The PC prior for the correlation ρ with $\rho = 1$ as the base-model

Parametrization

This prior is the PC prior for the correlation ρ where $\rho = 1$ is the base-model. The density for ρ is

$$\pi(\rho) = \frac{\lambda \exp(-\lambda \mu(\rho))}{1 - \exp(-\sqrt{2}\lambda)} \; J(\rho)$$

where

$$\mu(\rho) = \sqrt{1-\rho}$$

and

$$J(\rho) = \frac{1}{2\mu(\rho)}$$

The parameter λ is defined through

$$\text{Prob}(\rho > u) = \alpha, \qquad -1 < u < 1, \quad \sqrt{\frac{1-u}{2}} < \alpha < 1$$

where (u, α) are the parameters to this prior. The solution is implicite

$$\frac{\exp(-\lambda\sqrt{1-u})}{1 - \exp(-\sqrt{2}\lambda)} = \alpha$$

which explains why we have have

$$\alpha > \mu(u)/\sqrt{2} = \sqrt{\frac{1-u}{2}}$$

for a solution to exists with $\lambda > 0$. So for $u = 1/2$ then $\alpha > 1/2$.

Specification

This prior for the hyperparameters is specified inside the `hyper`-spesification, as

```
hyper = list(<theta> = list(prior="pc.rho1", param=c(<u>,<alpha>))))
```

Example

Notes