Telikani, Akbar; **Gandomi, Amir H.**; **Shahbahrami, Asadollah**
A survey of evolutionary computation for association rule mining. (English) Zbl 1458.68204
Inf. Sci. 524, 318-352 (2020).

Summary: Association Rule Mining (ARM) is a significant task for discovering frequent patterns in data mining. It has achieved great success in a plethora of applications such as market basket, computer networks, recommendation systems, and healthcare. In the past few years, evolutionary computation-based ARM has emerged as one of the most popular research areas for addressing the high computation time of traditional ARM. Although numerous papers have been published, there is no comprehensive analysis of existing evolutionary ARM methodologies. In this paper, we review emerging research of evolutionary computation for ARM. We discuss the applications on evolutionary computations for different types of ARM approaches including numerical rules, fuzzy rules, high-utility itemsets, class association rules, and rare association rules. Evolutionary ARM algorithms were classified into four main groups in terms of the evolutionary approach, including *evolution-based, swarm intelligence-based, physics-inspired*, and *hybrid approaches*. Furthermore, we discuss the remaining challenges of evolutionary ARM and discuss its applications and future topics.

MSC:

68T20 Problem solving in the context of artificial intelligence (heuristics, search strategies, etc.)
68T05 Learning and adaptive systems in artificial intelligence
68W50 Evolutionary algorithms, genetic algorithms (computational aspects)

Keywords:

data mining; association rule mining; evolutionary computation; swarm intelligence

Software:

GSA ; Rare-PEARs; QuantMiner; G3PARM; PeSOA; MODENAR; NICGAR; SPMF; NMEEF-SD

Full Text: DOI

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