

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 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

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

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

- family="logistic"
- Required arguments: y and s (keyword **scale**)

The scalings have default value 1.

Hyperparameter spesification and default values

doc The Logistic likelihoood

hyper

theta

hyperid 72001

name log precision

short.name prec

output.name precision for the logistic observations

output.name.intern log precision for the logistic observations

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.