

《时态信息处理技术及应用》

图书基本信息

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Time is a natural attribute of everything. With the explosive growth of computer and network systems, temporal information has received extensive attention in both academia and industry. It plays an increasingly important role in the new generation information systems and also a key role in some applications. The use of temporal information modeling and processing technology in these applications can make them more useful and more convenient. Temporal database and application problems have been mentioned during the 1970s. The groundbreaking study in this area was conducted by J. Ben Zvi, who proposed the bitemporal concept and a temporal database model in his dissertation, submitted to the University of California, Los Angeles, in 1982. In subsequent years, the temporal database theory research has grown vigorously and hundreds of temporal models have been proposed. James Clifford, Christian S. Jensen, Richard T. Snodgrass and Andreas Steiner made important contributions to temporal database models, theory and technology. In the recent years, along with information technology that can meet the increasing requirement for new applications, the temporal database theory and application technologies have made remarkable progress. However, there are many problems in temporal information processing, e.g., weakness in temporal calculus theory, low efficiency of temporal storage and access, complex temporal information processing and lack of the software development tools. There are three main trends in temporal technologies: model standardization, middleware development and application diversification. We began to pay special attention to research on temporal database when we undertook the software application project: Intelligent Decision Support System of Salary (SIDSS), in 1998. The main concept behind SIDSS is that an employee's wage is paid according to information related to the employee and to the policies of the salary management department. SIDSS is a typical temporal system, in which the employee information that influences his or her salary is the typical temporal data and the salary policies that can be changed by the management department which also are time-varying knowledge.

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内容概要

《时态信息处理技术及应用》读者对象为高等院校计算机专业的师生，科研机构及相关领域的研发人员等。时间是自然界无处不在的属性。时态信息处理已经成为现代信息系统的重要组成部分。《时态信息处理技术及应用》系统研究时态信息处理技术及其应用，内容包括：（1）时间模型、时间演算和时态逻辑方法；（2）时态数据库基本概念、时态数据模型、时间算子now的语义和时态数据索引；（3）时态数据查询语言，以TempDB为例介绍时态数据库管理系统的设计和实现；（4）XML、工作流时态扩展和时态知识模型；（5）时态应用模式，并给出一个典型的时态应用实例。

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Abstract Time data is one of the basic data types in database systems. There are two modes of using time data in applications , one is the explicit mode and the other is the implicit mode. In the second mode of application , time attributes of information need to be handled. In this chapter , we introduce three basic types of time data , i.e. , point , interval and span. Subsequently , we propose the concepts of temporal information , temporal database and temporal systems , and introduce the basic concepts and core technologies of temporal database. We also analyze the origin and development of temporal information processing technologies and divide the evolution in this research field into three phases. Finally , we analyze the current situation in temporal research field and propose some trends of temporal information technologies. Keywords time data , temporal information , temporal database , temporal system , basic concept , evolution , trends

1.1 Application Requirement

Time exists everywhere in the world. Its attributes are applied in many areas , such as e-commerce , e-government , global information system , and the stock market. However , some applications process time attribute in the same way as they would process a common attribute. For example , web sites can record logon time of users , but simply regard them as a normal attribute like number or character data type. We call these temporal applications implicit applications. There are other temporal applications that require special time processing mechanisms to manage time attributes. We call these applications explicit applications.

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