

Package ‘anim.plots’

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Type Package

Title Simple Animated Plots for R

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Description Simple animated versions of basic R plots, using the 'animation' package. Includes animated versions of plot, barplot, persp, contour, filled.contour, hist, curve, points, lines, text, symbols, segments, and arrows.

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anim.plots-package	<i>anim.plots: simple animated plots For R</i>
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Description

anim.plots provides simple animated versions of basic R plots, using the 'animation' package. It includes animated versions of plot, barplot, persp, contour, filled.contour, hist, curve, points, lines, text, symbols, segments, and arrows.

Details

For more information, run `vignette('anim.plots-stub')`, or check the vignette out on the web at <https://hughjonesd.github.io/anim.plots/anim.plots.html>.

Be aware that anim.plots is just a simple wrapper around Yihui Xie's "animation" package. You may want to consider more modern solutions such as [gganimate](#).

anim.barplot	<i>Create an animated barplot.</i>
--------------	------------------------------------

Description

Create an animated barplot.

Usage

```
anim.barplot(...)

## Default S3 method:
anim.barplot(
  height,
  times = NULL,
  show = TRUE,
  speed = 1,
```

```

    use.times = TRUE,
    window = t,
    window.process = NULL,
    width = 1,
    space = NULL,
    names.arg = NULL,
    beside = FALSE,
    density = NULL,
    angle = NULL,
    col = NULL,
    border = NULL,
    horiz = FALSE,
    xlim = NULL,
    ylim = NULL,
    xlab = NULL,
    ylab = NULL,
    main = NULL,
    sub = NULL,
    offset = NULL,
    legend.text = NULL,
    ...
  )

```

Arguments

height a vector, matrix or array. If a vector it is divided up by `times` and `barplot` is called on each chunk. If a matrix, `barplot` is called on each column. If an array, `barplot` is called on each matrix of form `height[, , i]`.

times a vector of times. If `NULL` and `height` is a matrix, the last dimension of `height` will be used

`show`, `speed`, `use.times`, `window`, `window.process`
see [anim.plot](#)

`width`, `space`, `beside`, `names.arg`, `density`, `angle`, `col`, `border`, `horiz`, `xlim`, `ylim`, `xlab`, `ylab`, `main`, `sub`, `offset`, `legend.text`
arguments passed to [barplot](#).

Details

Arguments `width`, `names.arg`, `density`, `angle`, `col`, `border` and `offset` may be either vectors of length `length(tbl)` or matrices with one column for each unique value of `times`. Other arguments should be length 1 or vectors.

Examples

```

anim.barplot(1:100, times=rep(1:10, each=10), ylim=c(0,100))
## barplot with a matrix
ChickWeight$wq <- cut(ChickWeight$weight, 5)
tbl <- as.array(xtabs(~ wq + Diet + Time, data=ChickWeight))
ptbl <- prop.table(tbl, 2:3)
anim.barplot(ptbl, xlab="Diet", ylab="N", xlim=c(0,8), legend.text=paste(

```

```

    "Quintile", 1:5), col=1:5)
anim.barplot(tbl, xlab="Diet", ylab="N", beside=TRUE, ylim=c(0,20),
  legend.text=paste("Quintile", 1:5), col=1:5)

```

anim.contour

Create an animated contour plot or perspective plot

Description

Create an animated contour plot or perspective plot of 3D data.

Usage

```

anim.contour(...)

anim.filled.contour(...)

## Default S3 method:
anim.filled.contour(...)

anim.persp(...)

## Default S3 method:
anim.contour(
  x,
  y,
  z,
  times,
  speed = 1,
  use.times = TRUE,
  window = t,
  window.process = NULL,
  show = TRUE,
  fn = contour,
  ...
)

```

Arguments

`x, y, z, ...` arguments passed to [contour](#) or [persp](#)

`times, speed, use.times, window, window.process, show` see [anim.plot](#) for details.

`fn` underlying function to use.

