

Package ‘playwith’

January 2, 2012

Type Package

Title A GUI for interactive plots using GTK+

Version 0.9-53

Date 2010-11-09

Author Felix Andrews <felix@nfrac.org>

Maintainer Felix Andrews <felix@nfrac.org>

Depends R (>= 2.7.0), lattice (>= 0.16-3), cairoDevice, gWidgetsRGtk2 (>= 0.0-45), grid

Imports RGtk2 (>= 2.20.1), gWidgets (>= 0.0-30), gridBase, grDevices,graphics, stats, utils

Suggests laticist, zoo, MASS, ggplot2, sp

Description A GTK+ graphical user interface for editing and interacting with R plots.

License GPL (>= 2)

URL <http://playwith.googlecode.com/>

Repository CRAN

Date/Publication 2010-11-09 15:04:48

R topics documented:

autoplay	2
callArg	3
convertFromDevicePixels	5
identifyGrob	7
panel.usertext	8
parameterControlTool	9
playDo	10
playGetIDs	11
playPointInput	13
playSelectData	14

playState	16
playwith	17
playwith.API	26
playwith.history	29
playwith.options	29
plotCoords	31
rawXLim	33
xyCoords	34

Index	36
--------------	-----------

autoplay	<i>Set playwith to run automatically.</i>
----------	---

Description

Set `playwith` to run automatically with Lattice graphics and/or base graphics.

Usage

```
autoplay(on = NA, lattice.on = on, base.on = on, grid.on = on, ask = FALSE)
```

Arguments

<code>on</code>	TRUE to set <code>playwith</code> to run automatically to display Lattice and base graphics. FALSE to revert to the default plot device (i.e. <code>getOption("device")</code>).
<code>lattice.on</code>	run automatically to display Lattice graphics.
<code>base.on</code>	run automatically to display base graphics (<code>plot</code> etc).
<code>grid.on</code>	run automatically to display grid graphics (except Lattice).
<code>ask</code>	if TRUE, select the appropriate plot call from a list (the call stack) when automatically starting a base graphics plot.

Details

When `lattice.on` is TRUE, the `print.trellis` function, which is typically called implicitly to create lattice plots, will trigger `playwith`, passing the original high-level call. So for lattice plots only, this is like changing your default plot device. It only replaces the screen device: plotting to a file device will work as normal. This feature requires `lattice` package version 0.17-1 or later.

When `base.on` is TRUE, any new base graphics plot will trigger `playwith` (via a hook in `plot.new`), and the high-level plot call is taken to be the first call (to a named function) on the call stack. The usual base graphics paradigm of building up a plot incrementally will not work well, because only the initial plot call is recorded, so any further additions will be lost when the plot is redrawn. For similar reasons, multiple-figure plots may not be redrawn correctly. The high-level plot will be called twice initially, due to constraints of the mechanism.

The `grid.on` argument is analogous to `base.on` for grid graphics, using a hook in `grid.newpage`.

Note that this automatic behaviour is not a full replacement for calling `playwith` directly, since it does not allow to you specify any of the optional arguments.

Another possibility is `options(device="playwith")`. This will act as a default device but without most of the interactive features. The plot can still be annotated with text and arrows in this case.

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playwith](#)

Examples

```
if (interactive()) {  
  
  ## lattice graphics in the playwith interface:  
  autoplay(lattice=T)  
  xyplot(Sepal.Length ~ Sepal.Width | Species, data=iris)  
  
  dev.off()  
  
  ## lattice graphics in your usual screen device:  
  autoplay(lattice=F)  
  xyplot(Sepal.Length ~ Sepal.Width | Species, data=iris)  
  
  ## base graphics in the playwith interface:  
  autoplay(TRUE)  
  frog <- rnorm(64)  
  hist(frog)  
  
  dev.off()  
  
  ## base graphics in your usual screen device:  
  autoplay(FALSE)  
  hist(frog)  
  
}
```

callArg

Work with plot call arguments

Description

Part of the **playwith** Application Programming Interface.

Usage

```
callArg(playState, arg, eval = TRUE, data = NULL)
callArg(playState, arg) <- value

mainCall(playState)
mainCall(playState) <- value

updateMainCall(playState)
```

Arguments

playState	a playState object representing the plot, window and device.
arg	the argument name or number in the main plot call. This can also be a language object (e.g. <code>quote(scales\$log)</code>). Argument numbers start from 1 (so 0 refers to the main function name). This is evaluated in the calling environment, so can refer to local variables (e.g. <code>data[[myname]]</code>).
eval	whether to evaluate the argument before returning it. Otherwise, just return the argument as it appears in the call.
data	a list or environment in which to evaluate the argument. Typically this will be the "data" argument to lattice or qplot functions.
value	the value to assign.

Details

These functions get and set argument values in the playState plot call.

As convenience functions for setting arguments in `playState$call`, the `callArg` function helps by:

- referring to the main call that accepts plot arguments, which is not necessarily the top-level call.
- automatically evaluating variables that have been stored in a local environment (`playState$env`).
- converting lists to language objects as needed.
- enforcing exact matching of argument names `exact=TRUE` (see [\[\]](#)).

Value

returns the value of the specified argument, possibly evaluated in a local environment (`playState$env`).

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playwith.API](#)

Examples

```

if (interactive()) {

  library(lattice)
  playwith(xyplot(1:10 ~ 1:10))
  playState <- playDevCur()

  callArg(playState, "pch") ## NULL
  callArg(playState, "pch") <- "$"
  callArg(playState, "pch") ## "$"
  playReplot(playState)

  ## referring to local variables
  tmp <- "x"
  callArg(playState, quote(scales[[tmp]]$cex)) <- 2
  playReplot(playState)

}

```

convertFromDevicePixels

Utilities for working with grobs and viewports in device coordinates.

Description

Utilities for working with grobs and viewports in device coordinates.

Usage

```

convertFromDevicePixels(x.px, y.px, unitTo = "native", valueOnly = FALSE)
convertToDevicePixels(x, y)

inViewport(x.px, y.px, viewport)
grobBBDevicePixels(grob, viewport, pad = 2)

showGrobsBB(draw = TRUE,
  gp.box = gpar(col = "yellow", lwd = 5, alpha = 0.2),
  gp.text = gpar(cex = 0.75, alpha = 0.5))

```

Arguments

x.px, y.px	locations in device coordinates (i.e. pixels, with origin at top-left corner of device). May be vectors.
unitTo	the unit to convert to.
valueOnly	to return values as numeric (native) rather than units.
x, y	locations in the current viewport (numeric native or units). May be vectors.
viewport	a viewport name or vpPath .

<code>grob</code>	a grob .
<code>pad</code>	number of pixels to expand bounding boxes.
<code>draw</code>	whether to draw bounding boxes and grob names.
<code>gp.box</code>	graphical parameters for bounding boxes.
<code>gp.text</code>	graphical parameters for grob name text.

Details

Not yet...

Value

`convertFromDevicePixels` returns a list with `x`, `y` (units or numeric) locations in the current viewport.

`convertToDevicePixels` returns a list with `x`, `y` (numeric) locations in pixels from the top-left corner of the device.

`inViewport` returns a logical: whether the given pixel location is inside the given viewport.

`grobBBDevicePixels` returns a list with `x`, `y` (numeric) locations in pixels giving the bounding box of the given grob. The grob must exist in the given viewport.

`showGrobsBB` returns a `data.frame` giving information about all grobs in the current scene.

