Student-t

Parametrization

The Student-t likelihood is defined so that

$$\sqrt{w\,\tau}(y - \eta) \sim T_\nu$$

for continuous response y where

τ : is the precision parameter

w : is a foxed weight $w > 0$

η : is the linear predictor

T_ν : is a standardized Student-t with ν degrees of freedom such that its variace is 1 for any value of ν.

Link-function

Identity

Hyperparameters

This likelihood has to hyperparameters

$$
\begin{aligned}
\theta_1 &= \log(\tau) \\
\theta_2 &= \log(\nu - 2)
\end{aligned}
$$

and the prior is defined on $\theta = (\theta_1, \theta_2)$.

Specification

- family = T

- Required argument: y and w (keyword weights, default to 1).

Hyperparameter spesification and default values

hyper

    theta1

        name log precision

        short.name prec

        initial 3

        fixed FALSE

        prior loggamma

        param 1 5e-05

        to.theta function(x) log(x)

        from.theta function(x) exp(x)

    theta2

        name log degrees of freedom

        short.name dof

        initial 0

        fixed FALSE

        prior loggamma

        param 1 0.5

        to.theta function(x) log(x-2)

        from.theta function(x) 2+exp(x)

survival FALSE

discrete FALSE

link default identity

pdf student-t

Example

```
#simulate data
n=100
phi=0.85
mu=0.5
eta=rep(0,n)
for(i in 2:n)
eta[i]=mu+phi*(eta[i-1]-mu)+rnorm(1)
nu=3
t=rt(n,df=nu)
y=eta+t/(sqrt(nu/(nu-2)))
data=list(y=y,z=seq(1:n))
#define the model and fit
formula=y~f(z,model="ar1")
result=inla(formula,family="T",data=data)
```

Notes

None