Research on Software Evolution Analysis Method Based on Fuzzy Concept Lattice and Code Analysis

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Abstract: Evolution Analysis of Software System is an Important Part of Program Analysis and Program Understanding. through Software Evolution Analysis, We Can Have a Good Grasp and Understanding of System Requirements and Design Trends, Thus Improving System Pertinence in System Design. from the Current Analysis of Software Evolution, Fuzzy Concept Lattice and Code Analysis Are the Basis of Software Evolution Analysis, Which Has an Important Impact on the Quality of Software Research and Development Analysis. Based on the Practice of Software Research and Development Analysis, This Paper Carefully Analyses the Influence of Fuzzy Concept Lattice and Code Analysis on Software Evolution Analysis, and Summarizes the Practical Application and Method Characteristics of Software Evolution Analysis Methods of Fuzzy Concept Lattice and Code Analysis.

1. Introduction

In the software system design, in order to improve the design quality of the software system and ensure the functional pertinence of the software system after the design is completed, the evolutionary analysis method is usually used to intervene in the design process of the software system. In evolutionary analysis, it is mainly based on fuzzy concept lattice and code analysis. Combining with the practical application characteristics of evolutionary analysis method and the characteristics of evolutionary analysis, fuzzy concept lattice and code analysis determine the results of evolutionary analysis. In practical application, we mainly carry out the change analysis of software system through fuzzy concept lattice and code analysis. Therefore, we should apply the evolution analysis of software system to fuzzy concept lattice and code analysis.

2. Fuzzy Concept Lattice and Software Evolution Analysis

2.1 Concept Lattice and Program Clustering

Formal concept analysis is a clustering analysis method based on lattice theory. Through clustering the relationship between objects and attributes under a specific formal background in a certain field, the corresponding conceptual structure can be obtained. The relationship between objects and attributes can be expressed by concept lattice. Concept lattice contains more information than traditional tree concept structure, because it supports multiple inheritances.

Concept lattice is an important expression in software evolution analysis. Analyzing concept lattice can not only summarize the characteristics of software system, but also find out the rules of concept lattice in evolution and change. At present, fuzzy concept lattice has a direct relationship with program clustering. Analyzing fuzzy concept lattice can find out the characteristics of fuzzy concept lattice and program clustering, which has an important influence on the evolution analysis and programming of programs. At the same time, in the analysis of fuzzy concept lattice, we should not only regard it as an important unit of program clustering, but also as an important node of program composition. Through the analysis of fuzzy concepts and properties, and the summary of the characteristics of fuzzy concept lattice, we can provide basic support for the application of fuzzy concept lattice.

Judging from the current understanding of concept lattice, concept lattice and program clustering

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are important parts of software programs. The relationship between fuzzy concept lattice and program clustering is subordinate relationship. The characteristics of fuzzy concept lattice determine that program clustering should take fuzzy concept lattice as the main basis. Through grasping and analyzing the characteristics of concept lattice, the important influence of fuzzy concept lattice on programs can be found. By summarizing the characteristics of the program and combining with the actual programming, we can have a correct understanding of the characteristics of fuzzy concept lattice and the evolution mode of fuzzy concept lattice, and then in the research and development analysis, we can summarize the characteristics of the software system through the analysis of fuzzy concept lattice.

2.2 Tree Matching

The purpose of tree matching is to discover the patterns shared by multiple trees and the corresponding subtrees. Tree matching technology is widely used, including pattern recognition, molecular biology, program compilation and natural language processing. The tree matching method will be used to discover the concept mapping relationships between different versions of concept lattices.

Tree matching is an important way to apply fuzzy concept lattice. The purpose of tree matching is to find out the correlation between number and number. Through identification of correlation degree and analysis of characteristics of fuzzy concept lattice, the fuzzy concept lattice is matched with actual data nodes to form mutual mapping of different versions of concept lattice. The application of the whole concept lattice is based on tree matching to form matching from point to surface. In actual matching, tree nodes that need concept lattices can also be found through the actual use of concept lattices, and then fuzzy concept lattices can be matched to the required nodes, so that the whole tree matching can complete the task, and the problem of insufficient data nodes can be effectively solved in the tree matching process. Through the effective application and reasonable matching of fuzzy concept lattice, the matching effect of data concept lattice is improved, which has played a strong support for the application of data concept lattice, and also solved the problem of insufficient nodes in the application of fuzzy concept lattice. Through this kind of matching, the matching degree of tree data can be higher, which not only solves the matching problem of tree data, but also realizes the effective application of fuzzy concept lattice. Therefore, understanding the characteristics of tree matching and doing a good job in tree matching play an important role in the application and development of fuzzy concept lattice.

2.3 Concept Mapping Based on Tree Matching

In order to analyze the differences between concepts lattices of different versions of a software system, corresponding mapping relationships must first be established, i.e. the corresponding relationships between concepts contained in different versions must be found. Based on this, we can further get the judgment of various types of evolutionary relationships. We use tree matching method to realize the mapping between different versions of concepts. Concept lattice itself is the data structure of lattice type. The deeper the level, the more connotations and less extension the concept has. Since multiple inheritance is supported, the concept lattice does not completely conform to the structural definition of the tree. Therefore, we regard the concept of having multiple parent nodes in the concept lattice as a shared node of multiple subtrees, and can add its copy to each shared subtree in the analysis process, thus realizing the structural characteristics of the tree.

