NMix

Parametrisation

The N-Mixture distribution is a Poisson mixture of the Binomials, as

$$\text{Prob}(y) = \sum_{n=y}^{\infty} \binom{n}{y} p^n (1-p)^{n-y} \times \frac{\lambda^n}{n!} \exp(-\lambda)$$

for responses $y = 0, 1, 2, \ldots, n$, where n is Poisson number of trials, and p is probability of success.

Link-function

The probability p is linked to the linear predictor by

$$p(\eta) = \frac{\exp(\eta)}{1 + \exp(\eta)}$$

for the default logit link, while λ depends on fixed covariates

$$\log(\lambda) = \sum_{j=1}^{m} \beta_j x_j$$

with one vector of covariates for each observation. m can be maximum 5 and minimum 1.

Hyperparameters

The parameters $\beta_1, \beta_2, \ldots, \beta_m$

Hyperparameter spesification and default values

hyper

theta1

hyperid 101101
name beta1
short.name beta1
initial 2.30258509299405
fixed FALSE
prior normal
param 0 0.5
to.theta `function(x) x`
from.theta `function(x) x`

theta2

hyperid 101102
name beta2
short.name beta2
initial 0
fixed FALSE
prior normal
param 0 1

to.theta `function(x) x`

from.theta `function(x) x`

theta3

hyperid 101103

name beta3

short.name beta3

initial 0

fixed FALSE

prior normal

param 0 1

to.theta `function(x) x`

from.theta `function(x) x`

theta4

hyperid 101104

name beta4

short.name beta4

initial 0

fixed FALSE

prior normal

param 0 1

to.theta `function(x) x`

from.theta `function(x) x`

theta5

hyperid 101105

name beta5

short.name beta5

initial 0

fixed FALSE

prior normal

param 0 1

to.theta `function(x) x`

from.theta `function(x) x`

status experimental

survival FALSE

discrete TRUE

link default logit probit

pdf nmix

Specification

- family = `nmix`
- Required arguments: the response and covariates as
  `inla.mdata(response, covariates [, covariates])`

The response is a vector, and the covariates is a vector, matrix or data.frame. Each row of the covariates, is $(x_{i1}, x_{i2}, \ldots, x_{im})$, and the covariates used for the i'th response. By convension, $\beta_{m+1}, \ldots, \beta_5$ are fixed to zero.

Example

In the following example we estimate the parameters in a simulated example with binomial responses.

Notes