Examples

```
tmp <- volcano
tmp[] <- 200 - ((row(tmp) - 43)^2 + (col(tmp) - 30)^2)/20
cplot <- array(NA, dim=c(87,61,20))
cplot[, , 1] <- tmp
cplot[, , 20] <- volcano
cplot <- apply(cplot, 1:2, function(x) seq(x[1], x[20], length.out=20))
cplot <- aperm(cplot, c(2,3,1))
anim.contour(z=cplot, times=1:20, speed=3, levels=80 + 1:12*10, lty=c(1,2,2))
anim.filled.contour(z=cplot, times=1:20, speed=3, levels=80 + 1:12*10,
  color.palette=terrain.colors)

cplot2 <- apply(cplot, 1:2, function(x) seq(0, x[20], length.out=20))
cplot2 <- aperm(cplot2, c(2,3,1))
anim.persp(z=cplot2, times=1:20, xlab="", ylab="", zlab="Height", phi=45,
  theta=30, speed=5, border=NA, r=3, col="yellowgreen", shade=.5, box=FALSE)
```

anim.curve

Draw an animated curve.

Description

This function is the animated version of [curve](#).

Usage

```
anim.curve(expr, x = NULL, from = 0, to = 1, n = 255, times, type = "l", ...)
```

Arguments

expr	a function which takes two arguments, or an expression involving x and t.
x	values of x at which the function will be evaluated in each frame. Alternatively, you may specify from, to and n.
from, to	endpoints of x
n	number of values of x at which the function will be evaluated for each frame
times	vector of values of t at which the function will be evaluated. Each unique value creates a single animation frame.
type, ...	parameters passed to anim.plot.default

Details

Note that times is interpreted differently here than elsewhere. In particular, it cannot be a length-1 vector.

Examples

```

anim.curve(x^t, times=10:50/10, n=20)
anim.curve(sin(x*t), times=1:30, n=100, speed=12, col="darkgreen", from=-1, to=1)

## curve is constant in t, but window moves.
## NB: 'from' and 'to' control where the expression is evaluated.
## 'xlim' just controls the window.
anim.curve(sin(cos(-x)*exp(x/2)), times=0:100/10, from=-5, to=10, n=500,
           col="red", lwd=2, xlim=rbind(top <- seq(-5, 10, 1/10), top+5))

```

anim.hist

Draw an animated histogram.

Description

Draw an animated histogram.

Usage

```

anim.hist(
  x,
  times,
  speed = 1,
  show = TRUE,
  use.times = TRUE,
  window = t,
  window.process = NULL,
  density = NULL,
  angle = NULL,
  col = NULL,
  border = NULL,
  ...
)

```

Arguments

x, density, angle, col, border, ...

parameters passed to [hist](#).

times, show, speed, use.times, window, window.process

see [anim.plot](#).

Details

Parameters x, density, angle, col and border are all "chunked", i.e. first recycled to the length of times or x (whichever is longer), then split according to the unique values of times. See [anim.plot](#) for more details.

Examples

```
anim.hist(rep(rnorm(5000), 7), times=rep(1:7, each=5000),
          breaks=c(5,10,20,50,100,200, 500, 1000))
```

anim.plot	<i>Create an animated plot.</i>
-----------	---------------------------------

Description

anim.plot

Usage

```
anim.plot(...)
```

```
anim.points(...)
```

```
anim.lines(...)
```

```
anim.text(...)
```

```
## Default S3 method:
```

```
anim.plot(
  x,
  y = NULL,
  times = 1:length(x),
  speed = 1,
  show = TRUE,
  use.times = TRUE,
  window = if (identical(fn, lines)) t:(t + 1) else t,
  window.process = NULL,
  xlim = NULL,
  ylim = NULL,
  col = par("col"),
  xaxp = NULL,
  yaxp = NULL,
  pch = par("pch"),
  cex = 1,
  labels = NULL,
  asp = NULL,
  lty = par("lty"),
  lwd = par("lwd"),
  fn = plot,
  ...
)
```

```
## S3 method for class 'formula'
```

```

anim.plot(
  formula,
  data = parent.frame(),
  subset = NULL,
  fn = plot,
  window = t,
  ...
)

## Default S3 method:
anim.points(...)

## Default S3 method:
anim.lines(...)

## Default S3 method:
anim.text(...)

anim.symbols(...)

## S3 method for class 'formula'
anim.points(formula, ...)

## S3 method for class 'formula'
anim.lines(formula, ...)

## S3 method for class 'formula'
anim.text(formula, ...)

