

Retraction

Retracted: Construction of a 5G Wireless Semantic Web-Assisted English Digital Learning Resource Query System

Discrete Dynamics in Nature and Society

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) Manipulated or compromised peer review

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] L. Liu, "Construction of a 5G Wireless Semantic Web-Assisted English Digital Learning Resource Query System," *Discrete Dynamics in Nature and Society*, vol. 2021, Article ID 8514944, 10 pages, 2021.

Research Article

Construction of a 5G Wireless Semantic Web-Assisted English Digital Learning Resource Query System

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Based on the 5G wireless semantic network, this paper realizes the construction of the English digital learning resources query system, providing the query and management functions for English digital learning resources, and realizes the integration of functions and resources on the digital learning system and mobile learning system. The platform is put into practical application, and data analysis is conducted to conclude how this system is used and whether it is conducive to improving students' interest in learning English and their English proficiency. We propose a quality algorithm for 5G wireless networks, which not only captures the characteristics of 5G wireless networks such as local broadcast and node movement but also combines quality predicates as guards with broadcast reception actions, which are used to portray that a node can continue to execute subsequent processes only when the node reception actions satisfy certain conditions, which works together with the node default value mechanism to reduce the impact caused by unreliable links. The query content is interpreted and supplemented at the semantic level by using synonym expansion, and the knowledge base is used to filter the synonym expansion and further expand the synonym expansion query based on knowledge structure, to tap the implicit knowledge points related to the query, and to fuse the two extensions to realize the knowledge-based query expansion. We use 5G wireless semantic web-related technologies to build an English digital learning resource query system with complete functions and good experience across terminals. Through the questionnaire survey and data analysis of the users of this system, it is found that the system is well used and effectively enhances students' interest in learning English and improves learning efficiency. By applying the experimental comparison method, it is known that this system has improved students' English proficiency to a certain extent.

1. Introduction

With the increasing reliance on computer networks, the network has become a basic tool indispensable for the normal operation of society and people's regular work life. The regular Internet becomes a constant demand for computer networks, so the research and application of 5G wireless networks have attracted great attention and research [1]. 5G wireless networks include voice and data networks for long-range 5G wireless connections, as well as infrared and RF technologies optimized for the implementation of close-range 5G wireless connections. 5G wireless networks are computer networks that use 5G wireless transmission media. The 5G wireless network environment can build a ubiquitous office and life network demand environment to meet people's needs for

communication and information transfer anytime and anywhere [2]. 5G wireless networks are similar to traditional wired computer networks, but regarding their transmission media and related technologies, there is a clear difference between the two. There are a large number of synonymous, near-synonymous, or up-and-down correlations and juxtapositions among teaching contents in educational resources, and a simple matching search of keywords only will result in a large number of missed detections of teaching resources related to the user's query intention [3]. For this reason, researchers have proposed a concept-semantic query extension method to understand the real needs of learners from the semantic level, grasp the real intentions of learners' queries, and provide learners with knowledge contents with related relationships to meet learners' requirements [4].

Learning resources have laid the foundation for the development of online education. At the same time, the development of online education has enriched learning resources. However, the single structure of these learning resources and the lack of semantic annotations make it impossible to share learning resources, which restricts the development of online education [5]. Therefore, this paper applies the method of constructing a knowledge base to English digital learning resources query and, on this basis, uses the method of latent semantic analysis to establish the index of English digital learning resources to knowledge points and then outputs English digital learning resources related to the query content by extracting knowledge points from the query content. Secondly, based on constructing a knowledge base to manage English digital learning resources, the semantic index based on knowledge structure of the knowledge base and the synonym information of the query content are fully utilized to find relevant knowledge points and realize knowledge-based query expansion and then realize the expansion of query results. In addition to the management of English digital learning resources, the effectiveness of querying English digital learning resources is closely related to the needs of learners, and how to dig out the query intention of users through the query content input by learners has become one of the core researches in the field of querying at present. Learners are the users of English digital learning resources queries and also the testers [6]. At the same time, we also design part of the framework through teaching experiments to derive some rules for designing the interactivity of multimedia screens in the digital learning environment, to provide guidelines with strong operability for the design and application of digital English digital learning resources, thus ending the current state of no rules for the design and application of digital English digital learning resources and providing a basis for the design of interactivity of digital English digital learning resources [7]. The design of digital English digital learning resources will be based on the rules and regulations.

This paper implements a set of technical solutions that can realize 5G wireless semantic network analysis and English digital learning resource extraction. The English digital learning resource extraction has an orderly structure of protocol control keywords, which can be used to achieve accurate and effective identification and marking of protocol traffic and further carry out the probabilistic inference and analysis of the protocol grammar rules to realize the extraction and expression of the protocol grammar rules [8]. In Introduction, the background and significance involved in this topic are introduced, and finally, the main work and contributions of this paper are described. In Related Work, aiming at the main objectives and application scenarios of this paper, the current status of multiple research means for 5G wireless semantic web for English digital learning resource query system at home and abroad is analyzed, and the current English digital learning resource query system technology is analyzed. In Sections 3 and 4, there is the research of English digital learning resources query system based on 5G wireless semantic network. Oriented to the quality algorithm of 5G wireless network, the algorithm

