

RELATIONAL DIFFERENTIATION ENCODING

TECHNICAL FIELD

This invention relates to data encoding, and more particularly to providing a compact data representation using relational differentiation encoding.

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BACKGROUND

Computers commonly use a binary data encoding system to store, process, and transmit data. For example, the number "4254" may be encoded as the binary string "1000010011110". Some coding systems, such as Huffman encoding, represent binary data in a manner that takes advantage of repeating information to provide a compact data representation. If a long bit string, such as "101101001101011101," repeats many times within a bit string, then all instances of the long bit string may be replaced by a much shorter representation of that bit string. Such run-length encoding techniques may be employed to create a more compact data representation.

Compression and/or data representation techniques may be used to significantly reduce the size of a bit string, with the resulting compact representation usually resembling a random string of bits with little redundancy or repeating patterns. It is widely believed that the resulting random bit string cannot be further compressed. However, just as it is possible to encode a number in decimal, hexadecimal, and binary data representations, it is possible to encode a random string of bits with a coding scheme more compact data representation.

Many modern computer systems are limited by the amount of data that can be stored or transmitted. For example, today's modems have reached a bottleneck due to physical and legal limits of modem technology over copper lines. More compact data representations could alter the bandwidth constraints, permitting increased throughput and density, perhaps fundamentally altering the bottlenecks of modern computer systems.

SUMMARY

In one general aspect, a method of encoding a target value for storage and/or transmission in a computer system is described. The method includes constructing a