Taylor Larrechea

Dr. Gustafson

Math 362 Fourier Analysis

November 1, 2017

Class Prep 12

Section 6.2

Key Concepts - In this section we develop the DCT IV, the discrete counterpart to the CT IV. We also look at a windowing vector, and see how the FFT can be used to compute the DCT IV.

|  |  |
| --- | --- |
| Input Commands | Output (Plot if Applicable) |
| >> x=[1,2,3,4]';  >> EvenOddVector(x);  >> x=[1,2,3,4]'  >> DCTIV(x) | y =  1 2 3 4 -4 -3 -2 -1 -1 -2 -3 -4 4 3 2 1    x =  1  2  3  4  c4 =  3.5997  -3.3399  1.7714  -1.6580 |

|  |  |
| --- | --- |
| Input Commands | Output (Plot if Applicable) |
| >> x=[1,2,3,4]';  >> DCTIVmatrix(x) | c4 =  3.5997  -3.3399  1.7714  -1.6580  x2 =  1.0000  2.0000  3.0000  4.0000 |

|  |  |
| --- | --- |
| Input Commands | Output (Plot if Applicable) |
| >> x=[1,2,3,4]';  >> DCTIVmatrix(x) | c4 =  3.5997  -3.3399  1.7714  -1.6580  x2 =  1.0000  2.0000  3.0000  4.0000 |

|  |  |
| --- | --- |
| Input Commands | Output (Plot if Applicable) |
| >> DCTIVwindow(8)  >> DCTIVwindow(32)  >> x=[1,2,3,4]';  >> DCTIVwinvec(x) | xw =  0.3827  1.8478  2.7716  1.5307 |

|  |  |
| --- | --- |
| Input Commands | Output (Plot if Applicable) |
| >> LinearDCTIVwin(2,-1,8)  >> ExpDCTIVwin(8) |  |

|  |  |
| --- | --- |
| Input Commands | Output (Plot if Applicable) |
| >> x=[1,2,3,4]';  >> N=length(x);  >> y=[0,1,0,2,0,3,0,4,0,-4,0,-3,0,-2,0,-1,0,-1,0,-2,0,-3,0,-4,0,4,0,3,0,2,0,1]';  >> z=(1/4)\*sqrt(2/N)\*real(fft(y));  >> c4=z(2:2:2\*N)  >> x=[1,2,3,4]';  >> DCTIVfft(x)  >> c=[3.5997,-3.3399,1.7714,-1.6580]';  >> DCTIVfft(c) | c4 =  3.5997  -3.3399  1.7714  -1.6580  c4fft =  3.5997  -3.3399  1.7714  -1.6580    c4fft =  1.0000  2.0000  3.0000  4.0000 |