Wrapped Cauchy

Parametrisation

The wrapped Cauchy distribution has density

$$f(y) = \frac{1}{2\pi} \frac{1 - (s\rho)^2}{1 + (s\rho)^2 - 2(s\rho)\cos(y - \mu)}$$

for continuously responses y where $|y| \leq \pi$ and $|\mu| \leq \pi$. Here,

μ is a measure of location,

ρ is a measure of the precision ($0 < \rho < 1$),

s is a fixed scaling ($0 < s \leq 1$).

Link-function

The "mean" of y is given as μ and the mean is linked to the linear predictor as

$$\mu = 2\arctan(\eta)$$

(Link function "tan")

Hyperparameters

The "precision" ρ is represented as

$$\rho = \frac{\exp(\theta)}{1 + \exp(\theta)}$$

and the prior is defined on θ.

Specification

- family = `wrappedcauchy`
- Required arguments: y and s (argument `scale`).

The scalings have default value 1.

Hyperparameter spesification and default values

hyper

theta

name log precision parameter
short.name prec
initial 2
fixed FALSE
prior loggamma
param 1 0.005
to.theta `function(x) log(x/(1-x))`
from.theta `function(x) exp(x)/(1+exp(x))`

survival FALSE

discrete FALSE

link default tan

pdf wrapped-cauchy

status disabled

Example

In the following example we estimate the parameters in a simulated example with wrapped Cauchy responses.

Notes

This likelihood is currently disabled.