

# Package ‘gdiff’

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**Type** Package

**Title** Graphical Difference Testing

**Version** 0.2-5

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**Description** Functions for performing graphical difference testing.  
Differences are generated between raster images.  
Comparisons can be performed between different package  
versions and between different R versions.

**Imports** grDevices, utils, tools, parallel, magick, pdftools

**Suggests** gridBezier, grImport, metapost, ssh, stevedore

**URL** <https://github.com/pmur002/>,  
<https://stattech.wordpress.fos.auckland.ac.nz/2020/01/06/2020-01-visual-testing-for-graphics-in-r/>

**License** GPL (>= 2)

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diffFiles	<i>Names of Files Showing Differences</i>
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**Description**

List all files that show differences between control and test output (as red pixels).

**Usage**

```
diffFiles(x)
```

**Arguments**

x                   A "gdiffComparison" object, as created by [gdiff](#) or [gdiffCompare](#).

**Value**

A character vector of file names (with paths).

**Author(s)**

Paul Murrell

**See Also**

[gdiff](#) and [gdiffCompare](#).

**Examples**

```
f1 <- function() plot(1)
f2 <- function() plot(2)

result <- gdiff(list(control=f1, test=f2), name="f",
                controlDir=file.path(tempdir(), "Control"),
                testDir=file.path(tempdir(), "Test"),
                compareDir=file.path(tempdir(), "Compare"))

result
diffFiles(result)
```

## Description

Generate a set of "control" graphical output files in one directory, a set of "test" graphical output files in another directory, and compare the two sets of output files (possibly generating "compare" graphical output of the differences in a third directory).

## Usage

```
gdiff(x, ...)
## S3 method for class 'function'
gdiff(x, name=deparse(substitute(x)), ...)
## S3 method for class 'list'
gdiff(x, name, ...)
```

## Arguments

x	Either a function, or a named list of functions (with names control and test).
name	A name to be used for output files.
...	Further arguments, currently including: <b>controlDir</b> , <b>testDir</b> , <b>compareDir</b> The names of the directories where output is produced. <b>clean</b> A logical indicating whether the output directories should be emptied. Can also be a list of logicals with names control, test, and compare. <b>compare</b> A logical indicating whether to perform the comparison step. <b>device</b> A specification of the graphics device to use for output; see <a href="#">gdiffDevice</a> . Can also be a list of graphics devices. <b>session</b> A specification of the R session to use for output; see <a href="#">gdiffSession</a> . Can also be a list of sessions with names control and test. <b>ncpu</b> How many cpus to employ when generating output.

## Value

A "gdiffComparison" object, which is a list containing information about the output files generated and the differences detected.

## Author(s)

Paul Murrell

## See Also

[gdiffExamples](#), [gdiffPackage](#), [gdiffOutput](#), and [gdiffCompare](#).

## Examples

```
f <- function() plot(1)

gdiff(f,
      controlDir=file.path(tempdir(), "Control"),
      testDir=file.path(tempdir(), "Test"),
      compareDir=file.path(tempdir(), "Compare"))
```

---

gdiffCompare

*Compare Control and Test Output*

---

## Description

Compare a set of "control" graphical output files in one directory with a set of "test" graphical output files in another directory (possibly generating "compare" graphical output of the differences in a third directory).

## Usage

```
gdiffCompare(controlDir, testDir, compareDir, ...)
```

## Arguments

controlDir, testDir, compareDir	The names of the directories where output is produced.
...	Further arguments, not currently used.

## Value

A "gdiffComparison" object, which is a list containing information about the output files generated and the differences detected.

## Author(s)

Paul Murrell

## See Also

[gdiff](#), and [gdiffOutput](#).

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gdiffDevice                      *Define a Graphics Device for Generating Output*

---

### Description

Define the device to be used for generating graphical output files. There are several predefined graphical devices, e.g., `pngDevice()`, and further devices can be defined using `gdiffDevice()`.

### Usage

```
pngDevice(...)  
pdfDevice(...)  
postscriptDevice(...)  
cairo_pdf_device(suffix=".cairo.pdf", ...)  
  
gdiffDevice(name, suffix=name, open,  
            close=function(dir, name) dev.off())
```

### Arguments

name	A name for the device (used by default for naming output files).
suffix	A suffix to be used for output files.
open	A function that opens a graphics device; this should open the device in such a way that multiple pages of graphical output will produce multiple files.
close	A function that closes the graphics device.
...	Further arguments typically used within the function that opens the device.

