



INVESTIGATION OF ISSUES, TASKS & APPLICATIONS OF TEMPORAL DATA MINING IN IT INDUSTRIES

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ABSTRACT : In our research problems & challenges related to spatiotemporal data representation, analysis, mining & visualization of knowledge have been presented. Many type of data mining tasks like association rules, classification clustering for discovering knowledge from spatiotemporal datasets are examined & reviewed. System functional requirements for such kind of knowledge discovery & database structure are discussed. So applications of spatiotemporal data mining are presented. Such applications are related to huge data of processed within IT industries. Temporal Data Mining is a rapidly evolving area of research that is at intersection of several disciplines, consisting statistics, temporal pattern recognition, temporal databases, optimization, visualization, high-performance computing & parallel computing. Spatiotemporal data generally consists states of an object and event or a position within space over a period of time.



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1. INTRODUCTION

Temporal property is timestamp or time interval for which object is valid. Spatiotemporal object usually contains spatial, temporal & thematic or non-spatial attributes. Examples of such objects are moving car, forest fire, & earth quake. Spatiotemporal object can be defined as an object that has at least one spatial & one temporal property. Spatial properties are location & geometry of object. Spatiotemporal data sets essentially capture changing values of spatial & thematic attributes over a period of time. An event within a spatiotemporal dataset describes a spatial & temporal phenomenon that may happens at a certain time t & location x . Examples of event types are earth quake, hurricanes, road traffic jam & road accidents. In real world many of these events interact with each other & exhibit spatial & temporal patterns which may help to understand physical phenomenon behind them. Therefore, it is very important to identify efficiently spatial & temporal features of these events & their relationships from large spatiotemporal datasets of a given application domain.

2. ISSUES & CHALLENGES

General issues & challenges in representation, processing, analysis & mining of spatiotemporal data are described below.

1. Design & development of robust spatiotemporal representation & data structures is fundamental issue for spatiotemporal data handling, analysis & mining.

2. unique characteristics of spatiotemporal datasets are that they carry distance & topological information which require geometric & temporal computation.
3. Spatial & temporal relationships like distance, topology, direction, before & after are information bearing. They need to be considered in spatiotemporal data analysis & mining.
4. Spatial & temporal relationships are implicitly defined. They are not explicitly encoded in a database. These relationships must be extracted from data. There is a trade-off between preprocessing them before actual mining process starts & computing them on-the fly as & when they are actually needed.

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