Abstract

The data handled in emerging applications like location based services, sensor monitoring systems, and data integration, are often inexact in nature. In this paper, the important problem of extracting frequent item sets from a large uncertain database, interpreted under the Possible World Semantics (PWS) is presented. This issue is technically challenging, since an uncertain database contains an exponential number of possible worlds. By observing that the mining process can be modeled as a Poisson binomial distribution, an algorithm was developed, which can efficiently and accurately discover frequent item sets in a large uncertain database. The important issue of maintaining the mining result for a database that is evolving (e.g., by inserting a tuple) can be presented. Specifically, the proposed mining algorithm can enable Probabilistic Frequent Item set (PFI) results to be refreshed. This reduces the need of re-executing the whole mining algorithm on the new database, which is often more expensive and unnecessary. The proposed algorithm can support incremental mining and provides the accurate results on mining the uncertain database. The extensive evaluation on real data set to validate the approach is performed.
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Index Terms

Computer Science  Artificial Intelligence

Keywords

PFI  PWS  S-PMF  CDF