Zhang, Shaopu; Sun, Pin; Feng, Tao
A graph approach for attribute reduction of Pythagorean fuzzy information systems. (Chinese. English summary) [Zbl 1449.68109]

Summary: Attribute reduction was a hot spot of knowledge discovery in information systems. It helped us to discover and simplify knowledge. There were many studies on attribute reduction using discernibility matrix. However, when the data dimension increased, the complexity of the algorithm also increased. Weighted Euclidean distance was used to define the binary relation and the discernibility matrix. Using the equivalence relationship between attribute reduction of a given information system and minimum vertex cover of a graph induced from this information system, the problem of solving reduction of discernibility matrix was transformed into the calculation of minimum vertex cover of the induced graph. Then a new algorithm of attribute reduction in Pythagorean fuzzy information system was proposed. Reduction algorithm based on the method of minimum vertex cover of Pythagorean fuzzy decision information system was constructed by the same way. Then, the effectiveness of the proposed algorithms was demonstrated by examples. Finally, the comparative analysis was given.

MSC:
68T37 Reasoning under uncertainty in the context of artificial intelligence
68R10 Graph theory (including graph drawing) in computer science

Keywords:
Pythagorean fuzzy information system; attribute reduction; discernibility matrix; minimum vertex cover

Full Text: DOI