Gamma and logGamma prior

Parametrization

The Gamma distribution has density

$$\pi(\tau) = \frac{b^a}{\Gamma(a)} \tau^{a-1} \exp(-b \tau) \tag{1}$$

for $\tau > 0$ where:

a > 0 is the shape parameter, and

b > 0 is the inverse-scale parameter.

The mean of τ is a/b and the variance is a/b^2 , and we denote this distribution Gamma(a, b). The variable θ has a logGamma(a, b) distribution, if $\theta = log(\tau)$ and τ is Gamma(a, b) distributed.

Specification

The Gamma and logGamma prior for the hyperparameters is specified as

```
f(<whatever>, hyper = list(<theta> = list(prior="gamma", param=c(<a>,<b>))))
or
f(<whatever>, hyper = list(<theta> = list(prior="loggamma", param=c(<a>,<b>))))
```

In the case where there is one hyperparameter for that particular f-model. In the case where we want to specify the prior for the hyperparameter of an observation model, for example the Gaussian, the the prior spesification will appear inside the control.family()-argument; see the following example for illustration.

Example

In the following example we estimate the parameters in a simulated example with gaussian responses and assign the hyperparameter θ (the precision parameter), a logGamma prior with parameters a=0.1 and b=0.1

Notes

None