ATSuite C++

v1.0

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Here is a list of all files with brief descriptions:

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File Documentation

2.1 /Users/atantet/PhD/dev/ATSuite/cpp/atgraph.hpp File Reference

```
#include <cstdio>
#include <cstdlib>
#include <stack>
#include <vector>
#include <iostream>
#include <igraph/igraph.h>
#include <Eigen/Dense>
#include <Eigen/Sparse>
#include <atio.hpp>
```

Typedefs

- typedef Eigen::SparseMatrix< double > SpMat
- typedef Eigen::SparseMatrix< double, RowMajor > SpMatCSR
- typedef Eigen::Triplet< double > Tri

Functions

- int pajek2igraph (FILE *f, igraph_t *dst_graph)
- int pajek2igraphNoVertices (FILE *f, igraph_t *dst_graph, int vertex_id0)
- int pajek2igraphSym (FILE *f, igraph_t *dst_graph)
- SpMat * pajek2EigenSparse (FILE *f)
- void EigenSparse2Pajek (FILE *f, SpMatCSR *P)
- SpMat * igraph2EigenSparse (igraph_t *srcGraph)
- int array2igraph (FILE *f, int N, igraph_t *dst_graph)
- void addCol2Col (SpMat *T, int j_src, int j_dst)
- void addCol2ColTriplet (SpMat *T, int jSrc, int jDst)
- void addRow2Row (SpMat *T, int i_src, int i_dst)
- void addRow2RowTriplet (SpMat *T, int iSrc, int iDst)
- void addRow2RowTriplet (SpMat *T, int iSrc, int iDst, SpMatCSR *TCSR)
- void scalProdInner (SpMat *T, int outer, double coef)
- void scalProdOuter (SpMat *T, int inner, double coef)
- double getModularity (SpMat *T)

2.1.1 Typedef Documentation

2.1.1.1 typedef Eigen::SparseMatrix<double> SpMat

2.1.1.2 typedef Eigen::SparseMatrix<double, RowMajor> SpMatCSR

2.1.1.3 typedef Eigen::Triplet<double> Tri

2.1.2 Function Documentation

2.1.2.1 void addCol2Col (SpMat ∗ *T,* int *j_src,* int *j_dst*)

2.1.2.2 void addCol2ColTriplet (SpMat ∗ *T,* int *jSrc,* int *jDst*)

2.1.2.3 void addRow2Row (SpMat ∗ *T,* int *i_src,* int *i_dst*)

2.1.2.4 void addRow2RowTriplet (SpMat ∗ *T,* int *iSrc,* int *iDst*)

2.1.2.5 void addRow2RowTriplet (SpMat ∗ *T,* int *iSrc,* int *iDst,* SpMatCSR ∗ *TCSR*)

2.1.2.6 int array2igraph (FILE ∗ *f,* int *N,* igraph_t ∗ *dst_graph*)

2.1.2.7 void EigenSparse2Pajek (FILE ∗ *f,* SpMatCSR ∗ *P*)

2.1.2.8 double getModularity (SpMat ∗ *T*)

2.1.2.9 SpMat∗ igraph2EigenSparse (igraph_t ∗ *srcGraph*)

2.1.2.10 SpMat∗ pajek2EigenSparse (FILE ∗ *f*)

2.1.2.11 int pajek2igraph (FILE ∗ *f,* igraph_t ∗ *dst_graph*)

2.1.2.12 int pajek2igraphNoVertices (FILE ∗ *f,* igraph_t ∗ *dst_graph,* int *vertex_id0*)

2.1.2.13 int pajek2igraphSym (FILE ∗ *f,* igraph_t ∗ *dst_graph*)

2.1.2.14 void scalProdInner (SpMat ∗ *T,* int *outer,* double *coef*)

2.1.2.15 void scalProdOuter (SpMat ∗ *T,* int *inner,* double *coef*)

2.2 /Users/atantet/PhD/dev/ATSuite/cpp/atgraph_alglib.hpp File Reference

```
#include <cstdio>
#include <cstdlib>
#include <stack>
#include <vector>
#include <iostream>
#include <igraph/igraph.h>
#include "linalg.h"
```

Macros

- #define plog2p(x) ((x) $>$ 0.0 ? (x) $*$ log(x) / log(2) : 0.0)

