Package 'shinylight'

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Title Web Interface to 'R' Functions

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Description Web front end for your 'R' functions producing plots or tables. If you have a function or set of related functions, you can make them available over the internet through a web browser. This is the same motivation as the 'shiny' package, but note that the development of 'shinylight' is not in any way linked to that of 'shiny' (beyond the use of the 'httpuv' package). You might prefer 'shinylight' to 'shiny' if you want a lighter weight deployment with easier horizontal scaling, or if you want to develop your front end yourself in JavaScript and HTML just using a lightweight remote procedure call interface to your R code on the server.

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`browseTo` *Opens a browser to look at the server*

Description

Opens a browser to look at the server

Usage

```
browseTo(server)
```

Arguments

`server`	The server to browse to

Value

No return value

`downloadCsv` *Encodes a data frame as a CSV file to be downloaded*

Description

Encodes a data frame as a CSV file to be downloaded

Usage

```
downloadCsv(results)
```

Arguments

`results`	Data frame to be returned

Value

A list to be returned to the browser describing a CSV file to be downloaded.

`encodePlot` *Renders a plot as a base64-encoded image*

Description

Renders a plot as a base64-encoded image

Usage

```
encodePlot(device, mimeType, width, height, plotFn)
```

Arguments

`device`	Graphics device function, such as `grDevices::png` or `grDevices::pdf`
`mimeType`	Mime type for the data produced by `device`
`width`	Width of the plot in units applicable to `device`
`height`	Height of the plot in units applicable to `device`
`plotFn`	Function to call to perform the plot

Value

list with two keys, whose values can each be NULL: `'plot'` is a plot in HTML img src form and `'data'` is a data frame or other non-plot result.

Examples

```
pdf <- encodePlot(grDevices::png, "image/png", 200, 300, function() {
  barplot(c(1, 2, 3, 4))
})
grDevices::png()  # workaround; you do not have to do this
```

encodePlotAs *Renders a plot as a base64-encoded PNG*

Description

The result can be set as the src attribute of an <img> element in HTML.

Usage

```
encodePlotAs(format, plotFn)
```

Arguments

format	An object specifying the output, with the following members: format$type is "png", "pdf" or "csv", and format$width and format$height are the dimensions of the PDF (in inches) or PNG (in pixels) if appropriate.
plotFn	Function to call to perform the plot

Details

You will not need to call this function unless you want to return more than one plot per call, as the last plot produced will be returned in the plot property of the result from shinylight.call anyway.

Value

list with two keys, whose values can each be NULL: 'plot' is a plot in HTML img src form and 'data' is a data frame or other non-plot result.

A list with an element named plot containing the plot encoded as required either for an HTML image element's src attribute, or a element's href attribute. If the function returns a matrix or data frame, this will be returned in the list's data element.

See Also

rrpcServer

Examples

```
pdf <- encodePlotAs(list(type="pdf", width=7, height=8), function() {
  barplot(c(1, 2, 3, 4))
})
grDevices::png()  # workaround; you do not have to do this
```

`framework.shinylightFrameworkStart`

JavaScript function: Starts the Shinylight Framework, if you want to use it.

Description

The Shinylight Framework allows you to declare all your functions in R and have a nice-looking web front end for your code without having to write any JavaScript.

You should never need to call this function yourself; if you do not provide your own `index.html`, the default Shinylight one will be used that will call this function on page load.

Using the Shinylight Framework entails calling the `slServer` function with the `interface` argument set to `list(getSchema=schema)`, where `schema` is defined in the following section.

Arguments

- `options` `object` [optional] An optional object containing options to modify the behaviour of the framework.
- `options.createFileInput` `function` [optional] A function to create an element that uploads a file, as required for `toolkit.loadFileButton`.

The Schema

It is a list with the following members:

`functions` a list of functions (keyed by their names), each of which is a list with the following members:

`params` a list of the main parameters the function accepts. The keys are the parameter names and the values are keys into the schema's `params` list.

`optiongroups` a vector of keys into the schema's `optiongroups` list giving other parameters to this function.

`functiongroups` optional: the menu structure for the functions menu. Each item in the list is either a function name (a string referencing a key in the `functions` list) or a list representing a submenu. Submenu keys are the name to be displayed in the list, which can be overridden in the app.json file's `functions` object, just like providing localized names for functions.

`params` a list of the parameters the functions take, each of which is a list with the following members:

`type` either a key into the schema's `types` list, giving the type of this parameter or the values it can take, or one of a set of standard types:

`'b'` Boolean

`'f'` Floating point

`'u8'` 8-bit unsigned integer

`'color'` Colour

'subheader' Vector of settings the user can choose for each column using selectors in the subheader row. This is usually used to select units (for example percent-by-weight versus parts-per-million) for the columns.

data a key into the schema's data list, giving initial or example data for this parameter.

types a list of types with keys referened from the schema's params lists's type values. The values are a list with the following members:

kind Mandatory; one of:

'enum' Enumeration type

'column' A column from the input grid

values A vector of permitted values (only if kind='enum')

factors Only if kind='enum' and this enum is used as the unit type for some column; a vector of factors to multiply column data by if the unit is changed by the user. Must have the same number of elements as the values vector. For every n, factors[[n]] of unit values[[n]] must be equal. For example, if values=c('mm', 'cm', 'inch') then factors could be c(25.4, 2.54, 1.0).

subtype Only if kind='column'. The type of data that can be entered into the column. Currenly only 'f' works well.

unittype Optional and only if kind='column'. The name of an enum type defining the units that the data in this column can be expressed in.

data A list of initial data with which table columns and controls will be populated. Can be a single value or vector (or list) as appropriate.

optiongroups A list of option groups. Each one is a set of parameters that can be added as a block to functions that want them. Each element is a list with the following keys:

type The same as for param's type: either a key into the schema's types list or one of the standard types ('b', 'u8', 'f' or 'color').

initial The initial value for this option.

