TECHNOLOGY

A Method of Matrix Spectral Factorization

OVERVIEW

Background
Spectral factorization is a method of reducing a matrix of a high order dimension into a series of smaller matrices to perform more efficient computations. Spectral factorization has broad applications, including signal and image filtering, control systems, data processing, and data compression. However, spectral factorization currently has practical limits when the values of the entries in a matrix are polynomial or nonrational, or if the matrix is high dimensional. Currently, it is not possible to process such information in real time, as would be the case with a wireless signal receiver or in a control system.

Innovative Technology
Researchers at the University of Maryland, in conjunction with researchers from the Andrea Razmadze Mathematical Institute in Tbilisi, Georgia, have developed a new method of matrix spectral factorization that allows for the efficient computation of high order matrices with high order polynomial or nonrational entries. The method allows for the user to select the degree of accuracy at each step of factorization, which increases computational efficiency. By developing a causal wavelet matrix from an original matrix, it is possible to reduce a spectral factorization problem to a system of linear algebraic equations, which is computable in real time.

APPLICATIONS

· Improved Wiener filtering
· Signal noise reduction
· Control systems
· Radar systems
· Speech systems

ADVANTAGES

· Can be applied to matrices of arbitrary dimension
· Degree of accuracy can be determined to any level
· Computationally practical in hardware or software

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Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Patent(s) pending

LICENSE STATUS

Available for exclusive or non-exclusive license

CATEGORIES

- Software + Algorithm

EXTERNAL RESOURCES

- US Patent 9,318,232

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