### Value

A "gdiffDevice" object, which may be used as the device argument to `gdiff`.

### Author(s)

Paul Murrell

### See Also

[gdiff](#).

### Examples

```
f <- function() plot(1)  
  
gdiff(f, device=pdfDevice(),  
      controlDir=file.path(tempdir(), "Control"),  
      testDir=file.path(tempdir(), "Test"),  
      compareDir=file.path(tempdir(), "Compare"))
```

---

`gdiffExamples`*Generate and Compare Control and Test Output for Function Examples*

---

**Description**

Generate a set of "control" graphical output files in one directory, a set of "test" graphical output files in another directory, and compare the two sets of output files (possibly generating "compare" graphical output of the differences in a third directory).

**Usage**

```
gdiffExamples(fun, ...)
## S3 method for class 'function'
gdiffExamples(fun, name=NULL, ...)
## S3 method for class 'character'
gdiffExamples(fun, name=fun, ...)
```

**Arguments**

<code>fun</code>	Either a function or the name of a function.
<code>name</code>	A name to be used for output files.
<code>...</code>	Further arguments; see <a href="#">gdiff</a> .

**Value**

A "gdiffComparison" object, which is a list containing information about the output files generated and the differences detected.

**Author(s)**

Paul Murrell

**See Also**

[gdiff](#) and [gdiffPackage](#).

**Examples**

```
gdiffExamples(plot,
              controlDir=file.path(tempdir(), "Control"),
              testDir=file.path(tempdir(), "Test"),
              compareDir=file.path(tempdir(), "Compare"))
```

---

gdiffExamplesOutput     *Generate Output Files from Function Examples*

---

### Description

Generate a set of graphical output files by running the examples from the help page for a function.

### Usage

```
gdiffExamplesOutput(fun, dir, ...)  
## S3 method for class 'function'  
gdiffExamplesOutput(fun, dir, name=NULL, ...)  
## S3 method for class 'character'  
gdiffExamplesOutput(fun, dir, name=fun, ...)
```

### Arguments

fun	Either a function or the name of a function.
dir	The name of a directory in which to create output files.
name	A name to be used for output files.
...	Further arguments; see <a href="#">gdiffOutput</a> .

### Value

A character vector containing the names (and paths) of all output files that were generated.

### Author(s)

Paul Murrell

### See Also

[gdiffOutput](#) and [gdiffPackageOutput](#).

### Examples

```
gdiffExamplesOutput(plot, dir=file.path(tempdir(), "Control"))
```

gdiffOutput

*Generate Graphical Output***Description**

Generate a set of graphical output files.

**Usage**

```
gdiffOutput(x, dir, ...)
## S3 method for class 'function'
gdiffOutput(x, dir, name=deparse(substitute(x)), ...)
```

**Arguments**

<code>x</code>	A function.
<code>dir</code>	The name of a directory in which to create output files.
<code>name</code>	A name to be used for output files.
<code>...</code>	Further arguments, currently including: <ul style="list-style-type: none"> <li><b>clean</b> A logical indicating whether the output directories should be emptied. Can also be a list of logicals with names <code>control</code>, <code>test</code>, and <code>compare</code>.</li> <li><b>device</b> A specification of the graphics device to use for output; see <a href="#">gdiffDevice</a>. Can also be a list of graphics devices.</li> <li><b>session</b> A specification of the R session to use for output; see <a href="#">gdiffSession</a>. Can also be a list of sessions with names <code>control</code> and <code>test</code>.</li> <li><b>ncpu</b> How many cpus to employ when generating output.</li> </ul>

**Value**

A character vector containing the names (and paths) of all output files that were generated.

**Author(s)**

Paul Murrell

**See Also**

[gdiffExamplesOutput](#), [gdiffPackageOutput](#), and [gdiff](#).

**Examples**

```
f <- function() plot(1)

gdiffOutput(f, dir=file.path(tempdir()), "Control")
```

---

`gdiffPackage`*Generate and Compare Control and Test Output for a Package*

---

**Description**

Generate a set of "control" graphical output files in one directory, a set of "test" graphical output files in another directory, and compare the two sets of output files (possibly generating "compare" graphical output of the differences in a third directory).

