

# 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://paul-shannon.github.io/BrowserViz/>

**BugReports** <https://github.com/paul-shannon/BrowserViz/issues>

**LazyLoad** yes

**biocViews** Visualization, ThirdPartyClient

**NeedsCompilation** no

**VignetteBuilder** knitr

**Encoding** UTF-8

**RoxygenNote** 7.0.2

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addRMessageHandler      *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

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

**Arguments**

portRange            The constructor looks for a free websocket port in this range. 15000:15100 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

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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>
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### 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

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closeWebSocket, BrowserViz-method	<i>Close the websocket connection - between your R session and your web browser.</i>
-----------------------------------	--

---

### Description

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

### Usage

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

### Arguments

`obj` An object of class BrowserViz

---

dispatchMessage	<i>Route the message coming in from the browser to the appropriate R function.</i>
-----------------	--

---

**Description**

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

**Usage**

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

**Arguments**

ws	a websocket connectin
msg	the JSON-encoded message from the browser
quiet	logical TRUE or FALSE

---

displayHTMLInDiv, BrowserViz-method	<i>Ask the browser to display html markup in the specified div</i>
-------------------------------------	--

---

**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	<i>Transform JSON string into a native R object</i>
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**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	<i>Retrieve basic attributes of the attached web browser.</i>
----------------------------------	---

---

**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

*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'  
getBrowserWindowTitle(obj)
```

### **Arguments**

obj                    An object of class BrowserViz

handleResponse      *handleResponse*

---

### Description

handleResponse

### Usage

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

### Arguments

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

---

port,BrowserViz-method  
*Get the port number*

---

### Description

Get the port number

### Usage

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

### Arguments

obj	An object of class BrowserViz
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### 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
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---

toJSON	<i>Transform an R data structure into JSON</i>
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**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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