There is one special key in the optiongroups list; this is the framework key. This is reserved for options that apply to the framework itself, not to any of your functions. So far, the only option it has is autorefresh=list(type="b", initial=FALSE). You can set its initial value to TRUE if you prefer. If you add this option, it controls whether the GUI has a "Calculate" button (FALSE) or whether the output should refresh a second or two after the user finishes changing parameters (TRUE).

Localization

To display human-friendly text on the controls and to get tooltip help text, you need one or more localization files. These files are named inst/www/locales/XX/app.json where XX is replaced with the appropriate ISO language code.

These files are JSON files containing an object with the following keys:

title Text for the link to put in the top left

homepage Destination for the link to put in the top left

functions One pair of translations for each function in the schema.

params One pair of translations for each parameter in the schema.

`optiongroups` Each of the `optiongroups` in the schema gets a key which maps to an object which has the following keys:

`@title` A translation pair for the option group itself.

... One translation pair for each option in the group.

`types` One object for each `'enum'` type in the schema. Each value is an object with one key per possible enum value. Each value in this object is that enum value's translation pair.

A "translation pair" is an object with the following keys:

`name` A short name

`help` Tooltip text

See Also

toolkit.loadFileButton

`getAddress` *Obtains the address that the server is listening on*

Description

Obtains the address that the server is listening on

Usage

```
getAddress(server)
```

Arguments

`server`	The server (returned by `slServer` or `slRunRServer`)

Value

The HTTP address as `protocol://address:port`

Examples

```
server <- slServer(
  port = 50051,
  interface = list(
    multiply = function(x, y) { x * y }
  )
)
address <- getAddress(server)
# ...
slStop(server)
stopifnot(address == "http://127.0.0.1:50051")
```

indexWithInit *Get index.html with (potentially) the JSON data in 'text' inserted.*

Description

Get index.html with (potentially) the JSON data in 'text' inserted.

Usage

```
indexWithInit(text, path)
```

Arguments

text	The text to insert as shinylight_initial_data
path	File system path to the index.html file

Value

The updated text

rrpcServer *Makes and starts a server for serving R calculations*

Description

It will serve files from the app directories specified by appDirs. If a file is requested that is not in one of those directories, the files in Shinylight's own inst/www directory will be served. Some paths have special meanings: / returns /index.html, /lang/ is redirected to /locales/<language-code>/ depending on the language selected in the request's Accept-Language header (that is, the browser's language setting) and the availability of the file requested. A POST request to /init with a data parameter will return /index.html, except that if the file has a line containing shinylight_initial_data = then this line with be replaced with a line initializing shinylight_initial_data to the data passed. This is used in shinylight-framework to permit linking to a framework app with specific data preloaded – the text should be as is downloaded with the "Save Data" button. Of course, this is available to non-framework apps, too.

Usage

```
rrpcServer(
  interface,
  host = "0.0.0.0",
  port = NULL,
  appDirs = NULL,
  root = "/",
  initialize = NULL,
  testFunction = NULL
)
```

Arguments

interface	List of functions to be served. The names of the elements are the names that the client will use to call them.
host	Interface to listen on (default is '0.0.0.0', that is, all interfaces)
port	Port to listen on
appDirs	List of directories in which to find static files to serve
root	Root of the app on the server (with trailing slash)
initialize	A json string or list (that will be converted to a JSON string) to be passed to the JavaScript as initial data. For non-framework apps, the index.html must contain a line containing `var shinylight_initial_data=`, which will be replaced with code that sets `shinylight_initial_data` to this supplied JSON string.
testFunction	Function to be called if the `/test` endpoint is requested. If the function returns successfully, a 200 status will be returned. If not, a 500 status will be returned.

Value

The server object, can be passed to `slStop`

---

runR *Returns a function that runs an R command*

Description

If you set this as a part of your interface, like: `runR=shinylight::runR(c("+", "plot", "c", "x", "y"))` then you can call it from Javascript like this:

```
rrpc.call("runR", {
 Rcommand:"2+2"
}, function(x) {console.log(x);});
rrpc.call("runR", {
 Rcommand:"y<-c(2,0,1);plot(c(1,2,3),y);y",
 'rrpc.resultformat': {
   type: 'png',
   width: 200,
   height: 300,
 }
}, function(x) {img.setAttribute('src', x.plot[0])});
```

Usage

```
runR(symbolList)
```

Arguments

symbolList	A list of permitted symbols in the R command

Value

A function that can be passed as one of the elements of slServer's interface argument.

