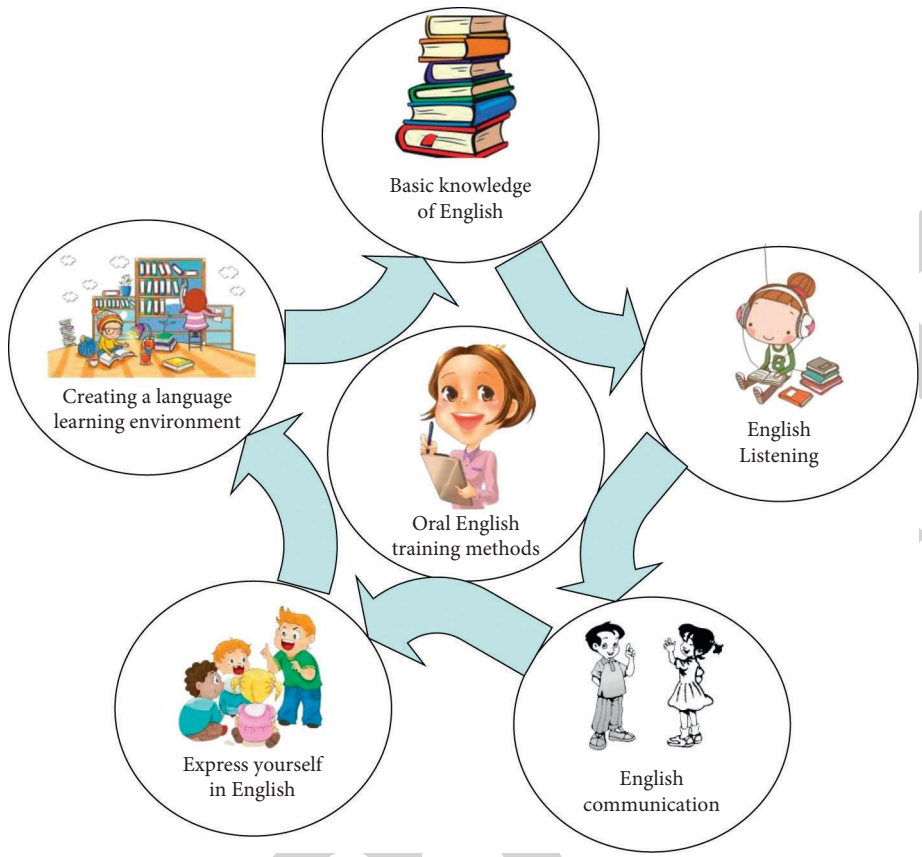


Figure 1: Self-study method of spoken English.

inspection-oriented. For the self-learning system of spoken English, the composition of the evaluation method is shown in Figure 2:

In Figure 2, the self-learning mode of oral English is dynamically constructed. From Figure 2, it can be seen that the evaluation structure is the main part of the entire evaluation system and plays an important role in the evaluation of oral English learning results. For each link in the above process, different evaluation indicators can be designed according to the actual situation. Among them, the process evaluation is aimed at the continuous correction of the self-study of oral English in learning, so as to monitor the effect of learning. Through the collection of corresponding oral English information in different evaluation stages, a complete feedback system for the results of oral English self-study is established.

2.1.3. Self-Learning Hardware System for Spoken English. The above is the discussion of the content of the establishment of the oral English self-study system, in addition to the establishment of the corresponding hardware system. For the evaluation of the learning effect of spoken English, the best method is to collect the voice data of the subjects who participated in the self-study of oral English, and then to analyze and to process the collected voice data. It then is compared with the input standard English phonetic database to give feedback on their learning of spoken English. In this way, a self-study system of spoken English with a score is constructed. Its specific construction form is shown in Figure 3:

Figure 3 is the hardware structure of the evaluation system for self-learning of spoken English. The structure consists of three parts in total: frontend, decoder, and knowledge base, which involves the collection of languages and the corresponding extraction of spoken English features. The collected voice data ares analyzed and processed with reference to the voice comparison database prepared in advance, and then the compared parameters are analyzed and processed through a certain algorithm model. In this paper, the processing of spoken English speech will use hidden Markov model to construct the subsequent self-learning system.

2.1.4. Hidden Markov Models under Limit Theory in Self-Teaching Systems. In this paper, the hidden Markov model is used for the spoken English self-learning system, and the purpose is to extract and recognize the spoken language of the spoken English self-learner. The application here is to use the spoken English phonetic data as the basis for the operation of the model, at the same time, the voice data in the English oral self-learning system is evaluated under the limit, and the data capacity under the limit working state of the system is solved, and finally evaluate the learning effect of the self-learner through the operation of the model [13]. Markov Model

