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# Single-Pass based Efficient Erasable Pattern Mining using List Data Structure on Dynamic Incremental Databases

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## Abstract

Many different approaches of data mining have been proposed to satisfy various demands of users. Erasable pattern mining is one of the interesting areas in frequent pattern mining, which was proposed to diagnose and solve financial problems caused in industrial fields. Since its original concept emerged, various relevant approaches have been devised. Analyzing incremental data becomes more important because interesting data are continually accumulated in various application fields including industrial areas. For this reason, an incremental method for erasable pattern mining has also been suggested in order to reflect such a trend. Since incremental data become gradually larger and more complicated with the passage of time, it is important to process such data as quickly and efficiently as possible. However, the previous method has limitations in this respect. Motivated by this challenge, we propose a new incremental erasable pattern mining algorithm including new data structures and mining techniques for efficient incremental data processing. We also demonstrate that the proposed method outperforms previous state-of-the-art approaches through extensive, empirical performance tests.

## Keywords

Data mining, Data streams, Erasable pattern mining, Financial crisis, Incremental data processing

## 1. Introduction

With the passage of time, more and more data have been accumulated in different application areas. In order to find interesting knowledge from such data, researchers have proposed various data mining techniques such as pattern mining (association rule mining) [1, 13, 14, 15, 23], clustering [9, 16], and classification [6, 28], and various applications such as social network analysis [25], electronic commerce management [7], bio research [8], multi-dimensional network analysis [5], online workflow analysis [17], and role-based access control [34].

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