

Package ‘stopmotion’

May 9, 2026

Type Package

Title Build Stop Motion Animations from Image Sequences

Version 0.1.0

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Description A pipeline-friendly toolkit for assembling stop motion animations from sequences of still images. Provides functions to read image directories, restructure frame sequences (duplicate, splice, arrange), apply per-frame pixel transformations (rotate, wiggle, flip, flop, blur, scale, crop, trim, border, background), and export the result as a GIF. All transformation functions accept a 'frames' argument to target any subset of frames, bridging the gap between 'magick' functions that operate on an entire image stack and fine-grained stop motion editing. Image processing is performed via 'ImageMagick Studio LLC' (2024) <<https://imagemagick.org>>.

Imports magick, checkmate

Suggests testthat (>= 3.0.0), withr, knitr, quarto

VignetteBuilder quarto

Config/testthat/edition 3

Config/testthat/parallel false

Config/testthat/start-first *utils*, *read*, *duplicate*

Language en-GB

Encoding UTF-8

RoxygenNote 7.3.3

NeedsCompilation no

Author Alban Sagouis [aut, cre, cph] (ORCID:
<<https://orcid.org/0000-0002-3827-1063>>)

Maintainer Alban Sagouis <sagouis@pm.me>

Repository CRAN

Date/Publication 2026-03-24 10:30:03 UTC

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arrange	<i>Reorder frames in a stop-motion film</i>
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Description

Returns a new magick-image object with frames placed in the order given by order. Use this after [read](#) when the lexicographic filename sort does not match the intended frame sequence.

Usage

```
arrange(images, order)
```

Arguments

images	an object of class magick-image to reorder.
order	integer vector of frame indices giving the desired order. Must be a permutation of 1:length(images) (every frame index appearing exactly once).

Value

a magick-image object with frames in the requested order.

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
# Swap the first and second frame.
images <- arrange(images, order = c(2L, 1L, seq(3L, 10L)))
```

background

Set the background colour of images

Description

Set the background colour of images

Usage

```
background(images, color = "white", frames = NULL)
```

Arguments

<code>images</code>	an object of class <code>magick-image</code> to modify
<code>color</code>	a character string specifying a colour, e.g. <code>"white"</code> or <code>"#FF0000"</code> .
<code>frames</code>	integer vector of frame indices to duplicate. Defaults to <code>NULL</code> , which duplicates all frames.

Value

a `magick-image` object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
background(images = images, color = "white")
background(images = images, color = "white", frames = 1)
```

blur	<i>Blur images</i>
------	--------------------

Description

Applies a Gaussian blur to selected frames. Wraps `magick::image_blur`.

Usage

```
blur(images, radius = 1, sigma = 0.5, frames = NULL)
```

Arguments

<code>images</code>	an object of class <code>magick-image</code> to modify
<code>radius</code>	a non-negative number specifying the blur radius in pixels.
<code>sigma</code>	a non-negative number specifying the standard deviation of the Gaussian, controlling blur strength. Use <code>0</code> for no blur.
<code>frames</code>	integer vector of frame indices to duplicate. Defaults to <code>NULL</code> , which duplicates all frames.

Value

a `magick-image` object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
blur(images = images, radius = 2, sigma = 1)
blur(images = images, radius = 2, sigma = 1, frames = 1:3)
```

border	<i>Add a border to images</i>
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Description

Adds a coloured border around selected frames. Wraps `magick::image_border`.

Usage

```
border(images, color = "lightgray", geometry = "10x10", frames = NULL)
```

Arguments

<code>images</code>	an object of class <code>magick-image</code> to modify
<code>color</code>	a character string specifying the border colour, e.g. "black" or "#FF0000".
<code>geometry</code>	a geometry string specifying border width and height, e.g. "10x10" for a 10-pixel border on all sides.
<code>frames</code>	integer vector of frame indices to duplicate. Defaults to <code>NULL</code> , which duplicates all frames.

Value

a `magick-image` object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
border(images = images, color = "black", geometry = "5x5")
border(images = images, color = "white", geometry = "10x10", frames = 1:3)
```

centre *Align frames to a common set of reference points*

Description

Transforms selected frames so that two user-supplied reference points (e.g. left and right eye positions) map onto the same pixel locations across all frames. The transformation is a full affine warp — rotation, scaling, and translation are applied simultaneously — computed from the two point correspondences via `magick::image_distort`.

