

# Package ‘DAC’

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**Type** Package

**Version** 0.1.1

**Title** Calculating Data Agreement Criterion Scores to Rank Experts  
Based on Their Beliefs

**Author** Duco Veen [aut, cre],  
Naomi Schalken [aut],  
Rens van de Schoot [aut]

**Maintainer** Duco Veen <ducoveen@gmail.com>

**Description** Allows to calculate Data Agreement Criterion (DAC) scores. This can be done to determine prior-data conflict or to evaluate and compare multiple priors, which can be experts' predictions. Bousquet (2008) <doi.org/10.1080/02664760802192981>.

**License** GPL-3

**Imports** blavaan, utils, stats, flexmix, sfsmisc, truncnorm

**Encoding** UTF-8

**LazyData** true

**Depends** R(>= 3.5.0)

**NeedsCompilation** no

**Repository** CRAN

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## R topics documented:

DAC.normal . . . . .	2
DAC.uniform . . . . .	3
Turnover . . . . .	4

<b>Index</b>	<b>6</b>
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DAC.normal

*DAC For Normal Benchmark Prior And Expert Priors*


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### Description

Calculates DAC values for multiple experts that provide prections in the form of a prior. The benchmark is set to be a normal distribution with user specified boundaries.

### Usage

```
DAC.normal(from, to, by, data, priors, mean.bench, sd.bench, n.iter = 10000)
```

### Arguments

from	Lower bound of the parameter space that is to be evaluated, as in the seq function of the base package.
to	Upper bound of the parameter space that is to be evaluated, as in the seq function of the base package.
by	Step size by which the defined parameter space is mapped out, as in the seq function of the base package.
data	A vector of your data points.
priors	A matrix of densities with in each column a density of a specific prior mapped on the paramater space that is equal to the parameter space that is supplied using the from, to, by statements. E.g. the parameter space runs from -10 to 10 in steps of 0.01 than your density of a standard normal distribution should be obtained using <code>dnorm(x = seq(from = -10, to = 10, by = 0.01), mean = 0, sd = 1)</code> . The first column will thus describe this density using 2001 rows and all other columns should use the same density mapping to the parameter space.
mean.bench	Mean of the benchmark prior.
sd.bench	SD of the benchmark prior.
n.iter	The number of iterations that is used to obtain the posterior distribution of the data and the benchmark prior note that only half of these iterations will be used to obtain samples, the other half is used for adaptation and burnin.

### References

- Bousquet, N. (2008) Diagnostics of prior-data agreement in applied bayesian analysis. *Journal of Applied Statistics*, **35**(9), 1011-1029.
- Veen, D., Stoel, D., Schalken, N., van de Schoot, R. (2017). Using the Data Agreement Criterion to Rank Experts' Beliefs. *arXiv preprint arXiv:1709.03736*.

**Examples**

```

y <- Turnover$actual.data
from <- -500
to <- 500
by <- .01
xx <- seq(from, to, by)
priors <- matrix(NA, ncol=4, nrow=length(xx))
for(i in 1:4){
  priors[,i] <- dnorm(xx, Turnover$expert.priors[i, 1], Turnover$expert.priors[i, 2])
}

out <- DAC.normal(from = from, to = to, by = by, data = Turnover$actual.data,
  priors = priors, mean.bench = 0, sd.bench = 100, n.iter = 1000)

```

DAC.uniform

*DAC For Uniform Benchmark Prior And Expert Priors***Description**

Calculates DAC values for multiple experts that provide precisions in the form of a prior. The benchmark is set to be a uniform distribution with user specified boundaries.

**Usage**

```
DAC.uniform(from, to, by, data, priors, lb.bench, ub.bench, n.iter = 10000)
```

**Arguments**

from	Lower bound of the parameter space that is to be evaluated, as in the seq function of the base package.
to	Upper bound of the parameter space that is to be evaluated, as in the seq function of the base package.
by	Step size by which the defined parameter space is mapped out, as in the seq function of the base package.
data	A vector of your data points.
priors	A matrix of densities with in each column a density of a specific prior mapped on the parameter space that is equal to the parameter space that is supplied using the from, to, by statements. E.g. the parameter space runs from -10 to 10 in steps of 0.01 than your density of a standard normal distribution should be obtained using dnorm(x = seq(from = -10, to = 10, by = 0.01), mean = 0, sd = 1). The first column will thus describe this density using 2001 rows and all other columns should use the same density mapping to the parameter space.
lb.bench	Lower boundary of the benchmark prior.
ub.bench	Upper boundary of the benchmark prior.

`n.iter` The number of iterations that is used to obtain the posterior distribution of the data and the benchmark prior note that only half of these iterations will be used to obtain samples, the other half is used for adaptation and burnin.

## References

Bousquet, N. (2008) Diagnostics of prior-data agreement in applied bayesian analysis. *Journal of Applied Statistics*, **35(9)**, 1011-1029.

Veen, D., Stoel, D., Schalken, N., van de Schoot, R. (2017). Using the Data Agreement Criterion to Rank Experts' Beliefs. *arXiv preprint arXiv:1709.03736*.

## Examples

```
y <- Turnover$actual.data
from <- -10
to <- 10
by <- .01
xx <- seq(from, to, by)
priors <- matrix(NA, ncol=4, nrow=length(xx))
for(i in 1:4){
  priors[,i] <- dnorm(xx, Turnover$expert.priors[i, 1], Turnover$expert.priors[i, 2])
}

out <- DAC.uniform(from = from, to = to, by = by, data = Turnover$actual.data,
  priors = priors ,lb.bench = 0, ub.bench = 5, n.iter = 1000)
```

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Turnover

*Expert predictions and actual turnover for the first quarter of 2016*

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## Description

Data set containing predictions of four experts concerning the turnover for the first quarter of 2016 and the actual realisation of the turnover. The scale is transformed so as to protect business sensitive information..

## Usage

```
data(Turnover)
```

## Format

A list of 2 providing the predictions of the experts and the actual data.

`expert.priors` Predictions of turnover by experts expressed in distributional form for the `dnorm` function of the `fGarch` package. Each row representens one expert, column the mean, column two the sd and column three the skewness parameter.

`actual.data` The realisation of turnover for the company.

## References

Veen, D., Stoel, D., Schalken, N., van de Schoot, R. (2017). *Using the Data Agreement Criterion to Rank Experts' Beliefs*. Manuscript submitted for publication.

## Examples

```
head(Turnover)
```

# Index

DAC.normal, [2](#)  
DAC.uniform, [3](#)

Turnover, [4](#)