

Automatic Differentiation Of Algorithms

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Automatic differentiation of numerical integration algorithms

A survey book focusing on the key relationships and synergies between automatic differentiation (AD) tools and other software tools, such as compilers and parallelizers, as well as their applications. The key objective is to survey the field and present the recent developments. In doing so the topics covered shed light on a variety of perspectives.

(PDF) Automatic differentiation of algorithms

Forward-mode automatic differentiation. The effect is remarkably simple: we just need to initialize $dx = 1$ and $dy = 0$ as the seed values for the algorithm. Hence, by choosing the seeds $dx = 1$ and $dy = 0$, the variable dz will contain the value of the derivative upon completion of the program. Similarly, if we want

Automatic differentiation of algorithms : theory ...

Automatic Differentiation of Algorithms: Theory, Implementation, and Application (Siam Proceedings Series) by Andreas Griewank and George F. Corliss | Jan 1, 1992. 5.0 out of 5 stars 1. Paperback More Buying Choices \$17.72 (7 used offers)

Automatic Differentiation of Algorithms: Theory ...

Publication date 1992 Note "Proceedings of the first SIAM Workshop on Automatic Differentiation, held in Breckenridge, Colorado, January 6-8, 1991"--T.p. verso.

Automatic Differentiation Of Algorithms

Automatic differentiation of algorithms 1. Introduction. 2. Forward accumulation. 3. Wengert lists. 4. Reverse accumulation. 5. Adjoint program construction. 6. Approximating differentiable functions. 7. Iteration and equation solving. 8. Automatic error analysis. 9. Higher derivatives. 10. ...

[1404.7456] Automatic Differentiation of Algorithms for ...

- Automatic Differentiation in Astrodynamical Modeling - Automatic Differentiation of Composite Functions - Automatic Differentiation of Inverse Functions - Automatic Differentiation of Nonlinear AMPL Models - Automatic Differentiation Viewed from Optimal Control Theory - Automatic Evaluation of Higher-Order Partial Derivatives for Nonlocal ...

Automatic differentiation of algorithms - ScienceDirect

In mathematics and computer algebra, automatic differentiation (AD), also called algorithmic differentiation or computational differentiation, is a set of techniques to numerically evaluate the derivative of a function specified by a computer program. AD exploits the fact that every computer program, no matter how complicated, executes a sequence of elementary arithmetic operations (addition, subtraction, multiplication, division, etc.) and elementary functions (exp, log, sin, cos, etc.).

Automatic Differentiation of Algorithms: Theory ...

Automatic differentiation—the mechanical transformation of numeric computer programs to calculate derivatives efficiently and accurately—dates to the origin of the computer age.

Automatic differentiation of algorithms, Journal of ...

Automatic differentiation of prototypical numerical integration algorithms Experimental results with a one-mass oscillator Application to a technical system Conclusions Automatic differentiation of numerical integration algorithms after Peter Eberhard, Christian Bischof Zofia Mączyńska 21. August 2006 Zofia Mączyńska Numerical integration algorithms

Automatic Differentiation of Algorithms for Machine ...

Automatic differentiation (AD) evaluates derivatives of any function specified by computer programs [1, 2] by propagating derivatives of primitive operations via chain rules. It is different from ...

AD Tools for C/C++ - Automatic differentiation

Automatic Differentiation (AD) is a maturing computational technology and has become a mainstream tool used by practicing scientists and computer engineers. The rapid advance of hardware computing power and AD tools has enabled practitioners to quickly generate derivative-enhanced versions of their code for a broad range of applications in applied research and development.

(PDF) Automatic differentiation of algorithms | Bruce ...

Automatic Differentiation of Algorithms: Theory, Implementation, and Application (Andreas Griewank and George F. Corliss, eds.)

Automatic Differentiation of Algorithms | SpringerLink

Automatic Differentiation of Algorithms for Machine Learning. Reverse mode automatic differentiation both antedates and generalizes the method of backwards propagation of errors used in machine learning. Despite this, practitioners in a variety of fields, including machine learning, have been little influenced by automatic differentiation....

Automatic differentiation - Wikipedia

Automatic Differentiation (AD) is a maturing computational technology and has become a mainstream tool used by practicing scientists and computer engineers. The rapid advance of hardware computing power and AD tools has enabled practitioners to quickly generate derivative-enhanced versions of their code for a broad range of applications in applied research and development.

Automatic Differentiation of Algorithms: From Simulation ...

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Automatic Differentiation of Algorithms - From Simulation ...

ADOL-C: A Package for the Automatic Differentiation of Algorithms Written in C/C++; this is the updated version of the paper published in ACM TOMS, vol. 22(2) June 1996, pp. 131-167. Algor. 755 T. Coleman and G. Jonsson, The Efficient Computation of Structured Gradients using Automatic Differentiation, Technical Report CTC97TR272, Cornell 1997.

Reverse-mode automatic differentiation: a tutorial ...

Automatic differentiation of algorithms Bartholomew-Biggs, Michael; Brown, Steven; Christianson, Bruce; Dixon, Laurence 2000-12-01 00:00:00 We introduce the basic notions of automatic differentiation, describe some extensions which are of interest in the context of nonlinear optimization and give some illustrative examples.

ADOL-C

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Algorithm 755: ADOL-C: a package for the automatic ...

Alphabetical List of tools. The Sacado package provides automatic differentiation tools for C++ applications and is part of the larger Trilinos framework. It provides both forward and reverse modes, and leverages expression templates in the forward mode and a simplified tape data structure in the reverse mode for improved efficiency.