Package 'rForest'

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Type Package

Title Forest Inventory and Analysis

Version 0.1.4

Depends R (>= 3.1.2)

Imports alphashape3d, geometry, rgl, sp

Description Set of tools designed for forest inventory analysis.

License GPL (>= 2)

RoxygenNote 7.1.2

URL https://github.com/carlos-alberto-silva/rForest

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ForestInv01 *Forest Inventory Data - Example 01*

Description

Forest inventory data collected in Eucalyptus spp. forest plantations. This is an example of forest inventory data used in poly5Model, plotStem2d and plotStem3d functions

Format

A data frame with 131 rows and 5 variables

Details

- id. unique number to identify tree information
- hi. height (m) of each section where diameter is taken
- di. diameter (cm) in hi
- ht. total height (m) of the tree
- dbh. diameter (cm) at breast height (e.g 1.30 m)

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plotStem2d *2D visualization of tree stems*

Description

plotStem3d is used to visualize tree stems in 3D

Usage

```
plotStem2d(hi,di,col)
```

Arguments

hi,	vector of measured tree i heights
di,	vector of measured tree diameters (di) at i heights
col,	stem color, e.g. "chocolate"

Value

Nothing, but outputs a plot

Author(s)

Carlos A. Silva

Examples

```
# Importing forest inventory data
data(ForestInv01)

# Subsetting Tree 1
tree1<-subset(ForestInv01,ForestInv01[,1]==1)
hi<-tree1$hi
di<-tree1$di

# Plotting stem 2d
plotStem2d(hi,di, col="forestgreen")
```

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plotStem3d *3D visualization of tree stems*

Description

plotStem3d is used to visualize tree stems in 3D

Usage

```
plotStem3d(hi,di,col,alpha)
```

Arguments

hi,	vector of trees his
di,	vector of trees dis
col,	stem color, e.g. "chocolate"
alpha,	stem transparency. Set a value from 0 to 1

Value

Nothing, but outputs a plot

Author(s)

Carlos Alberto Silva

Examples

```
# Importing forest inventory data
data(ForestInv01)

# Subsetting Tree 1
tree1<-subset(ForestInv01,ForestInv01[,1]==1)
hi<-tree1$hi
di<-tree1$di
```

```
# Plotting stem 3d
plotStem3d(hi,di,alpha=1,col="forestgreen")
```

---

poly5Model   *Fitting a fifth-degree polynomial taper model*

Description

poly5Model is used to fit a fifth-degree polynomial taper model

Usage

```
poly5Model(dbh,ht,di,hi, plotxy)
```

Arguments

dbh,	vector of diameter at breast height
ht,	vector of measured tree heights
di,	vector of measured tree diameters at i heights
hi,	vector of measured tree i heights
plotxy,	plot the fitted model

Value

Returns a fifth-degree polynomial taper model as an object of class "lm"

Author(s)

Carlos A. Silva, Samuel P. C. Carvalho, Carine Klauberg Silva and Manoela de O. Rosa

References

Schoepfer (1966) model :fifth-degree polynomial taper model
$$di/dbh = (hi/ht) + (hi/ht)^2 + (hi/ht)^3 + (hi/ht)^4 + (hi/ht)^5$$

Examples

```
# Importing forest inventory data
data(ForestInv01)

# setting model parametersdbh and ht
hi<-ForestInv01[,2]
di<-ForestInv01[,3]
ht<-ForestInv01[,4]
dbh<-ForestInv01[,5]

# fitting the fifth-degree polynomial taper model
```

```
fit <- poly5Model(dbh,ht,di,hi, plotxy=TRUE)
#grid()
```

VisTaperShape3d   *3-D visualization of taper models*

Description

VisTaperShape3d is used for visualizing taper models in 3-D

Usage

```
VisTaperShape3d(model,dbh,height,col, solid)
```

Arguments

model,	taper model as an object of class "lm"
dbh,	tree diameter at breast height, e.g. 35 cm
height,	tree height, e.g. 25 m
col,	taper color, e.g. "forestgreen"
solid,	if TRUE (default) returns a solid 3d model. If FALSE, returns a 3d grid model

Value

Nothing, but outputs a plot

Author(s)

Carlos Alberto Silva and Joao Paulo Sardo Madi

Examples

```
# Importing forest inventory data
data(ForestInv01)

# setting model parametersdbh and ht
hi<-ForestInv01[,2]
di<-ForestInv01[,3]
ht<-ForestInv01[,4]
dbh<-ForestInv01[,5]

# fitting the fifth-degree polynomial taper model
fit <- poly5Model(dbh,ht,di,hi, plotxy=TRUE)

dbh<-30 # cm
height<-25 # m
model<-fit
```

```
library(rgl)
# Plotting the taper model in 3-D
VisTaperShape3d(fit,dbh,height,col="forestgreen",solid=TRUE)
box3d()
grid3d(c("x+","y+"))
aspect3d(0.3,0.3,1)
```

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