portrays the structure of 5G wireless network from two aspects of process layer and network layer and improves the quality of service of 5G wireless system by adding the combined reception action with quality predicate at process layer and proposing the default value mechanism to ensure that the network nodes can still give reasonable node behavior in unreliable links, with design and implementation of an extended feedback query system for English digital learning resources. The system is first designed from a three-layer architecture, then each functional module of the system is introduced, and finally, the relevant methods are tested under the data collected by the system. In Section 5, the results are analyzed. By comparing and analyzing the query completeness and accuracy rates of conventional keyword query and conceptual semantic web extension query, it is proved that the conceptual semantic web query extension of teaching resources studied in this thesis can significantly improve the performance of resource queries in the education field, provide learners with guided associative learning in knowledge-related fields, and improve the efficiency of online learning. Conclusion summarizes this thesis and proposes the next research hope.

2. Related Work

The core of English digital learning resources query research is how to accurately and quickly select English digital learning resources that meet learners' needs from a variety of formats and complex structures of English digital learning resources [9]. Thongkoo K et al. proposed a method of querying English digital learning resources using context-awareness, in which learners log in to the query system through learning terminals, and the system will automatically obtain contextual information and process and interpret it, and according to learners' contextual information, the query system will provide learners with relevant English digital learning resources at the right time and the right location [10]. Kajamaa A et al. first establish the index between knowledge from building ontology, and when querying English digital learning resources, they not only match the query content but also query the course knowledge and English digital learning resources related to the query content, thus providing learners with a complete knowledge structure [11]. Based on 5G wireless semantic web technology, Ng B et al. combined and encapsulated English digital learning resources in a certain way and standardized English digital learning resources into a unified description, so that only the query content and the unified standard description of English digital learning resources need to be matched to query the required resources [12]. By establishing a model of learners' interests and English digital learning resources and matching English digital learning resources between them, we can query English digital learning resources according to learners' interests and provide personalized resource recommendation services based on learners' access records and query habits [13].

The extended query based on the conceptual semantic network can improve the query completeness and accuracy of teaching resources and provide learners with guided

associative learning in the domain related to the queried knowledge point, which is the current development direction of teaching resources query [14]. Lin C J et al. used special domain ontology to achieve semantic-based classification, browsing, and finding of English digital learning resources on the web [15]. Qiao X et al. used ontology modeling to achieve semantic matching based on the analysis of the semantic association between English digital learning resources and learners' interests and provided learners with personalized resources using filtering rules [16]. Wong K T et al. revisited the challenge of RDF to RDB conversion through the perspective of SQL query and rewrote SPARQL by using existing SQL optimization tools to rewrite SPARQL to achieve equivalent queries as much as possible to ensure the real-time consistency between the relational data model (RDB) and the semantic model (RDF), summarize the current mainstream RDB to RDF mapping methods, and compare the advantages and disadvantages of each method [17]. The above-related research features ontology technology to generate a knowledge base of a subject area to achieve knowledge query extension and help learners understand the relevant contents of the queried knowledge points more comprehensively and accurately [18]. Based on the hierarchical model of the semantic web, the semantic web uses the Resource Description Framework Language (RDF) and the Resource Description Framework Schema Language (RDF Schema) to describe the resources on the web and assign corresponding semantic information to them [19].

The research related to querying English digital learning resources, constructing a knowledge ontology base, establishing a user interest model, and conducting context-awareness can all meet the query needs in specific situations to a certain extent, and constructing an ontology knowledge base is an effective means to realize semantic querying, which can realize query expansion of query contents [20]. However, the methods related to the query of English digital learning resources analyze the needs of learners by modeling methods and provide relevant English digital learning resources, lacking learners' judgment on the query results, and the relevant feedback mechanism which can be used as a means to tune the query results has been well applied on many information query systems; however, it is not well applied to English [21]. This paper proposes a research on the search expansion of the conceptual semantic network of teaching resources. The purpose is to realize the expansion of the query of teaching resources through the construction of a good conceptual semantic network of teaching resources, so as to improve the recall and accuracy of the retrieval of teaching resources and at the same time provide learners with all the information. Guidance and association learning by checking relevant teaching content helps learners to have a more comprehensive and in-depth understanding of relevant knowledge content and improve the efficiency of learners' online learning.

Research is done on English digital learning resources query system based on 5G wireless semantic network.

3. English Digital Learning Resources Feature Extraction

The purpose of concept extraction is to identify the core words that represent the knowledge point in the key knowledge point, which are the query keywords that learners may enter when learning online. Extended concepts are the words that are synonymous with the query keywords about related concepts. We set up different templates to extract the concepts and extended concepts of the knowledge points and classify the extended concepts into different concept relations. The defined concept structure includes the concept table and the relationship table between them. The main table is the concept table, and we record the concepts with synonymous relationships directly in the concept table in a textual way, while their parent concept relationships are generally unique, and we record the number of the parent concept in the concept table, and the concept pointed by this number is the parent concept of this concept. For the practical requirements of the concept-semantic network, we design the entities and attributes as shown in Table 1.