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[grid.convert](#), [grobX](#), [grid.ls](#), [grid.show.layout](#)

Examples

```
print(xyplot(1:10 ~ 1:10 | c("a", "b")))

vpname <- trellis.vpname("panel", 1, 1)
downViewport(vpname)

convertToDevicePixels(x = 5:10, y = 5:10)
convertToDevicePixels(unit(0, "npc"), unit(0, "npc"))
convertFromDevicePixels(x = 100, y = 100)

inViewport(x = 100, y = 100, vpname)
inViewport(x = c(0, 100), y = c(0, 100), vpname)

myGrob <- grid.circle(r = 0.3, name = "myCircle")
grobBBDevicePixels(myGrob, vpname)

str(showGrobsBB(draw = TRUE))
```

identifyGrob	<i>return names of clicked grid-objects.</i>
--------------	--

Description

This identifies which [grobs](#) (grid objects) bounding boxes were clicked on (or otherwise identified by pixel coordinates), and returns their names. The names can be used by other grid functions, like [grid.edit](#) or [grid.remove](#).

Usage

```
identifyGrob(xy.pixels = grid.locator(), classes = NULL)
```

Arguments

<code>xy.pixels</code>	if given, a list with components <code>x</code> and <code>y</code> , being pixel coordinates in the current plot device.
<code>classes</code>	if given, one or more class names of grobs. This can be used to filter the results to only specified types of objects. Examples: "text", "lines", "segments", "rect".

Details

None yet.

Value

a character vector of grob names, or `NULL`.

Note

This will give an error if the current plot has no grobs, as returned by [grid.ls](#).

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[showGrobsBB](#)

Examples

```
if (interactive()) {  
  
  xyplot(1:10 ~ 1:10)  
  identifyGrob()  
  str(grid.get(identifyGrob()[1]))  
  grid.remove(identifyGrob(class = "points")[1])  
}
```

```
}

```

panel.usertext	<i>Annotations with custom style</i>
----------------	--------------------------------------

Description

These are versions of `panel.text` and `panel.points` with different (customisable) style settings.

Usage

```
panel.usertext(x, y = NULL, labels = seq_along(x), col,
              alpha, cex, srt = 0, lineheight, font,
              fontfamily, fontface, adj = c(0.5, 0.5),
              pos = NULL, offset = 0.5, ...)
```

```
panel.brushpoints(x, y = NULL, col, pch, alpha,
                 fill, cex, ...)
```

```
panel.brushlines(x, y = NULL, type, col, alpha,
                 lty, lwd, ...)
```

Arguments

`x`, `y` text or point locations.
`labels`, `col`, `alpha`, `cex`, `srt`, `lineheight`
 see the usual lattice functions in [llines](#).
`font`, `fontfamily`, `fontface`, `adj`, `pos`, `offset`
 as above.
`pch`, `fill`, `type`, `lty`, `lwd`, ...
 as above.

Details

The settings for `panel.usertext` are taken from `trellis.par.get("user.text")`, but default to `trellis.par.get("add.text")` if undefined. "user.text" is preferred to "add.text" for annotations because the latter also applies to strip text and key text.

The settings for `panel.brushpoints` are taken from `trellis.par.get("brush.symbol")`, but default to hard-coded settings if undefined.

The settings for `panel.brushlines` are taken from `trellis.par.get("brush.line")`, but default to hard-coded settings if undefined.

These functions are used in [playwith](#).

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[llines](#), [trellis.par.get](#)

Examples

```
xyplot(1:10 ~ 1:10, panel = function(...) {  
  panel.brushpoints(...)  
  panel.usertext(..., pos = 1)  
})
```

parameterControlTool *Create playwith tools for controlling parameter values*

Description

Part of the **playwith** Application Programming Interface.

Usage

```
## Note: this is only to be called inside a tool constructor function.  
parameterControlTool(playState, name, value, label = name,  
  handler = NULL, horizontal = TRUE)
```

Arguments

playState	a playState object, as passed in to the constructor function.
name	the parameter name as it appears in the plot call.
value	the possible or starting values for the parameter. Can be a single or vector value, of integer, numeric, character or logical. See playwith for details.
label	label for the widget.
handler	a function.
horizontal	FALSE to make a tool for a vertical toolbar.

Details

Note: this is only to be called inside a tool constructor function. It is not intended to be called directly.

Value

a [gtkToolButton](#).

Author(s)

Felix Andrews <felix@nfrac.org>

See Also[playwith](#)**Examples**

```
## none yet
```

playDo	<i>Do something in a specified plot space</i>
--------	---

Description

Part of the **playwith** Application Programming Interface.

Usage

```
playDo(playState, expr, space = "plot",
        clip.off = !isTRUE(playState$clip.annotations),
        return.code = FALSE)
```

Arguments

playState	a playState object representing the plot, window and device.
expr	an expression, typically a drawing operation, to evaluate in the plot space. It will be quoted (see examples).
space	the plot space (viewport) to go to before evaluating expr. This can be "plot", "page", or for lattice plots "packet N" (where N is a packet number), or for grid plots the name of a viewport passed to the viewport argument of playwith .
clip.off	enforce no clipping of drawing operations: see clip argument to viewport .
return.code	if TRUE, return code (as an expression) for the given actions, rather than executing them.

Details

This function allows an arbitrary expression to be evaluated while some part of the plot has been made active (i.e. moving to a grid graphics viewport). Grid viewports are used also to represent spaces in a base graphics plot (using the `gridBase` package). That means `expr` can always use Grid drawing operations.

The default `space="plot"` will work for base graphics, grid graphics and for single-panel lattice plots. It will also work for multi-panel lattice plots when one panel is in focus (see [trellis.focus](#)).

Using `space="page"` will apply to the whole device space in normalised device coordinates (0–1).

Other functions such as [playSelectData](#) and [playPointInput](#) return values that can be used directly for the space argument.

Value

the value returned by `expr`.

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playwith.API](#), [playSelectData](#), [playPointInput](#)

Examples

```
if (interactive()) {  
  
  library(lattice)  
  library(grid)  
  
  packs <- paste("packet", rep(1:4, each=4))  
  playwith(xyplot(1:16 ~ 1:16 | packs))  
  myGp <- gpar(fill="red", col="black", alpha=0.5)  
  
  ## draw in a specific packet  
  playDo(playDevCur(), grid.circle(gp=myGp), space="packet 2")  
  
  ## draw in default space="plot" after focussing on one panel  
  trellis.focus("panel", 1, 1)  
  packet.number() # 1, same as space="packet 1"  
  playDo(playDevCur(), grid.circle(gp=myGp))  
  trellis.unfocus()  
  
  ## space="plot" does not work in a multi-panel plot  
  ## unless one panel is in focus  
  try(playDo(playDevCur(), grid.circle(gp=myGp)))  
  
  ## draw on the whole page  
  playDo(playDevCur(), grid.circle(gp=myGp), space="page")  
  
}
```

playGetIDs

Get or set IDs of selected points

Description

Part of the **playwith** Application Programming Interface.

Usage

```
playGetIDs(playState = playDevCur(),
           type = c("labelled", "brushed"),
           labels = FALSE)

playSetIDs(playState = playDevCur(), value,
           type = "brushed", space = "plot",
           add = FALSE, redraw = NA, pos = 1)

playClear(playState = playDevCur(),
          type = c("annotations", "labelled", "brushed"),
          redraw = TRUE)
```

Arguments

playState	a playState object representing the plot, window and device.
type	which type of points to get or set subscripts for.
labels	TRUE to return the labels as displayed; otherwise the subscripts into the original data object.
value	specifies the set of points to be selected. Can be an integer vector of subscripts, or a logical vector (not recycled).
space	the space to draw labels in if type = "ids".
add	if TRUE, add to any existing set of points; otherwise replace them.
redraw	whether to redraw the plot. The default NA only redraws if necessary (i.e. if an existing selection was replaced). If FALSE nothing is drawn.
pos	position specifier for labels.

