



# COMPLEXITY EXPLORER

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ABOUT

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COURSES

SUPPORT



## Nonlinear Dynamics: Mathematical and Computational Approaches

Lead instructor: Liz Bradley

Resume Course

Unenroll

Description

Lectures

Supplementary Materials

Forum

FAQ

My Progress

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✓ 8.5 Caveats and extensions » Quiz

← Prev

Next →

Quiz scores are NOT recorded.

- You may come back to quizzes and take them as many times as you like
- When you are finished, clicking the "Score" button at the bottom of the test will show you the correct responses.

### Question 1

Delay-coordinate embedding was originally proposed in...

- ✓ ☒ A. Packard *et al.*'s 1980 paper entitled "Geometry from a time series."
- ☐ B. Saur *et al.*'s 1991 paper entitled "Embedology."
- ☐ C. Kennet *et al.*'s 1992 paper entitled "Determining embedding dimension using a geometrical construction."
- ☐ D. Kantz & Schreiber's 1997 book entitled "Nonlinear time-series analysis."

### Question 2

The delay-coordinate embedding machinery only works, in both theory and practice, if you have an infinite amount of noise-free data.

- ☐ A. True
- ✓ ☒ B. False

### Question 3

The delay-coordinate embedding machinery only works, in theory, if you have an infinite amount of noise-free data, but can still be useful in practice even if those conditions are not met.

- ✓ ☒ A. True
- ☐ B. False

### Question 4

If you have a time series consisting of 1000 data points...

#### [a]

It's fine to embed it in as many dimensions as the false near neighbor method suggests are appropriate.

- ☐ A. True
- ✓ ☒ B. False

#### [b]

The false near neighbor method will never work.

- ☐ A. True
- ✓ ☒ B. False

#### [c]

You really should not embed it in more than two or maybe three dimensions.

- ✓ ☒ A. True
- ☐ B. False

### Question 5

Repeating the same nonlinear time-series analysis procedures separately on chunks of your data set (e.g., the first half and the second half)...

- ☐ A. Can help you determine whether the data set was really long enough to support your original analysis.
- ☐ B. Can help you determine whether the data were gathered from a nonstationary system.
- ☒ C. Can tell you that one of those two effects (inadequate data or nonstationary system) is at work, but can't tell you *which one*.

You got 7 out of 7 questions correct

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