Logistic

Parametrisation

The logistic distribution is

$$f(y) = \frac{\kappa \exp(-\kappa (y - \mu))}{(1 + \exp(-\kappa (y - \mu)))^2}$$

for continuously responses y where

 μ : is the mean

 $\kappa = \tau s \pi / \sqrt{3}$: where τ is the precision

s: is a fixed scaling, s > 0.

Link-function

The mean and variance of y are given as

$$\mu$$
 and $\sigma^2 = \frac{1}{s\tau}$

and the mean is linked to the linear predictor by

$$\mu = \eta$$

Hyperparameters

The precision is represented as

$$\theta = \log \tau$$

and the prior is defined on θ .

Specification

- \bullet family = logistic
- Required arguments: y and s (keyword scale)

The scalings have default value 1.

Hyperparameter spesification and default values

hyper

theta

name log precision
short.name prec

initial 1

fixed FALSE

prior loggamma

param 1 5e-05

to.theta function(x) log(x)

from.theta function(x) exp(x)

survival FALSE

```
discrete FALSE
link default identity
pdf logistic
Example
rlogistic = function(n, mean = 0, sd = 1)
   p = runif(n)
   A = pi/sqrt(3)
   tauA = A/sd^2
    return ((tauA * mean - log((1-p)/p))/tauA)
}
n = 1000
z = rnorm(n, sd=0.1)
eta = 1 + z
y = rlogistic(n, mean = eta, sd = 1)
r = inla(y ~1 + z, data = data.frame(y, z), family = "logistic",
        control.compute = list(cpo=TRUE))
```

Notes

None.