Details

Not yet.

Value

playGetIDs returns an integer vector, or if labels = TRUE a character vector.

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playwith.API](#)

Examples

```

if (interactive()) {

  playwith(xyplot(1:100 ~ 1:100 | 1:2, subscripts = TRUE),
           labels = paste("label", 1:100, sep=""))
  playSetIDs(value = c(50:60, 100))
  playGetIDs()
  playSetIDs(value = c(10, 20, 30), type = "labelled",
             space = "packet 1")
  playGetIDs(labels = TRUE)
  playClear()
  playGetIDs()

}

```

playPointInput

Get point, line or rect input from playwith user

Description

Part of the **playwith** Application Programming Interface.

Usage

```

playPointInput(playState = playDevCur(), prompt)
playLineInput(playState = playDevCur(), prompt, scales = "dynamic")
playRectInput(playState = playDevCur(), prompt, scales = "dynamic")

```

Arguments

playState	a playState object representing the plot, window and device.
prompt	text to display in the prompt.
scales	the default allows the user to hold Shift while dragging, to constrain the selection to x or y scales. Otherwise this should be one or more of "x" and "y", specifying which axes to select along.

Details

playPointInput is similar to [locator](#), but returns native coordinates in whichever plot space was clicked on. Device coordinates and normalised device coordinates are also available.

playRectInput and playLineInput allow the user to interactively draw a rectangle or line.

Value

All these functions return NULL if the user cancelled (e.g. by right-clicking). Otherwise a list with:

space	character, specifies the plot space in which the user clicked or dragged. See the space argument to playDo .
coords	native coordinates of the point or shape in space. A list with numeric vectors x and y. For a rectangle or line, these are length 2 where the first element refers to the start of the drag motion. For a point these are length 1. If space is "page", this is NULL.
dc	device coordinates of the point or shape (pixels).
ndc	normalised device coordinates of the point or shape.
is.click	logical, whether it was a click (so probably should not be treated as a rectangle or line). This is not returned by <code>playPointInput</code> .
modifiers	a flag representing which modifier keys were pressed during the click (or at the end of a drag). E.g. to test for Shift key: <code>if (foo\$modifiers & GdkModifierType["shift-mask"])</code> . See enums-and-flags .

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playSelectData](#), [playwith.API](#)

Examples

```
if (interactive()) {
  library(lattice)
  playwith(xyplot(Sepal.Width ~ Petal.Width | Species, data = iris))
  playPointInput()
  playRectInput()
}
```

playSelectData

Let playwith user select data points

Description

Part of the **playwith** Application Programming Interface.

Usage

```
playSelectData(playState = playDevCur(),
  prompt = paste("Click or drag to select data points;",
    "Right-click or Esc to cancel."),
  scales = "dynamic",
  multiview = TRUE,
  foo = playRectInput(playState, prompt = prompt, scales = scales))
```

Arguments

playState	a playState object representing the plot, window and device.
prompt	text to display in the prompt.
scales	the default allows the user to hold Shift while dragging, to constrain the selection to x or y scales. Otherwise this should be one or more of "x" and "y", specifying which axes to select along.
multiview	to return a matrix of x and y when the plot contains multiple positions for the same points (e.g. splom).
foo	rectangular plot region structure, usually generated interactively.

Details

`playSelectData` is similar to [identify](#). The user is prompted to click or drag to select data points. If a click, the nearest point is selected, if it is within 11 points. If it is a drag, all points within the rectangular region are selected. Note that data points can be selected from one panel of a multi-panel lattice plot without specifying the panel beforehand.

Value

`playSelectData` returns NULL if the user cancelled (e.g. by right-clicking). Otherwise a list with:

space	character, specifies the plot space in which data points were selected. See the space argument to playDo .
subscripts	indices of the data points selected. This relies on the data being guessed correctly from the plot call, unless <code>data.points</code> was specified explicitly.
x, y	values of the selected data points.
is.click	logical, whether it was a click (otherwise a drag).
pos	position of click relative to the closest point, as in the <code>pos</code> argument to text . If <code>is.click</code> is false, this is NULL.
...	as well as all the other elements returned by playRectInput .

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playRectInput](#), [playwith.API](#)

Examples

```

if (interactive()) {

  library(lattice)
  playwith(xyplot(Sepal.Width ~ Petal.Width | Species, data = iris))
  playSelectData()

}

```

`playState`*Object representing the plot, window and device.*

Description

The `playState` object is created by `playwith` to represent the state of the plot, window and device. It is central to the `playwith.API`.

Details

A `playState` object is an `environment` (of class "playState") containing many other objects, including:

`win` the plot window (`gtkWindow`).

`dev` the plot device, as returned by `dev.cur`.

`call` the current plot call.

`env` local environment used to store plot data objects.

`accepts.arguments` whether the current main plot function accepts arguments.

`callName` name of the current main plot function.

`is.lattice`, `is.ggplot`, `is.vcd`, `is.base` whether the current plot is a Lattice / ggplot / base graphics plot. `is.base` is defined as TRUE if neither of the others is TRUE and `viewport` is undefined.

`result`, `trellis` `result` is the result of evaluating the plot call. If `is.lattice`, the `trellis` object is also stored in `trellis`.

`viewport` a named list of viewport paths (or names). One of these must be named "plot". NULL if the plot is a base graphics or Lattice plot.

`spaces` a character vector listing all *spaces* defined in the current plot, not including "page".

`labels` labels for data points, either given or guessed.

`data.points` given data points or NULL.

`ids` a named list of currently labelled data points. Each name corresponds to a "space", which can be "page" (positioned on page) or "plot" (positioned in plot coordinates). With Lattice graphics the space can be "packet 1" etc. Each list element is a data frame of numeric subscripts and `pos` (for label placement).

`annotations` a named list of calls to be evaluated in a target viewport: each name corresponds to a "space", as in `ids`.

linked an environment, containing a list "ids" and a list "subscribers". Elements of the former are subscripsts of brushed data points. Elements of the latter are the playState objects of all linked plots in this group. This linked object is shared by all subscribers.

tools hmm...

uiManager, actionGroups the [GtkUIManager](#) and a named list of its action groups.

widgets A list of the GUI widgets. The most useful one is drawingArea (the plot device widget).

tmp a list of temporary objects, including:

plot.ready whether the plot has been drawn and is ready for interaction.

identify.ok whether data points and labels are defined (or a plausible guess could be made), allowing points to be identified.

There are several other standard objects which can be inspected with `ls.str(playDevCur())`.

Other objects can be passed in through the `...` argument to [playwith](#), or defined by tools.

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playwith](#), [playwith.API](#)

playwith

An interactive plot GUI

Description

A GTK+ graphical user interface for exploring and editing R plots.