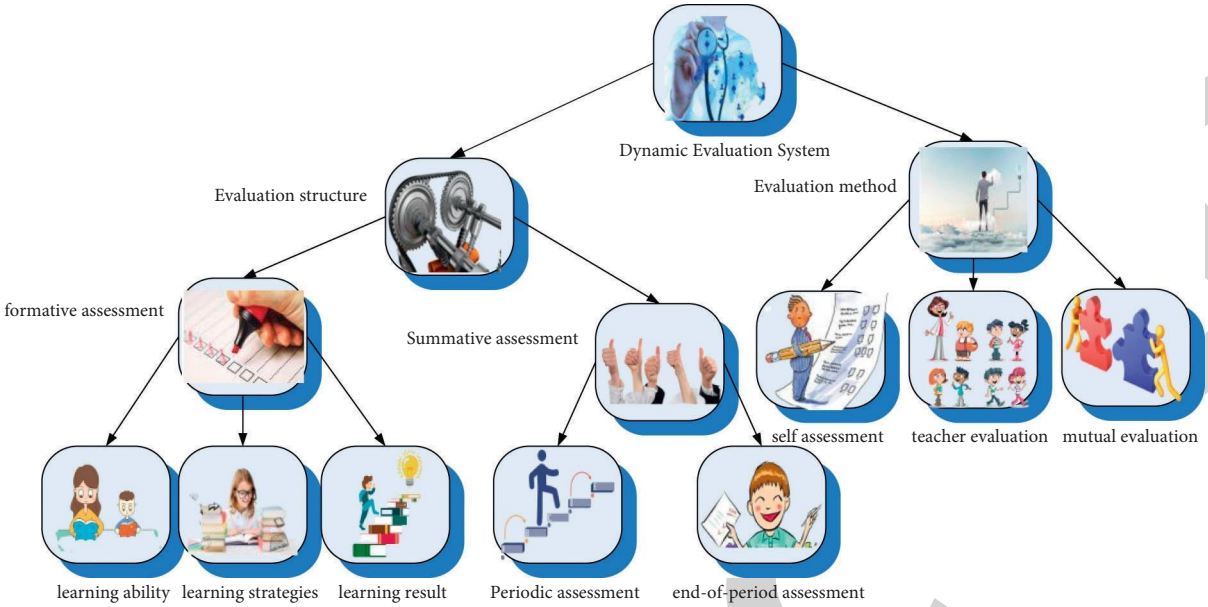


Figure 2: Dynamic assessment of oral English self-study.

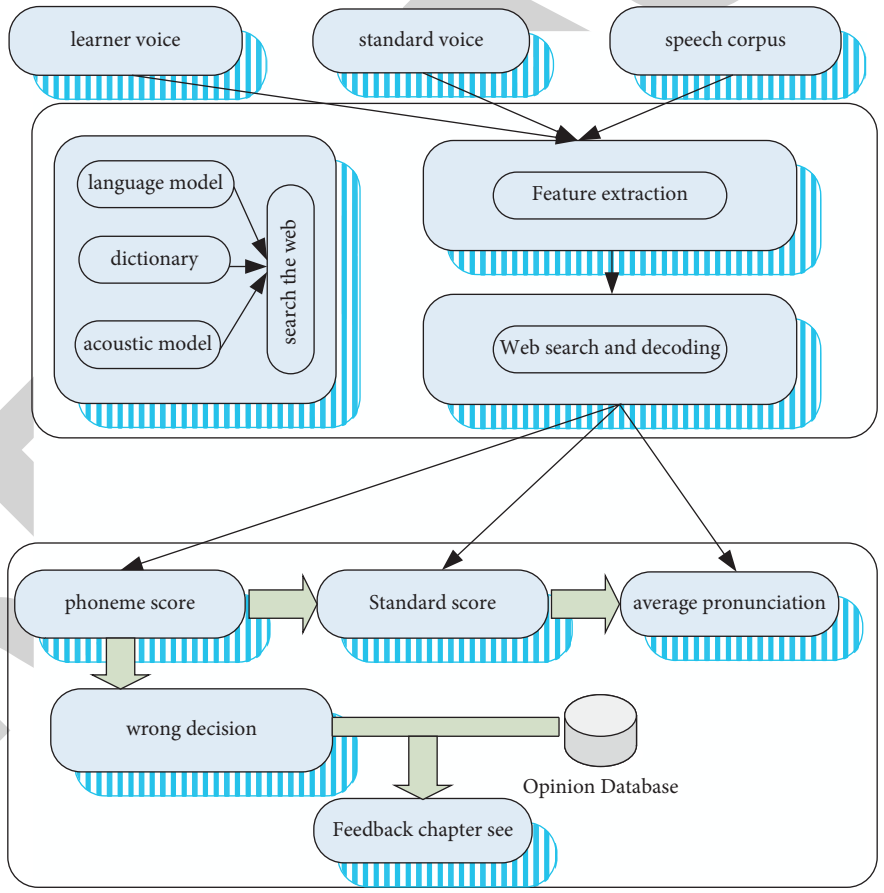


Figure 3: Hardware structure of oral English self-study assessment.

under Limit Theory also has different classification modes according to the content of some algorithms involved. There are also different types of corresponding Marko chains, and their shapes can be represented by Figure 4:

Figure 4 shows the application model of the Markov chain in different situations, which corresponds to different application scenarios. First, the Markov chain needs to be defined. Supposing that there is a set of data W_n, at time u,

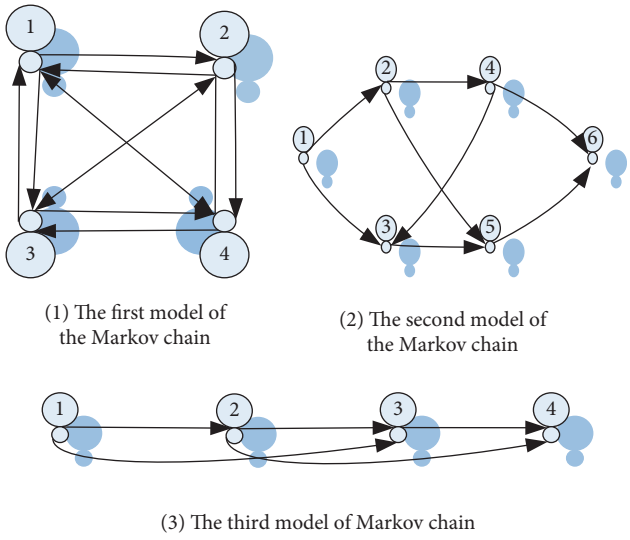


FIGURE 4: Different types of Markov chains: (a) The first model of the Markov chain. (b) The second model of the Markov chain. (c) The third model of Markov chain.