Examples

```
server <- slServer(
  port = 50051,
  interface = list(
    run_the_users_r_code = runR(
      list("c", "$", "list", "+", "-", "/", "*", "sqrt")
    )
  )
)
# ...
slStop(server)
```

---

sendInfoText *Sends informational text to the client.*

Description

During a slow remote procedure call, call this to inform the client of progress.

Usage

```
sendInfoText(text)
```

Arguments

text	The text to send

Value

No return value

See Also

sendProgress for sending a progress completion ratio to the user.

Examples

```
server <- slServer(
  port = 50051,
  interface = list(long_and_complicated = function(x) {
    # First part of work that takes some time
    # ...
    sendInfoText("We are about half way through")
    # Second part of work that takes some time
    # ...
```

```
  })
)
# ...
slStop(server)
```

`sendProgress` *Sends a progress update to the client.*

Description

During a slow remote procedure call, call this to inform the client of progress.

Usage

```
sendProgress(numerator, denominator = 1)
```

Arguments

`numerator`	The progress, out of `denominator`
`denominator`	What the progress is out of. You could use this for the number of known items to be completed so that each call increases either the numerator (for more items done) and/or the denominator (for more items discovered that need to be done). However, it is not necessary to be so precise; you can set the numerator and denominator however you like on each call as long as it makes sense to the user.

Value

No return value

See Also

`sendInfoText` for sending text to the user.

Examples

```
server <- slServer(
  port = 50051,
  interface = list(long_and_complicated = function(x) {
    sendProgress(0,3)
    # First part of work that takes some time
    # ...
    sendProgress(1,3)
    # Second part of work that takes some time
    # ...
    sendProgress(2,3)
    # Last part of work that takes some time
    # ...
    sendProgress(3,3)
  })
```

```
)
# ...
slStop(server)
```

`shinylight.call` *JavaScript function*

Description

Calls a server function as defined in the server's call to the `slServer` function.

Arguments

- `fn` `string` The name of the R function to call.
- `data` `object` An object whose keys are the arguments to the function being called.
- `plotElement` `string`, `HTMLElement` If provided, the `<img>` element (or id of the element) that will receive the plot output (if any). The plot returned will be the size that this element already has, so ensure that it is styled in a way that it has the correct size even if no image (or an old image) has been set.
- `extra` `object` [optional] An object whose keys can be: `"imgType"`: Type of image required, `"png"` (default) or `"svg"`; `"info"`: Function to be called if the R function `sendInfoText` is called; `"progress"`: Function to be called if the R function `sendProgress` is called.

Return Value

- Result object that might have a `plot` property (giving a string that would work as the `src` attribute of an `img` element, representing graphics drawn by the command), a `data` property (giving the value returned by the command) and a `headers` property (giving the column names in the data returned if any). If the promise resolves to an error, the argument to the error function is a string representing the cause of the error.

`shinylight.initialize` *JavaScript function*

Description

Call this before calling any other ShinyLight function. Returns a promise that resolves (to nothing) when the connection is ready.

`shinylight.makeTable` *JavaScript function*

Description

Turns data received from R into a form that can be set into dataentrygrid.js.

Arguments

- `data` `object` Data as returned from R
- `extraColumns` `Array.<string>`, `number` The extra column headers required or the number of extra columns required.

Return Value

- Headers and rows

Examples

```
## Not run:
t = shinylight.makeTable(data);
grid.init(t.headers, t.rows);

## End(Not run)
```

`shinylight.passToOther`
JavaScript function

Description

Open another tab with another (possibly remote from this one) instance of shinylight, initializing it with our own data.

Arguments

- `url` `string` The URL of the other shinylight instance
- `data` `any` The JSON to send. If a string is passed, this is assumed to be JSON and sent as-is. Otherwise it is stringified into JSON before being sent.

`shinylight.runR` *JavaScript function: Runs an R function.*

Description

The R side must be running the slRunRServer function.

Arguments

- `rCommand` `string` The R text to run. It can plot a graph and/or return some R data structure (such as a data frame).
- `data` `any` A javascript value that will be translated to the R command as a value also called 'data'.
- `plotElement` `string`, `HTMLElement` If provided, the `<img>` element (or id of the element) that will receive the plot output (if any). The plot returned will be the size that this element already has, so ensure that it is styled in a way that it has the correct size even if no image (or an old image) has been set.
- `extra` `object` [optional] An object whose keys can be: `"imgType"`: Type of image required, `"png"` (default) or `"svg"`; `"info"`: Function to be called if the R function `sendInfoText` is called; `"progress"`: Function to be called if the R function `sendProgress` is called.

Return Value

- Result object that might have a `plot` property (giving a string that would work as the `src` attribute of an `img` element, representing graphics drawn by the command) and a `data` property (giving the value returned by the command). If the promise resolves to an error, the argument to the error function is a string representing the cause of the error.

`shinylight.setElementJson`
JavaScript function

Description

Sets the text content of an element (or its `value` as appropriate) to the JSON representation of an object.

Arguments

- `elementOrId` `string`, `HTMLElement` The element (or its id) that will have its text set
- `object` `any` The object whose JSON representation will be set as the text content of the element

---

`shinylight.setElementPlot`

JavaScript function: Sets an `<img>` *element to display a plot returned by* runR.