The probability distribution of the primary pattern mining model of the LDA protocol using the 5G wireless semantic web algorithm is shown as follows:

$$P(x_i) = \beta^{(a_i)} + D(\beta^{(a_i)}). \quad (1)$$

Then the posterior probability of the protocol primary pattern x_i distribution of the LDA protocol primary pattern mining model is

$$P(x_i = k | x_{-i}, y_i) = \frac{M(-i, k) * Y(y_i) + \alpha}{M(-i, k) + Y * \alpha}, \quad (2)$$

where x_i characterizes all allocations of the protocol primary mode, $Y(y_i)$ characterizes the frequency of data units y_i contained in the protocol primary mode k , $M(-i, k)$ characterizes all data units in the protocol primary mode k , and $M(-i, k) * Y(y_i)$ characterizes the data unit size of the protocol message a_i protocol primary mode k .

By tagging protocol datagrams with primary pattern keywords, sequence comparison analysis processing is performed on the tagged fields in each protocol datagram. After the calculation of the score matrix, the global longest common subsequence of the protocol primary mode keyword field markers in each protocol message is extracted, and the common subsequence is used as the protocol standard model of this class of protocol messages. The upper-left element of the score matrix is assigned an initial value of 0, and the other elements are iteratively calculated as follows, for any two protocol control keywords $X(x_1, x_2, \dots, x_n)$ and $Y(y_1, y_2, \dots, y_m)$ marked by the protocol primary mode keywords in the same class of protocol messages.

$$H(i, k) = \begin{cases} H(i-1, k) + \beta(X(i), -) \\ H(i-1, k-1) + \beta(X(i), Y(k)). \\ H(i, k-1) + \beta(-, Y(k)) \end{cases} \quad (3)$$

The protocol syntax extraction scheme takes the protocol control keywords contained in the protocol standard pattern

TABLE 1: Concept table.

Field name	Type of data	Can it be empty	Illustrate
Id (concept)	String (250)	No	Concept number
Concept name	String (100)	No	Concept name
Abbreviation	String (100)	Yes	Concept abbreviation
English name	String (150)	Yes	Concept English name
Synonyms name	String (150)	Yes	Synonymous concept
Parent id	String (250)	Yes	Parent concept number
Is deleted	String (250)	No	Delete or not

as the basic processing unit, simulates and infers the multilevel logical relationships among the protocol control keywords, discovers the temporal relationships of protocol control keyword occurrences, and realizes the comprehensive semantic syntax expression of unknown protocols [22, 23]. With the protocol syntax as the benchmark, it is possible to realize the tagging of unknown protocol message data with significantly superior accuracy and recall and finally realize protocol feature keywords and semantic syntax mining based on protocol datagrams to realize a technical solution to complete the identification of unknown protocol-oriented messages with high accuracy.

English digital learning resources query 5G network model construction:

The accuracy of the related knowledge points queried depends entirely on the query, and the actual situation is that different learners have different descriptions of the same word, and it often happens that the documents related to the query request cannot be queried due to the different wording; moreover, learners are often interested in the knowledge points related to the knowledge points in the knowledge structure in addition to the related knowledge points and need to include the knowledge points that have other knowledge points that are related as related knowledge points. Part is to expand the query based on the knowledge structure to provide knowledge-related expansion based on the knowledge structure. After implementing the two parts of expansion, the two parts of expansion need to be fused by assigning different weights to them, and finally, the results of query expansion are provided to the learners. The learner confirms the knowledge-based query extensions and presents the relevant English digital learning resources according to the learner's confirmed relevant knowledge points. The specific implementation diagram is shown in Figure 1. The 5G wireless semantic network represents the development and trend of 5G. 5G semantics will introduce structure creation environment to wireless networks, give information resources clearer and more complete semantics, and enable computers to distinguish and recognize some semantic information so that they can understand learning resources.

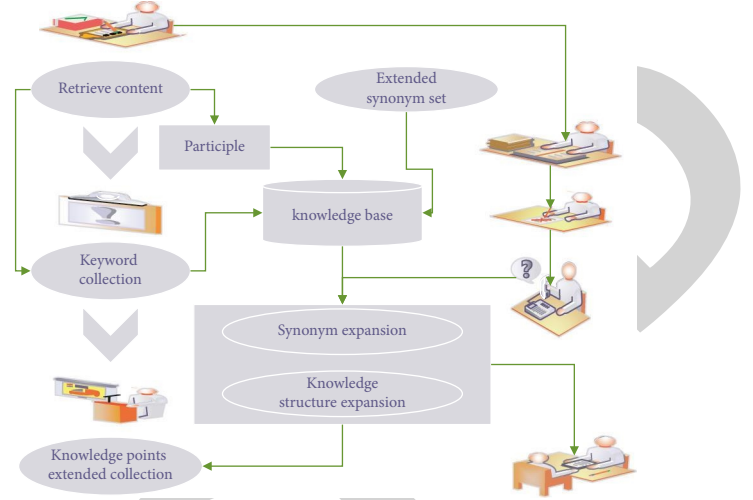


FIGURE 1: Query expansion process.

Domain entities exist in essence, abstract, conceptualized, and structured representation methods. Ontology refers to the related domains.