each item of data in the data can be described as $a_1, a_2, \ldots, a_n$. The above data state also satisfies the possibility that at time $x + y$, the corresponding p_{x+y} appears, which is associated with p_m. It can be expressed by formula (1):

$$P\left(W_{x+y} = \frac{p_{x+y}}{W_x} = p_x, W_{x-1} = p_{x-1}, \ldots, W_1 = p_1\right), \\ = P\left(W_{x+y} = \frac{p_{x+y}}{W_x} = p_x\right). \tag{1}$$

The P in formula (1) represents the probability of the data set appearing at different times, including formula (2):

$$p_1, p_2, \ldots, p_x, p_{x+y} \in (a_1, a_2, \ldots, a_n). \tag{2}$$

Formula (2) is a corresponding supplement to formula (1), and it can be known from the above formula that the data group W_n is a Markov chain. The use of the Markov chain scenario can be used to observe a variety of events, and through the operation of the model, the probability of the events that need to be understood can be speculated [14]. By setting the Markov chain model about weather forecast, the possible weather such as wind, rain, cloudy, snow, and other events, is corresponded to the corresponding state. Then according to the model, the probability of occurrence of each weather at the specified time is calculated. Based on the Markov chain, the Markov Model under limit theory can be established, which is mainly used to solve three types of problems. They are the calculation problem of the output probability, the decoding problem of the state sequence and the estimation problem of the model parameters. The first is the probability operation of the Markov model for the output of the event, belonging to the category of evaluation. Suppose that there is a data sequence $Q = (q_1, \ldots, q_i)$ that can be detected, the Markov model can be expressed by formula (3):

$$\beta = (\eta, M, N). \tag{3}$$

On the basis of formula (3), the probability of generating a data sequence matching the observed data sequence is calculated through its operation. Using the original probability calculation formula, it can be directly calculated as formula (4):

$$P(Q|\eta) = \sum_{a_1 a_2 \ldots a_t} P(Q|W, \eta) P(W|\eta). \tag{4}$$

Formula (4) is carried out for the calculation of the output probability of the event, where η represents the observed variable in the data sequence, but the application situations it can deal with are different [15]. In addition, in order to find the best data shift transformation for the output data in the data sequence of the English oral self-learning system under the limit state, a new algorithm is used here. In this way, the probability of the output of the optimal mode can be calculated while solving the optimal shift mode. Here the probability of the output of the accumulated data sequence is first defined as formula (5):

$$\varepsilon_t(c) = \max_{q_1, q_2, \ldots, q_{t-1}} P[q_1 q_2 \ldots q_{t-1}, q_t = c, a_1 a_2 \ldots a_t | \eta], \tag{5}$$

$\varepsilon_t(c)$ in formula (5) represents the total accumulation of sequence output probability. The operation of the auxiliary algorithm here can be expressed by formulas (6)–(8):

$$\varepsilon_1(c) = \eta_c h_c(a_1), \tag{6}$$

$$\varepsilon_t(c) = \max_{1 \le c \le m} [\varepsilon_{t-1}(c) a_{cd}] h_d(a_t), \tag{7}$$

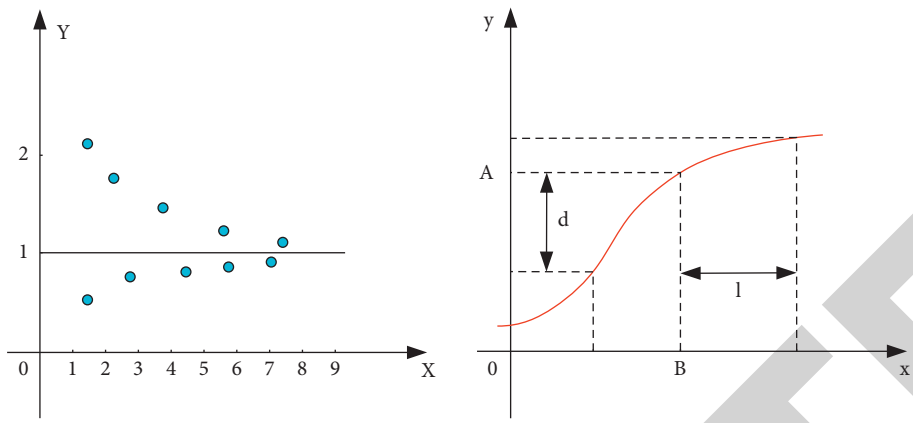
$$Q_T^* = \arg\max \varepsilon_T(c). \tag{8}$$

Formula (6) is to represent the initial operation. In formula (7), a represents the state of the data sample, h represents the probability of the observed reference value, and both c and d are integer parameter variables. The operation of this step is the iterative process of the entire auxiliary algorithm. The third step is the final solution of the result [16].

