Package 'crookR'

November 3, 2025

Title Synthetic Crook Deformations in Stem Point Clouds

Version 0.1.0

Description Simulates parameterized single- and double-directional stem deformations in tree point clouds derived from terrestrial or mobile laser scanning, enabling the generation of realistic synthetic datasets for training and validating machine learning models in wood defect detection, quality assessment, and precision forestry. For more details see Pires (2025) <doi:10.54612/a.7hln0kr0ta>.

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URL https://github.com/raudep/crookR

BugReports https://github.com/raudep/crookR/issues

Depends R (>= 4.2)

Imports data.table, stats, utils

Suggests knitr, lidR, rmarkdown, spelling, testthat (>= 3.0.0)

VignetteBuilder knitr

Config/testthat/edition 3

Encoding UTF-8

Language en-US

LazyData false

RoxygenNote 7.3.3

NeedsCompilation no

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Repository CRAN

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Contents

`Create_Krok` *Backwards-compatible wrapper keeping your original name/signature*

Description

Backwards-compatible wrapper keeping your original name/signature

Usage

```
Create_Krok(
  tree_stem,
  krok_length = 0.5,
  krok_start = 4,
  krok_type = "2dir",
  krok_deviation = 0.1,
  inflektion_X = 1/4,
  inflektion_ext = 1/2,
  az = 0,
  spar = 0.8
)
```

Arguments

`tree_stem`	tree stem point cloud (lidR::LAS or data.frame)
`krok_length`	range of the deformation along the stem's length
`krok_start`	start height of the crook
`krok_type`	single- or double-directional deviation
`krok_deviation`	extent of the deviation
`inflektion_X`	placement of double directional deviation
`inflektion_ext`	placement of double directional deviation
`az`	numeric degrees. Azimuth of lateral rotation (0 = X axis, 90 = Y axis). Default 0.
`spar`	smoothing parameter for `stats::smooth.spline` (0..1).

Value

Same class as input (LAS or data.frame object with crook deformation)

`crook_deform` *Apply a synthetic crook/krok deformation to a stem point cloud (LAS or XYZ)*

Description

Generalization of your `Create_Krok()` that supports `lidR::LAS` or data.frames, arbitrary azimuth, and safer handling of edge cases.

Usage

```
crook_deform(
  x,
  krok_length = 0.5,
  krok_start = 4,
  krok_type = c("2dir", "1dir"),
  krok_deviation = 0.1,
  inflektion_X = 1/4,
  inflektion_ext = 1/2,
  az = 0,
  spar = 0.8
)
```

Arguments

`x`	LAS or data.frame with X,Y,Z (case-insensitive if data.frame).
`krok_length`	range of the deformation along the stem's length
`krok_start`	start height of the crook
`krok_type`	single- or double-directional deviation
`krok_deviation`	extent of the deviation
`inflektion_X`	placement of double directional deviation
`inflektion_ext`	placement of double directional deviation
`az`	numeric degrees. Azimuth of lateral rotation (0 = X axis, 90 = Y axis). Default 0.
`spar`	smoothing parameter for `stats::smooth.spline` (0..1).

Value

Same class as input (LAS or data.frame object with crook deformation)

`example_stem` *Example stem point cloud (XYZ)*

Description

A LiDAR-derived stem used in examples and tests.

Format

A data frame with 3 variables:

X numeric, meters (local coord)

Y numeric, meters

Z numeric, meters above ground

Details

Points belong to a single Scots pine stem, pre-segmented.

Source

Synthetic/field data prepared for the crookR package.

Examples

```
data(example_stem)
head(example_stem)
```

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