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Nonlinear Dynamics: Mathematical and Computational Approaches

Lead instructor: Liz Bradley

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✓ 7.2 Lyapunov exponents » Quiz

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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

Sensitive dependence on initial conditions can only occur in a dynamical system that has at least one unstable manifold.

- ✓ ☒ A. True
- ☐ B. False

Question 2

An attractor can only exist in a dynamical system that has at least one stable manifold.

- ✓ ☒ A. True
- ☐ B. False

Question 3

Each stable manifold in a dynamical system has an associated Lyapunov exponent λ whose value is negative.

- ✓ ☒ A. True
- ☐ B. False

Question 4

What's the difference between local and global λ s?

- ☐ A. Local λ s are only defined for non-dissipative systems
- ✓ ☒ B. Local λ s reflect the behavior of trajectories on small patches of the attractor
- ☐ C. Local λ s are the average stretching and shrinking across the entire attractor

Question 5

 λ s are only associated with stable manifolds.

- ☐ A. True
- ✓ ☒ B. False

Question 6

There are n λ s in an n -dimensional dynamical system (experts: count repeated λ s individually).

- ✓ ☒ A. True
- ☐ B. False

Question 7

If λ_1 (the largest λ) is positive then it dominates in the long term.

- ✓ ☒ A. True
- ☐ B. False

Question 8

λ s are properties of attractors; they are the same for any initial condition in the basin of attraction.

- ✓ ☒ A. True
☐ B. False

Question 9

Stable and unstable manifolds are unrelated to the eigenvectors of the linearized system.

- ☐ A. True
✓ ☒ B. False

Question 10

A point on a stable or unstable manifold of a dynamical system stays on that manifold as time evolves.

- ✓ ☒ A. True
☐ B. False

You got 10 out of 10 questions correct

Reset