Student-t with strata

Parametrization

This model is an extention to the Student-t, where different strata have their own precisions but the degrees-of-freedom parameter is common.

The Student-t likelihood is defined so that

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

for continuous response y where

τ_s : is the precision parameter, depending on the stratum s

w : is a fixed 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, common for all strata.

Link-function

Identity

Hyperparameters

This likelihood $N_s + 1$ hyperparameters

$$\begin{aligned} \theta_1 &= \log(\nu - 2) \\ \theta_2 &= \log(\tau_1) \\ \theta_3 &= \log(\tau_2) \\ etc.... & \\ \theta_{N_s+1} &= \log(\tau_{N_s}) \end{aligned}$$

where N_s is the number of strata defined. The current implementation limits N_s to 10, but this is easy to fix if needed. The prior is defined on $\theta = (\theta_1, \theta_2, \ldots)$.

Specification

- family = `tstrata`
- Required argument: y and w (keyword `weights`, default to 1), and `inla()-argument` "`strata`" which is either a integer vector with elements $1, 2, \ldots, N_s$, or factor for which the levels defines the strata.

Hyperparameter spesification and default values

hyper

theta1

name log degrees of freedom

short.name dof

initial 4
fixed FALSE
prior loggamma
param 1 0.01
to.theta `function(x) log(x-5)`
from.theta `function(x) 5+exp(x)`

theta2

name log precision1
short.name prec1
initial 2
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta3

name log precision2
short.name prec2
initial 2
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta4

name log precision3
short.name prec3
initial 2
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta5

name log precision4
short.name prec4
initial 2
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta6

name log precision5

short.name prec5
initial 2
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta7

name log precision6
short.name prec6
initial 2
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta8

name log precision7
short.name prec7
initial 2
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta9

name log precision8
short.name prec8
initial 2
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta10

name log precision9
short.name prec9
initial 2
fixed FALSE
prior loggamma
param 1 5e-05
to.theta `function(x) log(x)`
from.theta `function(x) exp(x)`

theta11

name log precision10
short.name prec10
initial 2
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 identity

pdf tstrata

Example

Notes

None