The synonym expansion for all keywords is obtained using Cartesian product for the initial query. Suppose the initial query $M = \{m_1, m_2\}$, after synonym expansion $M_1 = \{m_{11}, m_{12}\}$, $M_2 = \{m_{21}, m_{22}\}$, then the synonym expansion query $Q(x)$.

$$Q(x) = \max \begin{cases} m_{11}, m_{21} \\ m_{11}, m_{22} \\ m_{12}, m_{21} \\ m_{12}, m_{22} \end{cases} * \beta. \quad (4)$$

In the query request after synonym expansion, the initial query is usually considered to have a high weight and the weight of the synonym expansion query is relatively low. Therefore, in this section, under the assumption that the weights of each synonym extended query are consistent, formula (4) is adopted to calculate the similarity between the synonym extended query $Q(x)$ and the knowledge point a_i , where a is the weight of the initial query, $Q(x_0)$ is the initial query, and n is the number of synonyms extended queries.

$$H(Q(x), a_i) = \alpha * H(Q(x_0), a_i) + \frac{(1 - \alpha) \sum_{k=1}^n H(Q(x_k), a_k)}{n}. \quad (5)$$

The similarity between the query vector and any extended knowledge point k_p in the set of extended knowledge points of similar knowledge point a_i is calculated as in (5), where u is the similarity between similar knowledge point a_i and query keyword vector $Q(k)$, and $v(k_p, k_i)$ is the shortest path between similar knowledge point k and extended knowledge point k_i .

$$H(Q(k), a_i | k_p) = \frac{\mu}{\mu + v(k_p, k_i)}. \quad (6)$$

When performing knowledge structure expansion, if for a knowledge point m_1 , it serves as both a similar knowledge point m_1 with query $Q(k)$ and an indexed knowledge point in the knowledge base with other similar knowledge points m_2 with query vector $Q(k)$, then the one with the high similarity between the two is taken as the similarity between that knowledge point and the query.

$$H(Q(k), m_1) = \max(H(Q(k-1)), m_1, H(Q(k+1), m_1 | m_2)). \quad (7)$$

We want each feedback from learners to make the query expression closer to the relevant documents of learner feedback and further away from the irrelevant documents of learner feedback, that is, to make the set of knowledge points related to the query closer to the learner's query. Therefore, the similarity between knowledge points and queries can be adjusted according to the set of relevant or irrelevant English digital learning resources of learners, which is represented by updating the similarity between queries and knowledge points using a model, as in equation (6), where $A(x)$ is the number of English digital learning resources that learners determine to be relevant to the query, $A(x+i)$ is the number of English digital learning resources that learners determine to be irrelevant to the query, $A(i+r)$ is the number of knowledge points m_i relevant English digital learning resources that learners determine to be relevant to the query, $A(x+r)$ is the number of knowledge points m_i relevant English digital learning resources that learners determine to be irrelevant to the query, $A(m_i+r)$ is the number of documents related to the knowledge point that learners determine as not relevant to the query, and β is the adjustment coefficient, which can increase or decrease the value generated by the calculation method.

$$H(Q, m_i) = \beta * \ln \frac{A(x+i) * A(i+r)}{A(x) * A(x+r) * A(m_i+r)}. \quad (8)$$

After the indexing confidence is updated, the inverted ranking of English digital learning resources does consider not only the weights of knowledge points and the indexing degrees of knowledge points and English digital learning resources, but also the confidence degrees of English digital learning resources and knowledge points, so the inverted ranking of English digital learning resources is calculated according to equation (9), where $H(B(x), Q)$ is the weight of knowledge point k_i , and $C(k_i, B_i)$ is the indexing weight of knowledge point k_i with English digital learning resource $B(x)$. Using a probability statement method, that is, the interval estimation method in mathematical statistics, that is, the estimated value and the overall parameter are within a certain allowable error range, and how big the corresponding probability is, this corresponding probability is called the confidence.

$$H(B(x), Q) = \sum_{i,k=1}^n H(Q, k_i) * C(k_i, B_i). \quad (9)$$

On the basis of related research, a knowledge-based query expansion method is implemented. The 5G wireless

semantic network is used for synonym expansion, and the knowledge structure of the knowledge base is used to expand the knowledge structure. Finally, we investigated how to apply relevant feedback in retrieval and finally realized relevant feedback based on knowledge. Through feedback, the weight of knowledge points was adjusted, and the concept of confidence was proposed to revise the index. The weight of knowledge points, learning resources, and index weights of knowledge points were proposed. And the three parts of index confidence invert the learning resources.

4. English digital learning resources query system design

The query is a tool for learners to conduct learning, and learning about English digital learning resources is the purpose. The English digital learning resources indexing module provides knowledge-to-English digital learning resources and English digital learning resources to knowledge services after the English digital learning resources query module presents the English digital learning resources related to the learner's input, helping learners to better use the query system for learning based on the knowledge system. The English digital learning resources index module is a module that presents the index of knowledge points and English digital learning resources for learners. Learners choose to view the details of the queried English digital learning resources to learn English digital learning resources, and on this basis, the index details of the relevant knowledge points of the English digital learning resources are displayed. The details of indexed knowledge point mainly include the name of knowledge points related to English digital learning resources, indexing degree, number of feedback of indexing, and indexing confidence, where the indexing confidence is presented by Echarts to present the trend of indexing confidence.

