Nobre Singer : Mixed Model Residuals

Usually one assumes

- $b_i \sim N_q(0, G) i = 1, ..., m$
- $e_i \sim N_{n_i}(0, \sigma_i)$
- b_i and e_i independent
- G and σ_i are $(q \times q)$ and $(n_i \times n_i)$ positive denite matrices with elements expressed as functions of a vector of covariance parameters θ not functionally related to β
- If $\sigma_i = I_{n_i}\sigma^2$: homoskedastic conditional independence model

$$\begin{bmatrix} \boldsymbol{b} \\ \boldsymbol{e} \end{bmatrix} \sim \mathcal{N}_{qm+n}$$

$$\boldsymbol{Q} = \boldsymbol{V}^{-1} - \boldsymbol{V}^{-1}\boldsymbol{X}(\boldsymbol{X}^T\boldsymbol{V}^{-1}\boldsymbol{X})^{-1}$$

Sensitivity and residual analysis of the underlying assumptions constitute important tools for evaluating the fit of any model to given data.

Generalized Leverage