

# Package ‘flexiblas’

February 26, 2022

**Type** Package

**Title** 'FlexiBLAS' API Interface

**Version** 3.1.0

**Description** Provides functions to switch the 'BLAS'/'LAPACK' optimized backend and change the number of threads without leaving the R session, which needs to be linked against the 'FlexiBLAS' wrapper library  
<<https://www.mpi-magdeburg.mpg.de/projects/flexiblas>>.

**License** GPL (>= 3)

**Encoding** UTF-8

**OS\_type** unix

**URL** <https://github.com/Enchufa2/r-flexiblas>

**BugReports** <https://github.com/Enchufa2/r-flexiblas/issues>

**Suggests** tinytest

**RoxygenNote** 7.1.1

**NeedsCompilation** yes

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**Repository** CRAN

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flexiblas-package      **flexiblas**: *FlexiBLAS API Interface for R*

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### Description

Provides functions to switch the BLAS/LAPACK optimized backend and change the number of threads without leaving the R session, which needs to be linked against the FlexiBLAS wrapper library.

### Author(s)

Martin Koehler, Iñaki Ucar

### References

Koehler M., Saak J. (2020). "FlexiBLAS - A BLAS and LAPACK wrapper library with runtime exchangeable backends." doi: [10.5281/zenodo.3909214](https://doi.org/10.5281/zenodo.3909214).

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flexiblas-backends      *Handle Backends*

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### Description

Get current backend, list available ones, load and switch between backends.

### Usage

```
flexiblas_current_backend()
```

```
flexiblas_list()
```

```
flexiblas_list_loaded()
```

```
flexiblas_load_backend(name)
```

```
flexiblas_switch(n)
```

### Arguments

name                    character vector of backend names or paths (case insensitive).

n                        loaded backend index.

**Value**

`flexiblas_current_backend` and `flexiblas_list*` return a character vector of backend names or paths.

`flexiblas_load_backend` and `flexiblas_switch` return the indices of the loaded backends if the operation was successful, or fail otherwise.

**See Also**

[flexiblas\\_avail](#), [flexiblas\\_version](#), [flexiblas-threads](#)

**Examples**

```
n <- 2000
runs <- 10
ignore <- "__FALLBACK__"

A <- matrix(runif(n*n), nrow=n)
B <- matrix(runif(n*n), nrow=n)

# load backends
backends <- setdiff(flexiblas_list(), ignore)
idx <- flexiblas_load_backend(backends)

# benchmark
timings <- sapply(idx, function(i) {
  flexiblas_switch(i)

  # warm-up
  C <- A[1:100, 1:100] %%% B[1:100, 1:100]

  unname(system.time({
    for (j in seq_len(runs))
      C <- A %%% B
  }))[3])
})

if (length(timings)) {
  results <- data.frame(
    backend = backends,
    `timing [s]` = timings,
    `performance [GFlops]` = (2 * (n / 1000)^3) / timings,
    check.names = FALSE)

  results[order(results$performance),]
}
```

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flexiblas-threads      *Get/Set Number of Threads*

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**Description**

Get or set the number of threads for the BLAS backend.

**Usage**

```
flexiblas_get_num_threads()
```

```
flexiblas_set_num_threads(n)
```

**Arguments**

n                    number of threads.

**Value**

flexiblas\_get\_num\_threads returns the number of threads.

flexiblas\_set\_num\_threads returns nothing.

**See Also**

[flexiblas\\_avail](#), [flexiblas\\_version](#), [flexiblas-backends](#)

**Examples**

```
max_threads <- 4
n <- 2000
runs <- 10

A <- matrix(runif(n*n), nrow=n)
B <- matrix(runif(n*n), nrow=n)

for (i in seq_len(max_threads)) {
  message("Set number of threads to: ", i)
  flexiblas_set_num_threads(i)

  print(system.time({
    for (j in seq_len(runs))
      C <- A %*% B
  })))
}
```

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flexiblas_avail	<i>Check Availability</i>
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**Description**

Check whether FlexiBLAS is available.

**Usage**

```
flexiblas_avail()
```

**Value**

A boolean.

**See Also**

[flexiblas\\_version](#), [flexiblas-backends](#), [flexiblas-threads](#)

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flexiblas_version	<i>Get Version</i>
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**Description**

Get current version of FlexiBLAS.

**Usage**

```
flexiblas_version()
```

**Value**

A [package\\_version](#) object.

**See Also**

[flexiblas\\_avail](#), [flexiblas-backends](#), [flexiblas-threads](#)

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