

Homework 3
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For the Bock et al. (2011) connectomics paper, propose a model for z , where z accounts for the directional selectivity of the neurons in the sample space.

Let the definitions from lecture apply, where:

Sample space $G_n = (V, X, Y, Z)$ where $V \in \{nodes\}$ is the set of nodes, X is the set of edges $X \in (0,1)^{n \times n}$, Y is the state of the neuron $Y \in (0,1)^n$, Z is the orientation of the node Z .

Let Z be an N -bin split between the range 0 to 2π , where each bin is denoted Z_n

$$Z = \{Z_1, Z_2, \dots, Z_N : Z_i \text{ is of size } \frac{2\pi}{N}\}$$

The final orientation encoded by the model, Z^* , can be computed using the function:

$$p : Z \rightarrow Z^*$$

where p is the linear combination of weight vector w with the states of Z . The rest of the model follows SBM as previously described.