

# Package ‘RcppLbfgsBlaze’

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**Type** Package

**Title** 'L-BFGS' Algorithm Based on 'Blaze' for 'R' and 'Rcpp'

**Version** 0.1.0

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**Maintainer** Ching-Chuan Chen <zw12356@gmail.com>

**URL** <https://github.com/ChingChuan-Chen/RcppLbfgsBlaze>,  
<https://github.com/ChingChuan-Chen/LBFGS-blaze>,  
<https://github.com/ZJU-FAST-Lab/LBFGS-Lite>,  
<https://bitbucket.org/blaze-lib/blaze/src/master/>

**BugReports** <https://github.com/Chingchuan-chen/RcppLbfgsBlaze/issues>

**Description** The 'L-

BFGS' algorithm is a popular optimization algorithm for unconstrained optimization problems.

'Blaze' is a high-performance 'C++' math library for dense and sparse arithmetic.

This package provides a simple interface to the 'L-BFGS' algorithm and allows users to optimize their objective functions with 'Blaze' vectors and matrices in 'R' and 'Rcpp'.

**Depends** R (>= 4.2.0)

**Imports** Rcpp (>= 1.0.0), RcppBlaze (>= 1.0.0)

**LinkingTo** Rcpp, RcppBlaze

**Suggests** tinytest, microbenchmark

**LazyLoad** yes

**Encoding** UTF-8

**License** MIT + file LICENSE

**RoxygenNote** 7.3.1

**NeedsCompilation** yes

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**Repository** CRAN

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RcppLbfgsBlaze-package

*RcppLbfgsBlaze - Rcpp interface to the L-BFGS algorithm with Blaze*

### Description

**RcppLbfgsBlaze** constructs a simple interface to the **L-BFGS** algorithm based on **Blaze** for **R** and **Rcpp**.

### Details

This package provides an implementation of the **L-BFGS** algorithm based on **Blaze** for **R** and **Rcpp**. The **L-BFGS** algorithm is a popular optimization algorithm for unconstrained optimization problems. **Blaze** is a high-performance **C++** math library for dense and sparse arithmetic. The package provides a simple interface to the **L-BFGS** algorithm and allows users to optimize their objective functions with Blaze vectors and matrices in **R** and **Rcpp**.

### Using RcppLbfgsBlaze

The simplest way to get started is to create a skeleton of a package using **RcppLbfgsBlaze**.

The important steps are

1. Include the 'RcppBlaze.h' and 'lbfgs.h' header files.
2. Import Rcpp. LinkingTo Rcpp, RcppBlaze and RcppLbfgsBlaze by adding these lines to the 'DESCRIPTION' file:

```
Imports: Rcpp (>= 1.0.0)
LinkingTo: Rcpp, RcppBlaze (>= 1.0.0), RcppLbfgsBlaze
```

3. Link against the BLAS and LAPACK libraries, by adding following two lines in the 'Makevars' and 'Makevars.win' files:

```
PKG_CXXFLAGS=$(SHLIB_OPENMP_CXXFLAGS)
PKG_LIBS = $(LAPACK_LIBS) $(BLAS_LIBS) $(FLIBS) $(SHLIB_OPENMP_CXXFLAGS)
```

### Author(s)

For RcppLbfgsBlaze: Ching-Chuan Chen Maintainer: Ching-Chuan Chen <zw12356@gmail.com>

## References

1. Blaze project: <https://bitbucket.org/blaze-lib/blaze>.
2. LBFGS-blaze: <https://github.com/ChingChuan-Chen/LBFGS-blaze>
3. LBFGS-Lite: <https://github.com/ZJU-FAST-Lab/LBFGS-Lite>
4. liblbfgs: <https://github.com/chokkan/liblbfgs>

## See Also

Useful links:

- <https://github.com/ChingChuan-Chen/RcppLbfgsBlaze>
- <https://github.com/ChingChuan-Chen/LBFGS-blaze>
- <https://github.com/ZJU-FAST-Lab/LBFGS-Lite>
- <https://bitbucket.org/blaze-lib/blaze/src/master/>
- Report bugs at <https://github.com/Chingchuan-chen/RcppLbfgsBlaze/issues>

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fastLogisticModel

*Logistic Regression Fitting Using L-BFGS Algorithm*

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## Description

This function leverage blaze and LBFGS-Blaze to efficiently fit logistic regression.

## Usage

```
fastLogisticModel(X, y)
```

## Arguments

X	The model matrix.
y	The response vector.

## Value

A list of L-BFGS optimization result.

## Examples

```
X <- matrix(rnorm(5000), 1000)
coef <- runif(5, -3, 3)
y <- sapply(1 / (1 + exp(-X %*% coef)), function(p) rbinom(1, 1, p), USE.NAMES = FALSE)

fit <- fastLogisticModel(X, y)
```

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