Typedefs

- typedef sparsematrix spAlg

Functions

- spAlg $*$ pajek2HashTable (FILE $*$f)
- spAlg $*$ igraph2HashTable (igraph_t $*$srcGraph)
- void setConstant (real_1d_array $*$v, double constant)
- void setConstant (integer_1d_array $*$v, int constant)
- void setLinSpaced (real_1d_array $*$v, double low, double high)
- void setLinSpaced (integer_1d_array $*$v, int low, int high)
- void setRow (real_2d_array $*$a, real_1d_array $*$row, int i)
- void setRow (integer_2d_array $*$a, integer_1d_array $*$row, int i)
- void setCol (real_2d_array $*$a, real_1d_array $*$col, int j)
- void setCol (integer_2d_array $*$a, integer_1d_array $*$col, int j)
- double getMin (real_1d_array $*$v, int $*$arg)
- int getMin (integer_1d_array $*$v, int $*$arg)
- int getNNZ (spAlg $*$s)
- double entropy (real_1d_array $*$dist)
- double entropyRate (spAlg $*$T, real_1d_array $*$dist)

2.2.1 Macro Definition Documentation

2.2.1.1 #define plog2p(*x*) ((x) $>$ 0.0 ? (x) $*$ log(x) / log(2) : 0.0)

2.2.2 Typedef Documentation

2.2.2.1 typedef sparsematrix spAlg

2.2.3 Function Documentation

2.2.3.1 double entropy (real_1d_array $*$ *dist*)

2.2.3.2 double entropyRate (spAlg $*$ *T*, real_1d_array $*$ *dist*)

2.2.3.3 double getMin (real_1d_array $*$ *v*, int $*$ *arg*)

2.2.3.4 int getMin (integer_1d_array $*$ *v*, int $*$ *arg*)

2.2.3.5 int getNNZ (spAlg $*$ *s*)

2.2.3.6 spAlg$*$ igraph2HashTable (igraph_t $*$ *srcGraph*)

2.2.3.7 spAlg∗ pajek2HashTable (FILE ∗ *f*)

2.2.3.8 void setCol (real_2d_array ∗ *a,* real_1d_array ∗ *col,* int *j*)

2.2.3.9 void setCol (integer_2d_array ∗ *a,* integer_1d_array ∗ *col,* int *j*)

2.2.3.10 void setConstant (real_1d_array ∗ *v,* double *constant*)

2.2.3.11 void setConstant (integer_1d_array ∗ *v,* int *constant*)

2.2.3.12 void setLinSpaced (real_1d_array ∗ *v,* double *low,* double *high*)

2.2.3.13 void setLinSpaced (integer_1d_array ∗ *v,* int *low,* int *high*)

2.2.3.14 void setRow (real_2d_array ∗ *a,* real_1d_array ∗ *row,* int *i*)

2.2.3.15 void setRow (integer_2d_array ∗ *a,* integer_1d_array ∗ *row,* int *i*)

2.3 /Users/atantet/PhD/dev/ATSuite/cpp/atio.hpp File Reference

```
#include <cstdlib>
#include <cstdio>
#include <vector>
#include <Eigen/Dense>
#include <Eigen/Sparse>
#include "arlnsmat.h"
#include "arlssym.h"
#include <gsl/gsl_vector.h>
#include <gsl/gsl_matrix.h>
```

Typedefs

- typedef Eigen::SparseMatrix< double, Eigen::ColMajor > SpMatCSC
- typedef Eigen::SparseMatrix< double, Eigen::RowMajor > SpMatCSR
- typedef Eigen::Triplet< double > Tri

Functions

- void Eigen2Pajek (FILE ∗, SpMatCSR ∗)
- void Eigen2Compressed (FILE ∗, SpMatCSC ∗)
- void Eigen2Compressed (FILE ∗, SpMatCSR ∗)
- SpMatCSC ∗ pajek2Eigen (FILE ∗)
- ARluNonSymMatrix< double, double > ∗ pajek2AR (FILE ∗)
- ARluNonSymMatrix< double, double > ∗ CSC2AR (FILE ∗)
- ARluNonSymMatrix< double, double > ∗ Eigen2AR (SpMatCSC ∗)
- ARluNonSymMatrix< double, double > ∗ Eigen2AR (SpMatCSR ∗)
- ARluSymMatrix< double > ∗ Eigen2ARSym (SpMatCSC ∗)
- ARluSymMatrix< double > ∗ Eigen2ARSym (SpMatCSR ∗)
- ARluNonSymMatrix< double, double > ∗ Compressed2AR (FILE ∗)
- SpMatCSR ∗ Compressed2Eigen (FILE ∗)
- gsl_matrix ∗ Compressed2EdgeList (FILE ∗)
- void Compressed2EdgeList (FILE ∗, FILE ∗)
- SpMatCSR ∗ CSC2CSR (SpMatCSC ∗T)
- SpMatCSC ∗ CSR2CSC (SpMatCSR ∗T)
- vector< Tri > Eigen2Triplet (SpMatCSC ∗)
- vector< Tri > Eigen2Triplet (SpMatCSR ∗)
- void fprintfEigen (FILE ∗, SpMatCSR ∗)
- size_t lineCount (FILE ∗)
- void fprintfEigen (FILE ∗fp, SpMatCSR ∗T, const char ∗format)