2.2. Applications of Limit Theory. The birth of limit theory and the thinking of limit are closely related. This theory first came from the idea of solving the area of a circle in ancient times. The content of its main thought is limit thinking, which is a kind of mathematical thought to solve some problems using limit thinking [17].

2.2.1. Source and Application of Extreme Thinking. The limit theory is an important theory in advanced mathematics, and it has been used as a basic idea in common methods of mathematics such as calculus. There are two different ways of defining the limit, which can be represented in Figure 5:

In Figure 5, different definitions are made for the application of extreme thinking. The first one is to perform infinite processing according to the data sequence, while the



(1) The first definition of limit theory (2) The second definition of limit theory

FIGURE 5: Type definitions for limit theory: (a) The first definition of limit theory. (b) The second definition of limit theory.

second one is to perform infinite processing according to different operation functions. The first definition mode in Figure 5 is for the convergence and discreteness of the data, while the second definition is for the definition type corresponding to the continuous data [7]. The principle of integral operation in mathematics is also based on the idea of limit, and the process of using derivatives is determined by the idea of limit. For the learning of limit ideas in advanced mathematics, the steps follow the following process, as shown in Figure 6:

Figure 6 shows the specific flow of extreme thinking learning in advanced mathematics, and the corresponding extreme thinking requirements for each stage are different. But each step is a constant deepening of extreme thinking. The application of limit theory in this paper will adopt a binary model structure based on uncertainty. The application of this model is to events with uncertainty. It is used in conjunction with the central limit theory in limit theory.

2.2.2. Principle and Application of Central Limit Theory. The core content of limit theory, that is, the mathematical idea of limit, has been discussed above, and the specific calculation of limit theory will be described next. The first introduction here is the central limit theory, which can be defined correspondingly by formula (9):

$$\lim_{m\longrightarrow\infty} R\left[\eta\left(\frac{\sum_{i=1}^{m} W_i}{\sqrt{m}}\right)\right] = R[\eta(\varepsilon)], \tag{9}$$

W_i in formula (9) is used to represent a random variable when the test sample to which the central limit theory is applied is detected for the ith time. In formula (9), m is a sample belonging to the natural number set M. $R(*)$ is the fuzzy function represented, and the variable ε in the formula is in line with the normal distribution in the relational expression [18]. The above definition of the central limit theory is an initial definition, which needs to be extensively improved. The first is the improvement toward normal distribution, and the result of the improvement is shown in formula (10):

$$|\delta(a) - \delta(b)| \le H\left(1 + |a|^n + |b|^n\right)|a - b|, \quad \forall a, b \in T. \tag{10}$$

In formula (10), $\delta(*)$ represents a continuous function that forms a locally linear part in the application space of the central limit theory. In addition, for the observed application part, the following definition relationship can be obtained for the variables of one of the levels, as shown in formula (11):

$$K_W[\delta] = R[\delta(W)]. \tag{11}$$

The K_X in formula (11) is a description of the distribution form, which mainly includes the change of random variables with the central limit theory. At the same time, it is assumed that there are two different variables W_1 and W_2 at the same level in formula (11). A similar arrangement can be achieved in the case of formula (12), which is expressed as formula (12):

$$R_1[\delta(W_1)] = R_2[\delta(W_2)], \quad \forall \delta \in T. \tag{12}$$

Formula (12) calculates the distribution relationship between two different random values in the observed data set. Now supposing that the relationship between two data in two levels in a measured data sample is tested, it can be expressed by formula (13):

$$R[\delta(W, Z)] = R[R[\delta(w, Z)]w = W]. \tag{13}$$

Under the condition that formula (13) is established, the relationship between the above two data is in a relatively independent state. In addition to the above distributions in different situations, it is also necessary to consider that the random variable W in the p-level can satisfy formula (14):

$$xW + y\overline{W}^p = \sqrt{x^2 + y^2}W, \quad \forall x, y \ge 0. \tag{14}$$

Both W and $\overline{W}$ in the above formula are the same. If the p-level in the data sample conforms to formula (14), it can be concluded that W is a data set subject to a normal distribution. In addition, it is assumed that in the data space, there is a symmetrically arranged number set $Q(P)$, and the formula for its definition can be expressed by formula (15):

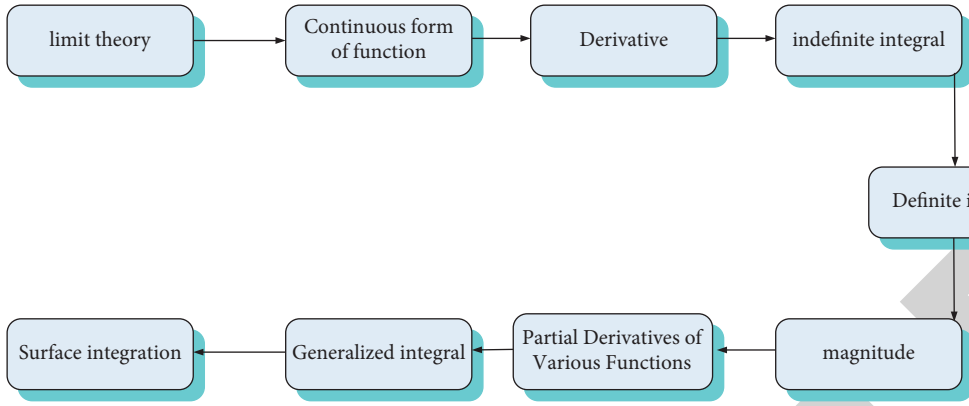


Figure 6: Learning steps for the limit idea of advanced mathematics.

$$Q_+(p) = \{k \in Q(p), k \geq 0\}. \quad (15)$$

In the arrangement for $Q(P)$, the normal distribution random quantity that conforms to formula (15) has the following functional relationship, and its formula expression is as formula (16):

$$O_W(k) = \frac{1}{2} R[\langle kW, W \rangle], \quad k \in Q(p). \quad (16)$$

It can be known from formula (16) that the arrangement of W can be calculated by $O(*)$, whose results can also be verified well. The moderate $O(*)$ represents the functional representation of a normal distribution [19].

