Design and Implementation of Web-based Translation Theory Online Assisted Teaching System

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Abstract. In this paper, the authors believe that establishing a web-based online teaching aid system for translation theory can be studied to address the above problems. The platform uses java language to collaborate with MySQL database on the SSH framework of Struts + Spring + Hibernate for the development of functions, and Nginx is used to deploy tomcat server to complete the final construction work. The study is conducive to enriching teaching resources, cultivating students' independent learning ability, and strengthening the teaching effect of university English translation courses.

Keywords: web · java · ssh · teaching system · online teaching

1 Introduction

Translation theory is the core course of English majors in universities, and students studying this course need to understand the basic translation theory concepts and translation standards under different grammars. However, the current translation theory course is usually taught by the teacher in the traditional classroom in a "big lecture" style, and students cannot improve their learning of translation theory according to their own needs, and lack the ability of independent inquiry that should be possessed in the translation theory course. [1] Based on the above analysis, the authors of this paper believe that a Web-based online assisted teaching system for translation theory should be designed and implemented. Teachers can select the learning resources that students need to supplement outside of class according to the translation course syllabus, which can make the teaching more targeted. [2].

2 Key Technology

2.1 MVC Mode

MVC pattern is the most popular design pattern for current web application design, which is to divide the application design into Model, View and Control layers. The structure diagram of MVC pattern is shown in Fig. 1 [3]. The model layer is javabean,

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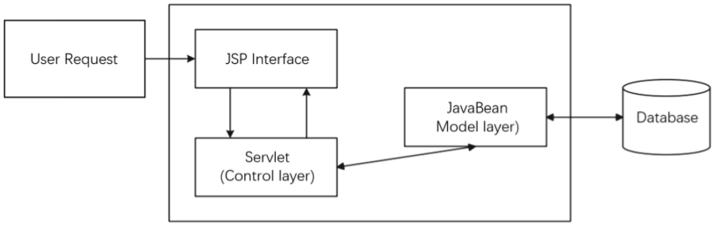

Fig. 1. Structure diagram of MVC pattern

which serves to encapsulate all the data and logic of the application. And the controller layer is servlet, the role is to interact the model layer with the data of VIve layer. The view layer is the JSP interface and its role is to make visual representation based on the data from the model layer and to accept the user's commands and pass them to the back model layer. [4].

2.2 Development Environment

The basic experimental environment operating system of the translation theory online assisted teaching system is chosen linux cent OS7. Vue.js framework is used for the front-end and Struts + Spring + Hibernate framework is used for the back-end development in the application development part. Web server is chosen Apache Tomcat 9.0, Java integrated development tool is chosen IntelliJ IDEA 2020, project management tool Maven 3.5.0, and MySql 8.0.28 was selected for the database.[5].

3 Overall Design

The translation theory online teaching system adopts B/S structure, which is a browser/server structure, and the B/S structure application can be designed in three layers, namely, the browser client, the server side and the database side.[6] The user side simply opens the system through the PC side, and the system will connect to the URL address where the server is located to achieve access. The server side is responsible for processing requests from the user side for processing, and the requests to access the database are implemented through the JDBC interface. [7] The system design architecture uses SSH framework. The browser interface is designed using VUE.js, the page logic control is done using struts, and the structs can jump to each level of the MVC pattern. And hibernate is responsible for the technical support of the persistence layer, spring manages hibernate and structs, and controls the logical functionality of the system implementation. [8].

4 Functional Implementation

By clicking the online chat function, students can discuss with the teacher about the difficult problems they encounter in the classroom and in the process of learning translation in class. The online chat function is implemented by ajax asynchronous sending

```
$.ajax({
url: '/gameUnionV2/client/sendMsg',
data:{account:account,gid:gid,sid:sid,uname:uname,role:info.role,title:info.title,avatar:info.avat
ar,msg:info.msg,time:info.time,msg_type:info.type},
type: 'post',
cache: false,
dataType: 'json',
success:function(data){},
error: function(){}});
```

Fig. 2. Ajax implementation of the message sending code.

function. The student user fills in the dialog box with the teacher and clicks the send button. The system executes the request through ajax and sends the content information data to the back-end server, which then pushes the information data to the teacher's port. And the teacher user side is through the ws.onmessage component to complete the acquisition and presentation of the back-end message content data. The message sending code is shown in Fig. 2. [9].