2.3.1 Typedef Documentation

2.3.1.1 typedef Eigen::SparseMatrix<double, Eigen::ColMajor> **SpMatCSC**

2.3.1.2 typedef Eigen::SparseMatrix<double, Eigen::RowMajor> **SpMatCSR**

2.3.1.3 typedef Eigen::Triplet<double> **Tri**

2.3.2 Function Documentation

2.3.2.1 ARluNonSymMatrix< double, double > ∗ Compressed2AR (FILE ∗ *f*)

2.3.2.2 gsl_matrix ∗ Compressed2EdgeList (FILE ∗ *f*)

2.3.2.3 void Compressed2EdgeList (FILE ∗ *src,* FILE ∗ *dst*)

2.3.2.4 **SpMatCSR** ∗ Compressed2Eigen (FILE ∗ *f*)

2.3.2.5 ARluNonSymMatrix< double, double > ∗ CSC2AR (FILE ∗ *f*)

2.3.2.6 **SpMatCSR** ∗ CSC2CSR (**SpMatCSC** ∗ *T*)

2.3.2.7 **SpMatCSC** ∗ CSR2CSC (**SpMatCSR** ∗ *T*)

2.3.2.8 ARluNonSymMatrix< double, double > ∗ Eigen2AR (SpMatCSC ∗ *TEigen*)

2.3.2.9 ARluNonSymMatrix< double, double > ∗ Eigen2AR (SpMatCSR ∗ *TEigenCSR*)

2.3.2.10 ARluSymMatrix< double > ∗ Eigen2ARSym (SpMatCSC ∗ *TEigen*)

2.3.2.11 ARluSymMatrix< double > ∗ Eigen2ARSym (SpMatCSR ∗ *TEigenCSR*)

2.3.2.12 void Eigen2Compressed (FILE ∗ *f*, SpMatCSC ∗ *P*)

2.3.2.13 void Eigen2Compressed (FILE ∗ *f*, SpMatCSR ∗ *P*)

2.3.2.14 void Eigen2Pajek (FILE ∗ *f*, SpMatCSR ∗ *P*)

2.3.2.15 vector< Tri > Eigen2Triplet (SpMatCSC ∗ *T*)

2.3.2.16 vector< Tri > Eigen2Triplet (SpMatCSR ∗ *T*)

2.3.2.17 void fprintfEigen (FILE ∗ , SpMatCSR ∗)

2.3.2.18 void fprintfEigen (FILE ∗ *fp*, SpMatCSR ∗ *T*, const char ∗ *format*)

2.3.2.19 size_t lineCount (FILE ∗ *fp*)

2.3.2.20 ARluNonSymMatrix< double, double > ∗ pajek2AR (FILE ∗ *f*)

2.3.2.21 SpMatCSC ∗ pajek2Eigen (FILE ∗ *f*)

2.4 /Users/atantet/PhD/dev/ATSuite/cpp/atmath.hpp File Reference

```
#include <cstdio>
#include <cstdlib>
#include <vector>
#include <list>
#include <gsl/gsl_vector.h>
#include <gsl/gsl_vector_int.h>
#include <gsl/gsl_matrix.h>
#include <Eigen/Dense>
#include <Eigen/Sparse>
```

Macros

- #define plog2p(x) ((x) > 0.0 ? (x) ∗ log(x) / log(2) : 0.0)

Typedefs

- typedef SparseMatrix< double, RowMajor > SpMatCSR
- typedef SparseMatrix< double, ColMajor > SpMatCSC
- typedef SparseMatrix< bool, ColMajor > SpMatCSCBool
- typedef SparseMatrix< int, RowMajor > SpMatIntCSR

