

MATH 416, FALL 2014, HW 8

Implement the 1st order finite difference transform in Matlab. Recall, that the 1st order finite difference was defined as $D(v)(k) = v(k) - v(k + 1), \text{ mod } n$, for $v \in \mathbb{R}^n$. Apply it iteratively 4 times to the sequence $s = \{\sin(2\pi n/512) : n = 0, \dots, 511\}$. In the resulting sequence, threshold (i.e., set to 0) all the coefficients with absolute value strictly below $\epsilon = 0.001$.

Repeat for $\epsilon = 0.01$ and $\epsilon = 0.1$, each time computing the compression rate (i.e., the ratio of non-zero coefficients in the transformed sequence and the number of non-zero coefficients in the thresholded sequence).