Usage

```
centre(images, points, reference = 1L, frames = NULL)
```

```
center(images, points, reference = 1L, frames = NULL)
```

Arguments

<code>images</code>	an object of class <code>magick-image</code> to modify
<code>points</code>	a <code>data.frame</code> with columns <code>frame</code> (integer frame index), <code>x</code> (numeric, pixels from the left edge), and <code>y</code> (numeric, pixels from the <i>bottom</i> edge, as returned by <code>locator()</code> after <code>plot(as.raster(images[[i]]))</code>). Exactly two rows per frame are required. Within each frame, the first row is reference point 1 and the second is reference point 2; the pairing must be consistent across frames (e.g. always left-eye first, right-eye second).
<code>reference</code>	integer. The frame whose reference points define the target alignment. All other selected frames are warped to match it. The reference frame itself is left unchanged. Defaults to 1L.
<code>frames</code>	integer vector of frame indices to duplicate. Defaults to NULL, which duplicates all frames.

Value

a `magick-image` object of the same length as `images`.

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)

# Manually record eye positions for each frame (e.g. using locator())
```

```

points <- data.frame(
  frame = c(1L, 1L, 2L, 2L, 3L, 3L),
  x      = c(210, 390, 215, 388, 208, 392),
  y      = c(180, 182, 176, 179, 183, 181)
)

centre(images = images, points = points, reference = 1L, frames = 1:3)

```

crop

Crop images

Description

Crops selected frames to a given geometry. Wraps `magick::image_crop`.

Usage

```
crop(images, geometry, gravity = NULL, repage = TRUE, frames = NULL)
```

Arguments

<code>images</code>	an object of class <code>magick-image</code> to modify
<code>geometry</code>	a geometry string specifying the cropped region, e.g. <code>"100x100+10+10"</code> (width-height+x_offset+y_offset).
<code>gravity</code>	anchor point for the crop: one of <code>"NorthWest"</code> , <code>"North"</code> , <code>"NorthEast"</code> , <code>"West"</code> , <code>"Center"</code> , <code>"East"</code> , <code>"SouthWest"</code> , <code>"South"</code> , <code>"SouthEast"</code> . Defaults to <code>NULL</code> (top-left).
<code>repage</code>	logical. If <code>TRUE</code> (default), resets the virtual canvas after cropping.
<code>frames</code>	integer vector of frame indices to duplicate. Defaults to <code>NULL</code> , which duplicates all frames.

Value

a `magick-image` object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```

dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
crop(images = images, geometry = "200x200+50+50")
crop(images = images, geometry = "200x200", gravity = "Center", frames = 1:3)

```

duplicate

*Duplicate frames***Description**

Duplicate frames

Usage

```
duplicate(images, style = c("linear", "looped", "shuffle"), frames = NULL)
```

Arguments

images	an object of class magick-image to modify
style	one of "linear", "looped", or "shuffle", controlling how duplicates are inserted: "linear" inserts one copy immediately before each selected frame, in order. The original frame follows its duplicate. "looped" appends one copy of each selected frame (in order) after <code>max(frames)</code> , creating a loop-back effect. Requires frames to be a consecutive sequence. "shuffle" randomly reorders both the originals and their copies within the selected range, replacing those positions. Requires frames to be a consecutive sequence.
frames	integer vector of frame indices to duplicate. Defaults to NULL, which duplicates all frames.

