Research on JAVA Mobile Application Development Framework based on Ant Colony Optimization

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Abstract. The application framework is a reusable design component. It specifies the architecture of the application, clarifies the dependency relationship, responsibility allocation and control flow among the whole design, collaboration components. JAVA mobile application program. In order to deepen the readers' understanding of JAVA, this paper first introduces the technology, and develops a practical application for JAVA mobile application development. The registration mechanism is used to verify the validity. The problem is solved by an ant colony optimization algorithm. First, using state, decision making, and patterning of problems, it is easy to use ACO to solve. Research shows that the algorithm determines the stack allocation object by analyzing the Java source code at the compile stage, and identifies these objects with extension instructions. When the program runs, they will be directly assigned to Java. These objects are automatically added when the program leaves its scope. Released, other Java objects are still allocated to the heap and are recycled by the garbage collector.

Keywords: Ant colony optimization algorithm, JAVA mobile application; program, framework.

1. Introduction

JAVA technology is mainly composed of three major versions of J2EE, J2SE and J2ME. As one of its main components, J2ME is a commonly used mobile domain development platform [1]. But in real life we sometimes want MID lets to start automatically under certain conditions, especially for some large enterprise mobile applications. There is often a push of information from the server to the mobile device [2]. In many cases, frameworks often come in the form of component libraries, but component libraries are just an important part of the framework. The key to the framework is also the interaction mode and control flow pattern between objects within the framework. Java programs can directly access the resources of the underlying operating system [3]. If you do this, the program becomes platform-dependent because the dynamic libraries that contain the native methods are platform-dependent. In addition, using native methods may also make the program relevant to a particular Java platform implementation [4].

Ant Colony Optimization (ACO) algorithm is similar to the optimal unit commitment problem. It tries to design the optimal unit commitment problem into a model similar to the problem and deal with various constraints flexibly, so ACO algorithm can be used to solve it. And keep running to wait for the server to send information to [5]. In this way, the client receiving program is always open, which not only occupies system resources, but also affects the operation of other applications. Programmers using this framework can start specific system development on the basis of a common function that has been implemented [6]. The framework provides a collection of classes for all the application's expected default behavior. It is possible to make various types of information appear in front of customers of mobile terminals actively, and it is timelier and more proactive in information transmission, reducing the time for users to search for various types of information [7]. At the same time, it is also possible to recommend various types of value-added services to the users, so that the WAP providing services and the users of the mobile terminals can be better connected. Specific applications support application-specific behavior by overriding subclasses (which are the default behavior of the framework) or assembling objects. At the same time, the necessary programming tools are provided according to the characteristics of the embedded application. With the help of the components, the application on the mobile terminal can be independent of the operating system and hardware platform, making the product more open and portable, thereby improving development efficiency, reducing development costs, and making application development more efficient. This paper studies the JAVA mobile application development framework based on ant colony optimization algorithm [8].

2. Materials and Methods

In this paper, we use the wireless message registration mechanism to activate the application by inbound connection activation, so as to simulate the implementation of a self-starting information receiving application. The framework establishes these classes and establishes the communication between them. What programmers need to do is to put the core data into the class that represents the data, and add the corresponding method, so that the method of display can be implemented in the class responsible for display. The framework itself is a complete program, which means that you don't need a programmer to add a line of code to run. The application types supported by the framework are divided into two types of parameters as shown in Table I and Figure 1. A necessary prerequisite for the application to receive information is that the application has completed the direction, and the specific information content should include both the connection type and the connection sender.

Table 1. Framework-supported application type parameters

	Target	Parameter
Single document single view	12.50±0.65	9.51±0.32
Multiple document types	9.52±1.20	8.75±0.95

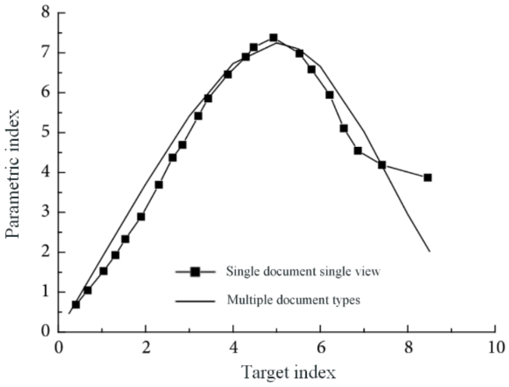

Fig 1. Framework-supported application type parameters

When mobile middleware applications are required to migrate seamlessly between different devices, users can seamlessly switch applications that are being executed on terminals to other devices during the use process, and vice versa. In the actual registration process, applications can reject or allow requests according to the actual situation. In some cases, they can also modify the registration to meet the actual situation. Therefore, this registration method is a dynamic registration. The advantage is reflected in the initiative and real-time of information, and the ant colony optimization algorithm is also a multistage optimal decision problem, and an unknown is selected in each stage. In order to transform the optimal input problem of the unit into the ant colony algorithm mode, the concept of state and decision in dynamic programming should be utilized. This greatly saves the time for users to search for information, and is also conducive to the promotion of value-added services. The ant colony optimization algorithm is shown in Figure 2. Therefore, the services provided by WAP are closer to the needs of users. There are also several event handling classes for handling user input, named event handling classes or control classes. An application can hold one or more different views at the same time, and the way to accommodate the view is different, so you need to have a sub-frame window class.

