

Computer Information Library Clusters



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INTRODUCTION

As well-known, the concept of “set” has been constantly expanded and developed. For example, it can be expanded and developed into the concepts of “generalized set” and the like. At present, many theories and practices demonstrate the viability of big data analysis as a global business activity. In order to meet the needs of big data analysis and the like, we consider that the concepts of “generalized set” and the like should be expanded and developed into the concept of “computer information library clusters” (CILC).

DEFINITIONS AND NOTATIONS

In this section we shall present some basic definitions and notations.

Definition 1: The expanded and developed result of set is defined as generalized and hybrid set.

Definition 2: The expanded and developed result of generalized and hybrid set is defined as library.

Definition 3: The expanded and developed result of libraries related to computer information is defined as “computer information library clusters” (CILC).

Definition 4: In this paper, the variation principle is defined as the following standard form

$$\Pi = \min_0$$

where: \min_0 is the minimum and its value should be equal to zero.

More definitions and notations can be found in (Fu, 2013), (Fu, 2016a), and (Fu, 2016b) respectively.

BACKGROUND

In (Fu, 2016a), generalized and hybrid set can be created with neutrosophy and quad-stage method. In which, generalized and hybrid set are discussed firstly; based on this, the concepts of “problem set”, “solution set”, “principle set”, “law set”, “theory set”, “formula set”, and the like are presented; Secondly the combination or synthetic body of generalized and hybrid sets is named as “library” (various generalized and hybrid sets can be put into the related “library”); such as “mathematics library”, “physics library”, “natural science library”, “social science library”, and the like. As for the constitution of “library”, referring to quad-stage method and Chinese ancient “Complete Library of Four Branches of Books”, the concept and methodology of a special “Four-library” (including four sub-libraries: information library, question library, correlation library, and achievement library) are proposed. Neutrosophy and quad-stage method can also be used to solve many practical problems within the framework of “set” and “library”; for example, based on the analyses of one “Four-library”, jointly solving problem of advance of planet’s perihelion with partial results of law of gravity and general relativity (these two theories belong to “gravitational theory set”); and jointly expanding “uncertainty principle” to “certainty-uncertainty principle set” (including three principles in different conditions:

“certainty principle”, “uncertainty principle”, and neutral (fuzzy) “indeterminacy principle”) with Heisenberg inequality and Ozawa inequality. Finally, with the help of the concepts of “generalized and hybrid set” and “library”, we introduce the concepts of “variation principle of set” and “variation principle of library”, and establish a kind of “partial and temporary unified theory of mathematics so far”.

Based on the concept of “library” presented in (Fu, 2016a), this paper presents the concept of “computer information library clusters” (CILC).

CONSTITUTION OF “COMPUTER INFORMATION LIBRARY CLUSTERS” (CILC)

There are various ways and means to form CILC. For instance, CILC can be considered as the “total-library”, and consists of several “sub-libraries”. The example is the “Four-library” presented in (Fu, 2016a) (including four sub-libraries: information library, question library, correlation library, and achievement library). As another example, in CILC, a “total-library” can be set up, and a number of “sub-libraries” are side by side with the “total-library”. In which, the relationships between “total-library” and “sub-libraries” are also various. In (Fu, 2016a), the “total-library” may include all or part of the contents (such as directory, abstracts, etc) of sub-libraries. Of course, generally the “total-library” includes part of the contents of sub-libraries only.

EXAMPLES OF “COMPUTER INFORMATION LIBRARY CLUSTERS” (CILC)

For the sake of convenience, only discuss the situation that the “total-library” consists of a number of “sub-libraries”. In which, “sub-library” can be

divided into “first order sub-library”, “second order sub-library”, and the like.

Firstly, we discuss “natural science computer information library clusters”. If it is seen as the “total-library”, then the “sub-library” can be constituted in the following three ways: (1) constituted in accordance with discipline, (2) constituted in accordance with name, (3) constituted in accordance with A to Z sequence.

If constituted in accordance with discipline, the “first order sub-libraries” include: “mathematics library”, “physics library”, “chemistry library”, “biology library”, “medicine library”, and so on. In “mathematics library”, “second order sub-libraries” include: “algebra library”, “geometry library”, “trigonometry library”, “calculus library”, and so on.

If constituted in accordance with name, the “first order sub-libraries” include: “Newton library”, “Einstein library”, “Archimedes library”, “Euclid library”, “Qian Xuesen library”, and so on. In “Newton library”, “second order sub-libraries” include: “Newton mathematics library”, “Newton physics library”, “Newton mechanics library”, and so on.

If constituted in accordance with A to Z sequence, the “first order sub-libraries” include: “information library that begin with the letter A” to “information library that begin with the letter Z”. In “information library that begin with the letter A”, “second order sub-libraries” include: “information library that begin with the letters AA” to “information library that begin with the letters AZ”.

Secondly, the “computer information library clusters” (CILC) can also be constituted according to the different requirements and different points of interest. Specially, for CILC, the operation functions can be added.

For example, in (Fu, 2013), for unified dealing with the problems of natural science, applying least square method, “partial and temporary unified theory of natural science so far” can be

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