Value

a magick-image object with duplicate frames inserted.

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
duplicate(images = images, style = "shuffle", frames = 1:2)
```

flip	<i>Flip images vertically</i>
------	-------------------------------

Description

Flip images vertically

Usage

```
flip(images, frames = NULL)
```

Arguments

images	an object of class magick-image to modify
frames	integer vector of frame indices to duplicate. Defaults to NULL, which duplicates all frames.

Value

a magick-image object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
flip(images = images, frames = 2:3)
```

flop	<i>Flop images horizontally</i>
------	---------------------------------

Description

Mirrors selected frames along the vertical axis (left-right reflection). For a vertical flip (top-bottom), see [flip](#). Wraps `magick::image_flop`.

Usage

```
flop(images, frames = NULL)
```

Arguments

images	an object of class magick-image to modify
frames	integer vector of frame indices to duplicate. Defaults to NULL, which duplicates all frames.

Value

a magick-image object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
flop(images = images)
flop(images = images, frames = 2:3)
```

montage

Display frames as a montage

Description

Arranges selected frames into a single composite image. Wraps `magick::image_montage`.

Usage

```
montage(  
  images,  
  geometry = NULL,  
  tile = NULL,  
  gravity = "Center",  
  bg = "white",  
  shadow = FALSE,  
  frames = NULL  
)
```

Arguments

images	an object of class magick-image to modify
geometry	a geometry string controlling the size and spacing of each tile, e.g. "64x64+2+2".
tile	a string specifying the grid layout, e.g. "5x2". Defaults to NULL, which lets ImageMagick choose.
gravity	anchor point for each tile's label and content: one of "Center", "North", "South", etc. Defaults to "Center".
bg	background colour string, e.g. "white".
shadow	logical. Whether to add a drop-shadow under each tile.
frames	integer vector of frame indices to duplicate. Defaults to NULL, which duplicates all frames.

Value

a magick-image object containing a single composite frame.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
montage(images)
montage(images, frames = 1:4, tile = "4x1", geometry = "128x128+4+4")
```

```
preview
```

```
Preview an animation
```

Description

Converts a stack of frames into an animated GIF for display, with each frame's index and label overlaid as text. In an interactive session the animation opens in the system viewer; in a knitr/Quarto document it is embedded as an inline animated GIF. Wraps `magick::image_animate`.

Usage

```
preview(images, fps = 10, loop = 0, frames = NULL, label = TRUE)
```

Arguments

images	an object of class magick-image to modify
fps	playback speed in frames per second. Must be a positive integer divisor of 100, because GIF delay is stored in hundredths of a second ($\text{delay} = 100 / \text{fps}$). Valid values: 1, 2, 4, 5, 10, 20, 25, 50, 100. Defaults to 10.
loop	a non-negative integer giving the number of times the animation loops. 0 (the default) means loop forever.

frames	integer vector of frame indices to duplicate. Defaults to NULL, which duplicates all frames.
label	logical. Whether to overlay the frame index and label on each frame. Defaults to TRUE.

Value

a magick-image object containing the animated sequence.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
preview(images)
preview(images, fps = 5)
preview(images, label = FALSE)
```

read	<i>Read images into a stop-motion film</i>
------	--

Description

Reads all image files from `dir` (optionally filtered by `pattern`) and returns them as a magick-image object.

Usage

```
read(dir, pattern = "")
```

Arguments

dir	path to directory containing the images relative to working directory.
pattern	an optional regular expression . Only file names which match the regular expression will be returned.

Value

an object of class magick-image

Frame order

Frames are loaded in the order returned by `list.files`, which sorts filenames lexicographically. This means the filesystem filename order determines the stop-motion frame order. Name your files accordingly (e.g. `frame_001.png`, `frame_002.png`, ...) to guarantee the intended sequence. If you need to reorder frames after loading, use [arrange](#).

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
```

rotate	<i>Rotate images</i>
--------	----------------------

Description

Replaces selected frames with a rotated version in place. For large-angle transformations. For a small-angle hand-held rock effect, see [wiggle](#).

