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MERLIN-3.1.1. A new version of the Merlin optimization environment ☆

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Abstract

We present a new version of the Merlin optimization package that contains an interface routine enabling the use of Merlin as a non-interactive local optimizer, and a capability to search for the global minimum when the objective function is multimodal. The present package also contains the Merlin Control Language compiler, which previously was distributed as a separate program. Additional features are a new automatic installation procedure and a convenient running script.

Program summary

Title of program: MERLIN-3.1.1
Catalogue identifier: ADSV
Program summary URL: http://cpc.cs.qub.ac.uk/summaries/ADSV
Program obtainable from: CPC Program Library, Queen's University of Belfast, N. Ireland.
Catalogue identifier of previous version: ADHQ [1], ADHR [2]
Authors of the original program: D.G. Papageorgiou, I.N. Demetropoulos and I.E. Lagaris
Does the new version supersede the original program: Yes
Computer for which the new version is designed and others on which it has been tested: Designed to be portable to any machine. Tested on SGI running IRIX, SUN running Solaris, INTEL and AMD based Linux machines, employing several compilers, CYGWIN environment under Microsoft Windows.
Installation: University of Ioannina, Greece.
Programming language used: ANSI Fortran-77
Memory required to execute with typical data: Approximately $O(n^2)$ words, where n is the number of variables.
No. of bits in a word: 64
No. of processors used: 1
Has the code been vectorized or parallelized?: No
No. of bytes in distributed program, including test data, etc.: 704254

☆ This paper and its associated computer program are available via the Computer Phisics Communications homepage on ScienceDirect (http://www.sciencedirect.com/science/journal/00104655).

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No. of lines in distributed program, including test data, etc.: 122294
Distribution format: gzipped tar file.
Reasons for the new version: Responding to user feedback we enhanced the Merlin package so as to simplify the installation and execution procedures and provide new facilities.
Summary of revisions: The new features are the following.

(1) We have automated the installation procedure for Unix systems by using the "make" facility. On non-Unix systems one may proceed with the instructions included in the previous version (Merlin 3.0). The new installation procedure has also been tested successfully in the "CYGWIN" [3] environment under Microsoft Windows. Installation instructions can be found in the new distribution.
(2) We have added the "run-merlin" Unix script that simplifies the compilation-linking-execution sequence. For instance it arranges automatically for the addition of the necessary "dummy" routines to satisfy the linker. It also simplifies the insertion of the user-plugins.
(3) We have added an interface routine (SUBROUTINE OPTIMA) that permits a user to call from his own program the whole Merlin environment as a common library minimization routine. We also added two new commands, command PRICE that implements a global optimization algorithm and command CHKMIN that checks if a point is a true minimum or not.
(4) Various bug-fixes and improvements.
(5) The Merlin's control language compiler is also updated and included.

Restrictions on the complexity of the problem: The only restriction is set by the available memory of the hardware configuration.
Typical running time: Depending on the objective function.
References: [1] D.G. Papageorgiou, I.N. Demetropoulos, I.E. Lagaris, Merlin-3.0. A multidimensional optimization environment, Comput. Phys. Commun. 109 (1998) 227–249.
[2] D.G. Papageorgiou, I.N. Demetropoulos, I.E. Lagaris, The Merlin Control Language for strategic optimization, Comput. Phys. Commun. 109 (1998) 250–275.
[3] http://www.cygwin.com/.
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