A special case of the Gamma-distribution

Parametrisation

We consider this distribution

$$\pi(y) = \frac{1}{\Gamma(a)} y^{a-1} \exp(-y), \qquad a > 0, \quad y > 0,$$

where $\mathrm{E}(y) = \mu = a$.

Link-function

The linear predictor η is linked to the mean μ using a default log-link

$$\mu = \exp(\eta)$$

Hyperparameter

None.

Specification

- `family="gammajw"` for regression models and `family="gammajw.surv"` for survival models.

- Required arguments: for `gammajw.surv`, y (to be given in a format by using `inla.surv()`), and for `gammajw`, y.

Hyperparameter spesification and default values

gammajw:

doc A special case of the Gamma likelihood

hyper

survival FALSE

discrete FALSE

link default log neglog

pdf gammajw

   gammajwsurv:

doc A special case of the Gamma likelihood (survival)

hyper

   theta1

      hyperid 58200
      name beta1
      short.name beta1
      initial -7
      fixed FALSE
      prior normal

param -4 100

to.theta function(x) x

from.theta function(x) x

theta2

hyperid 58201

name beta2

short.name beta2

initial 0

fixed FALSE

prior normal

param 0 100

to.theta function(x) x

from.theta function(x) x

theta3

hyperid 58202

name beta3

short.name beta3

initial 0

fixed FALSE

prior normal

param 0 100

to.theta function(x) x

from.theta function(x) x

theta4

hyperid 58203

name beta4

short.name beta4

initial 0

fixed FALSE

prior normal

param 0 100

to.theta function(x) x

from.theta function(x) x

theta5

hyperid 58204

name beta5

short.name beta5

initial 0

fixed FALSE

prior normal

param 0 100

to.theta function(x) x

from.theta function(x) x

theta6

hyperid 58205

name beta6

short.name beta6

initial 0

fixed FALSE

prior normal

param 0 100

to.theta function(x) x

from.theta function(x) x

theta7

hyperid 58206

name beta7

short.name beta7

initial 0

fixed FALSE

prior normal

param 0 100

to.theta function(x) x

from.theta function(x) x

theta8

hyperid 58207

name beta8

short.name beta8

initial 0

fixed FALSE

prior normal

param 0 100

to.theta function(x) x

from.theta function(x) x

theta9

hyperid 58208

name beta9

short.name beta9

initial 0

fixed FALSE

prior normal

param 0 100

to.theta function(x) x

from.theta function(x) x

theta10

hyperid 58209

name beta10

short.name beta10

initial 0

> **fixed** FALSE
>
> **prior** normal
>
> **param** 0 100
>
> **to.theta** function(x) x
>
> **from.theta** function(x) x

survival TRUE

discrete FALSE

link default log

pdf gammajw

Example

In the following example we estimate the parameters in a simulated example.

```
n <- 300
x <- rnorm(n, sd = 0.3)
eta <- 1 + x
mu <- exp(eta)
y <- rgamma(n, shape = mu, scale = 1)
r <- inla(y ~ 1 + x,
          data = data.frame(y, x),
          family = "gammajw",
          control.compute = list(cpo = TRUE),
          control.fixed = list(prec.intercept = 0.01),
          verbose = TRUE)
summary(r)

yy <- inla.surv(y, event = 1)
rr <- inla(yy ~ 1 + x,
          data = list(yy = yy, x = x),
          family = "gammajwsurv",
          control.compute = list(cpo = TRUE),
          control.fixed = list(prec.intercept = 0.01),
          verbose = TRUE)
summary(rr)

print(r$summary.fixed - rr$summary.fixed)
```

Notes

None.