

# Package ‘BrowserViz’

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**Type** Package

**Title** BrowserViz: interactive R/browser graphics using websockets and JSON

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**Depends** R (>= 3.5.0), jsonlite (>= 1.5), httpuv(>= 1.5.0)

**Imports** methods, BiocGenerics

**Suggests** RUnit, BiocStyle, knitr, rmarkdown

**Description** Interactive graphics in a web browser from R, using websockets and JSON.

**License** GPL-2

**URL** <https://gladkia.github.io/BrowserViz/>

**BugReports** <https://github.com/gladkia/BrowserViz/issues>

**LazyLoad** yes

**biocViews** Visualization, ThirdPartyClient

**NeedsCompilation** no

**VignetteBuilder** knitr

**Encoding** UTF-8

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|                    |                                                                     |
|--------------------|---------------------------------------------------------------------|
| addRMessageHandler | <i>Supply the name of a function to call, identified by its key</i> |
|--------------------|---------------------------------------------------------------------|

---

Description

Supply the name of a function to call, identified by its key

Usage

addRMessageHandler(key, functionName)

Arguments

- |              |                    |
|--------------|--------------------|
| key          | A character string |
| functionName | A character string |

---

browserResponseReady,BrowserViz-method  
*browserResponseReady*

---

## Description

browserResponseReady

## Usage

```
## S4 method for signature 'BrowserViz'
browserResponseReady(obj)
```

## Arguments

obj                      An object of class BrowserViz

---

BrowserViz constructor  
*Constructor for BrowserViz*

---

## Description

This constructor function:

- creates the BrowserViz object
- initializes the httpuv web server
- prepares that web server to additionally handle websocket traffic
- loads a "browserFile" - an html/javascript/css web page to communicate with in your web browser
- opens websocket communication between your R session and your browser
- installs an optional "httpQueryProcessingFunction" to handle http (non-websocket) requests.

## Usage

```
BrowserViz(
  host = "localhost",
  portRange = 10000:10100,
  title = "BrowserViz",
  browserFile,
  quiet = TRUE,
  httpQueryProcessingFunction = NULL
)
```

**Arguments**

|                             |                                                                                                                      |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------|
| host                        | character The constructor will open an http/websocket port here for web browsers to connect to. localhost by default |
| portRange                   | The constructor looks for a free websocket port in this range. 10000:10100 by default                                |
| title                       | Used for the web browser window, "igvR" by default                                                                   |
| browserFile                 | The full path to the bundled html, js and libraries, and css which constitute the browser app                        |
| quiet                       | A logical variable controlling verbosity during execution                                                            |
| httpQueryProcessingFunction | a function, default NULL, provides subclasses with the opportunity to execute code on the http server created here.  |

**Value**

An object of the BrowserViZ class

---

|                  |                                                                                                                                                               |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BrowserViz-class | <i>BrowserViz: a base class providing simple, extensible message passing between your R session and your web browser, for interactive data visualization.</i> |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

**Description**

Many of the best interactive graphics capabilities available today are written in Javascript and run in a web browser. BrowserViz makes these capabilities available in R, using websockets for message passing back and forth between R and the browser. This class connects your R session to your web browser via websockets, using the R httpuv library, which in turn uses the Rook webserver.

BrowserViz is a concrete base class, in that instances can be constructed and run - which we do for testing. The primary use of this BrowserViz is to be subclassed: to facilitate the creation of new browser-based, R-connected interactive graphics capabilities embodied in R packages, written by programmers with some skill in both R and Javascript. Two examples of this can be found in these Bioconductor packages <https://bioconductor.org/packages/devel/bioc/html/igvR.html> and <https://bioconductor.org/packages/devel/bioc/html/RCyjs.html>.

**Slots**

|                     |                                                            |
|---------------------|------------------------------------------------------------|
| uri                 | The http location at which this modest webserver runs      |
| port                | An integer port number for the http connection             |
| websocketConnection | An environment managed by the httpuv library on our behalf |
| quiet               | Logical variable controlling verbosity during execution    |

**See Also**

[BrowserViz](#)

An S4 class to create and manage a modest webserver for websocket message passing between R and Javascript running in your web browser

---

`closeWebSocket,BrowserViz-method`

*Close the websocket connection - between your R session and your web browser.*

---

### Description

Close the websocket connection - between your R session and your web browser.

### Usage

```
## S4 method for signature 'BrowserViz'  
closeWebSocket(obj)
```

### Arguments

|                  |                                            |
|------------------|--------------------------------------------|
| <code>obj</code> | An object of class <code>BrowserViz</code> |
|------------------|--------------------------------------------|

---

`dispatchMessage`

*Route the message coming in from the browser to the appropriate R function.*

---

### Description

Route the message coming in from the browser to the appropriate R function.

### Usage

```
dispatchMessage(ws, msg, quiet)
```

### Arguments

|                    |                                           |
|--------------------|-------------------------------------------|
| <code>ws</code>    | a websocket connectin                     |
| <code>msg</code>   | the JSON-encoded message from the browser |
| <code>quiet</code> | logical TRUE or FALSE                     |

---

displayHTMLInDiv, BrowserViz-method

*Ask the browser to display html markup in the specified div*

---

### Description

Ask the browser to display html markup in the specified div

### Usage

```
## S4 method for signature 'BrowserViz'
displayHTMLInDiv(obj, htmlText, div.id)
```

### Arguments

|          |                                     |
|----------|-------------------------------------|
| obj      | An object of class BrowserViz       |
| htmlText | A character string with HTML markup |
| div.id   | A character string                  |

---

fromJSON

*Transform JSON string into a native R object*

---

### Description

Transform JSON string into a native R object

### Usage

```
fromJSON(...)
```

### Arguments

|     |                                         |
|-----|-----------------------------------------|
| ... | Extra arguments passed to this function |
|-----|-----------------------------------------|

### Value

a native R data structure

### Examples

```
fromJSON(toJSON(data.frame(a=8:10, b=LETTERS[8:10], stringsAsFactors=FALSE)))
```

---

`getBrowserInfo,BrowserViz-method`*Retrieve basic attributes of the attached web browser.*

---

**Description**

Retrieve basic attributes of the attached web browser.

