Package 'varSel'

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Type Package

Title Sequential Forward Floating Selection using Jeffries-Matusita Distance

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Description Feature selection using Sequential Forward Floating feature Selection and Jeffries-Matusita distance. It returns a suboptimal set of features to use for image classification. Reference: Dalponte, M., Oerka, H.O., Gobakken, T., Gianelle, D. & Naesset, E. (2013). Tree Species Classification in Boreal Forests With Hyperspectral Data. IEEE Transactions on Geoscience and Remote Sensing, 51, 2632-2645, <DOI:10.1109/TGRS.2012.2216272>.

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LazyData TRUE

RoxygenNote 7.1.1

NeedsCompilation no

Repository CRAN

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R topics documented:

BHATdist *Bhattacharyya distance among classes*

Description

Bhattacharyya distance.

Usage

```
BHATdist(g, X)
```

Arguments

g	A column vector of the lables. length(g) is equal to nrow(X).
X	A dataframe of the features. ncol(X) is equal to the total number of features, and nrow(X) is equal to the number of avaialble training samples. nrow(X) is equal to length(g)

Value

A list containing a matrix of the class combinations and a vector of the Bhattacharyya distances of all the class combinations.

Author(s)

Michele Dalponte and Hans Ole Oerka

References

Dalponte, M., Oerka, H.O., Gobakken, T., Gianelle, D. & Naesset, E. (2013). Tree Species Classification in Boreal Forests With Hyperspectral Data. IEEE Transactions on Geoscience and Remote Sensing, 51, 2632-2645.

dat *Hyperspectral data acquired over a forest area*

Description

A dataset containing 3230 samples with 65 hyperspectral bands and 8 classes.

Usage

```
data(dat)
```

Format

A data frame with 3230 rows and 66 variables

Details

- B1...B65 Hyperspectral bands.
- SP. Classes.

`JMdist` *Jeffries-Matusita distance among classes*

Description

Jeffries-Matusita distance.

Usage

```
JMdist(g, X)
```

Arguments

`g`	A column vector of the lables. length(g) is equal to nrow(X).
`X`	A dataframe of the features. ncol(X) is equal to the total number of features, and nrow(X) is equal to the number of avaialble training samples. nrow(X) is equal to length(g)

Value

A list containing a matrix of the class combinations and a vector of the JM distances of all the class combinations.

Author(s)

Michele Dalponte and Hans Ole Oerka

References

Dalponte, M., Oerka, H.O., Gobakken, T., Gianelle, D. & Naesset, E. (2013). Tree Species Classification in Boreal Forests With Hyperspectral Data. IEEE Transactions on Geoscience and Remote Sensing, 51, 2632-2645.

varSelSFFS *Sequential Forward Floating Selection using Jeffries-Matusita Distance*

Description

Feature selection using the Sequential Forward Floating Selection search strategy and the Jeffries-Matusita distance.

Usage

```
varSelSFFS(g, X, strategy = "mean", n = ncol(X))
```

Arguments

g	A column vector of the lables. length(g) is equal to nrow(X).
X	A dataframe of the features. ncol(X) is equal to the total number of features, and nrow(X) is equal to the number of avaialble training samples. nrow(X) is equal to length(g)
strategy	string indicating the multiclass strategy to adopt: 'minimum' or 'mean'.
n	integer indicating the number of features to select. The algorithm will stop at n+1 features selected.

Value

A list containing a vector of the JM distances on the individual bands, a matrix with the set of features selected, and a vector containing the distances for each feature set from 1 to N-1, where N is equal to ncol(X).

Author(s)

Michele Dalponte and Hans Ole Oerka

References

Dalponte, M., Oerka, H.O., Gobakken, T., Gianelle, D. & Naesset, E. (2013). Tree Species Classification in Boreal Forests With Hyperspectral Data. IEEE Transactions on Geoscience and Remote Sensing, 51, 2632-2645.

Examples

```
## Not run:
data(dat)

se<-varSelSFFS(g=dat$SP,X=dat[,c(1:65)],strategy="mean",n=4)
summary(se)


## End(Not run)
```

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