3. Evaluation Experiment and Result of English Oral Self-study System under the Limit Theory

3.1. Experiment and Result of Self-study System Evaluation of Oral English. The data required by the system also needs to be collected before the corresponding evaluation of the English oral self-study system. The first is to conduct surveys and statistics on the learning situation of English oral self-students. Because for the oral English self-study system, there are different parts in the system constructed in this paper to manage the self-study's learning situation [20]. In this section, the staged evaluation process generated from the online course in the process of oral English self-study was taken as the specific object of the investigation. The survey objects were divided into four different levels, respectively, the formulation and implementation of learning plans, learning strategies, learning persistence, learning interests, etc. After analyzing and processing the recovered questionnaires, the reliable results of the questionnaires in Table 1 can be obtained.

The results in Table 1 were obtained through a reliability analysis of the questionnaires collected, and a specific assessment method was used. The final analysis results show that the reliability values of the major aspects of each survey were all greater than 0.6, which indicates that the reliability of the questionnaire is relatively high. Before conducting a questionnaire survey on oral English self-learners, a

Table 1: Reliability of the questionnaire.

Category	Coefficient evaluation method	Number of items
Overall questionnaire	0.913	19
Study plan	0.835	5
Learning strategies	0.811	4
Learn persistence.	0.839	4
Learning interest	0.665	5

reference group has been selected, which lacks a more systematic self-study arrangement compared with the survey group. In this paper, the survey subjects of oral English self-study took online courses on their own, while the control group studied completely. The test results of the self-learning ability of the respective members of the two groups before the investigation are shown in Table 2:

The corresponding minimum and maximum values in the data of the experimental group and the control group in Table 2 were 21, 60, and 21, 63 respectively, which indicates that the difference between the two was very small in quantity. Then, after the test processing, the test value between the two groups can be obtained as 0.253, and the difference between the two is 0.587, which did not meet the condition of the existence of the difference, indicating that the members of the two groups have the self-learning ability of spoken English. This shows that the differences in the self-learning ability of the members of the two groups of subjects for spoken English can be ignored. Next is the early collection of the oral English situation of the two group members, and the corresponding test results are shown in Table 3:

Results in Table 3 show that the extreme values of the size of the two groups were 21, 60, and 10, 60, respectively. Its results are very similar to those in Table 2, with little quantitative difference between the two groups [21]. The data in Table 3 above can be tested to obtain a test value of 0.517, and the corresponding difference value was 0.472. Similarly, the conditions were not met for differentiation, indicating that the English-speaking ability between the two groups was basically similar, and there were minor differences. For the two groups before and after participating in

Table 2: Results of the self-learning ability of the two groups of members before the implementation of the questionnaire.

	Number of people	Mean	Standard deviation	Standard error	Minimum	Maximum
Test group	60	37.1864	11.21351	1.32365	21	60
Control group	60	38.2131	9.32513	1.21317	21	63
Total	120	37.5138	9.71352	0.91235	21	63

Table 3: Oral English of the members of the two groups before the implementation of the questionnaire.

	Number of people	Mean	Standard deviation	Standard error	Minimum	Maximum
Test group	60	37.1213	9.35012	1.21522	21	60
Control group	60	38.5137	10.01023	1.25367	10	60
Total	120	37.6215	9.73162	0.95312	10	60

the survey, the results of spoken English scores are shown in Figure 7:

The statistical trend of the test results in Figure 7 is that the oral English of the self-learners who participated in the form of online self-study is slightly better than the self-study of the control group. The number of samples in this survey process was 60 people. Before the investigation, when the two groups had not adopted a certain way to learn oral English, the test value of the two groups' oral test scores was 0.712, and the corresponding difference was not less than 0.05. The difference was not obvious. The test value of 3.751 can be obtained after statistical processing of the survey results after the self-study of oral English in the two groups using different methods. The corresponding difference value was satisfied that the difference value was less than 0.05, at this time there was a relatively obvious difference between the two [22]. In addition, a survey experiment was carried out for the main survey objects of this paper. The survey item was the statistics of different learning effects of oral English learners. The results are shown in Figure 8:

As can be seen from Figure 8, although the surveyed self-taught English speakers were divided into three different groups, the scores of each member of the experimental group were improved to varying degrees. The difference between the three groups was less than 0.05, indicating that there is a difference among the three. This reflects that the staged evaluations studied are also very important for self-learners at different levels, and they can all improve the self-learning effect. This step was also carried out in the form of a questionnaire, the purpose of which was to arouse the self-learner's understanding of their own learning situation and to prepare for the learning of spoken English together with the abovementioned staged assessment. The results of the questionnaire survey are shown in Table 4:

It can be seen from Table 4 above that most oral English learners place more importance on self-assessment. 91% disagreed that the assessment of speaking ability was carried out entirely by teachers, which is the opposite of what is happening in schools today. This also shows that people who learn spoken English by themselves have better self-control ability, which can also be seen from 89% to 81% of people who think that self-assessment is of great importance. Certainly, most self-learners do not just focus on self-assessment in their study of spoken English, but will use a model that combines it with the abovementioned periodic assessment. It can be seen that many autodidacts are reliant on teacher evaluation. At the same time, they support self-assessment, while also acknowledging peer assessments. They acknowledge the diversity of assessments. The above is the data collected for the spoken English system.