**Usage**

```
## S4 method for signature 'BrowserViz'  
getBrowserInfo(obj)
```

**Arguments**

|     |                               |
|-----|-------------------------------|
| obj | An object of class BrowserViz |
|-----|-------------------------------|

---

`getBrowserResponse,BrowserViz-method`*Retrieve the response sent by the browser*

---

**Description**

Retrieve the response sent by the browser

**Usage**

```
## S4 method for signature 'BrowserViz'  
getBrowserResponse(obj)
```

**Arguments**

|     |                               |
|-----|-------------------------------|
| obj | An object of class BrowserViz |
|-----|-------------------------------|

---

`getBrowserWindowSize,BrowserViz-method`*Supply the name of a function to call, identified by its key*

---

**Description**

Supply the name of a function to call, identified by its key

**Usage**

```
## S4 method for signature 'BrowserViz'  
getBrowserWindowSize(obj)
```

**Arguments**

|     |                               |
|-----|-------------------------------|
| obj | An object of class BrowserViz |
|-----|-------------------------------|

---

|                                                                     |
|---------------------------------------------------------------------|
| getBrowserWindowTitle,BrowserViz-method                             |
| <i>Supply the name of a function to call, identified by its key</i> |

---

**Description**

Supply the name of a function to call, identified by its key

**Usage**

```
## S4 method for signature 'BrowserViz'  
getBrowserWindowTitle(obj)
```

**Arguments**

obj                    An object of class BrowserViz

---

|                |                       |
|----------------|-----------------------|
| handleResponse | <i>handleResponse</i> |
|----------------|-----------------------|

---

**Description**

handleResponse

**Usage**

```
handleResponse(ws, msg)
```

**Arguments**

ws                    websocket connection  
msg                   the JSON-encoded character string returned by the browser

---

|                            |
|----------------------------|
| port,BrowserViz-method     |
| <i>Get the port number</i> |

---

**Description**

Get the port number

**Usage**

```
## S4 method for signature 'BrowserViz'  
port(obj)
```



**Arguments**

obj                      An object of class BrowserViz

**Value**

the port number use in the websocket connection, a numeric value.

---

ready,BrowserViz-method

*Is the websocket connection to the browser ready for use?*

---

**Description**

Is the websocket connection to the browser ready for use?

**Usage**

```
## S4 method for signature 'BrowserViz'
ready(obj)
```

**Arguments**

obj                      An object of class BrowserViz

---

roundTripTest,BrowserViz-method

*Send data to the browser, ensure that it is returned accurately.*

---

**Description**

Send data to the browser, ensure that it is returned accurately.

**Usage**

```
## S4 method for signature 'BrowserViz'
roundTripTest(obj, ...)
```

**Arguments**

obj                      An object of class BrowserViz  
...                      other arguments

---

send,BrowserViz-method

*Send the specified message to the browser*

---

### Description

Send the specified message to the browser

### Usage

```
## S4 method for signature 'BrowserViz'  
send(obj, msg)
```

### Arguments

|     |                                                                                                               |
|-----|---------------------------------------------------------------------------------------------------------------|
| obj | An object of class BrowserViz                                                                                 |
| msg | A list with four fields: cmd: "someCommand", status: "request", callback: "someFunction", payload: "someData" |

---

setBrowserWindowTitle,BrowserViz-method

*Supply the name of a function to call, identified by its key*

---

### Description

Supply the name of a function to call, identified by its key

### Usage

```
## S4 method for signature 'BrowserViz'  
setBrowserWindowTitle(obj, newTitle)
```

### Arguments

|          |                               |
|----------|-------------------------------|
| obj      | An object of class BrowserViz |
| newTitle | A character string            |

---

 show, BrowserViz-method

*Display the core attributes of the BrowserViz object to stdout*


---

### Description

Display the core attributes of the BrowserViz object to stdout

### Usage

```
## S4 method for signature 'BrowserViz'
show(object)
```

### Arguments

object            An object of class BrowserViz

---

 toJSON

*Transform an R data structure into JSON*


---

### Description

The semantics of toJSON changed between RJSONIO and jsonlite: in the latter, scalars are promoted to arrays of length 1. rather than change our javascript code, and since such promotion – while sensible in the context of R – strikes me as gratuitous, I follow jeroen ooms suggestion, creating this wrapper

### Usage

```
toJSON(..., auto_unbox = TRUE)
```

### Arguments

...            Extra arguments passed to this function  
 auto\_unbox    Logical

### Value

a character string with the JSON representation of the R object

### Examples

```
toJSON(data.frame(a=8:10, b=LETTERS[8:10], stringsAsFactors=FALSE))
```

---

wait, BrowserViz-method

*Pause for the specified number of milliseconds*

---

### Description

Pause for the specified number of milliseconds

### Usage

```
## S4 method for signature 'BrowserViz'  
wait(obj, msec)
```

### Arguments

|      |                               |
|------|-------------------------------|
| obj  | An object of class BrowserViz |
| msec | Numeric                       |

---

webBrowserAvailableForTesting

*Is there a web browser available for testing?*

---

### Description

This package's unit tests require a web browser to connect to. our heuristic, though not bullet proof, is that one of three conditions must be met Supply the name of a function to call, identified by its key

### Usage

```
webBrowserAvailableForTesting()
```

### Value

Logical TRUE or FALSE

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