**Usage**

```
gdiffPackage(pkg, ...)
```

**Arguments**

<code>pkg</code>	The name of a package.
<code>...</code>	Further arguments; see <a href="#">gdiff</a> .

**Value**

A "gdiffComparison" object, which is a list containing information about the output files generated and the differences detected.

**Author(s)**

Paul Murrell

**See Also**

[gdiff](#) and [gdiffExamples](#).

---

`gdiffPackageOutput`*Generate Output Files from Function Package*

---

**Description**

Generate a set of graphical output files by running the examples from the help page for a function.

**Usage**

```
gdiffPackageOutput(pkg, dir, ...)
```

**Arguments**

<code>pkg</code>	The name of a package.
<code>dir</code>	The name of a directory in which to create output files.
<code>...</code>	Further arguments; see <a href="#">gdiffOutput</a> .

**Value**

A character vector containing the names (and paths) of all output files that were generated.

**Author(s)**

Paul Murrell

**See Also**

[gdiffOutput](#) and [gdiffExamplesOutput](#).

---

gdiffSession

*Define an R Session for Generating Output*


---

**Description**

Define the R session to be used for generating graphical output files. There are several predefined sessions, e.g., `currentSession()`, and further sessions can be defined using `gdiffSession()`.

**Usage**

```
currentSession(libPaths=NULL)
localSession(libPaths=NULL,
             Rpath=file.path(R.home("bin"), "Rscript"),
             ...)
remoteSession(remote, ...)
## S3 method for class 'character'
remoteSession(remote, libPaths=NULL, Rpath="Rscript", ...)
## S3 method for class 'cluster'
remoteSession(remote, libPaths=NULL, user=NULL, ...)
dockerSession(image, volumes=NULL, env=NULL, network="bridge",
             libPaths=NULL, Rpath="Rscript", ...)

gdiffSession(class, ...)
gdiffGenerateOutput(codeFun, dir, device, clean, ncpu)
```

**Arguments**

<code>libPaths</code>	One or more paths to installed R packages.
<code>Rpath</code>	A path to an Rscript binary.
<code>remote</code>	Either the name of a host or a cluster object (as produced by <code>parallel::makeCluster()</code> ).
<code>user</code>	A user name.
<code>image</code>	The name of a Docker image.
<code>volumes</code>	A character vector of volumes to mount on the container (of the form <code>/path/on/host:/path/on/container</code> ).

env	A character vector of environment variable settings for the container (of the form VAR=value).
network	A character vector describing the network connection for the container.
class	A unique class for a new type of R session.
...	Further arguments for future methods.
codeFun, dir, device, clean, ncpu	Arguments passed to generateOutput methods that can be passed on to gdiffGenerateOutput.

### Details

When defining a new session, `gdiffSession()` is just used to establish a new class. The important thing to do is to provide a `generateOutput` method for that class. Typically, this method will call `gdiffGenerateOutput()`.

### Value

A "gdiffSession" object, which may be used as the `session` argument to `gdiff`.

### Author(s)

Paul Murrell

### See Also

[gdiff](#).

### Examples

```
f <- function() plot(1)

gdiff(f, session=currentSession(),
      controlDir=file.path(tempdir(), "Control"),
      testDir=file.path(tempdir(), "Test"),
      compareDir=file.path(tempdir(), "Compare"))
```

---

samePDF

*Compare Two PDF Files*

---

### Description

Check whether two PDF files have the same content, ignoring some details like creation time and modification time.

### Usage

```
samePDF(file1, file2)
```

**Arguments**

file1, file2      Names of PDF files to compare.

**Details**

This function will compare any two files, byte by byte, but if a file is a PDF file that was generated by R, it will discard the file header, which may contain differences that do not matter, such as the creation date.

**Value**

A logical value.

**Author(s)**

Paul Murrell

**Examples**

```
f1 <- tempfile(fileext=".pdf")
f2 <- tempfile(fileext=".pdf")
pdf(f1)
plot(1)
dev.off()
pdf(f2)
plot(2)
dev.off()
samePDF(f1, f1)
samePDF(f1, f2)
```

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