Usage

```
playwith(expr,
  new = playwith.getOption("new"),
  title = NULL,
  labels = NULL,
  data.points = NULL,
  viewport = NULL,
  parameters = list(),
  tools = list(),
  init.actions = list(),
  preplot.actions = list(),
  update.actions = list(),
  ...,
  width = playwith.getOption("width"),
  height = playwith.getOption("height"),
  pointsize = playwith.getOption("pointsize"),
```

```
eval.args = playwith.getOption("eval.args"),
on.close = playwith.getOption("on.close"),
modal = FALSE,
link.to = NULL,
playState = if (!new) playDevCur(),
plot.call,
main.function)
```

Arguments

expr	an expression to create a plot, like <code>plot(mydata)</code> . Note, arguments and nested calls are allowed, just like a normal plot call (see examples). Could also be a chunk of code in <code>{braces}</code> . For quoted calls, use the <code>plot.call</code> argument.
new	if TRUE open in a new window, otherwise replace the current window (if one exists).
title	optional window title; otherwise derived from the plot call.
labels	a character vector of labels for data points. If missing, it will be guessed from the plot call arguments if possible.
data.points	a data frame (or other suitable plotting structure: see xy.coords) giving locations of data points, in case these can not be guessed from the plot call arguments. If a data frame, extra variables may be included; these can be used to label or locate points in the GUI. Note, if a suitable data argument is found in the plot call, that plays the same role.
viewport	name or <code>vpPath</code> of the <code>viewport</code> representing the data space. This allows interaction with grid graphics plots (but ignore this for Lattice plots). Experimental: can also be a named list.
parameters	defines simple tools for controlling values of any parameters appearing in the plot call. This must be a named list, where the value given for each name defines the possible or initial values of that parameter. The supported values are: <ul style="list-style-type: none"> • integer or AsIs (<code>I()</code>): creates a numeric spinbutton. • numeric scalar: creates a text entry box for numeric values. • numeric vector: creates a slider with given range. • character: creates a text entry box. • character vector: creates a combo box (including text entry). • logical: creates a checkbox. • function: creates a button, which calls the given function with a single argument <code>playState</code>. <p>These can also be lists, where the first item is the value as above. In this case an item named <code>label</code> can specify a label for the widget, and an item named <code>handler</code> can specify a function to run when the widget is changed. This function should be a function(<code>playState</code>, <code>value</code>); the parameter values are then accessed from <code>playState\$env</code>. If the function returns FALSE the plot is not redrawn.</p>
tools	a list of tool specifications. These are technically <code>GtkActionEntry</code> s but should be specified as lists with the following structure. Elements can be specified in this order, or named (as with a function call).

<code>name</code>	The name of the action (used internally to control the action state, or in a custom UI XML file). This item is required and must be the first element. All other elements are optional.
<code>stock_id</code>	The stock icon ID, or the name of an icon from the icon theme. See <code>unlist(gtkStockListIds())</code> or http://library.gnome.org/devel/gtk/unstable/gtk-Stock-Items.html for a list.
<code>label</code>	The label for the action. If label is NULL, the default label for the given <code>stock.id</code> is used.
<code>accelerator</code>	The accelerator for the action, in the format understood by <code>gtkAcceleratorParse</code> . See <code>gdkKeySyms</code> .
<code>tooltip</code>	The tooltip for the action.
<code>callback</code>	The function to call when the action is activated.
<code>is_active</code>	Only for toggle actions: sets the initial state (TRUE / FALSE).
<code>update.action, init.action</code>	If present these items must be named. Their values are included in the <code>update.actions</code> and <code>init.actions</code> lists.
<code>preplot.actions, update.actions</code>	<p>a list of actions to be run, respectively, <i>before</i> and <i>after</i> the plot is drawn (and each time it is redrawn). Note that <code>preplot.actions</code> can not assume that <code>playState\$is.lattice</code> (or other state values) are set. They can, however, modify the plot call or its data before the plot is drawn.</p> <p>These may be functions, or names of functions, or expressions. Functions are passed one argument, which is the <code>playState</code>. Note, these are in addition to any given in <code>playwith.options("update.actions")</code>.</p>
<code>init.actions</code>	<code>init.actions</code> are run whenever the plot type changes or its data changes. They are not run when only simple arguments to the call change, but they are run whenever the plot call is edited manually. Same format as <code>update.actions</code> .
<code>...</code>	<p>extra arguments are stored in the <code>playState</code> object. These can then be accessed by tools. The default tools will recognise the following extra arguments:</p> <p><code>click.mode</code> sets the initial action when clicking and dragging on the plot: one of "Zoom", "Identify", "Brush", "Annotation", or "Arrow".</p> <p><code>time.mode</code> whether the plot is to start in "time mode", with navigation along the x-axis. If NA, it will guess whether to start in time.mode based on whether the current plot looks like a time series plot (but this can chew some extra memory). The default is taken from <code>playwith.options("time.mode")</code>.</p> <p><code>time.vector</code> a vector defining discrete times, as numeric, <code>Date</code> or <code>POSIXt</code>. It must be sorted, increasing. If given, then the "time mode" is used to navigate along these discrete times, rather than along the continuous x-axis. Special objects <code>cur.index</code> and <code>cur.time</code> will be provided in the plot environment, so the plot call can refer to these. <code>cur.index</code> is the current time step, between 1 and <code>length(time.vector)</code>, and <code>cur.time</code> is <code>time.vector[cur.index]</code>. In this case <code>time.mode</code> will be on by default.</p> <p><code>cur.index, cur.time, time.mode.page.incr</code> If <code>time.vector</code> is given, either of <code>cur.index</code> or <code>cur.time</code> will set the initial time step. <code>time.mode.page.incr</code> sets the number of steps to jump if the user clicks on the scroll bar.</p> <p><code>page</code> In multi-page Lattice plots, this will set the initial page to display.</p>

	<code>label.offset</code>	the distance from a data point to its identifying label. Numeric, in units of character widths.
	<code>arrow</code>	a list with arguments to <code>panel.arrows</code> , specifying the type of arrows to draw. e.g. <code>list(ends="both", type="closed")</code> .
	<code>show.tooltips</code>	show tooltips for toolbar items. This uses the GTK event loop internally, which might, occasionally, cause the R terminal to freeze.
	<code>show.toolbars</code> , <code>show.statusbar</code> , <code>page.annotation</code> , <code>clip.annotations</code> , <code>keep</code> , <code>stay.on.top</code>	set the corresponding window options. All are logical. Defaults are taken from <code>playwith.options</code> .
<code>width</code> , <code>height</code>		initial size of the plot device in inches.
<code>pointsize</code>		default point size for text in the <code>Cairo</code> device.
<code>eval.args</code>		whether to evaluate the plot call arguments: can be TRUE, FALSE, NA (don't eval global vars) or a <code>regular expression</code> matching symbols to evaluate. Or a list. See below.
<code>on.close</code>		a function to be called when the user closes the plot window. The <code>playState</code> object will be passed to the function. If the function returns TRUE, the window will not be closed.
<code>modal</code>		whether the window is modal: if TRUE, the session will freeze until the window is closed.
<code>link.to</code>		an existing <code>playState</code> (i.e. <code>playwith</code> plot) to link to. The set of brushed data points will then be synchronised between them. It is assumed that the data subscripts of the two plots correspond directly. Links can be broken with <code>playUnlink</code> .
<code>playState</code>		the <code>playState</code> object for an existing plot window. If given, the new plot will appear in that window, replacing the old plot. This over-rides the <code>new</code> argument.
<code>plot.call</code>		a plot call (<code>call</code> object), if given this is used instead of <code>expr</code> .
<code>main.function</code>		the function (or its name) appearing in the call which accepts typical plot arguments like <code>xlim</code> or <code>ylab</code> . This will only be needed in unusual cases when the default guess fails.

Details

This function opens a GTK+ window containing a plot device (from the `cairoDevice` package), a menubar and toolbars. There is a call toolbar (similar to the "address bar" of a web browser) at the top, showing the current plot call, which can be edited in-place. Then there are up to four toolbars, one on each side of the plot. The user interface is customisable: see `playwith.options`.

With the `autoplay` facility, `playwith` can function like a default graphics device (although it is not technically a graphics device itself, it is a wrapper around one).

See `playwith.API` for help on controlling the plot once open, as well as defining new tools. For the special case of tools to control parameter values, it is possible to create the tools automatically using the `parameters` argument.

Four types of plots are handled somewhat differently:

- **Lattice** graphics: recognised by returning an object of class `trellis`. This is the best-supported case.

