Package ‘DatAssim’

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Type Package
Title Data Assimilation
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Description For estimation of a variable of interest using Kalman filter by incorporating results from previous assessments, i.e. through development weighted estimates where weights are assigned inversely proportional to the variance of existing and new estimates. For reference see Ehlers et al. (2017) <doi:10.20944/preprints201710.0098.v1>.
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Data Assimilation

Description

This function estimates a variable of interest through Data Assimilation technique by incorporating results from previous assessments.

Usage

datassim(X, Var, Corr)

Arguments

- **X**: Matrix of predictions, with \( n \) number of rows as the number of observations, and \( t \) number of columns as the number of time points from which data were collected.
- **Var**: Matrix of corresponding prediction variances, same dimension as \( X \).
- **Corr**: Matrix or value of correlations between observations from different time points, by default \( Corr = 0 \).

Value

- **$weights**: Estimated Kalman gain according to Eq.[7] in Ehlers et al. (2017).
- **$PredA**: Predicted values through Data Assimilation according to Eq.[5] in Ehlers et al. (2017).
- **$VarDA**: Corresponding estimated variances according to Eq.[6] in Ehlers et al. (2017).
- **$Correlation**: Correlation matrix.

References


Examples

```r
Pred1 = rnorm(10, mean = 50, sd = 100);
Pred2 = rnorm(10, mean = 50, sd = 30);
Pred3 = rnorm(10, mean = 50, sd = 80);
Pred4 = rnorm(10, mean = 50, sd = 100);

# Predictions based on ten observations, at four different time points
Prediction = cbind(Pred1, Pred2, Pred3, Pred4);
```
Var1 = matrix(10000, 10);
Var2 = matrix(900, 10);
Var3 = matrix(1600, 10);
Var4 = matrix(10000, 10);

# Corresponding prediction variances
Variance = cbind(Var1, Var2, Var3, Var4);

# Corr = 0 by default
dataassim(X = Prediction, Var = Variance);

# Corr = 0.5
dataassim(Prediction, Variance, 0.5);

Corr = cor(Prediction);
dataassim(Prediction, Variance, Corr);
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