

Project 2

Instructions: This project is worth a total of 10 points. You may use any notes or books that you wish but you must work individually. The only computation aid which you may use is MATLAB, unless otherwise indicated. The primary reference for this project is the notes on Fourier series, DFT and FFT which can be found at: http://www.math.ohio-state.edu/~husen/teaching/572/image_comp.pdf Make sure to write clearly and justify your answers.

(1.) Let

$$A = \begin{pmatrix} 88 & 88 & 89 & 90 & 92 & 94 & 96 & 97 \\ 90 & 90 & 91 & 92 & 93 & 95 & 97 & 97 \\ 92 & 92 & 93 & 94 & 95 & 96 & 97 & 97 \\ 93 & 93 & 94 & 95 & 96 & 96 & 96 & 96 \\ 92 & 93 & 95 & 96 & 96 & 96 & 96 & 95 \\ 92 & 94 & 96 & 98 & 99 & 99 & 98 & 97 \\ 94 & 96 & 99 & 101 & 103 & 103 & 102 & 101 \\ 95 & 97 & 101 & 104 & 106 & 106 & 105 & 105 \end{pmatrix}$$

Let H_1 , H_2 and H_3 be as in the notes. Proceed to find the normalized Haar wavelet image of A as follows:

- (a.) Find the normalized matrix \tilde{H}_1 of H_1 .
- (b.) Find the normalized matrix \tilde{H}_2 of H_2 .
- (c.) Find the normalized matrix \tilde{H}_3 of H_3 .
- (d.) Find the normalized matrix \tilde{H} of H .
- (e.) Find the compressed image of A using \tilde{H} .