# THE ENHANCEMENT OF THE ONE-DIMENSIONAL SIGNAL THROUGH KALMAN FILTERING

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## Abstract

Digital signal processing is the numerical manipulation of signals, usually with the intention to measure, filter, produce or compress continuous analog signals. It is characterized by the use of digital signals to represent these signals as discrete time, discrete frequency, or other discrete domain signals in the form of a sequence of numbers or symbols to permit the digital processing of these signals. This field of study is going to a very rapid development and includes increasingly encompassing applications. Therefore considering the development of digital signal processing algorithms, it is necessary the design and the conception of these algorithms that minimize the disturbing signals occurring during the processes and transformations that are subjected to a useful signal on the path towards digitalization. The Kalman filtering is the evaluator for what is called "quadratic-linear problem," which is the problem of evaluating the immediate state of a linear dynamic system which is worried from the white noise. This is accomplished using measurements that correlate linearly with the situation and are concerned by white noise. The resulting evaluator is statistically optimal in relation to any quadratic error evaluation function. In this paper we have modeled a simulation model through Matlab / Simulink to use one-dimensional Kalman filtering to minimize the noise of a certain signal. In this paper there are treated two cases of simulation to improve signals using Kalman filtering. In both cases we improve the periodic signals. In the first case we are dealing with continued periodic signal and in the second case we are dealing with a periodic signal of impulsive type. These two signals are mixed respectively with noise signals through a specific method and output consists in the respective improved signals which are certainly not identical with the useful signals entering in the system. After the simulation model, we have given the relevant results of the parameters of the improved signal, the signal-noise ratio, etc. Finally, part of this paper are the proposals for the development of other models of Kalman filtering to higher dimensions that can be used to improve images, videos, etc.

***Keywords***: *digital signal processing, Kalman filtering, Matlab/Simulink, one-dimensional signal, improves signal*