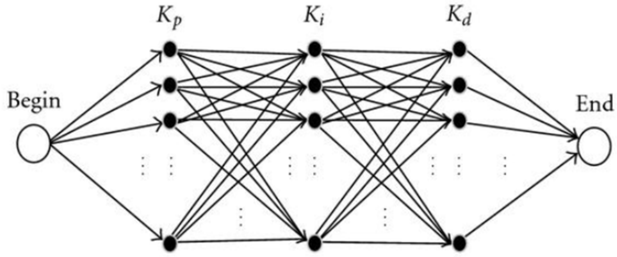

Fig 2. Ant colony optimization algorithm

Access to sensitive APIs is protected by permission in security mechanisms. Access to sensitive APIs is protected by permission in security mechanisms. Applications attempt to gain the appropriate privileges by applying for permission to sensitive APIs. One of the concepts associated with permission is the protection domain, which is a set of permissions and interaction patterns that act on them. The application attempts to gain the appropriate privileges by submitting a licensing application. One of the concepts associated with permission is the protection domain, which is a set of permissions and interaction patterns that act on them. Any state from the state of the period 1 to the period 3 is called a decision, and different decisions result in a difference in operating costs. Our goal is to find a decision path from time 1 that minimizes the total decision cost. When designing an application system, an in-depth understanding of important concepts in the dedicated field is required. These concepts evolved into classes through modeling and as building blocks for the entire application. When designing the framework, the focus is on identifying areas where flexibility is required, which is the "hot spot", which is also the key to the framework. The application can allow or deny PUSH requests on a case-by-case basis, and can even modify the registration as needed, so it is considered a dynamic registration.

3. Result Analysis and Discussion

The scale and field of mobile applications are expanding constantly. The whole embedded system is developing towards hierarchy and modularization. The upper embedded application software has gradually got rid of the dependence on embedded hardware. The upper and lower limits of the active power of the state can only be obtained by registering the real type of the object to the framework by the programmer, which creates this type of object. Although the JAVA language provides a mechanism for type registration, it cannot generate objects according to the type registered. Template is the solution to this problem. Compared with the load, if the lower limit value of one state is greater than the maximum load, or the upper limit value is less than the minimum load, the state is discarded; otherwise, the state and its upper and lower limits of active power are recorded. The emulation client sends information to the client from the server according to the number that comes with the emulator. The receiving program on the client is automatically activated to receive the information and process it.

The application needs to decode the data and convert it into raw data. With the development of hardware technology, the functions of mobile devices are becoming more and more powerful, so the storage capacity is also growing. On the other hand, mobile terminal applications are becoming richer and richer, and more and more data need to be persisted and stored, which is becoming more and more complex. When an application is running, the application can automatically process all related connections and optimize them step by step according to the time period. Ant colony optimization algorithm has the following characteristics: positive feedback of information; ants make decisions according to transfer probability, which has certain randomness. When the application is not running, the application management software can listen to all incoming inbound connections. Once the connection request is detected, the application management software will immediately call the relevant method to start the application. Therefore, in the multi-document mode, the acquisition of file information can only be implemented in a higher-level document management class, but not in the document class. In order to make the document class no difference to the framework (in the case of single document mode and multi-document mode), the acquisition of file information can only be implemented in the document management class.

An inbound connection can be based on static or dynamic addresses. An address consists of two parts, one is an address, such as an IP address or telephone number, and the other is a specified port. The telephone number is static and fixed. Before obtaining information, the server must send a request for information. This step is not necessary. This technology realizes that the server sends relevant information to the client independently. In the process of information pushing, the server is the initiator of a specific event. If the framework (Document Management Class handles this operation by itself, although it is feasible, it will make the Document Management Class redundant, because the final Document Management Class still calls the method of saving documents of the Document Class. So, if the Java object is generated in the native code, although there is a pointer to the Java object in the native stack, the garbage collector does not know the pointer information stored in the native stack, so it will be considered that the Java object does not. It is used, and it is considered as garbage and finally released.

4. Summary

In this paper, the development framework of JAVA mobile application based on ant colony optimization algorithm is studied. Then the message flow of JAVA mobile application framework is analyzed, including the flow of general command message, the flow of user adding command message and the flow of "activating" message. The information is sent from the server to the mobile terminal, and then the application program on the mobile terminal is used to process the received information. The ant colony optimizes the time constraint, reduces the number of search states and the transfer path, guides the ant search process, and improves the optimization efficiency. In addition, line security constraints are also considered. In mobile application development, and identifying these objects with extension directives, access to object members is translated into direct access, and they are directly assigned to Java when the program is run. These objects are released as soon as the program leaves its scope, and other objects are allocated to the heap for recycling by the garbage collector. With the gradual popularization of mobile application development, this paper will provide some reference for common programmers to develop mobile applications.

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