E-spline Analysis for De-noising and Wavelet Compression Applications

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Abstract:

B-splines caught interest of many engineering applications due to their merits of being flexible and provide a large degree of differentiability and cost/quality trade off relationship. However they have less impact with continuous time applications as they are constructed from piecewise polynomials. On the other hand, Exponential spline polynomials (E-splines) represent the best smooth transition between continuous and discrete domains as they are made of exponential segments. In this paper we present a technique for utilizing E-splines in image compression and de-noising applications. This technique is based upon sub-band decomposition of the image through an E-spline based perfect reconstruction (PR) system. Different thresholdings are applied on the decomposition layers for de-noising purposes. Due to the selective nature of E-spline based decomposition, the performance of our E-spline based de-noising technique outperforms all other literature techniques.

Published In:

IEEE EuroCon 2013 conference, Zagreb July 2013