

Computer Exercise Summary

Physics 682/CIS 629, Computational Methods for Nonlinear Systems, Fall 2006

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Intro to Python

- (1) Random Text Generation

Networks

- (3) Small World Networks
- (3) Percolation

Dynamics & Locomotion

- (2) Pendulum
- (3) Molecular Dynamics (unfinished)
- (4) Walker

Maps & Chaos

- (2) Chaos & Lyapunov
- (2) Invariant Measures
- (3) Fractal Dimensions
- (4) Period Doubling Route to Chaos

Biology

- (3) Stochastic Cells
- (4) The Repressilator
- (4) Cardiac Dynamics

Computational Complexity

- (4) Number partitioning (A fair split)
- (5) NP completeness and SAT

Randomness

- (2) Stocks, Volatility, & Diversification
- (2) Generating Random Walks
- (3) Gumbel Distributions (Biggest of Bunch)

- (3) Random Matrix Theory
- (4) The Ising Model

(X) represents difficulty level, indents denote prerequisites