```

Arguments

<code>x, y</code>	vectors of x and y coordinates. These can be passed in any way accepted by xy.coords .
<code>times</code>	a vector of times. If <code>times</code> is length one, there will be that many frames, equally divided over the length of x and y.
<code>speed</code>	animation speed.
<code>show</code>	if false, do not show plot; just return calls.
<code>use.times</code>	if TRUE, animation speed is determined by the <code>times</code> argument. If FALSE, animation speed is constant.
<code>window</code>	what window of times to show in each animation. The default, <code>t</code> , shows just plots from time <code>t</code> . To draw a plot incrementally, use <code>window=1:t</code> .
<code>window.process</code>	function to call on each window of each times. See details.
<code>xlim, ylim, col, pch</code>	arguments passed to plot .
<code>labels, cex, lty, lwd</code>	as above.

asp, xasp, yasp, ...	as above.
fn	function called to create each frame.
formula	a formula of the form $y \sim x + \text{time}$.
data	a data frame from where the values in formula should be taken.
subset	a vector specifying which rows of data to use.

Details

Each unique level of times will generate a single frame of animation. The frames will be ordered by times.

In general:

- Parameters that apply to each point of the plot, such as xlim, ylim, col, pch, labels and cex, can be passed as vectors which will be recycled to length(times).
- Parameters that apply to the plot as a whole, and always have length 1, such as xlab and main, can be passed as vectors and will be recycled to the number of frames.
- Parameters that apply to the plot as a whole, and can have length > 1, such as xlim and ylim, can be passed as vectors or matrices. If vectors, the same vector will be passed to every frame. If matrices, column i will be passed to the i'th frame.

window.process should be a function which takes two arguments: a list of potential arguments for the underlying call to plot, and a vector of times. The function should return the list of arguments after modification. This allows e.g. drawing "trails" of plot points. See the example

Examples

```
x <- rep(1:100/10, 10)
times <- rep(1:10, each=100)
y <- sin(x*times/4)
anim.plot(x,y,times, type="l", col="orange", lwd=2)

## changing colours - a per-point parameter
anim.plot(x,y,times, ylab="Sine wave", type="p", col=rainbow(100)[x *10])

## changing line width - a whole-plot parameter
anim.plot(x, y, times, lwd=1:10, type="l")

## times as a single number
anim.plot(1:10, 1:10, times=5)

## incremental plot
anim.plot(1:10, 1:10, window=1:t)

## moving window
anim.plot(1:10, 1:10, window=(t-2):t)

## Formula interface
ChickWeight$chn <- as.numeric(as.factor(ChickWeight$Chick))
```

```

tmp <- anim.plot(weight ~ chn + Time, data=ChickWeight, col=as.numeric(Diet),
  pch=as.numeric(Diet), speed=3)

# adding extra arguments:
replay(tmp, after=legend("topleft", legend=paste("Diet", 1:4), pch=1:4, col=1:4))

## Zooming in:
x <- rnorm(4000); y<- rnorm(4000)
x <- rep(x, 10); y <- rep(y, 10)
xlims <- 4*2^(-(1:10/10))
ylims <- xlims <- rbind(xlims, -xlims)
anim.plot(x, y, times=10, speed=5, xlim=xlims, ylim=ylims,
  col=rgb(0,0,0,.3), pch=19)

## window.process to create a faded "trail":
anim.plot(1:50, 1:50, speed=12, window=t:(t+5),
  window.process=function(args, times){
    times <- times - min(times)
    alpha <- times/max(times)
    alpha[is.na(alpha)] <- 1
    args$col <- rgb(0,0,0, alpha)
    return(args)
  })

## gapminder plot:
pl <- palette(adjustcolor(rainbow(23), 1, .6, .6, .6,
  offset=c(0,0,0,-0.1)))
anim.plot(lifex ~ GDP + year, data=gm_data, log="x",
  cex=sqrt(pop)*0.0004, pch=19, col=region, xlab="GDP",
  ylab="Life expectancy", speed=10, subset=year > 1850 & !year %% 5)
palette(pl)

## Not run:
## Earthquakes this week
if (require('maps')) {
  eq = read.table(
    file="http://earthquake.usgs.gov/earthquakes/catalogs/eqs7day-M1.txt",
    fill=TRUE, sep=",", header=TRUE)
  eq$time <- as.numeric(strptime(eq$Datetime, "%A, %B %d, %Y %X UTC"))
  eq <- eq[-1,]
  map('world')
  maxdepth <- max(max(eq$Depth), 200)
  tmp <- anim.points(Lat ~ Lon + time, data=eq, cex=Magnitude, col=rgb(
    1-Depth/maxdepth, 0, Depth/maxdepth,.7), pch=19, speed=3600*12,
    show=FALSE)
  replay(tmp, before=map('world', fill=TRUE, col="wheat"))
}

## Minard's plot
if (require('maps')) {
  map('world', xlim=c(22, 40), ylim=c(52,58))
  title("March of the Grande Armee on Moscow")
}

