

H9: Summing up the GWF course

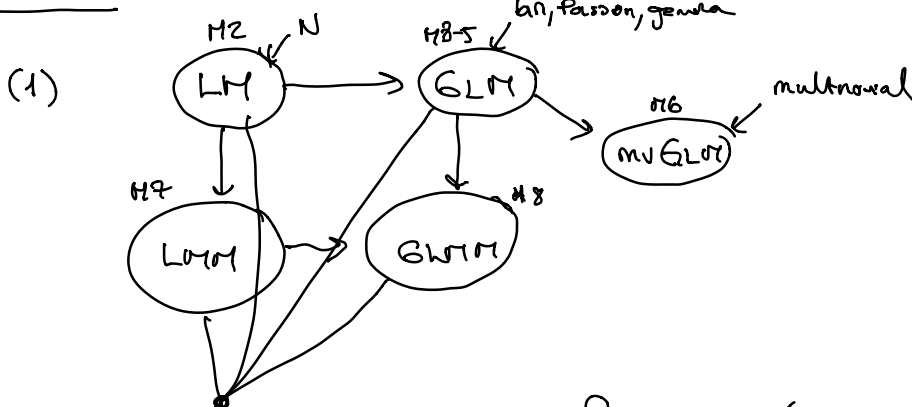
THA4015
22.11.2018

CORE: What is the effect of covariates x on response(s) y ?

interpretation

How to predict y from x ?

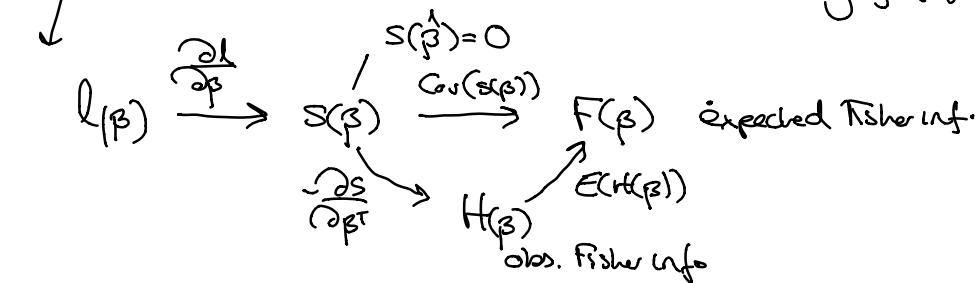
BASIC 5



(6) univariate exponential family: $f(y_i) = \exp\left(\frac{y_i \theta_i - b(\theta_i)}{\phi} \cdot w_i + c(y_i, w_i, \phi)\right)$

(2) Likelihood $L(\beta) = \prod_{i=1}^n f(y_i)$ (act really mvGLM)
← mostly for GLM
but also for LMM ~ mvN

find $\hat{\beta}$ by maximizing the likelihood
but for GLMM $f(y_i)$ marginal need $\int f(y_i | x_i) f(x_i) dx_i$



$$\beta^{(t+1)} = \beta^{(t)} + F^{-1}(\beta^{(t)}) S(\beta) \quad \text{Fisher scoring} \xrightarrow{\text{exp. fen}} \text{IRWLS}$$

canonical link: $F(\beta) = H(\eta)$

(3) Asymptotic distribution

$$\hat{\beta} \approx N_p(\beta, F^{-1}(\hat{\beta})) \rightarrow \text{Wald test}$$

$$LRT = -2 (\ln L(\hat{\beta}_B) - \ln L(\hat{\beta}_A)) \sim \chi^2_{\#A - \#B}$$

$\uparrow$ small $\uparrow$ big model B nested within A

↙ Deviance: where A is saturated model

(4)

R print-out

(5)

Exam → see Pb