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

doc A stratified version of the Student-t likelihood

hyper

    theta1

        hyperid 101001

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

    hyperid 101002

    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

    hyperid 101003

    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

    hyperid 101004

    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

    hyperid 101005

    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

    hyperid 101006

    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

    hyperid 101007

    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

    hyperid 101008

    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

    hyperid 101009

    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

    hyperid 101010

    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

    hyperid 101011

    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