

Simplex

Parametrisation

The Simplex distribution has the following density

$$\pi(y) = \frac{\sqrt{(s\tau)}}{\sqrt{2\pi[y(1-y)]^3}} \exp \left\{ \frac{-(s\tau)(y-\mu)^2}{2y(1-y)\mu^2(1-\mu)^2} \right\}$$

has has a continuously responses $0 < y < 1$ where

μ : is the mean,

τ : is a precision parameter, and

s : is a fixed scaling, $s > 0$.

For the simplex distribution we have

$$E(y) = \mu$$

Link-function

The linear predictor η is linked to the mean μ using a default logit-link,

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

Hyperparameter

The hyperparameter is the precision parameter τ , which is represented as

$$\tau = \exp(\theta)$$

and the prior is defined on θ .

Specification

- family="simplex"
- Required arguments: y .

Hyperparameter spesification and default values

doc The simplex likelihood

hyper

theta

hyperid 64001

name log precision

short.name prec

output.name Precision for the Simplex observations

output.name.intern Log precision for the Simplex observations

initial 4

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 logit loga cauchit probit cloglog ccloglog loglog

pdf simplex

```

Example

In the following example we estimate the parameters in a simulated example.

```

## this library is found at
## http://www.commanster.eu/rcode.html
library(rmutil)

n = 1000
x = rnorm(n, sd = 0.2)
eta = 1 + x
mu = exp(eta)/(1+exp(eta))

s = 0.3
y = rsimplex(n, m = mu, s = s)

r = inla(y ~ 1 + x, data = data.frame(y, x),
        family = "simplex")
## prec = 1/s
summary(r)

```

Notes

None.