

The Ascertainment of Scale Sampling Step for Numerical Realization Adopting Binary Dot-and-Grid Sampling of the Continuous Wavelet Transform

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ABSTRACT

One of the key discrete approaches for the numerical realization of the continuous wavelet transform is to ascertain the scale sampling step, which is the requirement and basic for wavelet analytic engineering achievement and research in theory. This article disserts the basic theory for the numerical realization of the continuous wavelet transform. According to the highest numeric angle frequency of signal is or below P , in this two cases the article respectively deduces the best results of the scale sampling step of Morlet mother wave and Gauss function's each phases differential coefficient of even or odd symmetric mother wave in the numerical realization of the continuous wavelet transform when binary dot-and-grid sampling is adopted. In the end, it discusses the time shift required in getting the results of odd symmetric mother wave in the numerical realization of the continuous wavelet transform. These useful conclusions solve a fundamental issue of wavelet analyses in engineering practice and research in theory.

Keywords: the scale sampling step, binary dot-and-grid sampling, ripple coefficient, symmetry of wavelet, numerical wavelet filter, time shift