libgencurvefit

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Data Structure Documentation

3.1 gencurvefitOptions Struct Reference

`#include <gencurvefit.h>`

Data Fields

- unsigned int iterations
- unsigned int popsizeMultiplier
- double k_m
- double recomb
- double tolerance
- unsigned int strategy
- double temp
- updatefunction updatefun
- unsigned int updatefrequency
- int seed
- int useinitialguesses

3.1.1 Field Documentation

3.1.1.1 unsigned int iterations

3.1.1.2 double k_m

3.1.1.3 unsigned int popsizeMultiplier

3.1.1.4 double recomb

3.1.1.5 int seed

3.1.1.6 unsigned int strategy

3.1.1.7 double temp

3.1.1.8 double tolerance

3.1.1.9 unsigned int updatefrequency

3.1.1.10 updatefunction updatefun

3.1.1.11 int useinitialguesses

The documentation for this struct was generated from the following file:

- /Users/andrew/Documents/Andy/programming/libgencurvefit/src/gencurvefit.h

3.2 mt19937p Struct Reference

`#include <mt19937p.h>`

Data Fields

- unsigned long mt [N]
- int mti
- unsigned long mag01 [2]

3.2.1 Field Documentation

3.2.1.1 unsigned long mag01[2]

3.2.1.2 unsigned long mt[N]

3.2.1.3 int mti

The documentation for this struct was generated from the following file:

- /Users/andrew/Documents/Andy/programming/libgencurvefit/src/mt19937p.h

Chapter 4

File Documentation

4.1 /Users/andrew/Documents/Andy/programming/libgencurvefit/src/errorEstima File Reference

```
#include "gencurvefit.h"
#include "math.h"
#include "stdlib.h"
#include "string.h"
```

Defines

- #define TINY 1.0e-20

Functions

- int getCovarianceMatrix (double **covarianceMatrix, void *userdata, fitfunction fitfun, double cost, double *coefs, int numcoefs, unsigned int *holdvector, double *ydata, double *edata, long datapoints, double **xdata, int numDataDims, int unitSD)

4.1.1 Define Documentation

4.1.1.1 #define TINY 1.0e-20

4.1.2 Function Documentation

4.1.2.1 int getCovarianceMatrix (double ** *covarianceMatrix*, void * *userdata*, fitfunction *fitfun*, double *cost*, double * *coefs*, int *numcoefs*, unsigned int * *holdvector*, double * *ydata*, double * *edata*, long *datapoints*, double ** *xdata*, int *numDataDims*, int *unitSD*)

4.2 /Users/andrew/Documents/Andy/programming/libgencurvefit/src/gencurvefit.h File Reference

```
#include "gencurvefit.h"
#include "mt19937p.h"
#include <stdlib.h>
#include <time.h>
#include "math.h"
#include "string.h"
```

Typedefs

- typedef struct waveStats waveStats
- typedef struct genoptStruct genoptStruct

Functions

- void * malloc2d (int ii, int jj, int sz)
- double gnoise (struct mt19937p *myMT19937, double sd)
- int genetic_optimisation (fitfunction fitfun, costfunction costfun, unsigned int numcoefs, double *coefs, const unsigned int *holdvector, const double **limits, long datapoints, const double *ydata, const double **xdata, const double *edata, unsigned int numDataDims, double *chi2, const gencurvefitOptions *gco, void *userdata)
- double chisquared (void *userdata, const double *params, unsigned int numcoefs, const double *data, const double *model, const double *errors, long datapoints)
- double robust (void *userdata, const double *params, unsigned int numcoefs, const double *data, const double *model, const double *errors, long datapoints)

4.2.1 Typedef Documentation

4.2.1.1 typedef struct genoptStruct genoptStruct

4.2.1.2 typedef struct waveStats waveStats

4.2.2 Function Documentation

4.2.2.1 double chisquared (void * *userdata*, const double * *params*, unsigned int *numcoefs*, const double * *data*, const double * *model*, const double * *errors*, long *datapoints*)