- **ggplot2** graphics: recognised by returning an object of class `ggplot`. This case is rather poorly supported.
- other **grid** graphics: you must give the `viewport` argument to enable interaction.
- base graphics: this is the default case. If a multiple-plot layout is used, interaction can only work in the last sub-plot, i.e. the settings defined by `par()`.

Some forms of interaction are based on evaluating and changing arguments to the plot call. This is designed to work in common cases, but could never work for all types of plots. To enable zooming, ensure that the main call accepts `xlim` and `ylim` arguments. Furthermore, you may need to specify `main.function` if the relevant high-level call is nested in a complex block of expressions.

To enable identification of data points, the locations of data points are required, along with appropriate labels. By default, these locations and labels will be guessed from the plot call, but this may fail. You can pass the correct values in as `data.points` and/or `labels`. Please also contact the maintainer to help improve the guesses. If identification of data points is not required, passing `data.points = NA`, `labels = NA` may speed things up.

Some lattice functions need to be called with `subscripts = TRUE` in order to correctly identify points in a multiple-panel layout. Otherwise the subscripts used will then refer to the data in each panel separately, rather than the original dataset. In this case a warning dialog box will be shown.

In order to interact with a plot, its supporting data needs to be stored: i.e. all variables appearing in the plot call must remain accessible. By default (`eval.args = NA`), objects that are not globally accessible will be copied into an attached environment and stored with the plot window. I.e. objects are stored unless they exist in the global environment (user workspace) or in an attached namespace. This method should work in most cases. However, it may end up copying more data than is really necessary, potentially using up memory. Note that if e.g. `foo$bar` appears in the call, the whole of `foo` will be copied.

If `eval.args = TRUE` then variables appearing in the plot call will be evaluated and stored even if they are defined in the global environment. Use this if the global variables might change (or be removed) before the plot is destroyed.

If `eval.args = FALSE` then the plot call will be left alone and no objects will be copied. This is OK if all the data are globally accessible, and will speed things up.

If a regular expression is given for `eval.args` then only variables whose names match it will be evaluated, and this includes global variables, as with `eval.args=TRUE`. In this case you can set `invert.match=TRUE` to store variables that are not matched. For example `eval.args="^tmp"` will store variables whose names begin with "tmp"; `eval.args=list("^foo$", invert.match=TRUE)` will store everything except `foo`.

Note: function calls appearing in the plot call will be evaluated each time the plot is updated – so random data as in `plot(rnorm(100))` will keep changing, with confusing consequences! You should therefore generate random data prior to the plot call. Changes to variables in the workspace (if they are not stored locally) may also cause inconsistencies in previously generated plots.

Warning: the `playwith` device will tend to make itself the active device any time it is clicked on, so be careful if any other devices are left open.

Value

`playwith` invisibly returns the `playState` object representing the plot, window and device. The result of the plot call is available as component `$result`.

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playwith.options](#), [autoplay](#), [playwith.API](#)

Examples

```

if (interactive()) {
options(device.ask.default = FALSE)

## Scatterplot (Lattice graphics).
## Labels are taken from rownames of data.
## Right-click on the plot to identify points.
playwith(xyplot(Income ~ log(Population / Area),
  data = data.frame(state.x77), groups = state.region,
  type = c("p", "smooth"), span = 1, auto.key = TRUE,
  xlab = "Population density, 1974 (log scale)",
  ylab = "Income per capita, 1974"))

## Scatterplot (base graphics); similar.
## Note that label style can be set from a menu item.
urbAss <- USArrests[,c("UrbanPop", "Assault")]
playwith(plot(urbAss, panel.first = lines(lowess(urbAss)),
  col = "blue", main = "Assault vs urbanisation",
  xlab = "Percent urban population, 1973",
  ylab = "Assault arrests per 100k, 1973"))

## Time series plot (Lattice).
## Date-time range can be entered directly in "time mode"
## (supports numeric, Date, POSIXct, yearmon and yearqtr).
## Click and drag to zoom in, holding Shift to constrain;
## or use the scrollbar to move along the x-axis.
library(zoo)
playwith(xyplot(sunspots ~ yearmon(time(sunspots)),
  xlim = c(1900, 1930), type = "l"),
  time.mode = TRUE)

## Time series plot (base graphics); similar.
## Custom labels are passed directly to playwith.
tt <- time(treering)
treeyears <- paste(abs(tt) + (tt <= 0),
  ifelse(tt > 0, "CE", "BCE"))
playwith(plot(treering, xlim = c(1000, 1300)),
  labels = treeyears, time.mode = TRUE)

## Multi-panel Lattice plot.
## Need subscripts = TRUE to correctly identify points.
## Scales are "same" so zooming applies to all panels.
## Use the 'Panel' tool to expand a single panel, then use
## the vertical scrollbar to change pages.

```

```

Depth <- equal.count(quakes$depth, number = 3, overlap = 0.1)
playwith(xyplot(lat ~ long | Depth, data = quakes,
  subscripts = TRUE, aspect = "iso", pch = ".", cex = 2),
  labels = paste("mag", quakes$mag))

## Spin and brush for a 3D Lattice plot.
## Drag on the plot to rotate in 3D (can be confusing).
## Brushing is linked to the previous xyplot (if still open).
## Note, brushing 'cloud' requires a recent version of Lattice.
playwith(cloud(-depth ~ long * lat, quakes, zlab = "altitude"),
  new = TRUE, link.to = playDevCur(), click.mode = "Brush")

## Set brushed points according to a logical condition.
playSetIDs(value = which(quakes$mag >= 6))

## Interactive control of a parameter with a slider.
xx <- rnorm(50)
playwith(plot(density(xx, bw = bandwidth), panel.last = rug(xx)),
  parameters = list(bandwidth = seq(0.05, 1, by = 0.01)))

## The same with a spinbutton (use I() to force spinbutton).
## Initial value is set as the first in the vector of values.
## This also shows a combobox for selecting text options.
xx <- rnorm(50)
kernels <- c("gaussian", "epanechnikov", "rectangular",
  "triangular", "biweight", "cosine", "optcosine")
playwith(plot(density(xx, bw = bandwidth, kern = kernel), lty = lty),
  parameters = list(bandwidth = I(c(0.1, 1:50/50)),
    kernel = kernels, lty = 1:6))

## More parameters (logical, numeric, text).
playwith(stripplot(yield ~ site, data = barley,
  jitter = TRUE, type = c("p", "a"),
  aspect = aspect, groups = barley[[groups]],
  scales = list(abbreviate = abbrev),
  par.settings = list(plot.line = list(col = linecol))),
  parameters = list(abbrev = FALSE, aspect = 0.5,
    groups = c("none", "year", "variety"),
    linecol = "red"))

## Looking through 100 time series and comparing to a reference;
## Use buttons to save the current series number or its mean value.
dat <- ts(matrix(cumsum(rnorm(100*100)), ncol = 100), start = 1900)
colnames(dat) <- paste("Series", 1:100)
ref <- (dat[,3] + dat[,4]) / 2
playwith(xyplot(cbind(dat[,i], ref = ref)),
  parameters = list(i = 1:100,
    print_i = function(playState) print(playState$env$i),
    print_mean = function(p) print(mean(dat[,p$env$i])),
    save_to_ii = function(playState)
      .GlobalEnv$ii <- playState$env$i,
    append_to_ii = function(playState) {
      if (!exists("ii")) ii <- c()

