

$$y = \alpha_0 + \alpha + \beta x + e \quad (1)$$

$$\alpha \sim MVN(0, \sigma_{P\alpha}^2) \quad (2)$$

$$\beta \sim MVN(0, \sigma_{P\beta}^2) \quad (3)$$

$$e \sim normal(0, \sigma_y^2) \quad (4)$$

$$\sigma_{P\alpha}^2 = \alpha_\alpha + \lambda_\alpha * \Sigma \quad (5)$$

$$\sigma_{P\beta}^2 = \alpha_\beta + \lambda_\beta * \Sigma \quad (6)$$

$$(7)$$

Where  $\Sigma$  is the phylogenetic structure,  $\alpha_0$  is a grand mean and species-level intercepts are partially pooled by phylogeny, scaled by  $\lambda_\alpha$  and slopes are also partially pooled by phylogeny, scaled by  $\lambda_\beta$ , and there is some residual error  $\sigma_y$ . Again, I ask what's wrong with this model?