

CS341 SYSTEMS BIOLOGY I

HOMEWORK ASSIGNMENT #7 – READING (THURS OCT 5, 2017)

1. READING

The goal of this reading assignment is to gain practice reading a journal article about a model of a gene regulatory network. When you read the article, focus on understanding the connections between the model and the data and in understanding the mathematical expressions used to capture the biological processes (why the authors chose them). Also, think about how you would write the code to reproduce their figures.

Read Becker-Weimann et al, ‘Modeling Feedback Loops of the Mammalian Circadian Oscillator’, *Biophysical Journal*, 2004 (emailed by Stephanie)

- (1) Write down the clock genes/proteins included in this model, with a very brief description about what is known about them.
- (2) What kinetics are chosen for this model (i.e. which types of mathematical expressions are used for each type of biological process)? When there is more than one transcription factor affecting gene expression, how do the authors combine their effects? Is it as straight forward as the AND, SUM, and OR gates covered in class?
- (3) The goal of this paper is to investigate the interdependence of the positive and negative feedback. What numerical experiments do they perform to achieve this goal?