3.2. Experiment and Result Analysis of Limit Theory for Self-Study System Evaluation of Oral English. The establishment of the English oral self-learning system is based on the hidden Markov model under the limit theory. The problems involved in this part are the acquisition method of spoken language and the systematic evaluation of the collected audio data. The experiment here will use the limit theory to solve the best language reference value of the spoken English self-learning system, and determine the optimal language reference value, which can be used to determine the error generated by the English morpheme of the self-learner. Therefore, it is first necessary to process the limit theory for the English speech data, and the result is shown in Figure 9:

The results in Figure 9 above show that the normal distribution forms corresponding to different spoken English morpheme samples are different, so what they obey is a distribution form that approximates the normal distribution. The above distribution form is for random variables, the corresponding mean is 25.1337, and the standard deviation is 2.01385. The above results reflect that the English phonetic data of the experimental subjects in this paper are in line with the normal distribution. Next, it is necessary to calculate the limit theory for the morpheme materials in the self-learning system of spoken English, and obtain the optimal morpheme reference value. The corresponding results are shown in Figure 10:

The result of Figure 10 above is that the accuracy of spoken English is judged by taking the spoken English speech database as the reference object of the morphological data collected by the spoken English self-learning system, and comparing the results. The reference value used in the experiment is set at 298, and the probability of misjudgment of the corresponding English phonetic elements is 1.4%, which is a relatively good result. The occurrence of misjudgment in this experiment is caused by the large gap between the standard pronunciation itself and the reference acoustic model, which leads to a decrease in the correct rate. The results of this evaluation well determine the optimal

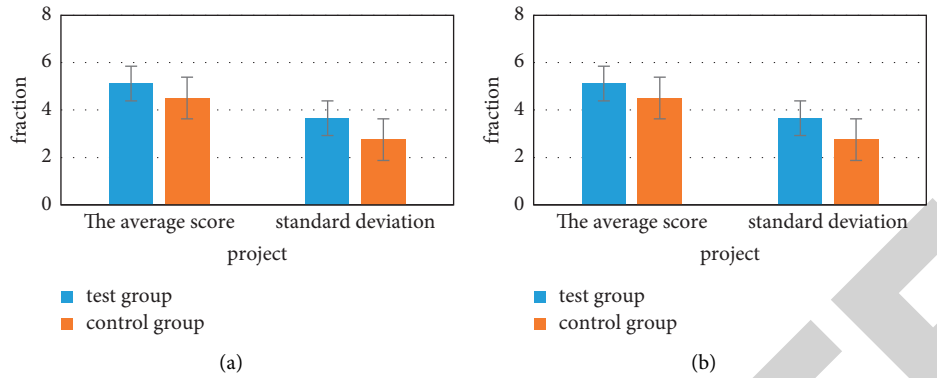


Figure 7: Test results of two groups of spoken English before and after the survey. (a) Oral test results of the two groups before the survey. (b) Oral test results of the two groups after the survey.

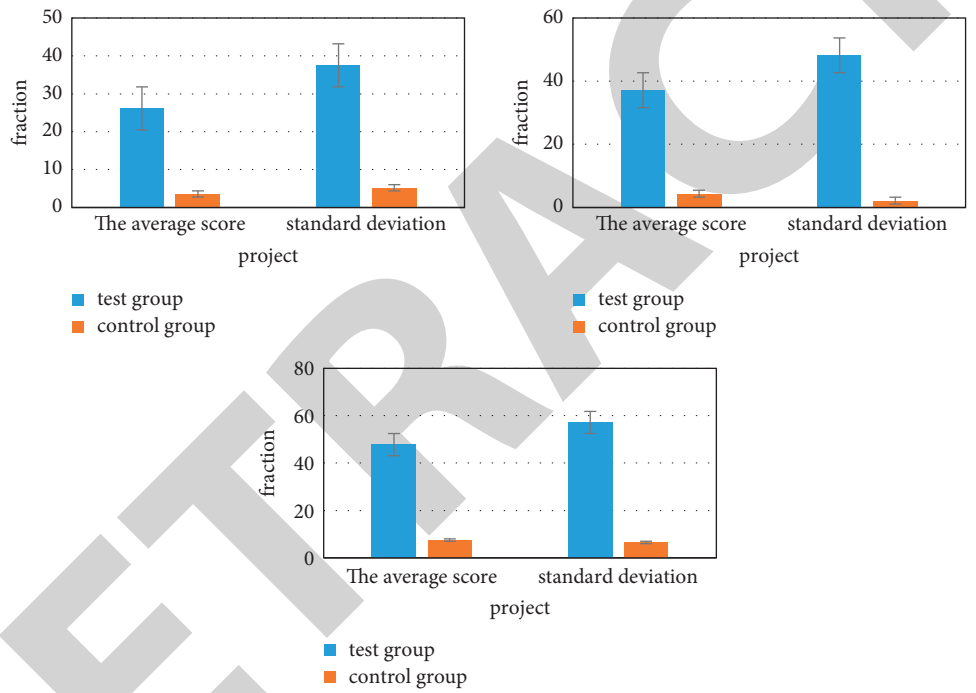


Figure 8: Statistical results of the self-study effect of oral English: (a) Good results in oral English learning. (b) Moderate results in oral English learning. (c) Poor results in oral English learning.

