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
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 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.