Package 'Rcppautodiff'

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Type Package

Title An Interface to the C++ Automatic Differentiation Library 'autodiff'

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URL https://github.com/sn248/Rcppautodiff, https://sn248.github.io/Rcppautodiff/

BugReports https://github.com/sn248/Rcppautodiff/issues

Description Provides an interface from R to the 'autodiff' library <https://autodiff.github.io/>, a modern header-only C++ library for automatic differentiation. Unlike numerical differentiation, automatic differentiation computes derivatives of functions to machine precision without truncation error, using either forward or reverse mode. The 'autodiff' header files are shipped with this package so that other R packages can use them by including 'Rcppautodiff' in the 'LinkingTo' field of their 'DESCRIPTION' file. Example programs demonstrate computing derivatives of single-variable and multi-variable functions, gradient vectors, Jacobian matrices and derivatives with respect to parameters, using 'Rcpp' and 'RcppEigen'.

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Suggests knitr, rmarkdown, tinytest

Encoding UTF-8

Imports Rcpp (>= 1.0.8.3), RcppEigen

LinkingTo Rcpp, RcppEigen

VignetteBuilder knitr

Config/roxygen2/version 8.0.0

NeedsCompilation yes

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`autodiff_single_var` *autodiff_single_var*

Description

Example function to show differentiation w.r.t. a single variable

Usage

```
autodiff_single_var(input)
```

Arguments

`input`	Value of independent variable (must be greater than 0)

Value

A named list with two elements, `value` (the function $f(x) = 1 + x + x^2 + 1/x + \log(x)$ evaluated at `input`) and `derivative` (the derivative of f evaluated at `input`).

Examples

```
res <- autodiff_single_var(2.0)
res$value        # f(2)  = 1 + 2 + 4 + 0.5 + log(2)
res$derivative   # f'(2) = 1 + 4 - 0.25 + 0.5 = 5.25
```

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