Table 4: Self-assessment survey results.

Item	Agree	Uncertain	Disagree
1. I think self-assessment is very helpful	89%	11%	0
2. I think self-assessment is useful to most people	81%	19%	0
3. I think teacher evaluation can improve my oral English	73%	21%	6%
4. I think self-assessment is more helpful than teacher assessment	23%	57%	20%
5. I think teachers mainly evaluate students' oral ability	0	9%	91%
6. I think self-assessment and teacher assessment should be combined	100%	0	0
7. I think self-assessment is not easy to implement	31%	21%	48%
8. I think oral assessment can be conducted among peers	73%	22%	5%

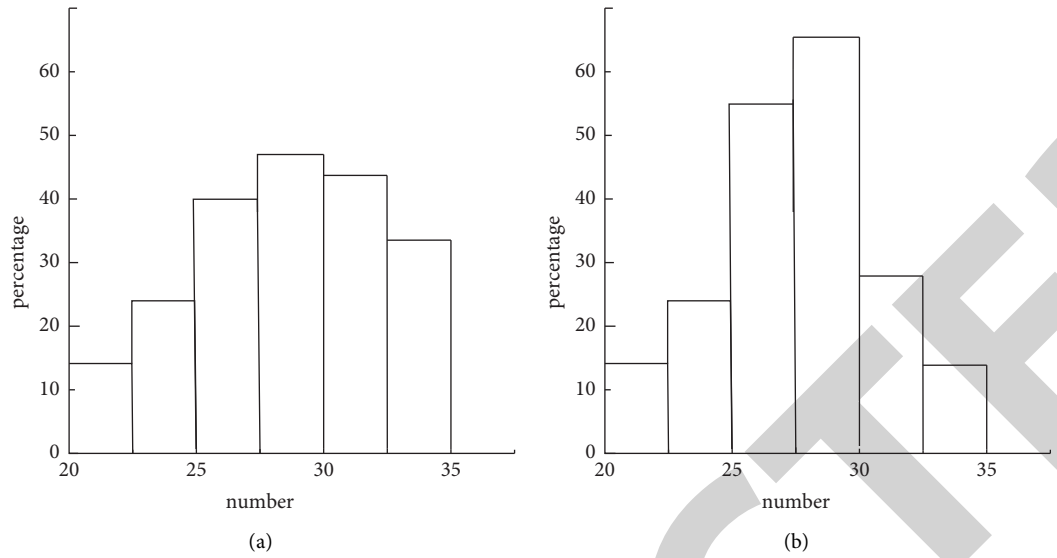


Figure 9: Normal distribution form for different quantities: (a) The number of samples is 300. (b) The number of samples is 700.

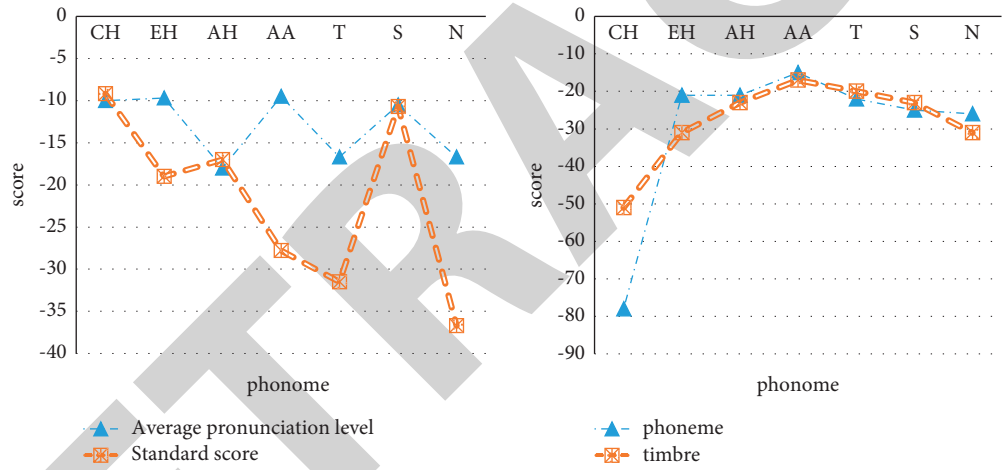


Figure 10: Scoring of different elements of spoken English.

misjudgment evaluation results of the spoken English self-study system and provide assistance for the stability of the system.

4. Conclusion

The content discussed in this paper is aimed at the evaluation of the oral English self-study system. The purpose of this research is to control the effect of oral English self-study to a certain extent, so as to finally improve the oral English. Because, for the system of oral English self-study, the most important thing is the determination of the maximum and minimum load capacity when the system is running, and these two values are also the most important parts for the system's working effect. Aiming at the working state of the spoken English self-learning system in the limit situation, the limit theory used in this paper solves the stability problem very well, reflecting the need for a higher quality of spoken accent from the past for the rough spoken language to the present. The research value of this proposition has also been revealed. In this paper, the self-study system of spoken English is firstly evaluated at the self-study level and the combination of the self-study classroom. The hardware and voice processing are designed for the self-learning system, so as to complete the whole self-learning process. The central limit theory in advanced mathematics is applied in the processing of English phonetic information, which is one of the applications of limit theory. In this paper, the processing of phonetic information data is more conducive to the effective grasp of the results.