The teacher side user needs to publish the test questions of the system. The process of implementation is that first of all, the teacher user selects the course that needs to publish the after-school homework, and then clicks into the list of test questions. The system performs addtest operation and uploads the test questions for check testinfo by the system, after which the test questions are completed and submitted to the test database of the system. When the teacher user approves the student user's assignment, the system executes Read And Correct Test to call the assignment file on the student side. After the teacher selects the student assignments to be graded, the system returns the corresponding Test Ansewer, the teacher submits the grading situation, and the system records the approval results and submits the test Result Info. [10].

For the course data to be transmitted a BP algorithm is used to achieve error back propagation and thus the purpose of building a multilayer neural network model. First, a randomly selected data sample j is chosen from the total data volume and the corresponding expected output is calculated. Then the input of the hidden layer is calculated, and the error value of the difference between the expected output and the actual output is calculated, so that the partial derivative function of the error in the hidden layer is further calculated, and the formula is shown in Eq. (1). The formula refers to the value of the output of the implied layer, which is the value of the correction weight.

$$\delta_h(j) = [\sum_{o=1}^{q} \delta_h(j) w_{ho}] h_{oh}(j)(1 - h_{oh}(j)) \tag{1}$$

Similarly, the partial derivative function of the output layer can be calculated to calculate the final global error, and the global error calculation formula is shown in Eq. (2).

$$E = \frac{1}{2m} \sum_{k=1}^{m} \sum_{o=1}^{q} 2(d_o(k) - y_o(k))^2 \tag{2}$$

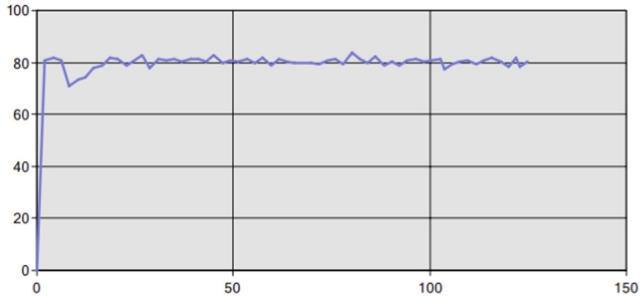

Fig. 3. Course Playback Test Run

Table 1. Test results of course playback function

Type	Dynamic
Concurrency of connected clients	20
Number of iterations that can be generated	15700
Number of requests that can be processed in unit time	20000
Number of connectable clients	5000
Request transients (seconds)	3.95

After completing the design of the system the functional implementation was tested in this paper. We set the load level to 10, and ran 10,000 functional test iterations after that. The test run diagram is shown in Fig. 3, the time does not exceed 10ms can basically reach 80 times of request processing. The test results of the course playback function are shown in Table 1. The number of iterations can be reached 15700, the number of requests can be processed within the unit time reaches 20000, the number of connectable clients is maintained at 5000, and the instantaneous amount of requests reaches 3.95 per second, which basically achieves the iterative generation efficiency of the course playback function required by the system.

5 Conclusion

In this paper, we have conducted an in-depth study on the online assisted teaching system of translation theory. The basic functions of the teaching platform have been basically realized, but due to the limited personal ability, development environment and research time, the system still has many areas to be further improved. The system lacks the setting of administrator's rights, which makes the system's security performance insufficient. In the process of future use and promotion, it is necessary to further improve the implementation of functions as much as possible, and to make the system run smoothly and securely. This study needs to be further optimized in the future.

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2. Project name: "Second Foreign Language French" MOOCs Construction and Blended Teaching Reform, Industry-School Cooperative Education Project of Jilin Province Education Department in 2022, Project No. 20221K1UNUQH.

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