Package 'mimdo'

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Type Package

Title Multivariate Imputation by Mahalanobis Distance Optimization

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Description Imputes missing values of an incomplete data matrix by minimizing the Mahalanobis distance of each sample from the overall mean [Labita, GJ.D. and Tubo, B.F. (2024) <doi:10.24412/1932-2321-2024-278-115-123>].

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`mimdo` *Multivariate Imputation by Mahalanobis Distance Optimization*

Description

Imputes missing values of an incomplete data matrix by minimizing the Mahalanobis distance of each sample from the overall mean. By utilizing Mahalanobis distance, this imputation method is preferable to be used on datasets with highly correlated variables.

Usage

```
mimdo(incomplete_data, inverse, iterations = 30)
```

Arguments

`incomplete_data`	A data frame with missing values.
`inverse`	If TRUE, the inverse covariance matrix will be used for distance calculation. If the covariance matrix is non-invertible, use inverse = FALSE.
`iterations`	Number of iterations. It can be adjusted to avoid long running time.

Value

The output returns a data frame of the complete imputed data. This means that the missing values of the original incomplete dataset have been imputed. If the function does not return a value, this means that the covariance matrix is not invertible and is exactly singular.

Author(s)

Geovert John D. Labita

References

Labita, GJ.D. and Tubo, B.F. (2024). Missing data imputation via optimization approach: An application to K-means clustering of extreme temperature. Reliability: Theory and Applications, 2(78), 115-123. DOI: https://doi.org/10.24412/1932-2321-2024-278-115-123

Bertsimas, D., Pawlowski, C., and Zhou, Y.D. (2018). From predictive methods to missing data imputation: An optimization approach. Journal of Machine Learning Research, 18(196), 1-39.

Examples

```
incomplete_data<-as.data.frame(matrix(c(5.1,NA,4.7,NA,3.0,3.2,1.4,1.4,NA,0.2,0.2,NA),nrow=3))
mimdo(incomplete_data, inverse=FALSE)
```

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