Description

Normally you do not need to call this because to get `shinylight` to produce a plot you need to set the `plotElement` argument, and doing so will cause this element to receive the plot automatically.

Arguments

- `elementOrId` `string`, `HTMLImageElement` The `<img>` element (or its id) that will receive the image.
- `result` `object` The result from runR.

`shinylight.setElementText`

JavaScript function

Description

Sets the text content of an element (or its `value` as appropriate).

Arguments

- `elementOrId` `string`, `HTMLElement` The element (or its id) that will have its text set
- `text` `string` The text to set into the element

`shinylight.setGridResult`

JavaScript function

Description

Sets a `dataentrygrid` object to the result of runR, if appropriate.

Arguments

- `grid` `DataEntryGrid` Table that receives the result
- `result` `object` Return value promised by runR

shinylight.setGridResultWithNamedRows *JavaScript function*

Description

Sets a `dataentrygrid` object to the result of `runR`. The object will have fixed rows, with names derived from the row names in the original data frame.

Arguments

- `grid` `DataEntryGrid` Table that receives the result
- `result` `object` Return value promised by `runR`

slRunRServer *Start a ShinyLight server which runs R that it is sent*

Description

Start a ShinyLight server which runs R that it is sent

Usage

```
slRunRServer(
  permittedSymbols,
  appDir = NULL,
  host = "127.0.0.1",
  port = NULL,
  daemonize = FALSE,
  initialize = NULL
)
```

Arguments

`permittedSymbols`	List of symbols that are permitted in the R commands passed. Remember to include `data`, `$` and `<-`.
`appDir`	Directory containing files to serve (for example system.file("www", package = "your-package"))
`host`	IP address to listen on, default is `"127.0.0.1"` (localhost). Use `"0.0.0.0"` to run in a docker container.
`port`	Internet port of the virtual server. If not defined, a random free port will be chosen and the browser will be opened to show the GUI.

daemonize — If TRUE, keep serving forever without returning. This is useful when called from RScript, to keep

initialize — A json string or list (that will be converted to a JSON string) to be passed to the JavaScript as initial data. The index.html must contain a line containing var shinylight_initial_data=, which will be replaced with code that sets shinylight_initial_data to this supplied JSON string.

Value

server object, unless daemonize is TRUE.

See Also

slServer for the more general form of this function, or slStop to stop a running server. shinylight.runR is the JavaScript function you need to call to pass R code from the browser to the server.

Examples

```
server <- slRunRServer(
  permitted = list("*"),
  port = 50053
)
# Normally we would use shinylight.js to send the function over
# and receive the result, not R and websocket.
ws <- websocket::WebSocket$new("ws://127.0.0.1:50053/x")
resultdata <- NULL
ws$onMessage(function(event) {
  resultdata <<- jsonlite::fromJSON(event$data)$result$data
})
ws$onOpen(function(event) {
  ws$send('{"method":"runR","params":{"Rcommand":"3 * 57"}}')
})
timeout = 30
while(is.null(resultdata) && 0 < timeout) {
  later::run_now()
  Sys.sleep(0.1)
  timeout <- timeout - 1
}
ws$close()
slStop(server)
stopifnot(resultdata == 171)  # 3 * 57 == 171
grDevices::png()  # workaround; you do not have to do this
```

---

slServer *Start a ShinyLight server*

Description

Start a ShinyLight server

Usage

```
slServer(
  interface,
  appDir = NULL,
  host = "127.0.0.1",
  port = NULL,
  daemonize = FALSE,
  initialize = NULL
)
```

Arguments

interface	List of functions you want to be able to call from the browser. If you want to use the Shinylight Framework, this should have one member `getSchema`. For details of this, see the documentation for [shinylightFrameworkStart].
appDir	Directory containing files to serve (for example system.file("www", package = "your-package"))
host	IP address to listen on, default is `"127.0.0.1"` (localhost). Use `"0.0.0.0"` to run in a docker container.
port	Internet port of the virtual server. If not defined, a random free port will be chosen and the browser will be opened to show the GUI.
daemonize	If TRUE, keep serving forever without returning. This is useful when called from `RScript`, to keep
initialize	A json string or list (that will be converted to a JSON string) to be passed to the JavaScript as initial data. For non-framework apps, the index.html must contain a line containing `var shinylight_initial_data=`, which will be replaced with code that sets `shinylight_initial_data` to this supplied JSON string.

Value

server object, unless daemonize is TRUE in which case the function will not return.

See Also

`slStop` to stop a running server, and `slRunRServer` to run a server that just accepts R code.

Examples

```
# You can leave out port and daemonize to launch a browser
# pointing at your server
server <- slServer(
  port = 50052,
  interface = list(
    multiply = function(x, y) { x * y }
  )
)
# Normally we would use shinylight.js to send the function over
# and receive the result, not R and websocket.
```

```
ws <- websocket::WebSocket$new("ws://127.0.0.1:50052/x")
resultdata <- NULL
ws$onMessage(function(event) {
  resultdata <<- jsonlite::fromJSON(event$data)$result$data
})
ws$onOpen(function(event) {
  ws$send('{ "method": "multiply", "params": { "x": 3, "y": 47 } }')
})
timeout = 30
while(is.null(resultdata) && 0 < timeout) {
  later::run_now()
  Sys.sleep(0.1)
  timeout <- timeout - 1
}
ws$close()
slStop(server)
stopifnot(resultdata == 141)  # multiply(3, 47) == 141
grDevices::png()  # workaround; you do not have to do this
```

`slStop` *Stops a ShinyLight GUI*

Description

Stops a ShinyLight GUI

Usage

```
slStop(server = NULL)
```

Arguments

`server`	The server (returned by `slServer` or `slRunRServer`) to stop. If not supplied all servers will be stopped.

