C interfaces to GALAHAD SEC

Jari Fowkes and Nick Gould
STFC Rutherford Appleton Laboratory
Sat Mar 26 2022

1 GALAHAD C package sec **1**

1.1 Introduction 1

1.1.1 Purpose 1

1.1.2 Authors 1

1.1.3 Originally released 1

2 File Index **3**

2.1 File List 3

3 File Documentation **5**

3.1 galahad_sec.h File Reference 5

3.1.1 Data Structure Documentation 5

3.1.1.1 struct sec_control_type 5

3.1.1.2 struct sec_inform_type 5

Index **7**

Chapter 1

GALAHAD C package sec

1.1 Introduction

1.1.1 Purpose

Build and update dense BFGS and SR1 secant approximations to a Hessian.

Currently, only the control and inform parameters are exposed; these are provided and used by other GALAHAD packages with C interfaces.

1.1.2 Authors

N. I. M. Gould, STFC-Rutherford Appleton Laboratory, England.

C interface, additionally J. Fowkes, STFC-Rutherford Appleton Laboratory.

1.1.3 Originally released

May 2008, C interface January 2022.

Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

galahad_sec.h 5

Chapter 3

File Documentation

3.1 galahad_sec.h File Reference

```
#include <stdbool.h>
#include "galahad_precision.h"
```

Data Structures

- struct sec_control_type
- struct sec_inform_type

3.1.1 Data Structure Documentation

3.1.1.1 struct sec_control_type

control derived type as a C struct

Data Fields

bool	f_indexing	use C or Fortran sparse matrix indexing
int	error	error and warning diagnostics occur on stream error
int	out	general output occurs on stream out
int	print_level	the level of output required. <= 0 gives no output, >= 1 warning message
real_wp_	h_initial	the initial Hessian approximation will be h_initial $* I$
real_wp_	update_skip_tol	an update is skipped if the resulting matrix would have grown too much
char	prefix[31]	all output lines will be prefixed by .prefix(2:LEN(TRIM(.prefix))-1) where .prefix contains the required string enclosed in quotes, e.g. "string" or 'string'

3.1.1.2 struct sec_inform_type

inform derived type as a C struct

Data Fields

int	status	return status. Possible valuesa are: • 0 successful return • -85 an update is inappropriate and has been skipped

Index

galahad_sec.h, 5

sec_control_type, 5
sec_inform_type, 5