```

```

        .GlobalEnv$ii <- c(ii, playState$env$i)
    })
)

## Composite plot (base graphics).
## Adapted from an example in help("legend").
## In this case, the initial plot() call is detected correctly;
## in more complex cases may need e.g. main.function="plot".
## Here we also construct data points and labels manually.
x <- seq(-4*pi, 4*pi, by = pi/24)
pts <- data.frame(x = x, y = c(sin(x), cos(x), tan(x)))
labs <- rep(c("sin", "cos", "tan"), each = length(x))
labs <- paste(labs, round(180 * x / pi) %% 360)
playwith( {
  plot(x, sin(x), type = "l", xlim = c(-pi, pi),
       ylim = c(-1.2, 1.8), col = 3, lty = 2)
  points(x, cos(x), pch = 3, col = 4)
  lines(x, tan(x), type = "b", lty = 1, pch = 4, col = 6)
  legend("topright", c("sin", "cos", "tan"), col = c(3,4,6),
        lty = c(2, -1, 1), pch = c(-1, 3, 4),
        merge = TRUE, bg = 'gray90')
}, data.points = pts, labels = labs)

## A ggplot example.
## NOTE: only qplot()-based calls will work.
## Labels are taken from rownames of the data.
if (require(ggplot2)) {
  playwith(qplot(qsec, wt, data = mtcars) + stat_smooth())
}

## A minimalist grid plot.
## This shows how to get playwith to work with custom plots:
## accept xlim/ylim and pass "viewport" to enable zooming.
myGridPlot <- function(x, y, xlim = NULL, ylim = NULL, ...)
{
  if (is.null(xlim)) xlim <- extendrange(x)
  if (is.null(ylim)) ylim <- extendrange(y)
  grid.newpage()
  pushViewport(plotViewport())
  grid.rect()
  pushViewport(viewport(xscale = xlim, yscale = ylim,
                       name = "theData"))
  grid.points(x, y, ...)
  grid.xaxis()
  grid.yaxis()
  upViewport(0)
}
playwith(myGridPlot(1:10, 11:20, pch = 17), viewport = "theData")

## Presenting the window as a modal dialog box.
## When the window is closed, ask user to confirm.
confirmClose <- function(playState) {
  if (gconfirm("Close window and report IDs?",

```

```

        parent = playState$win)) {
cat("Indices of identified data points:\n")
print(playGetIDs(playState))
return(FALSE) ## close
} else TRUE ## don't close
}
xy <- data.frame(x = 1:20, y = rnorm(20),
                 row.names = letters[1:20])
playwith(xyplot(y ~ x, xy, main = "Select points, then close"),
         width = 4, height = 3.5, show.toolbars = FALSE,
         on.close = confirmClose, modal = TRUE,
         click.mode = "Brush")

## Ask user to save plot to PNG when window is closed:
saveOnClose <- function(playState) {
  playDevSet(playState)
  if (!gconfirm("Save plot to PNG file? (Cancel = no)")) return(FALSE)
  fname <- gfile("Save PNG file as:", type = "save")
  if (is.na(fname)) return(TRUE) ## cancel
  dev.off(dev.copy(Cairo_png, file = fname,
                  width = dev.size()[1], height = dev.size()[2]))
  FALSE
}
#playwith.options(on.close = saveOnClose)

## Demonstrate cacheing of objects in local environment.
## By default, only local variables in the plot call are stored.
x_global <- rnorm(100)
doLocalStuff <- function(...) {
  y_local <- rnorm(100)
  angle <- (atan2(y_local, x_global) / (2*pi)) + 0.5
  color <- hsv(h = angle, v = 0.75)
  doRays <- function(x, y, col) {
    segments(0, 0, x, y, col = col)
  }
  playwith(plot(x_global, y_local, pch = 8, col = color,
               panel.first = doRays(x_global, y_local, color)),
           ...)
}
doLocalStuff(title = "locals only") ## eval.args = NA is default
## List objects that have been copied and stored:
## Note: if you rm(x_global) now, redraws will fail.
ls(playDevCur())$env
## Next: store all data objects (in a new window):
doLocalStuff(title = "all stored", eval.args = TRUE, new = TRUE)
ls(playDevCur())$env
## Now there are two devices open:
str(playDevList())
playDevCur()
playDevOff()
playDevCur()

```

```

## Not run:
## Big data example, do not try to guess labels or time.mode.
gc()
bigobj <- rpois(5000000, 1)
print(object.size(bigobj), units = "Mb")
gc()
playwith(qqmath(~ bigobj, f.value = ppoints(500)),
  data.points = NA, labels = NA, time.mode = FALSE)
playDevOff()
gc()
## or generate the trellis object first:
trel <- qqmath(~ bigobj, f.value = ppoints(500))
playwith(trel)
rm(trel)
## in this case, it is much better to compute the sample first:
subobj <- quantile(bigobj, ppoints(500), na.rm = TRUE)
playwith(qqmath(~ subobj))
rm(subobj)
rm(bigobj)

## End(Not run)

## See demo(package = "playwith") for examples of new tools.
}

```

playwith.API

The playwith API

Description

The **playwith** Application Programming Interface.

Details

playwith plots (incorporating a plot, window and device) are represented by a **playState** object.

The following sections list the API functions that can be used to work with the plot, and to write new interactive tools. See the links to specific help pages for details. In case these are insufficient, you may work with the **playState** object itself.

Device management

These are similar to `dev.set` etc.

`playDevCur()` returns the current or last active **playState** – this is not necessarily the active graphics device.

`playDevList()` lists all open **playStates**.

`playDevSet(playState)` sets the current **playState**, and sets the active graphics device.

`playDevOff(playState)` closes the device and window (`dev.off()` also works).

Common user commands

These functions are also available as menu items.

`playGetIDs`(playState, type, labels) returns indices (or labels) of currently brushed or labelled data points.

`playSetIDs`(playState, value, type, space, add, redraw, pos) sets which data points are brushed or labelled. type defaults to "brushed"; space is ignored unless type = "labelled".

`playClear`(playState, type, redraw) remove one or more of the types "annotations", "labelled", "brushed". The latter will also apply to any linked plots. If redraw = FALSE the display will not be updated.

`playUndo`(playState) reverts the last change any annotations (including the set of labelled and brushed data points).

`updateLinkedSubscribers`(playState, redraw) triggers a redraw of any linked plots.

`playUnlink`(playState) removes links from the given plot to any other plots (for linked brushing).

`playSourceCode`(playState) returns (deparsed) R code to reproduce the current plot display.

Interaction

These functions allow the user to click or drag on the plot. Click or drag locations are converted into the native coordinates of whatever plot *space* they occurred in (but are available as device coordinates too).

`playSelectData`(playState, prompt, scales, foo) interactively select data from the plot (one point or a whole region).

`playPointInput`(playState, prompt) prompt for a click on the plot. Similar to `locator`.

`playLineInput`(playState, prompt, scales) prompt to drag a line.

`playRectInput`(playState, prompt, scales) prompt to drag a rectangular region.

`playPrompt`(playState, text) sets the statusbar text. Pass NULL to reset. The GUI is frozen when the prompt is set and unfrozen when reset.

`playFreezeGUI`(playState), `playThawGUI`(playState) disables or re-enables the GUI.

Working with the display

`playDo`(playState, expr, space, clip.off, return.code) evaluates the given expression in the given plot *space*, i.e. after moving to the corresponding grid viewport.

`playAnnotate`(playState, annot, space, add, redraw) adds the annotation (a call or expression to draw on the plot) to the list of persistent annotations, and draws them. These will always be drawn after plotting (unless they are removed by the user).

`rawXLim`(playState, space) gets or sets the x axis limits, in native coordinates of the given *space* (viewport).

`rawYLim`(playState, space) same as `rawXLim`, for y axis limits.

`spaceCoordsToDataCoords`(playState, xy) converts raw space (viewport) coordinates to the data scale by applying an inverse log transformation if necessary. If there are no log scales this does nothing.

