

Journal of Physics: Conference Series 2016 vol.738 N1

Design of order statistics filters using feedforward neural networks

Maslennikova Y., Bochkarev V.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd. In recent years significant progress has been made in the development of nonlinear data processing techniques. Such techniques are widely used in digital data filtering and image enhancement. Many of the most effective nonlinear filters are based on order statistics. The widely used median filter is the best known order statistic filter. Generalized forms of these filters could be presented based on Lloyd's statistics. Filters based on order statistics have excellent robustness properties in the presence of impulsive noise. In this paper, we present a special approach for synthesis of order statistics filters using artificial neural networks. Optimal Lloyd's statistics are used for selecting of initial weights for the neural network. Adaptive properties of neural networks provide opportunities to optimize order statistics filters for data with asymmetric distribution function. Different examples demonstrate the properties and performance of the presented approach.

<http://dx.doi.org/10.1088/1742-6596/738/1/012130>
