Package: assessr (via r-universe)

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Version 1.0.0

Title Performance metrics for probabilitic forecasts

Description This package implements various metrics for assessing the performance of probabilitic forecasts.

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Repository https://mrc-ide.r-universe.dev

RemoteUrl https://github.com/mrc-ide/assessr

RemoteRef master

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Contents

`abs_madm` *MADM*

Description

Median absolute deviation about the median

Usage

```
abs_madm(pred)
```

Arguments

`pred`	T X N Matrix of predictions. Each column is a simulation.

Details

$$median(|pred - median(pred)|)$$

Median absolute deviation about the median is a measure of how clustered the forecasts are. A value of 0 indicates that all the predicted values are the same, thus highly clustered. Large values indicate more diffuse predictions.

Value

vector of length T.

References

https://bit.ly/2vPO0I9

See Also

`rel_madm()`

avg_residual *Average Residual*

Description

Residual averaged acorss simulations

Usage

```
avg_residual(obs, pred)
```

Arguments

obs	observed vector T X 1
pred	matrix of predicted observations. Each column is a simulation. T X N where N is the number of simulations.

Details

$$\sum_{i=1}^{N} obs - pred/N$$

Value

error T X 1. Each entry is the error averaged across the simulations.

Author(s)

Sangeeta Bhatia

bias *Bias*

Description

Bias in probabilistic forecasts

Usage

```
bias(obs, pred)
```

Arguments

obs	observed vector T X 1
pred	Simulated predictions T X N. Each column is a simulation.

Details

Bias is measured as

$$2 * mean((heaviside(obs - pred)) - 0.5)$$

where heaviside returns 1 if the arg is positive, 0 if this negative and 0.5 if it is 0. The average is taken over all simulations.

Value

vector of length T.

Author(s)

Sangeeta Bhatia

References

https://doi.org/10.1371/journal.pcbi.1006785

`mae` *Mean absolute error*

Description

Mean absolute error

Usage

```
mae(obs, pred)
```

Arguments

`obs`	T X 1 vector of observations.
`pred`	T X N matrix of predictions where each column is a simulation.

Value

T X 1 vector of mean absolute error

Author(s)

Sangeeta Bhatia

prop_in_ci *Proportion of observations in given credible interval*

Description

Proportion of observations in given credible interval

Usage

```
prop_in_ci(obs, min, max)
```

Arguments

obs	vector of observed values
min	vector of the lower end of the interval. Either length 1 vector or the same length as the that of obs.
max	vector of the upper end of the interval. Either length 1 or the same length as that of the obs vector.

Details

Proportion of observed values that fall within a given interval

Value

proportion of values in obs vector that are greater than or equal to min and less than or equal to max.

Author(s)

Sangeeta Bhatia

rel_madm *Relative sharpness*

Description

Relative sharpness: median absolute deviation about the median

Usage

```
rel_madm(pred)
```

Arguments

pred	T X N Matrix of predictions. Each column is a simulation.

Details

$$median(|(pred - median(pred))/pred|)$$

Value

vector of length T.

References

https://bit.ly/2vPO0I9

See Also

abs_madm()

`rel_mae` *Relative mean absolute error*

Description

Relative mean absolute error

Usage

```
rel_mae(obs, pred)
```

Arguments

`obs`	T X 1 vector of observations.
`pred`	T X N matrix of predictions where each column is a simulation.

Details

Relative mean absolute error is defined as

$$\sum_{i=1}^{N} |obs - pred|/N * |obs + 1|$$

Value

T X 1 vector of mean absolute error normalised by the observed value.

Author(s)

Sangeeta Bhatia

rel_mean_dvtn *Relative sharpness*

Description

Relative mean absolute deviation about the median

Usage

```
rel_mean_dvtn(pred)
```

Arguments

pred	T X N Matrix of predictions. Each column is a simulation.

Details

$$median(|(pred - median(pred))/pred|)$$

Value

vector of length T.

References

https://bit.ly/2vPO0I9

rel_mse *Average relative mean squared error*

Description

Relative mean squared error averaged acorss simulations

Usage

```
rel_mse(obs, pred)
```

Arguments

obs	observed vector T X 1
pred	matrix of predicted observations. Each column is a simulation. T X N where N is the number of simulations.

Details

Relative average mean square error is

$$\sum_{i=1}^{N} (obs - pred)^2 / N * (obs + 1)^2$$

We add 1 to the observed vector to avoid dividing by 0.

Value

error T X 1. Each entry is the error averaged across the simulations

Author(s)

Sangeeta Bhatia

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