Usage

```
rotate(images, degrees, frames = NULL)
```

Arguments

images	an object of class <code>magick-image</code> to modify
degrees	a number in $[-360, 360]$ specifying the rotation angle.
frames	integer vector of frame indices to duplicate. Defaults to <code>NULL</code> , which duplicates all frames.

Value

a `magick-image` object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
rotate(images = images, degrees = 90, frames = 2L)
```

scale	<i>Scale images</i>
-------	---------------------

Description

Scale images

Usage

```
scale(images, geometry, frames = NULL)
```

Arguments

images	an object of class magick-image to modify
geometry	a character string specifying the target geometry, e.g. "50%" or "800x600".
frames	integer vector of frame indices to duplicate. Defaults to NULL, which duplicates all frames.

Value

a magick-image object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
scale(images = images, geometry = "50%")
scale(images = images, geometry = "50%", frames = 2:3)
```

splice	<i>Splice frames into a film</i>
--------	----------------------------------

Description

Splice frames into a film

Usage

```
splice(images, insert, after)
```

Arguments

images	an object of class magick-image to modify
insert	an object of class magick-image containing 1 or more images to be inserted.
after	integer scalar (or vector of scalars) giving the frame number(s) after which insert will be inserted. When a vector is supplied the insertions are applied left-to-right, each offset by the cumulative growth of the film from prior insertions.

Value

a magick-image object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
splice(images = images, insert = magick::wizard, after = 1)
```

`stopmotion_verbosity` *Control stopmotion verbosity*

Description

Convenience wrapper around `options(stopmotion.verbose =)` for enabling or disabling the frame-sequence messages printed after each operation. By default messages are shown in interactive sessions and suppressed in non-interactive contexts (e.g. knitr/Quarto rendering).

Usage

```
stopmotion_verbosity(verbose)
```

Arguments

verbose TRUE to enable messages, FALSE to suppress them.

Value

the previous value of the option, invisibly.

Examples

```
old <- stopmotion_verbosity(FALSE)
on.exit(stopmotion_verbosity(old))
```

trim

Trim edges from images

Description

Removes border pixels from selected frames by detecting the background colour and trimming uniform edges. Wraps `magick::image_trim`.

Usage

```
trim(images, fuzz = 0, frames = NULL)
```

Arguments

images	an object of class <code>magick-image</code> to modify
fuzz	a number in $[0, 100]$ controlling colour tolerance when detecting the background. Higher values trim more aggressively.
frames	integer vector of frame indices to duplicate. Defaults to <code>NULL</code> , which duplicates all frames.

Value

a `magick-image` object

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
trim(images = images)
trim(images = images, fuzz = 10, frames = 1:3)
```

wiggle *Add a wiggle effect to frames*

Description

Inserts two rotated copies after each selected frame — one tilted +degrees and one tilted -degrees — creating a hand-held stop-motion rock effect. For large-angle permanent rotations, see [rotate](#).

Usage

```
wiggle(images, degrees = 3, frames = NULL)
```

Arguments

images	an object of class magick-image to modify
degrees	a positive number specifying the tilt angle in degrees. Both +degrees and -degrees are applied automatically.
frames	integer vector of frame indices to duplicate. Defaults to NULL, which duplicates all frames.

Value

a magick-image object with 2 extra frames per selected frame.

Verbosity

After each operation a message listing the updated frame sequence is printed in interactive sessions. Use `stopmotion_verbosity(FALSE)` to suppress these messages, or set `options(stopmotion.verbose = FALSE)` in your script or `‘.Rprofile’`.

Examples

```
dino_dir <- system.file("extdata", package = "stopmotion")
images <- read(dir = dino_dir)
wiggle(images = images, degrees = 3, frames = 1:2)
```

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