Package 'r2stl'

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Title Visualizing Data using a 3D Printer

Description Converts data to STL (stereolithography) files
that can be used to feed a 3-dimensional printer. The
3-dimensional output from a function can be materialized
into a solid surface in a plastic material, therefore allowing
more detailed examination. There are many possible uses for
this new tool, such as to examine mathematical expressions
with very irregular shapes, to aid teaching people with
impaired vision, to create raised relief maps from digital
elevation maps (DEMs), to bridge the gap between mathematical
tools and rapid prototyping, and many more. Ian Walker created
the function r2stl() and Jose' Gama assembled the package.

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Encoding UTF-8

Depends R (>= 2.7.0)

Imports graphics

RoxygenNote 7.2.3

URL <https://github.com/paulnorthrop/r2stl>,
<https://paulnorthrop.github.io/r2stl/>

BugReports <https://github.com/paulnorthrop/r2stl/issues>

NeedsCompilation no

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Repository CRAN

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r2stl	*Save R data to an STL file*

Description

r2stl takes numeric input exactly as with the [persp](#) function. The output is a STL (stereolithography) file.

Usage

```
r2stl(
  x,
  y,
  z,
  filename = "3d-R-object.stl",
  object.name = "r2stl-object",
  z.expand = FALSE,
  min.height = 0.008,
  show.persp = FALSE,
  strict.stl = FALSE
)
```

Arguments

x	A numeric vector with the x-coordinates to plot.
y	A numeric vector with the y-coordinates to plot.
z	A numeric length(x) by length(y) matrix with the z-coordinates to plot.
filename	The STL filename.
object.name	The object that is being described must have a name specified inside the file. There's probably no point changing it from the default.
z.expand	To force the 3D plot to touch all six faces of the imaginary cube that surrounds it, set this argument to TRUE.
min.height	The minimum height for the printed material.
show.persp	If set to TRUE then a [persp](#) plot of this object is shown on the screen.
strict.stl	If set to TRUE it makes files smaller but isn't strictly proper STL format.

Details

To view and test the STL files before printing them can be done with many programs, for example an open-source option is Meshlab https://www.meshlab.net/.

Value

The object returned when [close](#) is used to close the connection to `filename`.

Author(s)

Ian Walker.

Examples

```
# Let's do the classic persp() demo plot
x <- seq(-10, 10, length = 100)
y <- x
f <- function(x,y) {
  r <- sqrt(x^2+y^2)
  return(10 * sin(r) / r)
}
z <- outer(x, y, f)
z[is.na(z)] <- 1
file1 <- tempfile(fileext = ".stl")
r2stl(x, y, z, filename = file1, show.persp = TRUE)

# Now let's look at R's Volcano data
z <- volcano
x <- 1:dim(volcano)[1]
y <- 1:dim(volcano)[2]
file2 <- tempfile(fileext = ".stl")
r2stl(x, y, z, filename = file2, show.persp = TRUE)
```

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