```

```

points(cities$long, cities$lat, pch=18)
text(cities$long, cities$lat, labels=cities$city, pos=4, cex=.7)
with(troops[troops$group==1,], anim.lines(x=long,
      y=lat, window=t:(t+1), speed=3, lwd=survivors/10000))
}

## End(Not run)

```

anim.save

Save an anim.frames object in various formats.

Description

This function simply calls `replay` on the object and then calls `saveGIF` and friends on the result.

Usage

```

anim.save(
  obj,
  filename,
  type = switch(file_ext(filename), gif = "GIF", mp4 = "Video", swf = "SWF", html =
    "HTML", tex = "Latex"),
  ...
)

```

Arguments

<code>obj</code>	an <code>anim.frames</code> object, or an expression to evaluate
<code>filename</code>	file to save to
<code>type</code>	one of 'GIF', 'Video', 'SWF', 'HTML', or 'Latex'
<code>...</code>	arguments passed to e.g. <code>saveGIF</code>

Examples

```

## Not run:
tmp <- anim.plot(1:10, 1:10, pch=1:10, show=FALSE)
anim.save(tmp, "mygif.gif")

anim.save(replay(tmp, after=legend("topleft", legend="My legend")),
  "mygif2.gif")

## End(Not run)

```

anim.segments	<i>Draw an animation of line segments or arrows.</i>
---------------	--

Description

Draw an animation of line segments or arrows.

Usage

```
anim.segments(
  x0,
  y0,
  x1 = NULL,
  y1 = NULL,
  times = NULL,
  speed = 1,
  show = TRUE,
  use.times = TRUE,
  window = t,
  window.process = NULL,
  fn = segments,
  col = NULL,
  lty = NULL,
  lwd = NULL,
  ...
)

anim.arrows(..., length = 0.25, angle = 30, code = 2)

anim.segmentplot(...)

anim.arrowplot(...)
```

Arguments

<code>x0, y0, x1, y1, col, lty, lwd, length, angle, code, ...</code>	arguments passed to segments or arrows
<code>times, speed, show, use.times, window, window.process</code>	see anim.plot for details
<code>fn</code>	underlying function to use

Details

`anim.segments` and `anim.arrows` draw lines on to an existing plot. If you want to redraw the plot between each frame, use `anim.arrowplot` or `anim.segmentplot`.

If both `x1` and `y1` are missing, then segments are plotted from the current time to the following time in each frame. If only `x1` is missing it is set equal to `x0`, similarly if only `y1` is missing.

Examples

```

anim.segments(x0=rep(1:5, 5), y0=rep(1:5, each=5), y1=rep(2:6, each=5),
             times=rep(1:5, each=5) )

## Short version
anim.arrowplot(rep(1:5, 5), rep(1:5, each=5), times=5)

if (require('maps')) {
  hr <- subset(hurricanes, lat > 0 & lat < 50 & lon > -95 & lon < -20 &
              Shour %% 6 == 0)
  hr$dlat <- cos(hr$diruv/360*2*pi) * hr$maguv / 8
  hr$dlon <- sin(hr$diruv/360*2*pi) * hr$maguv / 8
  hr$name <- sub("\\s+$", "", hr$name)
  map('world', xlim=c(-95,-20), ylim=c(0,50))
  title("Hurricanes, 2009")
  with(hr[!duplicated(hr$name),], text(lon, lat,
    labels=paste0(name, "\n", Yr), cex=0.8))
  with(hr, anim.arrows(x0=lon, y0=lat, y1=lat+dlat, x1=lon+dlon,
    times=Shour, speed=12, col=rgb(0,0,1,0.8), length=.1, lwd=2))
}

```

anim.smooth

Smooth an anim.frames object

Description

Some export formats ignore information in the `times` attribute and plot frames at constant speed. `anim.smooth` creates a smoothed version of the `anim.frames` object with frames at constant intervals, suitable for export.

