

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

doc The wrapped Cauchy likelihoood

hyper

theta

hyperid 68001

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.