



Heterogeneous and Mobile Databases

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Friday 6 November, 12:00 – 1:00

Tech Hall S105



Mobile systems require access to information “anytime, anywhere.” The extensive diversity in the range of information that is accessible to a user at any given time is growing at a rapid rate. Furthermore, rapidly expanding technology is making available a wide breadth of devices with different memory, storage, network, power, and display requirements to access this diverse data set.

Classical distributed database systems monolithically offer distribution transparency and higher performance. However, with the advances in technologies this monolithic approach is insufficient. In the new computational environment data distribution issue has been evolved to the data integration from several heterogeneous databases.

Multidatabases are designed to deal with the data integration issue. They are designed to allow timely and reliable access to large amount of heterogeneous and autonomous data sources in an environment that is characterized as “sometime, somewhere.” However, the concept of mobility, where a user accesses data through a remote connection with a portable device, has introduced additional complexities and restrictions in a multidatabase system. These include: reduced capacity network connection, processing and resource restrictions, and effectively locating and accessing information from a multitude of sources.

An extended multidatabase system (MDBS) that facilitates “anytime, anywhere” access to the information is called a mobile data access system (MDAS). Within the scope of MDAS, we distinguish three classes of services: Broadcast based services, On-demand based services, and Pervasive based services.

Within the scope of broadcasting, we introduce and evaluate several algorithms that address Data allocation and retrieval on single and parallel channels, application of indexing on the air channel (s), access conflict and conflict resolution, and power management

Professor Ali Hurson is Professor and Chair of the Computer Science at Missouri University of Science and Technology. His research for the past 25 years has been directed toward the design and analysis of general as well as special purpose computer architectures. His research has been supported by NSF, NCR Corp., DARPA, IBM, Lockheed Martin, ONR, and Penn State University.

He has published over 250 technical papers in areas including database systems, multidatabases, global information sharing, application of mobile agent technology, object oriented databases, Mobile databases, mobile computing, computer architecture parallel and distributed processing.

Dr. Hurson served as the Guest Co-Editor of special issues of the IEEE Proceedings on Supercomputing Technology, the Journal of Parallel and Distributed Computing on Load Balancing and Scheduling, the journal of integrated computer-aided engineering on multidatabase and interoperable systems, IEEE Transactions on Computers on Parallel Architectures and Compilation Techniques, Journal of Multimedia Tools and Applications, and Journal of Pervasive and Mobile Computing. He is the co-author of the IEEE Tutorials on Parallel Architectures for Database Systems, Multidatabase systems: An advanced solution for global information sharing, Parallel architectures for data/knowledge base systems, and Scheduling and Load Balancing in Parallel and Distributed Systems.

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