Wireless Information Highways - Dimitrios Katsaros

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Wireless networks and mobile computing concepts even exist for some time, their impact is increasing in the current period due to the emergence of Wireless information highways.

This current compilation is a set of individual contributions on two principal areas, mobile computing and wireless networks. The contents are organized in to five categories such as broadcasting, local management, network support, location-based services and two few emerging areas security in pervasive computing and broadcast databases.

The collection has 16 chapters written by different experts. The chapter one overviews the data broadcasting which is the baseline for dissemination of information over asymmetric wireless environments where the needs of the various data items are felt. This chapter besides presenting the communication asymmetry, discusses broadcast schedule construction for systems employing a single broadcast channel, schedule construction for systems employing multiple broadcast channels and schedule construction for systems that take into account the effect of reception errors. Mobile data access can be eased with advanced client side data-caching techniques. In the chapter on Mobile Cache Management, the authors address three issues, viz., cache replacement policy for realisitic wireless data broadcasting service, caching issues for mobile data applications and two novel cache replacement policies for location-dependent data.

The indexing and clustering of wireless broadcast data management issues in wireless data broadcasting are briefed in a chapter while solutions for indexing scheme, broadcasting over single and parallel channels, data distribution and replication strategy are discussed in another chapter. In a discussion, the algorithms for placing broadcast data to multiple wireless channels and modeling and management location and mobility are discussed in one part. Main standards and basic procedures and advanced mobility management schemes are discussed widely in a separate chapter.

The section three discuss first the service discovery in wireless and mobile networks with a description of service discovery mechanisms such as SLP, Jine, Salutation and others. The protocols and algorithms for wireless sensor networks are proposed subsequently. The connection admission control in wireless system and resource management discussions follow the section on networking issues.

Location based services section addresses the issues for offering contemporary solutions for indexing mobile objects. The platform issues for location based services deployment and provisioning are also addressed in the next chapter. The impact of mobile architecture on benchmarking design is given significance in the chapter on location dependent query processing benchmarking. The infrastructure issues for mobile data management are presented in detail in the chapter on data access and queries.

Two advance topics, viz., security in pervasive computing which is crucial in this book emphasise that the security requirements for pervasive computing environment are different from the fixed network environment. The suitability of existing security methods are assessed in this chapter. The complexity of broadcast transaction processing is presented and solutions for it are also discussed in the final unit.

The most significant factor one can find in this book is that the most crucial challenges in mobile data environment is addressed extensively. The present collection we do hope would serve as a basic as well as advanced level document for students, teachers and researchers in mobile data management. Each component in this book deals unique issues and addresses the challenges comprehensively.

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Data Mining with Computational Intelligence

With 72 figures and 65 tables
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In the recent period, unprecedented production of data in heterogeneous form is noticed in many disciplines. We have no authentic data about data available to human beings currently as it is anybody's estimate. Unless the available data is properly managed, the production and availability of data will offer no value to the people. Researchers and workers have to manage the large volume of data with computational ease and time. Realising this growth, researchers in data mining work for new algorithms and techniques to make the data management a simple and efficient way.

Data mining has its origin from the traditional but highly scientific processes known in forms such as classification, clustering and organizing. These concepts thus play major roles in structuring the data in a perfectly scientific way. The authors have highlighted the basic facts relating to data mining in the preliminary pages of the current book on data mining.

While fundamental concepts of data mining are outlined, the authors stress the importance of the fuzzy neural networks, radial basis function, neural networks, genetic algorithms and support vector machines in data mining. Irrelevant and redundant data exists in most data sets and the ways to clean them are highlighted with proper techniques.

This book deals neural networks in different perceptions such as MLP neural networks for time series prediction and classification, RBF neural network classifier and fuzzy neural networks for bioinformatics. Data Dimension Reduction is a classical technique for data mining process. The authors have presented techniques for different application sets to ease of the removable data. The genetic algorithms for class dependent feature selection for data dimension reduction are given explicitly in a separate chapter. Rule extraction procedures are presented more logically with a wide range of applications and experimental sets.

Protein structure understanding requires a better and scalable application of data mining. The authors have a unique presentation in a chapter with architecture, techniques and experimental results where several accuracy measures are employed. Support vector machines are discussed in two chapters with specification and presentation for bioinformatics. Illustrations are supported in cancer diagnosis.

The value of this book content is increased with an extensive bibliography, index and appendices. The current work is a significant addition in the literature of data mining.

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