

# Package ‘anim.plots’

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**Type** Package

**Title** Simple Animated Plots for R

**Version** 0.2.2

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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.

**License** GPL-2

**LazyData** TRUE

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**BugReports** <https://github.com/hughjonesd/anim.plots/issues>

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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 <a href="#">anim.plot.default</a>

## 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 <a href="#">xy.coords</a> .
<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 <a href="#">plot</a> .
<code>labels, cex, lty, lwd</code>	as above.



asp, xaxp, yaxp, ...	as above.
fn	function called to create each frame.
formula	a <a href="#">formula</a> 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 <a href="#">segments</a> or <a href="#">arrows</a>
<code>times, speed, show, use.times, window, window.process</code>	see <a href="#">anim.plot</a> 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 Armee's march on Moscow</i>
--------	---

---

**Description**

Cities near the Grande Armee'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. <a href="#">anim.plot</a>
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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