Value

No return value

Examples

```
server <- slServer(
  port = 50051,  # leave this out if you don't care about the port number
  interface = list(
    multiply = function(x, y) { x * y }
  )
)
# ...
slStop(server)
```

`toolkit.all` *JavaScript function: Finds if a predicate is true for all members of an array or object.*

Description

Calls a function for each member of an array or object until either one of them returns false (in which case `all` returns false) or we run out of elements (in which case `all` returns true).

Arguments

- `a object` Object or array to be iterated through.
- `p function` Function to call with two arguments: the key of the element (or index in the case of an array) and the value; should return a boolean.

`toolkit.any` *JavaScript function: Finds if a predicate is true for any member of an array or object.*

Description

Calls a function for each member of an array or object until either one of them returns true (in which case `any` returns true) or we run out of elements (in which case `any` returns false).

Arguments

- `a object` Object or array to be iterated through.
- `p function` Function to call with two arguments: the key of the element (or index in the case of an array) and the value; should return a boolean.

`toolkit.banner` *JavaScript function*

Description

Returns a Container Element for displaying controls horizontally.

Arguments

- `elements Array.<HTMLControlElement>` Initial array of elements to be added.
- `className string` HTML class for the returned banner.

Return Value

- The banner element.

toolkit.button *JavaScript function: Returns a button.*

Description

This button is an HTML element, but it is not an HTML button. Styling and JavaScript provide the button-like look-and-feel.

Arguments

- `id` `string` The HTML id of the button will be `'button-' + id`. It is also used in the interpretation of the `translations` argument.
- `fn` `function` Unary function that takes a single parameter of a nullary function. This function will be called on completion of the work (which will be used to remove the button's 'click' animation). If the function want to use as a callback does not take an argument, you can wrap it in `toolkit.withTimeout`. You might also want to use `toolkit.withTimeout` if your function returns too quickly, otherwise the user might not see the button click.
- `translations` `object` An object with a key `id` having a value that is an object having a key `'name'` with value the display name of the button, and optionally a key `'help'` with value of the tooltip text.

Return Value

- The button.

toolkit.deref *JavaScript function: Dereferences an object or array through multiple indices.*

Description

`deref(o, [a,b,c], d)` is a safe way of doing `o[a][b][c]`. If that path does not exist, d is returned. If d is not supplied, null is returned. Any undefined values in path are ignored.

Arguments

- `object` `object` The object to be dereferenced.
- `path` `Array` The series of indices to be applied.
- `defaultValue` `toolkit.any` The default value to be returned if the path cannot be followed to the end.

Return Value

- Object dereferenced, `defaultValue`, or null.

toolkit.footer *JavaScript function: A panel with a smaller footer.*

Description

Returns a Positioned Element consisting of a body and a footer.

Arguments

- `ftr` `HTMLElement` The footer element.
- `main` `toolkit.HTMLPositionedElement` The body element.

Return Value

- The element containing the footer and body.

toolkit.forEach *JavaScript function*

Description

Calls a function for each member of an array or object.

Arguments

- `a` `object` Object or array to be iterated through.
- `f` `function` Function to call with two arguments: the key of the element (or index in the case of an array) and the value.

toolkit.groupTitle *JavaScript function: Option group title*

Description

Adds a group title to an `toolkit.optionsPage`.

Arguments

- `container` `HTMLElement` The container, preferably the return value from `toolkit.optionsPage`.
- `labelTranslations` `object` An object with two keys: `'name'` is the display text for this title, `'help'` (optional) is the tooltip text.

`toolkit.header` *JavaScript function: A panel with a smaller header.*

Description

Returns a Positioned Element consisting of a header and a body.

Arguments

- `hdr` `HTMLElement` The header element.
- `main` `toolkit.HTMLPositionedElement` The body element.

Return Value

- The element containing the header and body.

`toolkit.HTMLContainerElement`
JavaScript class: A monkey-patched `HTMLElement`.

Description

A Container Element is an element for displaying a set of controls and their labels.

Properties

makeSubElement `function` Gets an element in which a control and its label can be stored. You do not need to call this unless you have made your own custom control; it will be called by functions such as `toolkit.paramText`. Pass in the ID of the control (you will need the ID for the `getData` and `setData` calls).

getData `function` Returns an object mapping contained controls (or nested containers) to their current values.

setData `function` Sets the values of the contained controls. `data` is a mapping from the IDs of the contained controls to the data that should be set on them.

See Also

`toolkit.stack`

`toolkit.banner`

`toolkit.optionsPage`

`toolkit.HTMLControlContainerElement`

JavaScript class

Description

A container for a single control.

Properties

addElement `function` Adds an element. Should be called once with a control's label, and then again with the control itself.