Learners and administrators use the system by interacting with all aspects of the system. If learners want to get the standard pronunciation of a vocabulary word, they can click on the pronunciation button in the vocabulary word learning interface; learners can also click on the next or previous one to view different words. Whichever module function is completed, it is done by the learner or administrator interacting with the system interface. The interaction design of this system follows the following guidelines: first, simple interaction instructions, users can perform the interaction operation they want through simple text prompts on the interface; second, fast response, when the user clicks on the relevant, the information or operation result will be responded to the user quickly and effectively to improve the user experience; third, timely feedback, the administrator or system manager should give the learner's test results back to the fourth, interaction among learners: learners can leave messages and answers to each other in the learning community, upload English digital learning resources, enhance the relationship among learners, and summarize and share English learning experience.

The architecture of this system adopts this design model, and there are three roles of the system as follows: learners,

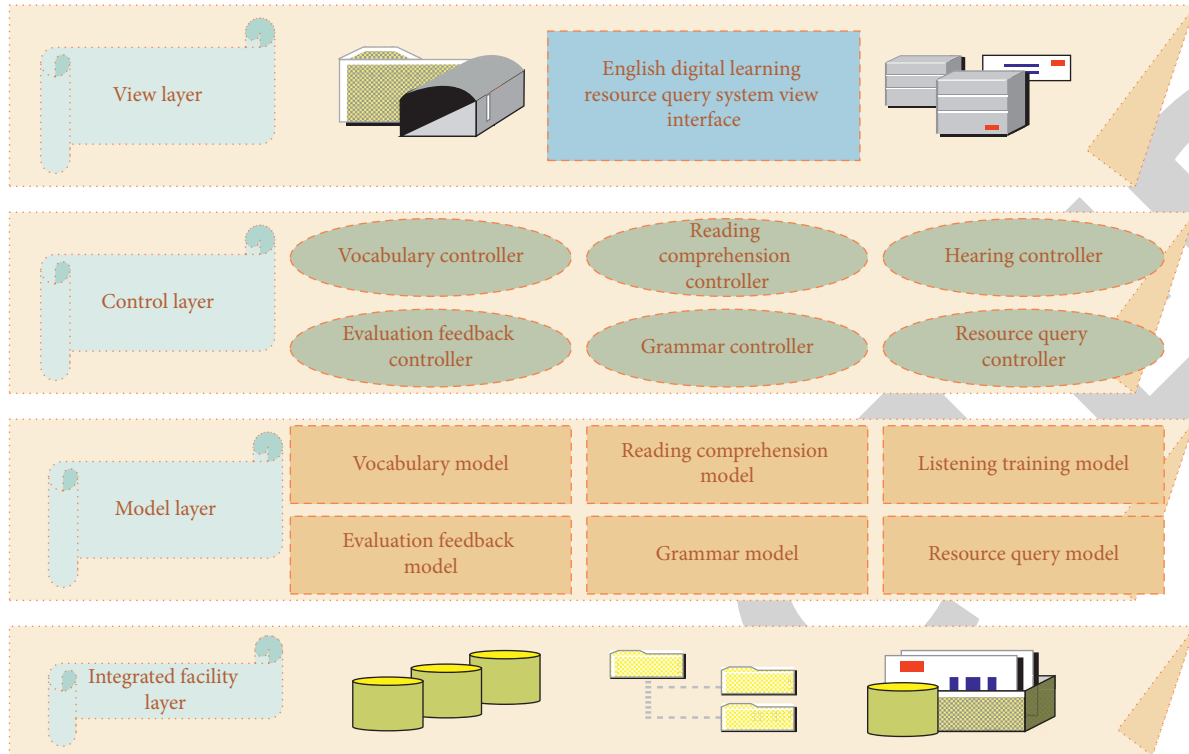


FIGURE 2: System software architecture diagram.

general administrators, and system administrators. The learners mainly learn related knowledge on this system, and the general administrator and system administrator manage the learning navigation, English digital learning resources, system users, and system data on this system, which is divided into learner subsystem and administrator subsystem. Each subsystem is architected according to the complete MVC design model, and the software architecture of the system is shown in Figure 2. When performing query expansion, it is necessary to consider synonym expansion. If only the given query keywords are used for searching, ignoring the synonymous expansion words will often cause the system to miss a lot of information related to the query semantics.

5. Results and Analysis

5.1. Algorithm Performance Analysis. In the experiments of the unknown protocol identification scheme based on protocol syntax rules, the protocol syntax was able to identify FTP text protocol datagrams with 94.35% accuracy and 97.19% recall and FTP binary protocol datagrams with 89.53% accuracy and 92.65% recall. The scheme can effectively identify and mark text protocols as well as binary protocol datagrams. The accuracy of the protocol recognition scheme based on protocol syntax rules is lower than the recall rate in the process of recognizing protocols, as the miss recognition rate of protocol recognition is slightly higher than the false recognition rate. For this paper, in the process of text mining, the threshold value is set high in the process of determining protocol control keywords based on the

contribution value, resulting in some of the protocol control keywords that do not appear frequently enough being censored out. In the process of threshold setting, too high threshold setting will lead to a high leakage recognition rate of protocol identification, and too low threshold setting will lead to a low datagram recognition rate, and a balance point threshold needs to be sought between the two. The experimental results are shown in Figure 3.

