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NPTEL

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Courses » Introduction to Time-Frequency Analysis and Wavelet Transforms

Announcements

Course

Ask a Question

Progress



Unit 13 - Week 8: Continuous Wavelet Transforms (Contd..)

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..)

● Lecture 7.4A:
Scalogram and
MATLAB Demonstration
(Part 1)

● Lecture 7.4B:
Scalogram and
MATLAB Demonstration
(Part 2)

● Lecture 7.5A: Scaling
Function (Part 1)

● Lecture 7.5B: Scaling
Function (Part 2)

● Lecture 7.6A: Wavelets
(Part 1)

● Lecture 7.6B: Wavelets
(Part 2)

○ Data file: a7_cwt.mat

● Solutions to Week 7 and
8 Assignment

○ Quiz : Assignment for
Week 7 and 8

Week 9: Discrete
Wavelet Transforms

Week 10: Discrete
Wavelet Transforms
(Contd..)

Assignment for Week 7 and 8

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

Due on 2016-09-19, 23:59 IST

1)

1 point

1. Which of the following is/are TRUE for a wavelet?

- (a) The area under the wavelet should be zero.
- (b) The magnitude square of Fourier transform should decay rapidly than the frequency.
- (c) The value of Fourier transform should be zero at zero frequency.
- (d) The amplitude of the wavelet should be non-negative.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a
b
c

2)

1 point

2. Choose correct statement(s) from the following.

- (a) There exists no exact relationship between scale and frequency.
- (b) Qualitatively, scale and frequency share inverse relationship.
- (c) Peak and the center frequency coincide for a symmetric wavelet.
- (d) None of the above.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a
b
c

3)

1 point

3. Select the correct statement with respect to the computational aspects of the CW

- (a) In the convolution based method, the CWT is evaluated at all values of τ in a single
- (b) In the FFT based method, the CWT cannot be evaluated at all values of τ in a single
- (c) FFT based method assumes that the signal is periodic outside the observation interval
- (d) All of the above.

- a
- b
- c
- d

Week 11: Discrete Wavelet Transforms (Contd..)

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

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

4)

1 point

4. Select the correct **statement(s)** from the following in regard to wavelet transforms

- (a) The aggregate of all details at scales $s > 1$ is approximation of the signal at $s = 1$.
- (b) The scales $s < 1$ contain the details of the signal at scale $s = 1$.
- (c) The aggregate of all details at scales $s < 1$ is approximation of the signal at $s = 1$.
- (d) The scales $s > 1$ contain the details of the signal at $s = 1$.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

b

5)

1 point

5. The duration-bandwidth product for the mother wave as compared to the wavelet

- (a) Higher at larger scales and lower at smaller scales.
- (b) Lower at larger scales and higher at smaller scales.
- (c) Higher at all scales.
- (d) Identical at all scales.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

6)

1 point

6. Which of the following is TRUE with regard to vanishing moments and compact support of a wavelet?

- (a) The compact support increases with increase in vanishing moments of wavelet.
- (b) The compact support decreases with increase in vanishing moments of wavelet.
- (c) The compact support is independent of vanishing moments of wavelet.
- (d) None of the above.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

7)

1 point

7. Which of the following is TRUE regarding the reliability (as a result of edge effects) scalogram values across scales?

- (a) The reliability is more at higher scales than lower scales.
- (b) The reliability is more at lower scales than higher scales.
- (c) The reliability at intermediate scales is more than higher and lower scales.
- (d) The reliability is same across all the scales.

- a

- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

8)

8. A Daubechies 3 (db3) wave is used for analysis of a signal. If it is required to c
scale into frequency, then the value of frequency for scale, $s = 2$ is _____
(You may use 12 iterations for generating db3. Report your answer to one deci

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) 0.1

9)

Questions 9 to 11 are based on the data file a7_cwt.mat. The data file consists of CWT
signal. The sym4 wave was used in computing the continuous wavelet transform. The s
vector used is $s_0 \times 2^{1:0.01:\log_2 N}$, where s_0 is 2 and N is 1000 (length of the signal). Th
sampling interval is 10^{-3} sec. It is given that the signal contains a sinusoid, a linear chi
two impulses.

9. Which of the following inference(s) is/are TRUE based on the given continuous wa
transform?

- (a) A sinusoid is present through out the signal length.
- (b) A linear chirp is present through out the signal length.
- (c) Around $t = 0.3$ sec, there is a transition from linear chirp to a sinusoid.
- (d) Around $t = 0.3$ sec, there is a transition from sinusoid to a linear chirp.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

10)

10. The frequency of the sinusoid present in the signal is

- (a) higher than most of the frequencies present in the chirp.
- (b) lower than most of the frequencies present in the chirp.
- (c) contained in the frequency interval (5 20) Hz.
- (d) contained outside the frequency interval (5 20) Hz.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b



1 point

1 point

1 point

11)

1 point

11. Which of the following is TRUE regarding the impulses present in the signal?

- (a) Both the impulses are located after 0.4 sec.
- (b) Both the impulses are located before 0.4 sec
- (c) One impulse is located after 0.4 sec and other is below 0.4 sec.
- (d) The time gap between the impulses is less than 0.2 sec.

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c



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