Student-t

Parametrization

The Student-t likelihood is defined so that

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

for continuous response y where

τ : is the precision parameter

s : is a fixed scaling $s > 0$

η : is the linear predictor

T_{ν} : is a **reparameterized standard** Student-t with $\nu > 2$ degrees of freedom with **unit variance for all values of ν. Please see the example for details!**

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 s (keyword `scale`, default to 1).

Hyperparameter spesification and default values

hyper

theta1

hyperid 100001
name log precision
short.name prec
initial 0
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta2

hyperid 100002

name log degrees of freedom

short.name dof

initial 5

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