In the LDA model parameter selection section, since this section extracts the sequence form expression of the protocol primary patterns, the values of the prior distribution parameters of the LDA model determine the specific probability distribution in the set of unknown protocol datagrams of primary patterns and data units. Using the protocol word in the RFC file as the measurement benchmark, the keyword coverage of each set of primary patterns is calculated, and the protocol primary pattern keyword coverage of the protocol datagram is averaged for each set of combinations of values. For different combinations of values, the primary mode keyword sequence coverage is shown in Figure 4.

From the above experimental results and evaluation index data, it is shown that the overall protocol keyword coverage of the text protocol is higher than that of the binary protocol. The main reason for the difference in the experimental results lies in the data processing part, where different data unit slicing schemes are used for the protocol datagrams of two different language groups. Since there are natural protocol word separators in the protocol data of this paper, the protocol unit slice is more accurate and the experimental results are better. For the binary protocol, the datagram does not have a natural separator; this part uses

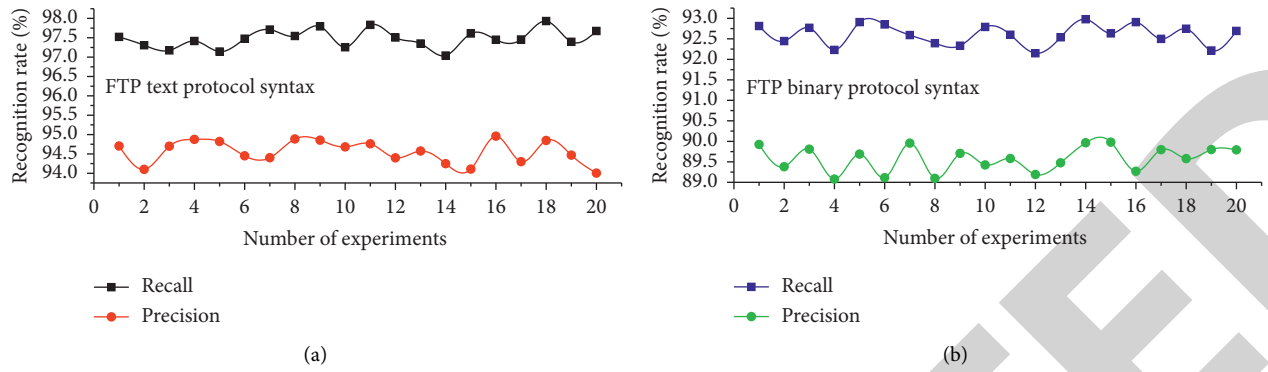


FIGURE 3: The recognition rate of protocol syntax.

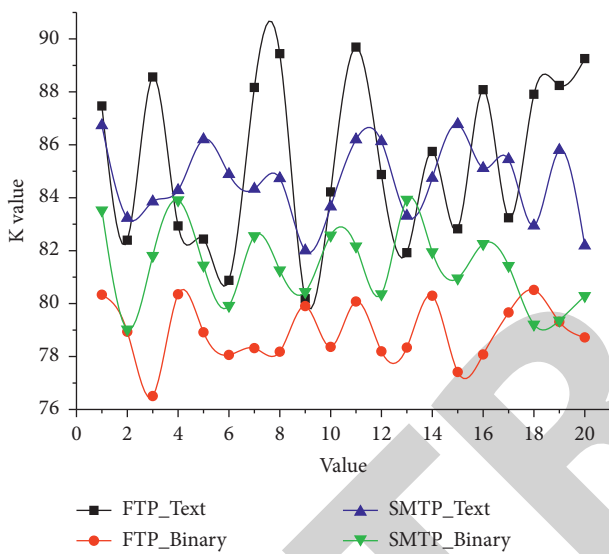


FIGURE 4: The k -value distribution.

1 byte as unit length for the protocol datagram to perform unit cutting and achieves the generation of protocol control word by the longest possible splicing means in the later stage of the experiment. Human factors will inevitably introduce some errors, resulting in a slightly less effective extraction of protocol control words than textual protocols. In practical applications, the application of a priori knowledge can minimize this human error factor and optimize the experimental results.

5.2. Model Simulation Analysis. Figure 5 gives the experimental scheme for multiple groups of ontologies and describes it by the size of the ontologies and their experimental effects. Specifically, we use quantitative features such as the size of triples, the size of classes, and the size of properties in RDF as the parameter indicators to measure the generality of the experiments. The scale of entities, the scale of relationships, and the scale of attributes in the prototype model obtained by querying the construction rules are also used as reference elements to characterize the experimental effects.

We use the OR method in the advanced search to implement the synonymous concept expansion search; we add “OR” to the query to indicate the “or” relationship between synonymous concepts. The comparison results of the query completion rate show that the concept expansion query can significantly improve the completion rate, and the comparison results of the query accuracy show that the accuracy rate of the concept expansion query is generally better than that of the regular query. The accuracy of concept expansion query is as high as 94.87%, which is more than 10% higher than the conventional long-beard. The above two query results show that the query expansion based on the semantic network of teaching resources is better.

