1 Introduction

2 Methods

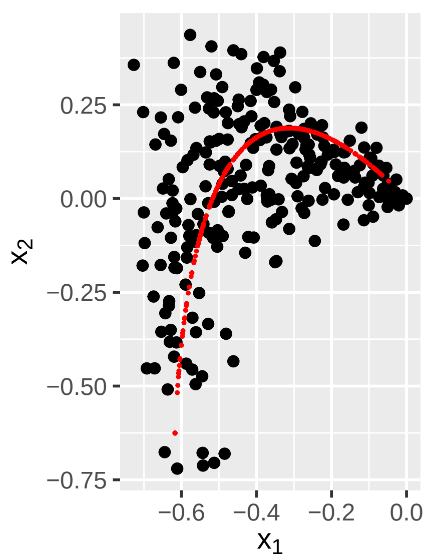
3 Simulation Study

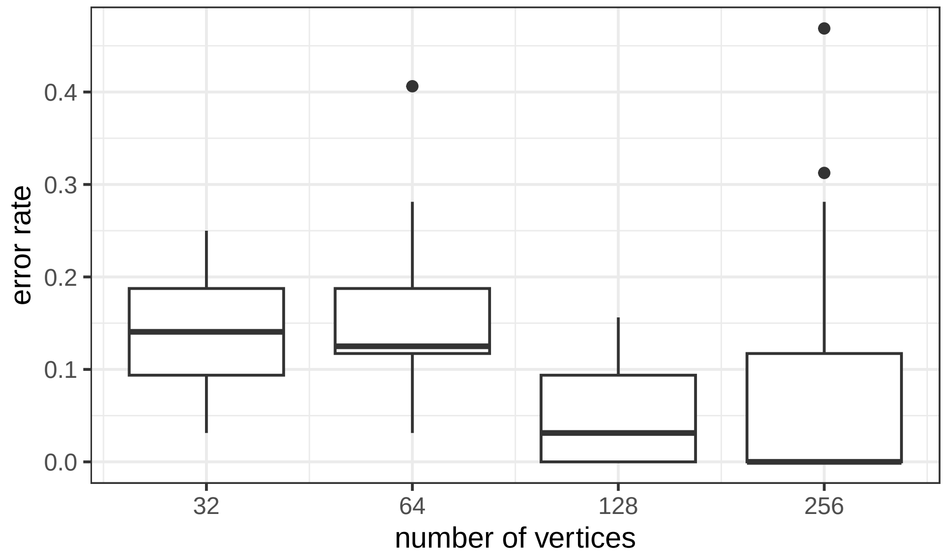
3.1 Classification

In this simulation experiment, the latent vectors were sampled along a Bezier curve defined by $g(t) = \begin{bmatrix} t^2 & 2t(1-t) \end{bmatrix}^\top$. The timepoints t_i were sampled as iid Beta random variables with two sets of parameters, (α_1, β_1) and (α_2, β_2). The setup is as follows:

1. Draw response variables $y_1, ..., y_n \overset{\text{iid}}{\sim} \text{Multinomial}(1/2, 1/2)$.
2. For each $i = 1, ..., n$, draw $t_i \mid y_i \overset{\text{ind}}{\sim} \text{Beta}(\alpha_{y_i}, \beta_{y_i})$, such that
   - $\alpha_1 = 1$
   - $\beta_1 = 2$
   - $\alpha_2 = 2$
   - $\beta_2 = 1$
3. Construct each latent vector as $x_i = g(t_i)$ and compile them in data matrix $X = \begin{bmatrix} x_1 & \cdots & x_n \end{bmatrix}^\top$.
4. Sample graph and its adjacency matrix as $A \sim \text{RDPG}(X)$.

For each graph, we constructed the ASE, which was used to estimate the parameters $(\hat{\alpha}, \hat{\beta})$ for the graph, using the maximum likelihood method. The estimated parameters were then used as predictors $y_1, ..., y_n$, setting aside half for training and half for testing. We investigated graphs of size $|V| = 32, 64, 128, 256$. The number of graphs for each experiment was set to $n = 64$. For each (number of graphs, size of graph) pair, we performed 32 replicates. Figure **??** shows the ASE of one graph.
Figure **??** shows the boxplots of the classification error rates.

