ORTHONORMAL NON−UNIFORM B−SPLINE SCALING AND WAVELET BASES ON NON−EQUALLY SPACED KNOT SEQUENCE FOR MULTIRESOLUTION SIGNAL APPROXIMATIONS (WedPmPO3)

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Abstract :

This paper investigates the mathematical framework of multiresolution analysis based on irregularly spaced knots sequence. Our presentation is based on the construction of nested non−uniform B−spline multiresolution spaces. From these spaces, we present the construction of orthonormal scaling and wavelet basis functions on bounded intervals. For any arbitrary degree of the spline function, we provide an explicit generalization allowing the construction of the scaling and wavelet bases on the non−traditional sequences. We show that the orthogonal decomposition is implemented using filter bank coefficients of which depend on the location of the knots on the sequence. Examples of orthonormal spline scaling and wavelet bases are provided.

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