`dataCoordsToSpaceCoords(playState, xy)` converts data coordinates to raw space (viewport) coordinates by applying a log transformation if necessary. If there are no log scales this does nothing.

Working with the call

`callArg(playState, arg, eval, data)` gets or sets arguments to the main plot call.

`mainCall(playState)` gets or replaces the main plot call (which is not necessarily the same as the top-level call, `playState$call`).

`updateMainCall(playState)` locates the main plot call within the top-level call – by matching against the given `main.function`, or by guessing. This allows `callArg()` to work correctly; it should be called if `playState$call` is replaced.

`playReplot(playState)` redraws the plot by evaluating the plot call, and runs *update actions*. This should be called after changing plot arguments (or annotations if that requires a redraw). However, if the data has changed or the type of plot (e.g. the high-level plot function) has changed, `playNewPlot` should be used instead. `playReplot` is triggered when zooming, editing plot settings, removing annotations, etc.

`playNewPlot(playState)` redraws the plot by evaluating the plot call, updates the main call, runs *init actions* (such as detecting whether zooming, identifying or brushing data points is possible), as well as running *update actions* as with `playReplot`. Note: `playNewPlot` is triggered when the call text is edited manually in the GUI.

Working with data

`xyData(playState, space)` attempts to extract plot data in terms of x and y locations, but in the original data form (such as factor, date or time). This uses the generic function `plotCoords` to generate plot locations; new methods can be defined for non-standard plot types.

`xyCoords(playState, space)` same as `xyData`, converted to numeric coordinates.

`getDataArg(playState, eval)` attempts to extract the underlying data set (typically a `data.frame`), which may contain more variables than those currently plotted. This may come from a data argument to the plot call, or from a `with()` block.

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

`playwith`, `playState`, `convertFromDevicePixels`

Examples

```
if (interactive()) {
  demo(package = "playwith")
}
```

playwith.history	<i>Session history for playwith</i>
------------------	-------------------------------------

Description

A basic history of plot calls in playwith, like [history](#).

Usage

```
playwith.history(max.show = 100, ...)
```

Arguments

max.show	maximum number of history items to show.
...	ignored.

Details

The returned history is a combination of the stored session history (stored in `playwith:::PlaywithEnv$history` and the current history for all open playwith windows.

See Also

[playwith](#)

Examples

```
if (interactive()) {  
  playwith.history()  
}
```

playwith.options	<i>User default settings for playwith</i>
------------------	---

Description

A basic user settings facility, like [options](#) and [lattice.options](#).

Usage

```
playwith.options(...)  
playwith.getOption(name)
```

Arguments

name character giving the name of a setting.

... new options can be defined, or existing ones modified, using one or more arguments of the form 'name = value' or by passing a list of such tagged values. Existing values can be retrieved by supplying the names (as character strings) of the components as unnamed arguments.

Details

These functions are direct copies of the lattice equivalents: see [lattice.options](#).

The available options can be seen with `str(playwith.options())`. Many of these simply provide defaults for corresponding arguments to the `playwith` function.

See Also

[playwith](#)

Examples

```
oopt <- playwith.options()
str(oopt)

playwith.options(time.mode = FALSE)

## list options are merged, not replaced
playwith.getOption("arrow")
playwith.options(arrow = list(type = "closed", length = 0.1))
playwith.getOption("arrow")

playwith.options(save.as.format = "png")
playwith.options(toolbar.style = "icons")
playwith.options(deparse.options =
  c("keepInteger", "showAttributes", "keepNA"))

## make a new "style shortcut" (an arbitrary expression)
## to add a standard sub-title to the plot:
doMySub <- quote({
  txt <- ginput("Enter subtitle text:",
               text = paste(Sys.time(), Sys.info()["login"],
                           R.version.string, sep = ", "))
  if (!is.na(txt))
    callArg(playState, "sub") <- if (nchar(txt) > 0) txt
})
playwith.options(styleShortcuts = list("mySub" = doMySub))

## try it:
if (interactive())
  playwith(plot(1:10))

## reset
playwith.options(oopt)
```

plotCoords

API for defining data coordinates of a plot

Description

Given a call to a plot function, return the data coordinates.

Usage

```
plotCoords(name, object, call, envir, ...)

## Default S3 method:
plotCoords(name, object, call, envir, data, panel.args, ...)

## S3 method for class 'qqnorm'
plotCoords(name, object, call, envir, ...)
## S3 method for class 'qqplot'
plotCoords(name, object, call, envir, ...)

plotCoords.plot(name, object, call, envir, ...)
## Default S3 method:
plotCoords.plot(name, object, call, envir, data, ...)
## S3 method for class 'dendrogram'
plotCoords.plot(name, object, call, envir, ...)
## S3 method for class 'mca'
plotCoords.plot(name, object, call, envir, ...)

plotCoords.biplot(name, object, call, envir, ...)
## Default S3 method:
plotCoords.biplot(name, object, call, envir, ...)
## S3 method for class 'prcomp'
plotCoords.biplot(name, object, call, envir, ...)
## S3 method for class 'princomp'
plotCoords.biplot(name, object, call, envir, ...)

## S3 method for class 'qqmath'
plotCoords(name, object, call, envir, panel.args, ...)
## S3 method for class 'cloud'
plotCoords(name, object, call, envir, panel.args, ...)
## S3 method for class 'parallel'
plotCoords(name, object, call, envir, panel.args, ...)
## S3 method for class 'splom'
plotCoords(name, object, call, envir, panel.args,
           packet, ...)
```

Arguments

name	The class of this object is the name of the plot function. Hence methods can be defined for different plot functions.
object	the object passed as first argument to the plot call.
call	the plot call.
envir	environment containing objects referenced by the call. Call arguments should be evaluated in this environment.
panel.args	passed for Lattice plots only: panel arguments for the relevant panel.
packet	passed for Lattice plots only: packet number for which to return data (corresponds to panel.args).
data	passed for non-Lattice plots only: a "data" argument, or NULL, to be used in evaluating call arguments (in addition to envir).
...	ignored.

Details

None yet...

Value

a list with components:

x, y	data point coordinates (in native panel / user coordinates).
subscripts	(optional) data point subscripts.

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[xyData](#), [xy.coords](#)

Examples

```
## Note, these are not designed to be called directly;
## they are used internally in playwith().
## But for demonstration purposes:
pargs <- trellis.panelArgs(qqmath(rnorm(20)), packet = 1)
plotCoords(structure("qqmath", class = "qqmath"),
            call = quote(qqmath(rnorm(20))), envir = new.env(),
            panel.args = pargs)
```

rawXLim	<i>Get or set current plot limits</i>
---------	---------------------------------------

Description

Part of the **playwith** Application Programming Interface.

Usage

```
rawXLim(playState, space = "plot")
rawYLim(playState, space = "plot")
rawXLim(playState) <- value
rawYLim(playState) <- value

spaceCoordsToDataCoords(playState, xy)
dataCoordsToSpaceCoords(playState, xy)
```

Arguments

playState	a playState object representing the plot, window and device.
space	character, the plot space for which to get or set limits. See the space argument to playDo ; however, in this case, space="plot" will always return a value: if it is a Lattice plot with multiple panels, one will be chosen arbitrarily.
value	numeric length 2, the new nominal x or y limits (for xlim or ylim plot arguments).
xy	list with at least one of the elements x and y (as numeric).

Details

`rawXLim` returns the current plot limits, on a numeric, linear scale. This is as simple as: `playDo(playState, space=space, list(x=convertX(unit(0:1, "npc"), "native", valueOnly=TRUE), y=convertY(unit(0:1, "npc"), "native", valueOnly=TRUE)))` except that the default space="plot" will always return a value: if it is a Lattice plot with multiple panels, one will be chosen arbitrarily.