Functions

- double entropy (VectorXd *)
- double entropyRate (SpMatCSC *, VectorXd *)
- double entropyRate (MatrixXd *, VectorXd *)
- void toRightStochastic (SpMatCSC *)
- void toRightStochastic (SpMatCSR *)
- void toLeftStochastic (SpMatCSR *)
- void toAndStochastic (SpMatCSR *)
- void toAndStochastic (SpMatCSC *)
- gsl_vector * getRowSum (SpMatCSR *)
- void getRowSum (SpMatCSR *, gsl_vector *)
- gsl_vector_int * getRowSum (SpMatIntCSR *)
- gsl_vector * getColSum (SpMatCSR *)
- void getColSum (SpMatCSR *, gsl_vector *)
- gsl_vector * getColSum (SpMatCSC *)
- double getSum (SpMatCSR *)
- double sumVectorElements (gsl_vector *)
- void normalizeVector (gsl_vector *)
- void normalizeRows (SpMatCSR *, gsl_vector *)
- void condition4Entropy (SpMatCSC *)
- SpMatCSCBool * cwiseGT (SpMatCSC *, double)
- SpMatCSCBool * cwiseLT (SpMatCSC *, double)
- bool any (SpMatCSCBool *)
- double max (SpMatCSC *)
- double min (SpMatCSC *)
- vector< int > * argmax (SpMatCSC *)
- void lowlevelTransition (SpMatCSC *, VectorXd *, VectorXi *, MatrixXd *, VectorXd *)

2.4.1 Macro Definition Documentation

2.4.1.1 #define plog2p(*x*) ((x) > 0.0 ? (x) * log(x) / log(2) : 0.0)

2.4.2 Typedef Documentation

2.4.2.1 typedef SparseMatrix<double, ColMajor> SpMatCSC

2.4.2.2 typedef SparseMatrix<bool, ColMajor> SpMatCSCBool

2.4.2.3 typedef SparseMatrix<double, RowMajor> SpMatCSR

2.4.2.4 typedef SparseMatrix<int, RowMajor> SpMatIntCSR

2.4.3 Function Documentation

2.4.3.1 bool any (SpMatCSCBool $*$ *T*)

2.4.3.2 vector$<$ int $>$ $*$ argmax (SpMatCSC $*$ *T*)

2.4.3.3 void condition4Entropy (SpMatCSC $*$ *T*)

2.4.3.4 SpMatCSCBool $*$ cwiseGT (SpMatCSC $*$ *T,* double *ref*)

2.4.3.5 SpMatCSCBool $*$ cwiseLT (SpMatCSC $*$ *T,* double *ref*)

2.4.3.6 double entropy (VectorXd $*$ *dist*)

2.4.3.7 double entropyRate (SpMatCSC $*$ *T,* VectorXd $*$ *dist*)

2.4.3.8 double entropyRate (MatrixXd $*$ *T,* VectorXd $*$ *dist*)

2.4.3.9 gsl_vector $*$ getColSum (SpMatCSR $*$ *T*)

2.4.3.10 void getColSum (SpMatCSR $*$ *T,* gsl_vector $*$ *colSum*)

2.4.3.11 gsl_vector $*$ getColSum (SpMatCSC $*$ *T*)

2.4.3.12 gsl_vector $*$ getRowSum (SpMatCSR $*$ *T*)

2.4.3.13 void getRowSum (SpMatCSR $*$ *T,* gsl_vector $*$ *rowSum*)

2.4.3.14 gsl_vector_int $*$ getRowSum (SpMatIntCSR $*$ *T*)

2.4.3.15 double getSum (SpMatCSR $*$ *T*)

2.4.3.16 void lowlevelTransition (SpMatCSC $*$ *highT,* VectorXd $*$ *highDist,* VectorXi $*$ *member,* MatrixXd $*$ *lowT,* VectorXd $*$ *lowDist*)

2.4.3.17 double max (SpMatCSC $*$ *T*)

2.4.3.18 double min (SpMatCSC $*$ *T*)

2.4.3.19 void normalizeRows (SpMatCSR $*$ *T,* gsl_vector $*$ *rowSum*)

2.4.3.20 void normalizeVector (gsl_vector $*$ *v*)

2.4.3.21 double sumVectorElements (gsl_vector $*$ *v*)

