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

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

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.