4.2.2.2 int genetic_optimisation (fitfunction *fitfun*, costfunction *costfun*, unsigned int *numcoefs*, double * *coefs*, const unsigned int * *holdvector*, const double ** *limits*, long *datapoints*, const double * *ydata*, const double ** *xdata*, const double * *edata*, unsigned int *numDataDims*, double * *chi2*, const gencurvefitOptions * *gco*, void * *userdata*)

4.2.2.3 double gnoise (struct mt19937p * *myMT19937*, double *sd*)

4.2.2.4 void* malloc2d (int *ii*, int *jj*, int *sz*)

4.2.2.5 double robust (void * *userdata*, const double * *params*, unsigned int *numcoefs*, const double * *data*, const double * *model*, const double * *errors*, long *datapoints*)

4.3 /Users/andrew/Documents/Andy/programming/libgencurvefit/src/gencurvefit.h File Reference

Data Structures

- struct gencurvefitOptions

Defines

- #define NO_MEMORY -1
- #define INCORRECT_LIMITS -2
- #define HOLDVECTOR_COEFS_MISMATCH -3
- #define NO_VARYING_PARAMS -4
- #define WRONG_NUMBER_OF_PARAMS -5
- #define COEFS_MUST_BE_WITHIN_LIMITS -6
- #define PROBLEM_CALCULATING_COVARIANCE -7
- #define PI 3.14159265358979323846

Typedefs

- typedef int(* fitfunction)(void *userdata, const double *coefs, unsigned int numcoefs, double *model, const double **xdata, long datapoints, unsigned int numDataDims)
- typedef double(* costfunction)(void *userdata, const double *params, unsigned int numcoefs, const double *data, const double *model, const double *errors, long datapoints)
- typedef int(* updatefunction)(void *userdata, const double *coefs, unsigned int numcoefs, unsigned int iterations, double cost, unsigned int updatetime, double convergenceNumber)
- typedef struct gencurvefitOptions gencurvefitOptions

Functions

- void * malloc2d (int ii, int jj, int sz)

- int genetic_optimisation (fitfunction fitfun, costfunction costfun, unsigned int numcoefs, double *coefs, const unsigned int *holdvector, const double **limits, long datapoints, const double *ydata, const double **xdata, const double *edata, unsigned int numDataDims, double *chi2, const gencurvefitOptions *gco, void *userdata)

- int getCovarianceMatrix (double **covarianceMatrix, void *userdata, fitfunction fitfun, double cost, double *coefs, int numcoefs, unsigned int *holdvector, double *ydata, double *edata, long datapoints, double **xdata, int numDataDims, int unitSD)

- double chisquared (void *userdata, const double *params, unsigned int numcoefs, const double *data, const double *model, const double *errors, long datapoints)

- double robust (void *userdata, const double *params, unsigned int numcoefs, const double *data, const double *model, const double *errors, long datapoints)

4.3.1 Define Documentation

4.3.1.1 #define COEFS_MUST_BE_WITHIN_LIMITS -6

4.3.1.2 #define HOLDVECTOR_COEFS_MISMATCH -3

4.3.1.3 #define INCORRECT_LIMITS -2

4.3.1.4 #define NO_MEMORY -1

4.3.1.5 #define NO_VARYING_PARAMS -4

4.3.1.6 #define PI 3.14159265358979323846

4.3.1.7 #define PROBLEM_CALCULATING_COVARIANCE -7

4.3.1.8 #define WRONG_NUMBER_OF_PARAMS -5

4.3.2 Typedef Documentation

4.3.2.1 typedef double(∗ costfunction)(void ∗userdata, const double ∗params, unsigned int numcoefs, const double ∗data, const double ∗model, const double ∗errors, long datapoints)

4.3.2.2 typedef int(∗ fitfunction)(void ∗userdata, const double ∗coefs, unsigned int numcoefs, double ∗model, const double ∗∗xdata, long datapoints, unsigned int numDataDims)

4.3.2.3 typedef struct gencurvefitOptions gencurvefitOptions

4.3.2.4 typedef int(∗ updatefunction)(void ∗userdata, const double ∗coefs, unsigned int numcoefs, unsigned int iterations, double cost, unsigned int updatetime, double convergenceNumber)