5.3. System Measurement Analysis. The results of the survey on the interactivity of the system are shown in Figure 7(a). 34.95% of the students chose very well, 35.76% chose well, 29.3% said average, and no students chose poorly. This shows that the interactivity of this platform is generally accepted by students. The results of the survey on the usefulness of the system are shown in Figure 7(b). 35.96% of the students chose very useful; 37.3% of the students chose more useful; 26.74% of the students thought it was average; and no students chose uselessly. This shows that the system is highly targeted and can help students consolidate their basic English knowledge and quickly find what they need to learn, which meets their functional needs.

The results of the survey on the completeness of the system’s functions, as shown in Figure 8(a), showed that 31.89% of the students chose very complete; 28.33% chose relatively complete; 27.72% thought it was average; and 12.06% chose not complete. It can be seen that the functions provided by the system can support students’ learning English well and have the common functions for learning English in junior high school. The results of student’s evaluation of the overall effectiveness of the system are shown in Figure 8(b). 25.12% of the students chose very effective; 30.76% chose relatively effective; 26.28% chose average; and 17.84% chose insignificant. Although the students’ evaluation of the effectiveness of the system is rather subjective and does not use relevant data analysis, it reflects the effectiveness of the system to some extent. The

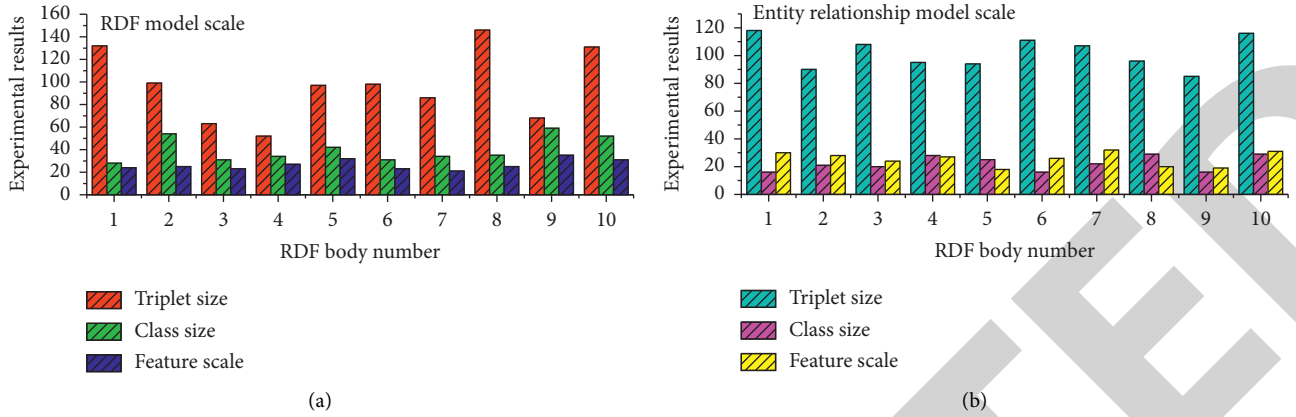


FIGURE 5: Effect of ontology scale experiments in multiple ontology groups.

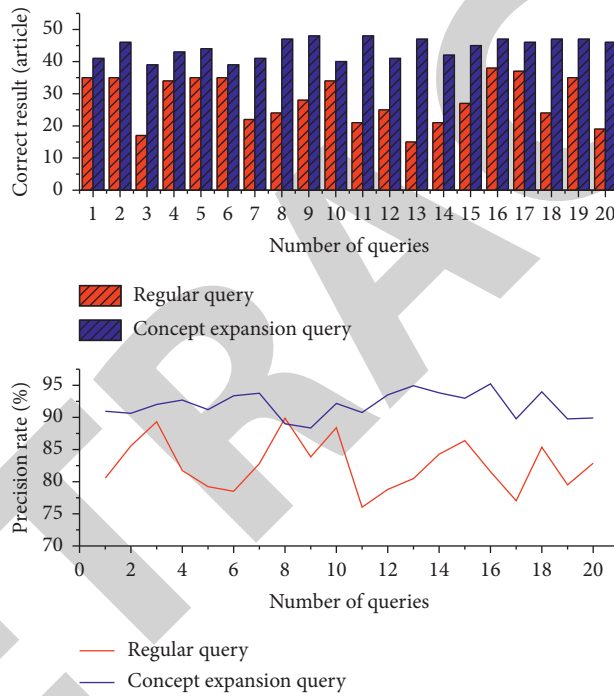


FIGURE 6: Comparison of the two query methods.