See Also

`toolkit.HTMLContainerElement`

`toolkit.HTMLControlElement`

JavaScript class

Description

A monkey-patched `HTMLElement` representing a control with its label.

Properties

getData `function` Returns the current displayed value.

setData `function` Sets the value.

hide `function` Makes the element invisible and non-interactive

show `function` makes the element visible and (potentially) interactive

See Also

`toolkit.paramBoolean`

`toolkit.paramColor`

`toolkit.paramFloat`

`toolkit.paramInteger`

`toolkit.paramSelector`

`toolkit.paramText`

`toolkit.HTMLPositionedElement`

JavaScript class: A monkey-patched `HTMLElement` *with some extra methods.*

Description

Certain elements returned by Toolkit methods are Positioned Elements. It is necessary for elements in some places in the document to be Positioned Elements for the document resizing and formatting to work.

If you have an HTML element that is not a Positioned Element that you want to add to a place where only Positioned Elements are required, wrap it in `toolkit.scrollingWrapper` or `toolkit.nonScrollingWrapper`.

Properties

setSize `function` Sets the position of the element on the document in pixels, with parameters for left, top, width and height in that order.

getSize `function` Returns an object with members `left`, `top`, `width` and `height` for the position of the element.

hide `function` Makes the element invisible and non-interactive

show `function` makes the element visible and (potentially) interactive

---

`toolkit.image` *JavaScript function*

Description

An image element.

Arguments

- `updateSizeFunction` `function` Nullary function called when the object's size is changed.

Return Value

- Image element. It has a `getSize()` method, returning an object with width and height members. This is the width and height set by `reposition()`, not the actual on-screen width and height, if that is different for some reason. In other words, it returns the width and height the image "should" have.

toolkit.leftSideBar *JavaScript function: A panel with a side bar.*

Description

Returns a Positioned Element consisting of a left side bar and a body.

Arguments

- `bar` `HTMLElement` The side bar element.
- `main` `toolkit.HTMLPositionedElement` The body element.

Return Value

- The Toolkit Positioned Element containing the side bar and body.

toolkit.loadFileButton *JavaScript function: Returns a button that uploads a file from the client.*

Description

This button is an HTML element, but it is not an HTML button. Styling and JavaScript provide the button-like look-and-feel.

Arguments

- `id` `string` The HTML id of the button will be `'button-' + id`. It is also used in the interpretation of the `translations` argument.
- `fn` `function` A binary callback function. Its two parameters are the File object uploaded and a (nullary) function that will be called when the operation completes.
- `translations` `object` An object with a key `id` having a value that is an object having a key `'name'` with value the display name of the button, and optionally a key `'help'` with value of the tooltip text.
- `createFileInput` `function` [optional] A function to create an element that uploads a file. By default this is a normal `<input type="file">` with an extra `show` member function that does nothing. The function takes two parameters: `uploadFn` and `doneFn`. `uploadFn` must be called when a file has been chosen for upload; it takes two parameters: a File object and a callback function that is called on completion. You should either pass `doneFn` as this second parameter, or a function that performs some actions then calls `doneFn()` itself. The return value of `createFileInput` should be the element itself, monkey-patched to include a `show()` method that will be called when the Load button is clicked.

Return Value

- The button.

`toolkit.makeLabel` *JavaScript function: Makes a label suitable for labelling a control.*

Description

The label has translatable text and a help tooltip (if translated for).

Arguments

- `translations` `object` `translations[id].name` is the string to use as label's text, `translations[id].help` is the string to use as the label's tooltip. If `id` is undefined or null, `translations.name` and `translations.help` are used.
- `container` `toolkit.HTMLControlContainerElement` [optional] Where to put the label.
- `id` `string` [optional] Where to look in `translations` for the text.
- `idFor` `string` [optional] The `id` attribute of the HTML element that this element refers to.

Return Value

- The label.

`toolkit.nonScrollingWrapper`
JavaScript function: Returns a Positioned Element just containing one element.

Description

This element does not gain scrollbars if it is too large for this returned container, and it will try to take up its full size in the layout.

Arguments

- `element` `HTMLElement` The element to be wrapped
- `verticalPadding` `int` The number of extra pixels above the element's height to use as the returned element's default height.
- `horizontalPadding` `int` The number of extra pixels above the element's width to use as the returned element's default width.

Return Value

- The wrapper.

toolkit.optionsPage — *JavaScript function: Returns a Container Element for displaying controls vertically.*

Description

Returns an element with a `makeSubElement` method that adds elements vertically. This differs from `toolkit.stack` in that the labels will be aligned on the left and the controls will be aligned on the right. It would make a nice options page, for example.

Return Value

- A Container Element for displaying elements vertically.

toolkit.overlay — *JavaScript function: A panel with an overlay.*

Description

Returns a Positioned Element consisting of two elements placed in the same position. To be able to see the lower (main) element you must either call `hide()` on the overlay, or make it transparent with CSS.

Arguments

- `overlay` `HTMLElement` The higher element. Any `getData()` or `setData()` call on the returned element will not be passed on to this overlay element.
- `main` `toolkit.HTMLPositionedElement` The lower element.

Return Value

- The element containing both elements.

toolkit.pages *JavaScript function: Returns a Positioned Element for displaying controls in tabbed pages.*

Description

Only one page will be visible at a time. The returned element has `getData` and `setData` methods that take or return (respectively) an object with keys that are the IDs of the pages.