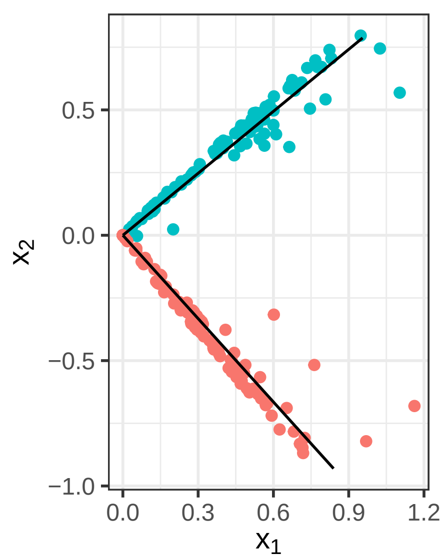


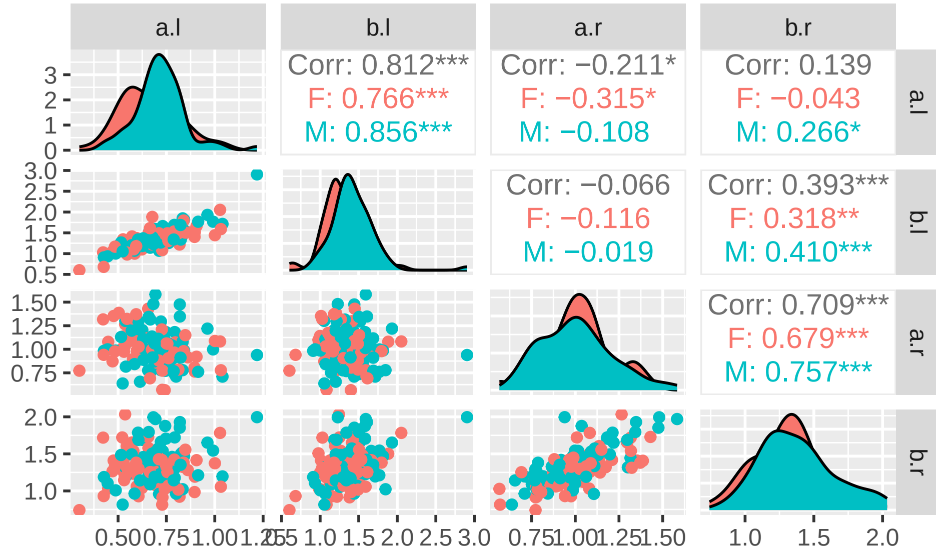


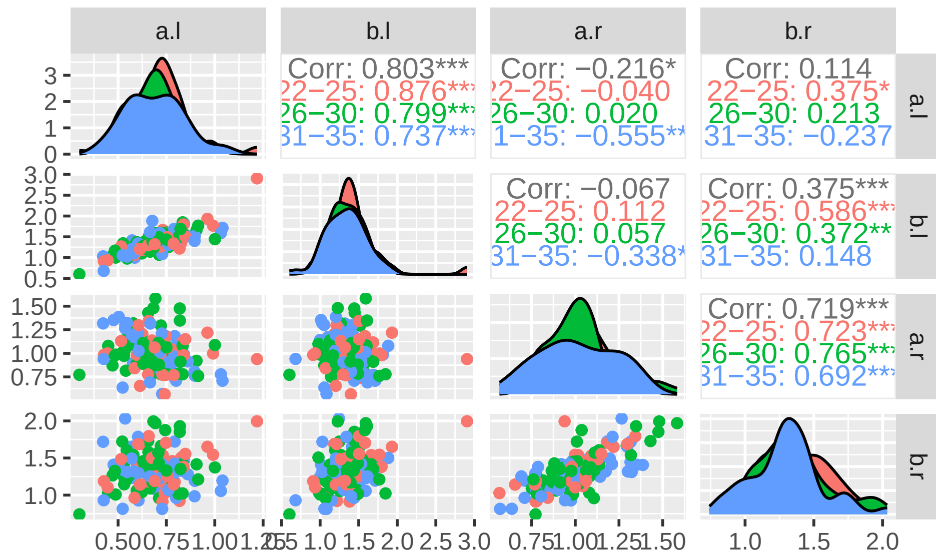
3.2 Regression

4 Applications

HCP data







5 Discussion