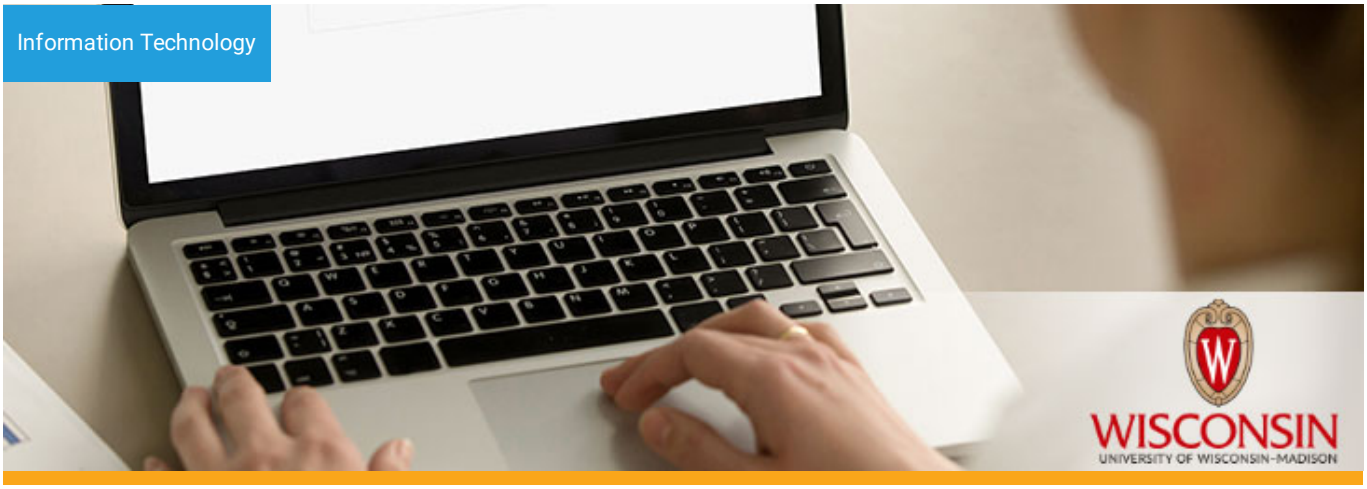
Information Technology



Faster Scans with Improved Bit-Parallel Processing

View U.S. Patent No. 9,002,903 in PDF format.

WARF: P130164US01

Inventors: Jignesh Patel, Yinan Li

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a database system, or incorporating techniques into an existing database system, that organizes data and processes queries for improved parallelism at the bit level.

Overview

A database system combines hardware and software to manage and selectively access the large amounts of data it holds. Such a structure may hold data elements organized in logical rows and columns (for example, rows associated with different customers and columns of information like age, income, etc.).

Accessing the database structure commonly is done by means of 'queries,' which scan multiple data elements to identify relevant results (e.g., 'identify all customers over the age of 35'). Of course, faster query scans would be advantageous, especially for analyzing large databases. A key design goal in main memory databases is to run at the 'bare metal speed,' in other words, processing data at the speed of the processor itself.

The Invention

UW–Madison researchers have developed a method for improved parallel processing at the bit level. Faster query scans are performed by making better use of an existing processor 'word,' a unit of data of a defined size.

The system selects between two different organization techniques (a horizontal or vertical bit parallel structure). Data elements are prepacked into one of these structures according to processor word size. After words are populated with data from multiple elements of the database, query operations process them in each data word simultaneously in the arithmetic logic unit (ALU).

Applications

- Database management
- Analytics dealing with vast amounts of data

Key Benefits

- Speed gains
- Multiple bits of data from different values can be operated on in a single cycle.
- Increased utilization of processing word of the ALU
- Supports efficient data transfer

Additional Information

For More Information About the Inventors

- Jignesh Patel

Related Technologies

- WARF reference number P95197US describes a fast data processing system for modern hardware.

Tech Fields

- Information Technology : Computing methods, software & machine learning

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842