Statistical Connectomics Homework 4

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The Mean Human Connectome

The Statistical Decision Theoretic

1. Sample Space

$$\Xi = A_n = \{0,1\}^{n\times n}$$

2. Model

$$P = \{P_\theta : \theta \in \Theta\}$$
$$SBM_k^n(\vec{\rho}, \vec{\beta})$$

where n = each voxel

3. Action Space

$$(0,1)^{n\times n}$$

defines the possible outcomes

4. Decision Rule

The rejection region is calculated by setting

$$\hat{P} = \frac{1}{n} \sum_1^n A^{(i)}$$

where i is an arbitrary number

5. Loss function

$$l = \sum_{uv} (a_{uv} - p_{uv})^2$$

where: a_{uv} is the average connectivity between u and v, and p_{uv} is the actual connectivity between u and v (ground truth).

6. Risk functional

   The risk functional is the expected loss:
   $\mathrm{E}[l]$