Usage

```
anim.smooth(x, fps = 10)
```

Arguments

<code>x</code>	an <code>anim.frames</code> object
<code>fps</code>	how many frames per second to smooth to

Details

Note that plot parameters such as `x` and `y` positions are not interpolated. If you want your whole animation to look smoother, you have to do the work yourself using e.g. [approx](#).

If you smooth to a large value of `fps`, the animations may look bad in R because they overtax the graphics engine. They should still look good when saved, though.

Value

A smoothed `anim.frames` object, with the `speed` attribute equal to `fps`.

Examples

```

accel <- anim.plot(1, 1:30, times=sqrt(1:30))
## Not run:
anim.save(accel, "GIF", "wrong.gif")

## End(Not run)
accel <- anim.smooth(accel, fps=20)
## Not run:
anim.save(accel, "GIF", "better.gif")

## End(Not run)

```

cities	<i>Cities near the Grande Arme'e's march on Moscow</i>
--------	--

Description

Cities near the Grande Arme'e's march on Moscow

gm_data	<i>Gapminder GDP, life expectancy and population data</i>
---------	---

Description

Gapminder GDP, life expectancy and population data

Source

<http://gapminder.org>

hurricanes	<i>Wind speed data for hurricanes in 2009</i>
------------	---

Description

Wind speed data for hurricanes in 2009

Source

<http://myweb.fsu.edu/jelsner/Data.html>

merge.anim.frames	<i>Merge anim.frames objects</i>
-------------------	----------------------------------

Description

Merge two or more anim.frames objects to create a new anim.frames object

Usage

```
## S3 method for class 'anim.frames'  
merge(..., speed = NULL)
```

Arguments

...	anim.frames objects returned from, e.g. anim.plot
speed	speed for the merged object. This may be left unspecified only if all objects have the same speed.

Details

If two or more calls in the merged animation are at the same time, calls from the earlier object in ... will be run first.

If you merge two animations from [anim.plot](#), plot.window will be called before each frame of the merged animation. This may not be what you want. Instead, use [anim.points](#) or similar for all but the first animation.

Examples

```
tmp <- anim.plot(1:5, 1:5, speed=2)  
tmp2 <- anim.plot(1:5, 5:1, col="red", speed=2)  
## Not what you want:  
replay(merge(tmp, tmp2))  
  
## better:  
tmp3 <- anim.points(1:5, 5:1,col="red", speed=2)  
newf <- merge(tmp, tmp3)  
replay(newf)  
## NB: result of the merge looks different from the two  
## individual animations  
  
## not the same:  
newf2 <- merge(tmp2, tmp)  
## points will be called before plot!  
replay(newf2)
```

 PGgame

Data from 20 rounds of a public goods game with punishment

Description

A 2x3x20 array of data from a laboratory public goods game. Dimensions are Picked (was subject picked for punishment?), Contribution (of subject: Non-unique lowest, Not lowest/all same and Unique lowest), and Period.

Details

Provided by the package author.

replay

Replay an anim.frames object

Description

Replay all or some of the frames of an object.

Usage

```
replay(...)

## S3 method for class 'anim.frames'
replay(
  x,
  frames = 1:length(x),
  speed = attr(x, "speed"),
  after = NULL,
  before = NULL,
  ...
)

## S3 method for class 'anim.frames'
plot(x, ...)
```

Arguments

...	other arguments (not currently used)
x	an anim.frames object
frames	numeric vector specifying which frames to replay
speed	a new speed
after	an expression to evaluate after each frame is plotted
before	an expression to evaluate before each frame is plotted

Details

before and after will have the arguments from the frame's call available in their environment - see the example.

The plot method simply calls replay.

Examples

```
myplot <- anim.plot(1:10, 1:10, speed=3)
replay(myplot, speed=5)
replay(myplot, frames=c(1,5,6,10))
```

```
myplot <- anim.plot(x<-rnorm(100), x+rnorm(100,0,3), 20, window=1:t,
  show=FALSE, main="Regressions as sample size increases")
replay(myplot, after=abline(lm(y~x), col="red"))
```

temps

Temperatures for the Grande Armee's march on Moscow

Description

Temperatures for the Grande Armee's march on Moscow

troops

Troop numbers for the Grande Armee's march on Moscow

Description

Troop numbers for the Grande Armee's march on Moscow

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