Concept mapping based on tree matching is an important case of concept lattice in evolutionary analysis. Through the use of concept lattice, we can evaluate the system characteristics of software, find out the specific problems existing in the process of number matching, and effectively solve them in tree matching, improve the effect of tree matching, and enable tree matching to realize the effective application of fuzzy concept lattice. In addition, in the concept mapping of tree matching, the results of tree matching are tested, and the validity of the tree data structure is verified, which ensures that tree matching can achieve positive effects in the use of data matching and concept lattice, especially in the process of tree matching, the expected goals can be achieved in the use of concept lattice and the matching of concept lattice. The matching problem of fuzzy concept lattices

enables the matching of concept lattices to meet the requirements of data usage and the requirements of software system construction. In the use of specific concept lattices, the advantages of concept lattices and the detailed features of concept lattices can be highlighted so that concept lattices can achieve positive effects in data application. From this point of view, concept mapping based on tree matching is an important form of concept lattice application, and it is also the key to check the effect of concept lattice application. In the whole process of tree matching, the application process of data can be checked through concept mapping, thus improving the application quality of data.

3. Evolutionary Analysis Method Based on Concept Mapping

3.1 Conceptual Similarity Calculation

Since each node in the tree structure of the concept lattice is a concept, how to define the similarity between concepts becomes the key to measure whether the two concepts are similar.

In the application of specific evolutionary analysis methods, conceptual similarity calculation should be done well. At present, the concept similarity calculation is mainly to find out the correlation between the two concept lattices and to adjust the application of the concept lattices. Through the different matching of concept lattices and the change of usage rules, the representative function of concept lattices is strengthened. At the same time, the difference of application environment between the two concept lattices and the application characteristics of concept lattices can be found, which is of great significance to the use of the whole concept lattices. In evolutionary analysis, concept similarity calculation is a basic analysis method, which can effectively analyze fuzzy concept lattice and improve the accuracy of the whole similarity calculation in the specific similarity calculation process. The calculation of concept similarity can summarize the strict application situation and the application degree of concept lattice, which has an important influence on the application of the whole concept lattice. Through the calculation of concept similarity, we can find out the characteristics and application positions of two identical concept lattices, which is of great help to the analysis of software functions.

3.2 Relaxation Matching Algorithm on Fuzzy Concept Lattice

On the basis of concept similarity, we further refer to relaxation matching model to design relaxation matching algorithm of fuzzy concept lattice. The algorithm realizes the concept mapping between the two concept lattices, which can be used to determine the corresponding relation between concepts and the concept partial ordering relation with the same structure. The isomorphic concept lattices formed by the detected concept sets and partial ordering relation can help us to understand the software version difference to a certain extent.

In the application of fuzzy concept lattice, relaxation matching algorithm can divide concept lattice orderly and apply concept lattice according to the demand position of concept lattice, which not only improves the application effect of concept lattice, but also can solve the problems existing in concept and application. At present, relaxation matching algorithm is an effective operation mode, which has important application in the process of software evolution analysis and also has important influence on the application of fuzzy concept lattice. In the actual analysis process, relaxation matching algorithm should be applied according to the actual needs of tree matching. In the specific application process, fuzzy concept lattices should be distributed according to the characteristics of tree matching and the characteristics of fuzzy concept lattices, so that the fuzzy concept lattices can form function trees, give full play to the characteristics of concept lattices, and form support for software functions in the application process. Through the effective application of fuzzy concepts, the software can meet the practical requirements in terms of functions, and the application problem of fuzzy concept lattice can also be solved, so that fuzzy concept lattice can become an important representative of software functions. Through the node allocation of fuzzy concept lattices, the fuzzy concept lattices are effectively matched, and the matching quality of the fuzzy concept lattices is improved.

3.3 Evolution Type

We regard each concept in the fuzzy concept lattice as a functional unit of the system and each sub-lattice identified as a functional module of the system. Based on the mapping relationship between concepts and concept sub-lattices obtained by tree matching, we can identify some common evolution types according to the structural differences between different versions of concept lattices, including both fine-grained evolution in implementation and evolution in local design.

The function of software is analyzed by evolutionary analysis method, in which the understanding of evolutionary types is an inevitable requirement. In the current evolution type, each concept of fuzzy concept lattice can become an important component of the system and represents relevant functions in the system. By analyzing the position of fuzzy concept lattice, we can master the functional characteristics of fuzzy concept lattice and understand the functions of software system in time, providing strong support and help for the analysis of the whole software system. At the same time, we can analyze the application characteristics of fuzzy concept lattice according to the characteristics and attributes of software, providing strong support for the application of fuzzy concept lattice. Through the understanding of evolution types, we can also master more ways and means in the process of evolution analysis to ensure that evolution analysis can be effectively implemented and achieve positive results in the implementation process.

4. Conclusion

Through the analysis of this article, we can know that fuzzy concept lattice and code analysis are important elements in the evolution analysis of software system. In the actual evolution analysis, we can deeply analyze the characteristics of concept lattice and code, master the system composition of software, and play an important role in the analysis of software characteristics and software functions. Therefore, we should realize the function of fuzzy concept lattice and its role and position in software evolution analysis, and do a good job in software research and development analysis according to the characteristics of fuzzy concept lattice, so that the research and development analysis of software can be improved in terms of scientificalness, effectiveness and accuracy, and the focus problem in software evolution analysis can be solved. Through the analysis of the function of fuzzy concept lattice, the basic function of software and the composition mode of software system can be mastered. Therefore, we should recognize the characteristics of fuzzy concept lattice and code, and do a good job in the analysis of fuzzy concept lattice in the process of software analysis.

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