

CS341 SYSTEMS BIOLOGY I

HOMEWORK ASSIGNMENT #13 – READING (TUES DEC 5, 2017)

1. READING

The goal of this reading assignment is to provide context in which to learn about sensitivity analysis. This paper represents how local sensitivity analysis is used in the literature.

Read “Robustness properties of circadian clock architectures” by J Stelling, ED Gilles, and FJ Doyle III, PNAS, 2004 (emailed by Stephanie)

- (1) Which two models are analyzed in this paper? Why were they chosen? What are their chief similarities and differences?
- (2) Describe Fig. 2. What does a parameter rank of 0 indicate? What does a parameter rank of 1 indicate? What do the error bars indicate?
- (3) What do the authors mean by “global”, “local”, and “mixed”? (Notice that this is not “global” sensitivity as described in lecture, but a term applied to the parameters themselves).
- (4) Describe the numerical experiments they performed to generate the data for Fig. 5.