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NPTEL

reviewer1@nptel.iitm.ac.in ▼

Courses » Introduction to Time-Frequency Analysis and Wavelet Transforms

Announcements

Course

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## Unit 17 - Week 12: DWT (Contd..) and Closing Summary

### Course outline

Registration for  
MATLAB Exam

How to access the  
portal

MATLAB Online Access

MATLAB Tutorials  
created by MathWorks

Week 1: Introduction,  
Basic definitions and  
Concepts

Week 2: Fourier  
transforms (a review)

Week 3: Duration and  
Bandwidth

Week 4: Short-time  
Fourier transform

Week 5: Wigner-Ville  
Distributions

Week 6: Wigner-Ville  
Distributions (Contd..)

Week 7: Continuous  
Wavelet Transforms

Week 8: Continuous  
Wavelet Transforms  
(Contd..)

Week 9: Discrete  
Wavelet Transforms

Week 10: Discrete  
Wavelet Transforms  
(Contd..)

Week 11: Discrete  
Wavelet Transforms  
(Contd..)

Week 12: DWT (Contd..) and Closing Summary

- Lecture 8.5 B: MATLAB Demonstration (Part 2)
- Lecture 8.5 C: MATLAB Demonstration (Part 3)
- Closing Summary
- Data files
- Solutions to Week 12 assignment
- Lecture 8.6: Revisiting the concepts through questions
- Quiz : Week 12 Assignment

### Week 12 Assignment

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

Due on 2016-10-11, 23:59 IST

1)

1 point

1. The norm preservation and orthogonality is only preserved when:

- (a) symmetric extension is used with a dyadic length extended signal.
- (b) zero padding extension is used with a dyadic length extended signal.
- (c) periodic extension is used with a dyadic length extended signal.
- (d) All of the above.

- a
- b
- c
- d

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
c

2)

1 point

2. Which of the following statements is/are TRUE regarding soft and hard thresholding?

- (a) In soft thresholding, the coefficients below the threshold are set to zero.
- (b) In hard thresholding, the coefficients below the threshold are set to the threshold value.
- (c) In soft thresholding, the coefficients above the threshold are set to threshold value.
- (d) In hard thresholding, the coefficients above the threshold value are retained as they are.

- a
- b
- c
- d

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
a  
d

3)

3. The approximation and detail coefficients from the DWT of a signal  $x[k]$ ,  $k = 0, 1, \dots$  are given below.

$$a_2 = \{10.7322, 7.2678\}$$

$$d_2 = \{2.8150, -0.0512\}$$

$$d_1 = \{1.4142, 0.1895, -4.7603, 0.3282\}.$$

$$\text{The value of } \sum_0^7 x^2[k] = \underline{\hspace{2cm}}$$

(Report the answer to the nearest integer)

No, the answer is incorrect.  
Score: 0

Accepted Answers:

(Type: String) 208

1 point

4)

4. A signal  $z[k]$ ,  $k = 0, 1, 2, \dots$  is decomposed upto level 2 using a 'db1' wavelet. The reconstructed approximation and detail coefficients are as follows:

$$A_2 = \{2.5, 2.5, 2.5, 2.5, 4, 4, 4, 4\}$$

$$D_2 = \{-0.5, -0.5, 0.5, 0.5, 2, 2, -2, -2\}$$

$$D_1 = \{0, 0, 1, -1, -2, 2, 0, 0\}.$$

The value of  $z[2] = \underline{\hspace{2cm}}$

(Report the answer to the nearest integer)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) 4

1 point

5)

5. The value of fourth impulse response coefficient ( $\tilde{g}[3]$ ) of a 'Coiflet 1' synthesis filter is \_\_\_\_\_. (report answer upto 2 decimal places)

**Note:** The filter coefficients are denoted by  $\tilde{g}[n]$ , with  $n$  starting from 0.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) -0.85

1 point

6)

6. A half point symmetric extension has been used for the signal  $x[k] = \{4, 6, 3, 2, 5, 7, 2, 3, 5\}$ ,  $k = 0, 1, \dots, 8$ . The value of  $x[-2] + x[9]$  is \_\_\_\_\_.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) 11

1 point

7)

7. A signal  $x[k]$ , with  $k = 0, 1, \dots, N - 1$  is available in the data file a10.SigData. Assume that the signal is at level 0, decompose the given signal upto level 2 using a 'Haar' wavelet. Only the approximation coefficients at level 2 are used for reconstruction by setting all the detail coefficients to 0. If the reconstructed signal is  $\hat{x}[k]$ , then the value of  $\sum_0^{N-1} (x[k] - \hat{x}[k])^2$  is \_\_\_\_\_ ( Report the answer to nearest integer.)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) 174

1 point

8)

8. A signal  $y[k]$ , with  $k = 0, 1, \dots, N - 1$  is available in the data file a10\_SigData1. A wavelet is used for DWT. Given that the signal is available at level 0 and the reconstruction error is bounded by  $\sum_0^{N-1} (y[k] - \hat{y}[k])^2 < 25$ , the maximum level  $J$  at which the signal can be decomposed and reconstructed (using the approximation coefficients at that level and setting all the detail coefficients to 0) is \_\_\_\_\_.  
(The reconstructed signal is denoted by  $\hat{y}[k]$ )

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) 4



1 point

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