Arguments

- `pageElements` `object` dictionary of pageIds to elements (that will be added to the return value of this function). These elements each need methods `show`, `hide` and `setData` (like the ones returned by `toolkit.header`, `toolkit.scrollingWrapper`, `toolkit.nonScrollingWrapper`, `toolkit.leftSideBar`, (that is to say, Positioned Elements) if they are to be output pages. Only `show` and `hide` if they are to be available permanently and not be set through the `setData` call.
- `labelTranslations` `object` dictionary of pageIds to objects with keys `name` (for the label text) and `help` (for tooltip help HTML)
- `tabIdPrefix` `string` If you want HTML IDs for your tab elements, set this and the ID will be set to `tabIdPrefix` + `pageId`.

Return Value

- An element that has the tabs and the tabs that switch between them. The active tab has the "active" class. It has the following extra methods: `setData(data)`: data is a dictionary with keys matching the pageIds. The values are passed to the `setData()` functions of the corresponding elements. Pages without any data (and their corresponding radio buttons) are summarily disabled. Pages with data are enabled. `reposition()`: sets each page to the same dimensions as the container and calls each page's `reposition()` method (if it exists).

toolkit.paramBoolean *JavaScript function: Returns a checkbox input Toolkit Control.*

Description

A control for a boolean value rendered as a checkbox.

Arguments

- `id` `string` when `getData` or `setData` is called on the container, the value at `'id'` refers to this selector. The HTML id is set to `'param-'` + `id`.
- `container` `toolkit.HTMLContainerElement` [optional] Where to put the control.

- `translations` `object` Optional mapping: `translations.id` is the name of the control to be displayed and `translations.help` is help text to be displayed if the user hovers over the label
- `initial` `string` Optional initial value for the control
- `callback` `function` Optional function to be called whenever the input value changes

Return Value

- Checkbox input control.

`toolkit.paramColor` *JavaScript function: Returns a colour input Toolkit Control.*

Description

It is a standard HTML input control with type `color`. The value returned is a six-hex-digit string prefixed with a #.

Arguments

- `id` `string` when `getData` or `setData` is called on the container, the value at `'id'` refers to this selector. The HTML id is set to `'param-' + id`.
- `container` `toolkit.HTMLContainerElement` [optional] Where to put the control.
- `translations` `object` Optional mapping: `translations.id` is the name of the control to be displayed and `translations.help` is help text to be displayed if the user hovers over the label
- `initial` `string` Optional initial value for the control
- `callback` `function` Optional function to be called whenever the input value changes

Return Value

- Text input control.

`toolkit.paramFloat` *JavaScript function: Returns a floating point input Toolkit Control.*

Description

Values outside the permitted range will gain the "invalid" class, but there is no other effect.

Arguments

- `id` `string` when `getData` or `setData` is called on the container, the value at `'id'` refers to this selector. The HTML id is set to `'param-' + id`.
- `container` `toolkit.HTMLContainerElement` [optional] Where to put the control.
- `translations` `object` Optional mapping: `translations.id` is the name of the control to be displayed and `translations.help` is help text to be displayed if the user hovers over the label
- `initial` `string` Optional initial value for the control
- `callback` `function` Optional function to be called whenever the input value changes
- `min` `float` Minimum permitted value (optional).
- `max` `float` Maximum permitted value (optional).

Return Value

- Text input control.

`toolkit.paramInteger` *JavaScript function: Returns an integer input Toolkit Control.*

Description

Values outside the permitted range will gain the "invalid" class, but there is no other effect.

Arguments

- `id` `string` when `getData` or `setData` is called on the container, the value at `'id'` refers to this selector. The HTML id is set to `'param-' + id`.
- `container` `toolkit.HTMLContainerElement` [optional] Where to put the control.
- `translations` `object` Optional mapping: `translations.id` is the name of the control to be displayed and `translations.help` is help text to be displayed if the user hovers over the label
- `initial` `string` Optional initial value for the control
- `callback` `function` Optional function to be called whenever the input value changes
- `min` `int` Minimum permitted value (optional).
- `max` `int` Maximum permitted value (optional).

Return Value

- Text input control.

toolkit.paramSelector *JavaScript function: Returns a custom selection box Toolkit Control.*

Description

This is different to a normal selection box because it allows tooltips on the items within the list.

Arguments

- `id` `string` when `getData` or `setData` is called on the container, the value at `'id'` refers to this selector. The HTML id is set to `'param-' + id`.
- `container` `toolkit.HTMLContainerElement` [optional] Where to put the control. the container came from `optionsPage()` the new selection box will be formatted as a table row.
- `labelTranslations` `object` A dictionary with two optional keys; 'name' gives the label to display and 'help' gives HTML help text. 'help' has no effect unless 'name' is also present.
- `values` `Array.<int>` An array of the IDs of the options in the selection.
- `valueTranslations` `object` A dictionary whose keys are the IDs of the options in the selection, the values are more dictionaries. These dictionaries have two optional keys; `'name'` (giving the name to display for this option) and `'help'` (giving tooltip HTML text).
- `initial` `string` ID of the option to start selecting (optional)
- `callback` `function` The (nullary) function to call when the value changes (optional)

Return Value

- The selection box.

toolkit.paramText *JavaScript function: Returns a text input Toolkit Control.*

Description

Any text is permitted unless a `validate` function is supplied.

