

$$\begin{pmatrix} \sigma_1 & & & & \\ & \sigma_2 & & & \\ & & \ddots & & \\ & & & \sigma_{p-1} & \\ & & & & \sigma_p \end{pmatrix}$$

$$= \Sigma = (X)_{cov}$$

$$3 + \dots + \beta X = h$$

$$0 \leq \sigma \leq 1$$

$$X \sim \mathcal{N}(0, \Sigma)$$

$$\mathcal{L}(y | h) = \int_{\sigma_1 \in \mathcal{C}} \dots \int_{\sigma_p \in \mathcal{C}} \mathcal{L}(y | h, \sigma) \mathcal{L}(\sigma)$$

$$\underbrace{\mathcal{L}(y | h, \sigma)}_{\text{same } \mathcal{L} \neq} \cdot \underbrace{\mathcal{L}(\sigma)}_{\text{same } \mathcal{L} \neq}$$

because of ellipticality and Gaussian X

$$Z = \begin{pmatrix} 1 & s & s^2 & \dots & s^{r-1} \\ s & 1 & s & \dots & s^{r-2} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ s^{r-2} & s^{r-3} & s^{r-4} & \dots & 1 \end{pmatrix}$$

Toeplitz matrix

→ I cannot prove exchangeability w/ampkin

without sample splitting:

(i) ~~run basis on full sample~~

(ii) ~~perform t-test on selected features/variables in (i)~~

you would use the same data twice!

$\beta_{raw, j}$ controls type I-error if

Screening property holds:

$$\hat{\Sigma}(I_1) \geq \Sigma_0$$

$$y = X\beta + \varepsilon$$

$$= \sum_{j=1}^p \beta_j X_j + \varepsilon$$

$$= \sum_{j \in S_0} \beta_j X_j + \varepsilon$$

$$= \sum_{j \in S_0} \beta_j X_j + \varepsilon$$

if

$$3 + \beta X = \sum_{j \in \mathcal{I}} \beta_j (v_j) \neq$$

$$3 + \beta X = h$$

$$\sigma \neq (v_j) + i$$

multiple testing.

$H_{0,1}, H_{0,2}, \dots, H_{0,p}$

p hypotheses

Bonferroni (~~FDR~~): $p \cdot P_{\text{raw},j} = P_{\text{corr},j}$ ($j=1, \dots, p$)

~~or FWER $\leq \alpha$~~

We reject $H_{0,j} \iff P_{\text{corr},j} \leq \alpha$

\implies $\text{FWER} \leq \alpha$