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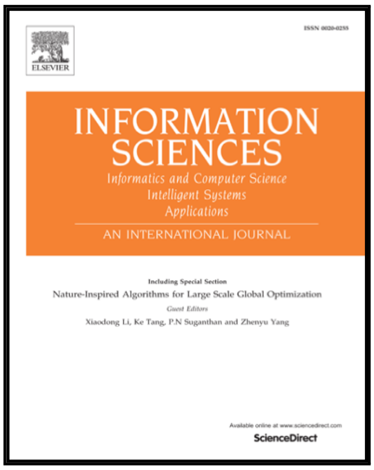

Partial Multi-dividing Ontology Learning Algorithm

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PARTIAL MULTI-DIVIDING ONTOLOGY LEARNING ALGORITHM

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Abstract. As an effective data representation, storage, management, calculation and model for analysis, *ontology* has attracted more and more attention by researchers and it has been applied to various engineering disciplines. In the background of big data, the ontology is expected to increase the amount of data information and the structure of its corresponding ontology graph has become more important due to its complexity. It demands that the ontology algorithm must be more efficient than before. In a specific engineering application, the ontology algorithm is required to find in a quick way the semantic matching set of the concept and rank it back to the user according to their similarities. Therefore, to use learning tricks to get better ontology algorithms is an open problem nowadays.

The aim of the present paper is to present a partial multi–dividing ontology algorithm with the aim of obtaining an efficient approach to optimize the partial multi–dividing ontology learning model. For doing it we state several theoretical results from a statistical learning theory perspective. Moreover, we present five experiments in different engineering fields to show the precision of our partial multi-dividing algorithm from angles of ontology, similarity measuring and ontology mapping building point of view.

1. Introduction

The concept of *ontology*, inspired in the philosophical notion, started to use in sciences in 1980s refers to different properties of a materia and their relations. Later, it was introduced into the field of computer and information technology, and from the 90's of the last century it became one of the hot research fields in artificial intelligence. Because of its powerful semantic query and concept management ability, the ontology has been applied to other fields in the past 10 years. Now, it is used in nearly all disciplines, such as chemical science (see for instance Vijayasarathi and Sankar [47] or Banchetti-Robino [4]), pharmacology science (see Sarntivijai et al. [36]), biology science (see Kohler et al. [26], Levine et al. [30] and Vishnu et al. [48]), psychology (see Aime and Charlet [1] and Petrunia [34]), education system (see Demartini et al. [12], Kruger-Ross [28] and Ochara [33]), geographic information system (GIS) (see Vaccari et al. [46], Delgado et al. [11] and Tahmoorespur et al. [44]), medical science (see Bertaud-Gounot et al. [6] and Lousado et al. [31]), material science

Key words and phrases. Ontology, similarity measuring, ontology mapping, multi-dividing setting, learning.