ON THE REPRESENTATION ERROR OF DIGITIZED SIGNALS (MonPmOR7)

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Abstract :

Although the origin of many sources of information is analogue or continuous−time, due to practical considerations signal representation is usually based on discrete−time basis functions. These basis functions are in many cases sampled versions of harmonic signals (Fourier), Gabor, wavelets and the like. In this paper, we examine the accuracy of this approach, where the calculation of the representation coefficients is performed using digital inner product rather than analogue. By interpreting the sampling process as a bounded linear operator, we analyze the difference between the analogue domain inner product and the result one may get in the digital domain. We consider both the one−dimensional and two−dimensional cases, and several applicable examples are given.

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