University of Colorado
Department of Computer Science

Chaotic Dynamics – CSCI 4446/5446

Reading Assignments for Time-Series Analysis

Slant font means "required;" normal font means "optional."

- Embedding, in general:
  1. *pp 1–3 (through section II A) of E. Bradley and H. Kantz, "Nonlinear time-series analysis revisited," Chaos* **25***:097501 (2015).*
     You can download that paper from `arxiv.org/abs/1503.07493`
  2. *pp10–13 of Liz's time-series analysis notes* (through section 3.1)
  3. *section 3.2 of Kantz & Schreiber.*
  4. sections 12.4–5 of Strogatz.
  5. chapter 2 of Abarbanel (on reserve in the Gemmill Engineering library).
  6. more detail: chapter 9 of Kantz & Schreiber; "Coping...", chapters 5 (an overview) and 6 (reprints of classic journal papers on this topic). Also on reserve.
- Finding d_E and τ:
  1. *section II B of the Bradley/Kantz paper listed above*
  2. *sections 3.3–3.4 of Kantz & Schreiber*
  3. more detail: chapters 3 and 4 of Abarbanel, chapter 5 of "Coping...", and section 3.2 of Liz's time-series analysis notes
- Lyapunov exponents:
  1. *chapter 5 of Kantz & Schreiber*
  2. *Liz's notes on Wolf's algorithm.*
  3. section III 2 of Bradley/Kantz paper listed above
  4. sections 5.3 and 5.5 of Abarbanel.
  5. section 10.5 of Strogatz covers Lyapunov exponents of 1D maps
  6. more detail: sections 3.3-4 of Parker & Chua (also on reserve), as well as "Coping...", chapters 4 (an overview) and 8 (reprints of classic journal papers on this topic).
- Fractal dimensions:
  1. *review sections 11.4 and 11.5 of Strogatz.*
  2. *chapter 6 of Kantz & Schreiber (through 6.7 only)*
  3. section 7.1 of Parker and Chua has some good discussion of other kinds of dimensions besides capacity and correlation. There's a scan of this section on the course webpage.
  4. section 5.2 of Abarbanel.
  5. more detail: "Coping...", chapters 2 (an overview) and 7 (reprints of classic journal papers on this topic)
  6. F. Hunt and F. Sullivan, "Efficient Algorithms for Computing Fractal Dimensions," in *Dimensions and Entropies in Chaotic Systems*, Springer-Verlag, Berlin, 1985, pp 74–81. A synopsis of this paper appears on pp 180–181 of Parker & Chua