Data Availability

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

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] F. Ismail, R. M. Alipiah, N. Mansor, and W. H. W. Z. Syukri, "A cross-cultural study of destination attributes: impact on sustainability of island tourism," *Journal of Sustainability Science and Management*, vol. 2018, no. 5, pp. 1–14, 2018.

[2] R. J. Werner, "'Trusting the process': Part Three of my autoethnography as a self-directed learner of French," *Studies in Self-Access Learning*, vol. 12, no. 4, pp. 347–369, 2020.

[3] Z. Ke, "The influence of self-efficacy on Chinese English major's oral learning strategies," *Advances in Literary Study*, vol. 06, no. 2, pp. 62–68, 2018.

[4] S. A. Jawher and M. Y. M. Amin, "Motivational self-regulated strategy for learners in erbil universities of Iraq," *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, vol. 12, no. 13, pp. 3967–3983, 2021.

[5] M. Y. Chien and M. Valcke, "A study of the difficulties and instructional support related to spoken interaction in an EMI course for higher education students," *Journal of Educational Research and Practice*, vol. 10, no. 1, pp. 129–144, 2020.

[6] M. Rodriguez and P. F. Rodriguez, "Limit theory for random walks in degenerate time-dependent random environments," *Journal of Functional Analysis*, vol. 274, no. 4, pp. 985–1046, 2018.

[7] S. Vuckovic, S. Gori Giorgi, and P. Gori Giorgi, "Response potential in the strong-interaction limit of density functional theory: analysis and comparison with the coupling-constant average," *Journal of Chemical Theory and Computation*, vol. 14, no. 8, pp. 4151–4167, 2018.

[8] D. Pawlas, Z. Yukich, and J. E. Yukich, "Limit theory for unbiased and consistent estimators of statistics of random tessellations," *Journal of Applied Probability*, vol. 57, no. 2, pp. 679–702, 2020.

[9] S. Buhl and C. Kluppelberg, "Limit theory for the empirical extremogram of random fields," *Stochastic Processes and thr Applications*, vol. 128, no. 6, pp. 2060–2082, 2017.

[10] B. Baszczyszyn, D. Yogeshwaran, and J. E. Yukich, "Limit theory for geometric statistics of point processes having fast decay of correlations," *Annals of Probability*, vol. 47, no. 2, pp. 835–895, 2019.

[11] L. Iswati, "Investigating learners' beliefs in learning English: a case study," *IJEE (Indonesian Journal of English Education)*, vol. 6, no. 2, pp. 153–170, 2020.

[12] D. Dayter, "Self-praise online and offline," *Internet Pragmatics*, vol. 1, no. 1, pp. 184–203, 2018.

[13] M. S. Hasan, M. B. Karim, and M. M. Rahman, "English language assessment in Bangladesh today: principles, practices, and problems," *Language Testing in Asia*, vol. 11, no. 1, pp. 1–31, 2021.

[14] N. Dewi, N. S. N. Supriyono, and Y. Supriyono, "Self-directed learning in spoken grammar activities using poster presentation," *JEE*, vol. 5, no. 2, pp. 171–176, 2020.

[15] C. Durot and H. P. Lopuhaa, "Limit theory in monotone function estimation," *Statistical Science*, vol. 33, no. 4, pp. 547–567, 2018.

[16] M. Sato and Y. Sugimoto, "Perturbative string theory from Newtonian limit of string geometry theory," *The European Physical Journal C*, vol. 80, no. 8, pp. 1–8, 2020.

[17] R. A. Matthews, "The origins of the treatment of uncertainty in clinical medicine - Part 2: the emergence of probability theory and its limitations," *Journal of the Royal Society of Medicine*, vol. 113, no. 6, pp. 225–229, 2020.

[18] F. Meksaouine and M. Meksaouine, "Application of the theory of limit analysis for the study of the behavior of the ground anchor in homogeneous soil," *Selected Scientific Papers Journal of Civil Engineering*, vol. 14, no. 2, pp. 73–86, 2019.

[19] B. Wang, W. Zhang, J. S. Cheng, and H. C. Zhang, "Safe range analysis of clear distance of twin shallow tunnels based on limit analysis and reliability theory," *Journal of Central South University*, vol. 25, no. 1, pp. 196–207, 2018.

[20] X. Hu, L. Ma, K. Sun, T. Huang, and S. Li, "Theory performance limit and soft-decision based encoding and decoding algorithm of high order quantity error correction codes," *XI Tong Gong Cheng Yu Dian Zi Ji Shu/systems Engineering & Electronics*, vol. 39, no. 10, pp. 2312–2319, 2017.

[21] Z. Luo and P. Wang, "Limit theory of isv-functions and its application for rough sets," *Journal of Intelligent and Fuzzy Systems*, vol. 39, no. 13, pp. 1–19, 2020.

[22] I. W. Irungu, P. N. Mwita, and A. G. Waititu, "Limit theory of model order change-point estimator for GARCH models," *Journal of Mathematical Finance*, vol. 8, no. 2, pp. 426–445, 2018.