Faculty of Engineering Science

Denoising and inpainting with wavelets

Wavelets with application in signal and Image processing

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1 Wavelet-based denoising

1.1 A univariate functions with noise

1.1.1 Question 2.1

Function being sampled, $N = 1000$, between $[-2, 2]$

$$f(x) = (2 + \cos(x))|x| \operatorname{sign}(x - 1)$$

Tested for wavelet transform of 4 levels deep, using the Daubechies 2

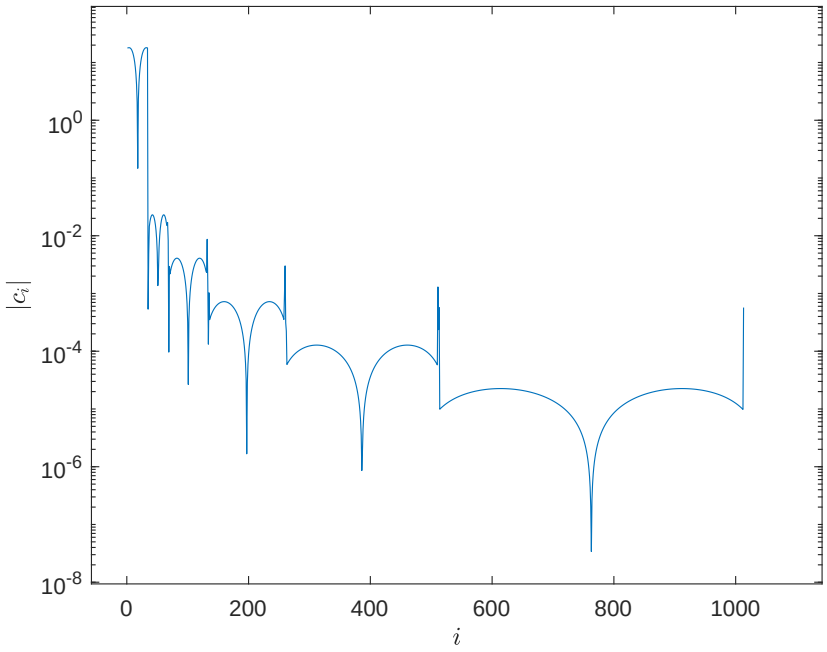

Figure 1: Coefficients of Wavelet transform (4 levels deep, using the Daubechies 2, $N = 1000$ sample points, between $[-2, 2]$

We can see in fig. 1, that the size of the coefficients decreases as i increases. The meaning of this is that the coefficients of small size are of less importance to the reconstruction of the signal, and can be more easily effected by added noise.