

In the name of God

Department of Physics
Shahid Beheshti University

NUMERICAL ANALYSIS COURSE

Exercise Set 12: Wavelet Transformation

(Due Date: 1403/10/30)

- Using the data sets (0.2.txt, 0.5.txt and 0.8.txt), do following tasks:
 - Use the Haar, Daubechie, Symlet families, to compute wavelet spectrum of above series.
 - For each data sets, construct the $x(t) \rightarrow x'(t) = x(i) + 2\sin(3t) + 2\sin(50t)$ and then compute the wavelet spectrum.
 - According to the rule such that for $t < 100$ use $x'(t) = x(i) + 2\sin(3t)$ and for $t > 100$ consider $x'(t) = x(i) + 2\sin(50t)$, and now use wavelet transform mentioned in part A. Compare your results for FFT.
 - Use the sunspot.txt data and apply the Haar, Daubechie, Symlet families. Explain your results.
- Take a photo from yourself and then apply the 2D FFT on that. Compare your results if you use sym3.
- Use your photo and keep e.g 100 Fourier coefficients and by doing inverse Fourier transformation construct the modified picture. Use the same just to remove first 100 coefficients and keep the rest and by doing inverse Fourier transformation, construct the modified photo. compare your results.

Good luck, Movahed