Arguments

- `id` `string` when `getData` or `setData` is called on the container, the value at `'id'` refers to this selector. The HTML id is set to `'param-' + id`.
- `container` `toolkit.HTMLContainerElement` [optional] Where to put the control.
- `translations` `object` Optional mapping: `translations.id` is the name of the control to be displayed and `translations.help` is help text to be displayed if the user hovers over the label
- `initial` `string` Optional initial value for the control
- `callback` `function` Optional function to be called whenever the input value changes
- `validate` `function` Optional function returning `true` if passed a value that this control should accept or `false` otherwise.

Return Value

- Text input control.

`toolkit.preformattedText`

JavaScript function: A static text Toolkit Control in a preformatted style.

Description

This element is like a control in that it has a label and actual text content, but it is not interactive.

Arguments

- `id` `string` The ID of this control within the container
- `container` `toolkit.HTMLContainerElement` [optional] Where to put the control.
- `translations` `object` An object with keys `'name'` for the label displayed by the text and `'help'` for tooltop text.

Return Value

- The static text element. The text content can be set by calling its `setData()` function with any plain text.

`toolkit.progressBar` *JavaScript function: Returns a Positioned Element progress bar.*

Description

The progress is set by calling the `setData()` method.

Return Value

- The progress bar element.

`toolkit.rightSideBar` *JavaScript function: A panel with a side bar.*

Description

Returns a Positioned Element consisting of a right side bar and a body.

Arguments

- `bar` `HTMLElement` The side bar element.
- `main` `toolkit.HTMLPositionedElement` The body element.

Return Value

- The Toolkit Positioned Element containing the side bar and body.

`toolkit.scrollingWrapper`
JavaScript function: Returns a Positioned Element just containing one element.

Description

This element gains scrollbars if it is too large for this returned container.

Arguments

- `element` `HTMLElement` The element to be wrapped
- `verticalPadding` `int` The number of extra pixels above the element's height to use as the returned element's default height.
- `horizontalPadding` `int` The number of extra pixels above the element's width to use as the returned element's default width.

Return Value

- The wrapper.

`toolkit.setAsBody` *JavaScript function: Replaces the* `<main>` *tag in the document with this element.*

Description

The element will have its `resize` event wired up. If `el` is a Toolkit Positioned Element, it will be resized correctly when the window is resized.

Arguments

- `el` `HTMLElement` The element to set as `<main>`

`toolkit.stack` *JavaScript function: Returns a Container Element for displaying controls vertically.*

Description

Returns a Container Element with a `makeSubElement` method that adds elements vertically, with the labels above the controls they correspond to.

Arguments

- `elements` `Array.<HTMLElement>` Initial array of elements to be added.

Return Value

- A Container Element for displaying elements vertically.

`toolkit.staticText` *JavaScript function: A static text Toolkit Control.*

Description

This element is like a control in that it has a label and actual text content, but it is not interactive.

Arguments

- `id` `string` The ID of this control within the container
- `container` `toolkit.HTMLContainerElement` [optional] Where to put the control.
- `translations` `object` An object with keys `'name'` for the label displayed by the text and `'help'` for tooltop text.

Return Value

- The static text element. The text content can be set by calling its `setData()` function. This text can include HTML entities, so you might want to replace & with `&` and < with `<` if it is plain text.

`toolkit.verticalDivide`

JavaScript function: Left/right panels with a draggable divider.

Description

Returns a Positioned Element with a draggable vertical divider bordering two other Positioned Elements.

Arguments

- `container` `toolkit.HTMLPositionedElement` The container to divide. If null, a container will be created for you.
- `left` `toolkit.HTMLPositionedElement` The element to put on the left of the divider.
- `right` `toolkit.HTMLPositionedElement` The element to put on the right of the divider.

Return Value

- The element created. If a container was provided it is this argument.

`toolkit.whenQuiet` *JavaScript function: Transforms a function that should not be called too often into a function that can be called as often as you like.*

Description

The returned function can be called as often as you like with whatever arguments you like. If it is called again within `ticks` ticks (a tick is 100ms), this call is ignored. If it is not called again within this time, the arguments are passed on to the delegate function. In other words, in a string of calls less than `ticks` x 100ms apart from each other, only the last of these calls actually happens.

Arguments

- `ticks` `int` Duration (x 100ms) to wait until calling the delgate function.
- `f` `function` Delegate function to be called `ticks` ticks after the last call to the retuned function.

Return Value

- Function that can be called often, resulting in fewer calls to the delegate function `f`.

`toolkit.withTimeout` *JavaScript function: Adds a fake callback argument to a nullary function.*

Description

Perhaps you have a nullary function that you want called when the user clicks a button, but the `toolkit.button` function wants a unary function that has a completion callback so that the button knows when to pop back up again. In this situation you might wrap your function with a call to `toolkit.withTimeout`.

Arguments

- `fn` `function` Nullary function to wrap.

Return Value

- Unary function (taking one function as an argument) that simply calls `fn` immediately then calls its argument again after 200ms.

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