4.3.3 Function Documentation

4.3.3.1 double chisquared (void ∗ *userdata,* const double ∗ *params,* unsigned int *numcoefs,* const double ∗ *data,* const double ∗ *model,* const double ∗ *errors,* long *datapoints*)

4.3.3.2 int genetic_optimisation (fitfunction *fitfun,* costfunction *costfun,* unsigned int *numcoefs,* double ∗ *coefs,* const unsigned int ∗ *holdvector,* const double ∗∗ *limits,* long *datapoints,* const double ∗ *ydata,* const double ∗∗ *xdata,* const double ∗ *edata,* unsigned int *numDataDims,* double ∗ *chi2,* const gencurvefitOptions ∗ *gco,* void ∗ *userdata*)

4.3.3.3 int getCovarianceMatrix (double ∗∗ *covarianceMatrix,* void ∗ *userdata,* fitfunction *fitfun,* double *cost,* double ∗ *coefs,* int *numcoefs,* unsigned int ∗ *holdvector,* double ∗ *ydata,* double ∗ *edata,* long *datapoints,* double ∗∗ *xdata,* int *numDataDims,* int *unitSD*)

4.3.3.4 void∗ malloc2d (int *ii,* int *jj,* int *sz*)

4.3.3.5 double robust (void ∗ *userdata,* const double ∗ *params,* unsigned int *numcoefs,* const double ∗ *data,* const double ∗ *model,* const double ∗ *errors,* long *datapoints*)

4.4 /Users/andrew/Documents/Andy/programming/libgencurvefit/src/mt19937p.c File Reference

```
#include "mt19937p.h"
```

Defines

- #define N 624
- #define M 397
- #define MATRIX_A 0x9908b0df
- #define UPPER_MASK 0x80000000
- #define LOWER_MASK 0x7fffffff
- #define TEMPERING_MASK_B 0x9d2c5680
- #define TEMPERING_MASK_C 0xefc60000
- #define TEMPERING_SHIFT_U(y) (y >> 11)
- #define TEMPERING_SHIFT_S(y) (y << 7)
- #define TEMPERING_SHIFT_T(y) (y << 15)
- #define TEMPERING_SHIFT_L(y) (y >> 18)

Functions

- void sgenrand (unsigned long seed, struct mt19937p *config)
- double genrand (struct mt19937p *config)
- unsigned long genrand_int (struct mt19937p *config)

4.4.1 Define Documentation

4.4.1.1 #define LOWER_MASK 0x7fffffff

4.4.1.2 #define M 397

4.4.1.3 #define MATRIX_A 0x9908b0df

4.4.1.4 #define N 624

4.4.1.5 #define TEMPERING_MASK_B 0x9d2c5680

4.4.1.6 #define TEMPERING_MASK_C 0xefc60000

4.4.1.7 #define TEMPERING_SHIFT_L(*y*) (y >> 18)

4.4.1.8 #define TEMPERING_SHIFT_S(*y*) (y << 7)

4.4.1.9 #define TEMPERING_SHIFT_T(*y*) (y << 15)

4.4.1.10 #define TEMPERING_SHIFT_U(*y*) (y >> 11)

4.4.1.11 #define UPPER_MASK 0x80000000

4.4.2 Function Documentation

4.4.2.1 double genrand (struct mt19937p * *config*)

4.4.2.2 unsigned long genrand_int (struct mt19937p * *config*)

4.4.2.3 void sgenrand (unsigned long *seed,* struct mt19937p * *config*)

4.5 /Users/andrew/Documents/Andy/programming/libgencurvefit/src/mt19937p.h File Reference

Data Structures

- struct mt19937p

Defines

- #define MATRIX_A 0x9908b0df
- #define N 624

Functions

- void sgenrand (unsigned long seed, struct mt19937p *config)
- double genrand (struct mt19937p *config)
- unsigned long genrand_int (struct mt19937p *config)

4.5.1 Define Documentation

4.5.1.1 #define MATRIX_A 0x9908b0df

4.5.1.2 #define N 624

4.5.2 Function Documentation

4.5.2.1 double genrand (struct mt19937p * *config*)

4.5.2.2 unsigned long genrand_int (struct mt19937p * *config*)

4.5.2.3 void sgenrand (unsigned long *seed,* struct mt19937p * *config*)

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