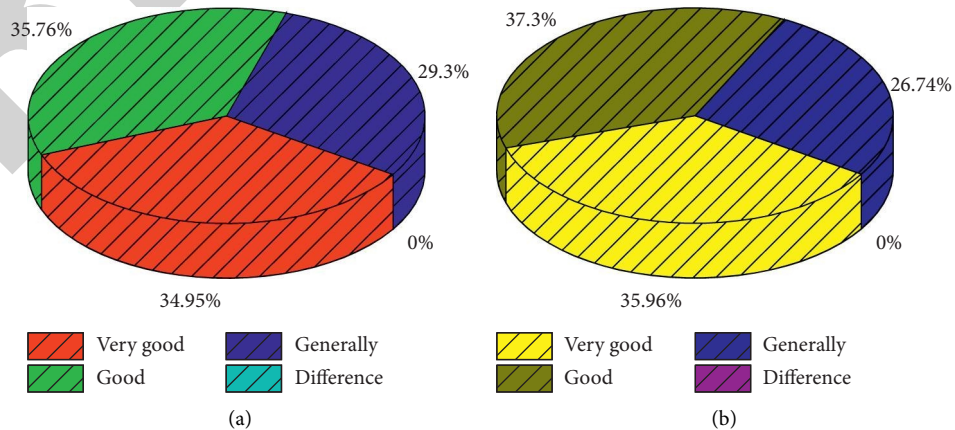


FIGURE 7: Results of the system interaction performance and usefulness survey. (a) System interaction performance survey. (b) System usefulness survey.

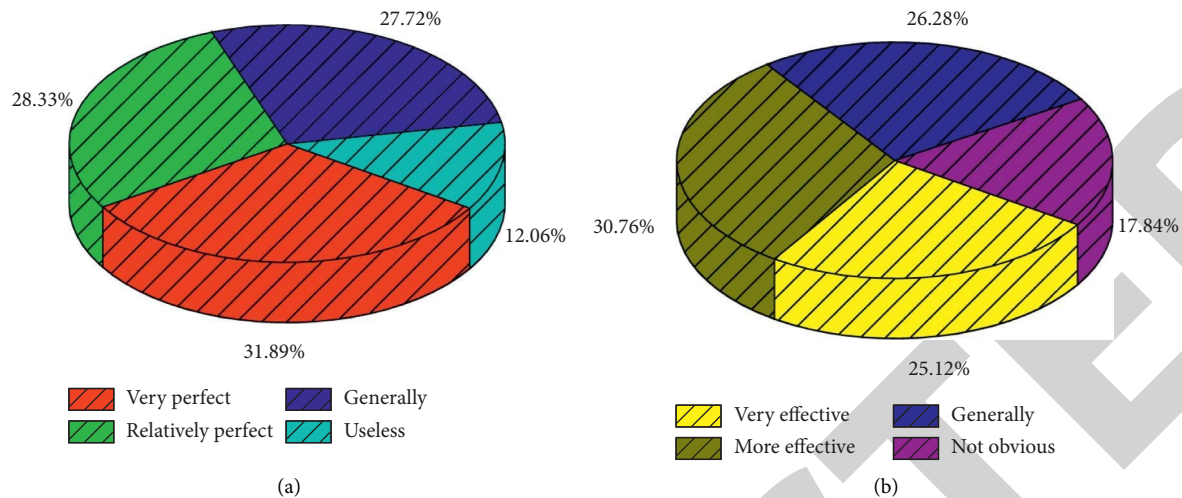


FIGURE 8: System functional completeness and effectiveness survey. (a) Investigation of the completeness. (b) System effectiveness survey

validity of the system is verified using relevant data analysis methods in the last part of this section.

6. Conclusion

This paper focuses on the research of English digital learning resources query system in 5G wireless network environment, the extraction of semantic mining of unknown protocols, the identification and analysis of protocol patterns, and the extraction of inferred syntax rules. The design and implementation of the English digital learning resource query system in the 5G wireless network environment are realized. The system of this study is constructed with the software design principles of modularity, abstraction, low coupling, and high cohesion, and the system is architected with the MVC design idea. The functional modules of the system are constructed in detail, and the functional modules of each subsystem are described in more detail. For the management frame data of unknown protocol datagram, the discovery of protocol format part based on protocol control keywords can be realized by LDA text topic mining model and combining with the characteristics of network communication protocol itself, using probability estimation model and datagram replay technology. The tests show that the datagram semantic mining in this paper can achieve the effective extraction of protocol primary patterns. In this paper, we propose a query mechanism that provides relevant feedback on query results to make the query results closer to the query requirements relevant feedback. On the one hand, we use multiple rounds of relevant feedback to adjust the weights of relevant knowledge points to make the presented English digital learning resources more in line with learners' knowledge requirements, and on the other hand, we use multiple people's relevant feedback to correct the indexing of English digital learning resources to knowledge points. The knowledge-based query results of English digital learning resources are made more reliable. By adding the knowledge-based feedback function to the system, collecting data, and providing multiple rounds of

feedback, it is found that the accuracy rate increases with the number of feedback rounds. In our future work, we hope to introduce probabilistic operators at the level of the algorithmic language for the probabilistic communication characteristics of 5G wireless network systems, to form an English language with probabilistic process algorithms, give semantic forms of the language, and conduct further research for its related properties. Continue to use the program static analysis theory to analyze the semantic calculus with probability, and apply the analysis results to the relevant learning resource query of the wireless network.

Data Availability

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

Conflicts of Interest

The author declares that there are no conflicts of interest.

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