The assignment form converts a numeric range, in the raw native plot coordinates, to values suitable for the plot `xlim` argument: it may convert back from log-transformed scales, and convert to factor levels if necessary. It then updates the current plot call with the new value.

`spaceCoordsToDataCoords` converts from the native viewport coordinates to the data coordinates, which simply involves converting from a log scale if necessary. `dataCoordsToSpaceCoords` is the inverse case: applying a log transformation if necessary. It used to refer to the position of data points in the viewport.

Value

the extractor form returns the x or y plot limits as numeric length 2.

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playwith.API](#)

Examples

```
if (interactive()) {

  playwith(plot(1:10, log="x"))
  playState <- playDevCur()
  rawXLim(playState) # -0.04 1.04
  rawXLim(playState) <- c(0, 2)
  playReplot(playState)
  ## now xlim=c(1, 100)
  (rawx <- rawXLim(playState)) # -0.08 2.08

  spaceCoordsToDataCoords(playState, list(x=rawx))
  dataCoordsToSpaceCoords(playState, list(x=1:10))

}
```

xyCoords

Get playwith plot data points

Description

Part of the **playwith** Application Programming Interface.

Usage

```
xyCoords(playState = playDevCur(), space = "plot")
xyData(playState = playDevCur(), space = "plot")
getDataArg(playState = playDevCur(), eval = TRUE)
```

Arguments

playState	a playState object representing the plot, window and device.
space	character, the plot space for which to get data. This is only relevant to multi-panel lattice plots, where data is split across panels. In this case, if space="page", the combined data from all panels is returned. See the space argument to playDo .
eval	whether to evaluate the argument; otherwise return the it as it appears in the call.

Details

None yet.

Value

the returned value is a list with elements x and y, which are numeric vectors in the case of xyCoords. Can also include an element subscripts, and generally will for lattice plots (similar to the result of calling [trellis.panelArgs](#)).

Author(s)

Felix Andrews <felix@nfrac.org>

See Also

[playwith.API](#), [plotCoords](#)

Examples

```
if (interactive()) {  
  
  library(lattice)  
  x <- as.Date("1990-01-01") + 1:20 - 1  
  ab <- rep(c("a", "b"), each=10)  
  playwith(xyplot(1:20 ~ x | ab, subscripts = TRUE))  
  playState <- playDevCur()  
  xyCoords(playState, space="packet 2")  
  xyData(playState, space="packet 2")  
  try(xyData(playState, space="plot"))  
  getDataArg(playState)  
  
}
```

Index

- *Topic **aplot**
 - panel.usertext, 8
- *Topic **device**
 - autoplay, 2
 - playwith, 17
- *Topic **dplot**
 - convertFromDevicePixels, 5
 - plotCoords, 31
- *Topic **dynamic**
 - playwith, 17
- *Topic **iplot**
 - autoplay, 2
 - convertFromDevicePixels, 5
 - identifyGrob, 7
 - parameterControlTool, 9
 - playGetIDs, 11
 - playSelectData, 14
 - playwith, 17
- *Topic **programming**
 - callArg, 3
 - parameterControlTool, 9
 - playDo, 10
 - playPointInput, 13
 - playState, 16
 - playwith.API, 26
 - playwith.options, 29
 - rawXLim, 33
 - xyCoords, 34
- *Topic **utilities**
 - playwith.API, 26
 - playwith.history, 29
- [[, 4
- autoplay, 2, 20, 22
- Cairo, 20
- call, 20
- callArg, 3, 28
- callArg<- (callArg), 3
- case.names.Date (plotCoords), 31
- case.names.dendrogram (plotCoords), 31
- case.names.hclust (plotCoords), 31
- case.names.mca (plotCoords), 31
- case.names.POSIXt (plotCoords), 31
- case.names.prcomp (plotCoords), 31
- case.names.princomp (plotCoords), 31
- case.names.ts (plotCoords), 31
- case.names.yearmon (plotCoords), 31
- case.names.yearqtr (plotCoords), 31
- case.names.zoo (plotCoords), 31
- convertFromDevicePixels, 5, 28
- convertToDevicePixels
 - (convertFromDevicePixels), 5
- dataCoordsToSpaceCoords (rawXLim), 33
- Date, 19
- dev.set, 26
- enums-and-flags, 14
- environment, 16
- gdkKeySyms, 19
- getDataArg, 28
- getDataArg (xyCoords), 34
- grid.convert, 6
- grid.edit, 7
- grid.ls, 6, 7
- grid.newpage, 2
- grid.remove, 7
- grid.show.layout, 6
- grob, 6, 7
- grobBBDevicePixels
 - (convertFromDevicePixels), 5
- grobX, 6
- gtkAcceleratorParse, 19
- GtkActionEntry, 18
- gtkToolButton, 9
- GtkUIManager, 17
- gtkWindow, 16
- history, 29

- identify, 15
- identifyGrob, 7
- inViewport (convertFromDevicePixels), 5
- lattice.options, 29, 30
- llines, 8, 9
- locator, 13, 27
- mainCall, 28
- mainCall (callArg), 3
- mainCall<- (callArg), 3
- options, 29
- panel.arrows, 20
- panel.brushlines (panel.usertext), 8
- panel.brushpoints (panel.usertext), 8
- panel.usertext, 8
- parameterControlTool, 9
- playAnnotate (playwith.API), 26
- playClear, 27
- playClear (playGetIDs), 11
- playDevCur (playwith.API), 26
- playDevList (playwith.API), 26
- playDevOff (playwith.API), 26
- playDevSet (playwith.API), 26
- playDo, 10, 14, 15, 27, 33, 34
- playFreezeGUI (playwith.API), 26
- playGetIDs, 11, 27
- playLineInput, 27
- playLineInput (playPointInput), 13
- playNewPlot (playwith.API), 26
- playPointInput, 10, 11, 13, 27
- playPrompt (playwith.API), 26
- playRectInput, 15, 27
- playRectInput (playPointInput), 13
- playReplot (playwith.API), 26
- playSelectData, 10, 11, 14, 14, 27
- playSetIDs, 27
- playSetIDs (playGetIDs), 11
- playSourceCode (playwith.API), 26
- playState, 4, 10, 12, 13, 15, 16, 19–21, 26, 28, 33, 34
- playThawGUI (playwith.API), 26
- playUndo (playwith.API), 26
- playUnlink, 20
- playUnlink (playwith.API), 26
- playwith, 2, 3, 8–10, 16, 17, 17, 26, 28–30
- playwith.API, 4, 11, 12, 14–17, 20, 22, 26, 34, 35
- playwith.getOption (playwith.options), 29
- playwith.history, 29
- playwith.options, 19, 20, 22, 29
- plot, 2
- plot.new, 2
- plotCoords, 28, 31, 35
- plotOnePage (playwith), 17
- POSIXt, 19
- print.playState (playState), 16
- print.trellis, 2
- rawXLim, 27, 33
- rawXLim<- (rawXLim), 33
- rawYLim (rawXLim), 33
- rawYLim<- (rawXLim), 33
- regular expression, 20
- showGrobsBB, 7
- showGrobsBB (convertFromDevicePixels), 5
- spaceCoordsToDataCoords, 27
- spaceCoordsToDataCoords (rawXLim), 33
- text, 15
- trellis.focus, 10
- trellis.panelArgs, 35
- trellis.par.get, 9
- unit, 5
- updateLinkedSubscribers (playwith.API), 26
- updateMainCall, 28
- updateMainCall (callArg), 3
- viewport, 10, 18
- vpPath, 5, 18
- xy.coords, 18, 32
- xyCoords, 28, 34
- xyData, 28, 32
- xyData (xyCoords), 34