

NAME

`cgd/sdcgd` – CUTer interface with the CG_DESCENT solver.

SYNOPSIS

```
[sd]cgd [-decode] [-n] [-h] [-k] [-r] [-o 0|1] [-l secs] [-f] [-b] [-a 1|2] [-show] [[-param name=value[,name=value...]] [-force]] [-debug] [-Lpath/to/lib] [--blas keyword] [--lapack keyword] [problem[.SIF]]
```

DESCRIPTION

`sdcgd` interfaces the CG_DESCENT solver with the CUTer tools and SIF-encoded problems. `sdcgd` applies the SIF decoder to the problem `problem.SIF` to produce the OUTSDIF.d file and the problem-dependant Fortran subroutines. If `problem.SIF` has already been decoded, the script `cgd` may be run by itself. CG_DESCENT minimizes an unconstrained objective using a nonlinear conjugate-gradient method.

`sdcgd` is only included for backward compatibility with earlier versions of CUTE, and simply calls `cgd` with the `-decode` flag.

`cgd` sets the environment and calls `runpackage` to link all the needed libraries and modules for the CG_DESCENT solver to solve the problem decoded from the SIF file and generates the executable.

[sd]cgd Options

You can start `[sd]cgd` with the following options:

-decode

Applies the SIF decoder to the problem `problem.SIF` to produce the OUTSDIF.d file and the problem-dependant Fortran subroutines. It is redundant to call `sdcgd` with the `-decode` flag.

-n Use the load module if it already exists. Compiling a new load module is the default.

-h Print a short help message.

-k Keep the generated executable after use. May be useful when solving a particular problem with the same solver with different parameters. Deleting the executable after use is the default.

-r Discourage recompilation of the test problem. Default is to recompile object files.

-o *0|1*

Regulates the output level of `[sd]cgd`. Verbose mode is **-o 1**, silent mode is **-o 0**. Silent mode is the default.

-l *secs*

sets a limit of `secs` second on CG_DESCENT runtime. Unlimited cputime is the default.

-f Use automatic differentiation in Forward mode

-b Use automatic differentiation in Backward mode

-a *1|2*

-a 1 uses the older HSL automatic differentiation package AD01 and **-a 2** uses the newer HSL automatic differentiation package AD02. **-a 2** is the default.

-show

displays possible parameter settings for `problem[.SIF]`. Other options are ignored.

-param

cast `problem[.SIF]` against explicit parameter settings. Several parameter settings may be given as a comma-separated list following `-param` or using several `-param` flags. Use `sifdec -show problem` to view possible settings. If a setting is not allowed in the SIF file, no action is taken unless `-force` is present.

-force

Forces the setting of the parameters named using `-param` to the given values, even if those values are not predefined in the SIF file.

-Lpath/to/lib

This option is passed directly to the linker and causes the path *path/to/lib* to be searched for libraries.

--blas keyword

Overrides usage of the default *linpack* library packaged with CUTER. Instead, use the BLAS library specified by *keyword*. The keyword *keyword* has one of two forms. The first, *-lmyblas* causes the linker to search for BLAS subprograms in the *libmyblas.a* library. The second, *none*, causes the linker to skip inclusion of any external BLAS. Use the first option if an optimized BLAS library is available on the host system, e.g., the ATLAS BLAS. The second option is useful for packages which already include the necessary BLAS subprograms.

--lapack keyword

Overrides usage of the default *linpack* library packaged with CUTER. Instead, use the LAPACK library specified by *keyword*. The keyword *keyword* has one of two forms. The first, *-lmylapack* causes the linker to search for LAPACK subroutines in the *libmylapack.a* library. The second, *none*, causes the linker to skip inclusion of any external LAPACK. Use the first option if an optimized LAPACK library is available on the host system. The second option is useful for packages which already include the necessary LAPACK subprograms.

problem

problem.SIF is the name of the file containing the SIF information on the problem to be solved.

ENVIRONMENT

CUTER

Home directory for CUTER

MYCUTER

Home directory of the installed CUTER distribution.

MASTSIF

A pointer to the directory containing the CUTER problems collection. If this variable is not set, the current directory is searched for *problem.SIF*. If it is set, the current directory is searched first, and if *problem.SIF* is not found there, \$MASTSIF is searched.

AUTHORS

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NOTES

CG_DESCENT was written by William Hager and Hongchao Zhang (U. Florida).

SEE ALSO

CUTER (and SifDec): A Constrained and Unconstrained Testing Environment, revisited,

N.I.M. Gould, D. Orban and Ph.L. Toint, ACM TOMS, **29**:4, pp.373-394, 2003.

CUTE: Constrained and Unconstrained Testing Environment,

I. Bongartz, A.R. Conn, N.I.M. Gould and Ph.L. Toint, ACM TOMS, **21**:1, pp.123-160, 1995.

CG_DESCENT, A conjugate gradient method with guaranteed descen,

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sifdecode(1), gen(1), cgdma(3).