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**HUDEC, M. - VUČETIĆ, M. - VUJOŠEVIĆ, M.:**  
***COMPARISON OF LINGUISTIC SUMMARIES AND FUZZY***  
***FUNCTIONAL DEPENDENCIES RELATED TO DATA***  
***MINING<sup>1</sup>***

Mining potentially valuable relational knowledge from the data is a topic which has been under continuous development since the first databases appeared. The increasing use of information systems by businesses and governmental agencies has created mountains of data. Undoubtedly, this data should be swiftly and efficiently processed and interpreted by to be useful.

Natural species have remarkable capability to solve variety of tasks without precise measurements and calculations. This capability helps solving everyday tasks in a space full of vague and uncertain information, constraints and dangers in order to survive.

Keeping in mind both above mentioned aspects, biologically inspired techniques for solving data mining tasks are vivid research topic. The book: *Biologically-inspired techniques for knowledge discovery and data mining* edited by S. Alam, G. Dobbie, Y. Sing Koh & S. Rehmanis is an excellent and timely overview of new findings in knowledge discovery and data mining by particle swarm optimization, neural networks, evolutionary algorithms, fuzzy logic and their hybridization. The book includes interesting and innovative chapters belonging to aforementioned work lines. We would like to draw attention to the chapter *Comparison of linguistic summaries and fuzzy functional dependences related to data mining* written by Miroslav Hudec (Faculty of Economic Informatics, University of Economics in Bratislava), Miljan Vučetić and Mirko Vujošević (both Faculty of Organizational Sciences, University of Belgrade). Authors are experienced internationally recognized researchers in fuzzy logic, information systems and operations research.

The starting point for the chapter is the following. Decision makers are usually not interested in large sheets of data, but in relational knowledge that is usually overshadowed by large amount of collected data. However, traditional knowledge discovery provides precise information from the data rather than providing a global review of the whole database. Furthermore, for people the natural way of communication is terms of natural languages which do not have sharp boundaries.

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<sup>1</sup> Kapitola v knihe: *Biologically-Inspired Techniques for Knowledge Discovery and Data Mining*. Hershey, PA: Information Science Reference. ISBN: 9781466660786.

The chapter contains four main parts. In the first part authors analyse linguistic summaries for mining relational knowledge in the data. Linguistic summaries are able to process short sentences of natural language to mine abstract from data and generate rules. Issues such as construction of fuzzy sets for linguistic terms and quantifiers are examined because they are crucial for solving tasks. Next part is focused on fuzzy functional dependencies. In this part authors expand traditional dependences to fuzzy ones to explain ways for detecting more or less similar attributes in databases. Detected dependencies could be converted into *if-then* rules or used for databases' optimization. Third part illustrates advantages of linguistic summaries and fuzzy functional dependencies on case studies on real data. Using fuzzy functional dependencies and linguistic summaries in a complementary way could mine variety of valuable information from relational databases. Therefore, next part is dedicated to their synergy in order to create more sophisticated approach. Finally, authors discussed issues and promising topics for future research activities. Therefore, the chapter, as well as the whole book, is a valuable source for students and practitioners.

We can find other papers dealing with linguistic summaries and fuzzy functional dependencies. However, there is the lack of papers devoted to the issues of construction of fuzzy sets, generating rules and the synergy of these approaches.

Summarizing, we can state that the chapter by Miroslav Hudec, Miljan Vučetić and Mirko Vujošević offers an excellent perspective what is now being investigated in linguistic summaries and flexible functional dependencies in databases. In addition, authors provide up-to-date list of references, key terms, useful examples of applicability and promising topics for future research activities.

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