

Package ‘RcppXsimd’

July 21, 2025

Type Package

Title Xsimd C++ Header-Only Library Files

Version 7.1.6

Date 2021-01-05

Description This header-only library provides modern, portable C++ wrappers for SIMD intrinsics and parallelized, optimized math implementations (SSE, AVX, NEON, AVX512). By placing this library in this package, we offer an efficient distribution system for Xsimd <<https://github.com/xtensor-stack/xsimd>> for R packages using CRAN.

License BSD_3_clause + file LICENSE

Imports Rcpp (>= 1.0.0)

LinkingTo Rcpp

RoxygenNote 7.1.1

Encoding UTF-8

Suggests testthat

NeedsCompilation yes

Author Marc A. Suchard [aut, cre],
Andrew J. Holbrook [aut],
Observational Health Data Sciences and Informatics [cph],
Johan Mabille [cph, ctb] (author and copyright holder of Xsimd library
under a BSD-3 license),
Sylvain Corlay [cph, ctb] (author and copyright holder of Xsimd library
under a BSD-3 license),
Alexander J. Lee [cph, ctb] (author and copyright holder of
FeatureDetector library under a CC0 1.0 license)

Maintainer Marc A. Suchard <msuchard@ucla.edu>

Repository CRAN

Date/Publication 2021-01-21 23:30:10 UTC

Contents

getAVX512Flags 2

getAVXFlags	2
getNEONFlags	3
getSimdFeatures	3
getSSEFlags	4
RcppXsimd	4
supportsAVX	4
supportsAVX512	5
supportsNEON	6
supportsSSE	7
Index	8

getAVX512Flags	<i>Concatenate supported AVX512 compiler flags for system CPU</i>
----------------	---

Description

Concatenate supported AVX512 compiler flags for system CPU

Usage

getAVX512Flags()

Value

String for compiler flags

getAVXFlags	<i>Concatenate supported AVX compiler flags for system CPU</i>
-------------	--

Description

Concatenate supported AVX compiler flags for system CPU

Usage

getAVXFlags()

Value

String for compiler flags

getNEONFlags	<i>Concatenate supported NEON compiler flags for system CPU</i>
--------------	---

Description

Concatenate supported NEON compiler flags for system CPU

Usage

```
getNEONFlags()
```

Value

String for compiler flags

getSimdFeatures	<i>Poll OS and CPU for SIMD feature support</i>
-----------------	---

Description

Execute CPUID to poll operating system and central processing unit for single instruction, multiple data feature support.

Usage

```
getSimdFeatures()
```

Value

List of operating system (OS) and hardware (HW) feature support; see CPUID Wiki page for flag definitions

References

<https://en.wikipedia.org/wiki/CPUID>

getSSEFlags	<i>Concatenate supported SSE compiler flags for system CPU</i>
-------------	--

Description

Concatenate supported SSE compiler flags for system CPU

Usage

getSSEFlags()

Value

String for compiler flags

RcppXsimd	<i>RcppXsimd: Rcpp wrapper to Xsimd</i>
-----------	---

Description

The RcppXsimd package wrappers the header-only C++ Xsimd library that provides parallelized math implementations using SIMD

supportsAVX	<i>Determine if CPU supports AVX SIMD instructions</i>
-------------	--

Description

Determine if CPU supports AVX SIMD instructions

Usage

supportsAVX()

Value

Boolean

Examples

```
## Not run:

if (supportsAVX()) {
  Sys.setenv(PKG_CPPFLAGS = getAVXFlags())
  Rcpp::sourceCpp(verbose = TRUE, code='
    // [[Rcpp::plugins(cpp14)]]
    // [[Rcpp::depends(RcppXsimd)]]

    #include <Rcpp.h>
    #include "xsimd/xsimd.hpp"

    // [[Rcpp::export]]
    void demoAVX() {
      xsimd::batch<double, 4> a(1.0);
      xsimd::batch<double, 4> b(1.0);
      Rcpp::Rcout << a << " + " << b << " = " << (a + b) << std::endl;
    }')
  demoAVX()
} else {
  message("AVX is not supported")
}

## End(Not run)
```

supportsAVX512

*Determine if CPU supports AVX512 SIMD instructions***Description**

Determine if CPU supports AVX512 SIMD instructions

Usage

```
supportsAVX512()
```

Value

Boolean

Examples

```
## Not run:

if (supportsAVX512()) {
  Sys.setenv(PKG_CPPFLAGS = getAVX512Flags())
  Rcpp::sourceCpp(verbose = TRUE, code='
    // [[Rcpp::plugins(cpp14)]]
```

```

// [[Rcpp::depends(RcppXsimd)]]

#include <Rcpp.h>
#include "xsimd/xsimd.hpp"

// [[Rcpp::export]]
void demoAVX512() {
  xsimd::batch<double, 8> a(1.0);
  xsimd::batch<double, 8> b(1.0);
  Rcpp::Rcout << a << " + " << b << " = " << (a + b) << std::endl;
}
demoAVX512()
} else {
  message("AVX512 is not supported")
}

## End(Not run)

```

 supportsNEON

Determine if CPU supports NEON SIMD instructions

Description

Determine if CPU supports NEON SIMD instructions

Usage

```
supportsNEON()
```

Value

Boolean

Examples

```

## Not run:

if (supportsNEON()) {
  Sys.setenv(PKG_CPPFLAGS = getNEONFlags())
  Rcpp::sourceCpp(verbose = TRUE, code='
    // [[Rcpp::plugins(cpp14)]]
    // [[Rcpp::depends(RcppXsimd)]]

    #include <Rcpp.h>
    #include "xsimd/xsimd.hpp"

    // [[Rcpp::export]]
    void demoNEON() {
      xsimd::batch<double, 2> a(1.0);
      xsimd::batch<double, 2> b(1.0);

```

```

        Rcpp::Rcout << a << " + " << b << " = " << (a + b) << std::endl;
    }')
    demoNEON()
} else {
    message("NEON is not supported")
}

## End(Not run)

```

 supportsSSE

Determine if CPU supports SSE SIMD instructions

Description

Determine if CPU supports SSE SIMD instructions

Usage

```
supportsSSE()
```

Value

Boolean

Examples

```

## Not run:

if (supportsSSE()) {
  Sys.setenv(PKG_CPPFLAGS = getSSEFlags())
  Rcpp::sourceCpp(verbose = TRUE, code='
    // [[Rcpp::plugins(cpp14)]]
    // [[Rcpp::depends(RcppXsimd)]]

    #include <Rcpp.h>
    #include "xsimd/xsimd.hpp"

    // [[Rcpp::export]]
    void demoSSE42() {
      xsimd::batch<double, 2> a(1.0);
      xsimd::batch<double, 2> b(1.0);
      Rcpp::Rcout << a << " + " << b << " = " << (a + b) << std::endl;
    }')
  demoSSE42()
} else {
  message("SSE4.2 is not supported")
}

## End(Not run)

```

Index

`getAVX512Flags`, [2](#)
`getAVXFlags`, [2](#)
`getNEONFlags`, [3](#)
`getSimdFeatures`, [3](#)
`getSSEFlags`, [4](#)

`RcppXsimd`, [4](#)

`supportsAVX`, [4](#)
`supportsAVX512`, [5](#)
`supportsNEON`, [6](#)
`supportsSSE`, [7](#)