

1. MagdyTawfik Hanna, Nabila Philip Attalla Seif, Waleed Abd El Maguid Ahmed, "Discrete Fractional Fourier Transform Based on the Eigenvectors of Grünbaum Tridiagonal Matrix," Proceedings of the IEEE International Symposium on Circuits and Systems, Seattle, Washington, USA, pp. 1160-1163, May 18-21, 2008.

Abstract:

The development of the discrete fractional Fourier transform (**DFRFT**) necessitates the availability of a complete set of orthonormal eigenvectors of the **DFT** matrix **F**. An eigenanalysis is performed for the original Grünbaum tridiagonal matrix **T** – which commutes with matrix **F** – having only one eigenvalue of multiplicity two and simple remaining eigenvalues. The two easily obtainable eigenvectors of **T** corresponding to its repeated eigenvalue – which are not eigenvectors of **F** – are exploited for analytically generating two orthonormal eigenvectors common to both **T** and **F**.