Chapter 12
Computer Information Library Clusters

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ABSTRACT

Based on creating generalized and hybrid set and library with neutrosophy and quad-stage method, this chapter presents the concept of computer information library clusters (CILC). There are various ways and means to form CILC. For example, CILC can be considered as the "total-library" and consists of several "sub-libraries." 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. Specially, for CILC, the operation functions can be added; for example, according to natural science computer information library clusters (natural science CILC), and applying variation principle of library (or sub-library), partial and temporary unified theory of natural science so far with different degrees can be established. Referring to the concept of natural science CILC, the concepts of social science CILC, natural science and social science CILC, and the like can be presented. While referring to the concept of computer information library clusters, the concepts of computer and non-computer information library clusters, earth information library clusters, solar system information library clusters, Milky Way galaxy information library clusters, universe information library clusters, and the like can be presented.

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).

DOI: 10.4018/978-1-5225-7659-4.ch012

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).