2.4.3.22 void toAndStochastic (SpMatCSR $*$ *T*)

2.4.3.23 void toAndStochastic (SpMatCSC $*$ *T*)

2.4.3.24 void toLeftStochastic (SpMatCSR $*$ *T*)

2.4.3.25 void toRightStochastic (SpMatCSC $*$ *T*)

2.4.3.26 void toRightStochastic (SpMatCSR $*$ *T*)

2.5 /Users/atantet/PhD/dev/ATSuite/cpp/atspectrum.hpp File Reference

```
#include "arlnsmat.h"
#include "arlsnsym.h"
```

Functions

- void getEigValNonSym (ARluNonSymMatrix< double, double > $*$, double $*$, double $*$, int, const char $*$, double, int, int, bool, double $*$)

2.5.1 Function Documentation

2.5.1.1 void getEigValNonSym (ARluNonSymMatrix< double, double > $*$ *P,* double $*$ *EigValReal,* double $*$ *EigValImag,* int *nev,* const char $*$ *which,* double *tol* = `0.`, int *maxit* = `0`, int *ncv* = `0`, bool *AutoShift* = `true`, double $*$ *resid* = `NULL`)

2.6 /Users/atantet/PhD/dev/ATSuite/cpp/ODESolvers.hpp File Reference

```
#include <gsl/gsl_vector.h>
#include <gsl/gsl_matrix.h>
```

Functions

- gsl_matrix $*$ generateCuspEuler (gsl_vector $*$, double, double, double, double, int, double)
- gsl_vector $*$ cuspEuler (gsl_vector $*$, double, double, double)
- gsl_vector $*$ cuspField (gsl_vector $*$, double, double)
- gsl_matrix $*$ generateLorenzRK4 (gsl_vector $*$, double, double, double, double, double, int, double)
- gsl_vector $*$ lorenzRK4 (gsl_vector $*$, double, double, double, double)
- gsl_vector $*$ lorenzField (gsl_vector $*$, double, double, double)

2.6.1 Function Documentation

2.6.1.1 gsl_vector ∗ cuspEuler (gsl_vector ∗ *state,* double *r,* double *h,* double *dt*)

2.6.1.2 gsl_vector ∗ cuspField (gsl_vector ∗ *state,* double *r,* double *h*)

2.6.1.3 gsl_matrix ∗ generateCuspEuler (gsl_vector ∗ *state,* double *r,* double *h,* double *length,* double *dt,* int *sampling,* double *spinup*)

2.6.1.4 gsl_matrix ∗ generateLorenzRK4 (gsl_vector ∗ *state,* double *rho,* double *sigma,* double *beta,* double *length,* double *dt,* int *sampling,* double *spinup*)

2.6.1.5 gsl_vector ∗ lorenzField (gsl_vector ∗ *state,* double *rho,* double *sigma,* double *beta*)

2.6.1.6 gsl_vector ∗ lorenzRK4 (gsl_vector ∗ *state,* double *rho,* double *sigma,* double *beta,* double *dt*)

2.7 /Users/atantet/PhD/dev/ATSuite/cpp/SDESolvers.hpp File Reference

```
#include <cstdio>
#include <cstdlib>
#include <cmath>
#include <ODESolvers.hpp>
```

Functions

- gsl_matrix ∗ generateCuspAdditiveWienerEM (gsl_vector ∗, double, double, gsl_matrix ∗, double, double, double, int, double)
- gsl_matrix ∗ generateCuspAdditiveWienerEM (gsl_vector ∗, double, gsl_vector ∗, gsl_matrix ∗, double, double, double, int, double)
- gsl_vector ∗ cuspAdditiveWienerEM (gsl_vector ∗, double, double, gsl_vector ∗, double, double)
- gsl_matrix ∗ generateLorenzLinearWienerEM (gsl_vector ∗, double, double, double, gsl_matrix ∗, double, double, double, int, double)
- gsl_vector ∗ lorenzLinearWienerEM (gsl_vector ∗, double, double, double, gsl_vector ∗, double, double)
- gsl_vector ∗ additiveWienerField (double, gsl_vector ∗)
- gsl_vector ∗ linearWienerField (gsl_vector ∗, double, gsl_vector ∗)

2.7.1 Function Documentation

2.7.1.1 gsl_vector ∗ additiveWienerField (double *Q,* gsl_vector ∗ *noiseSample*)

2.7.1.2 gsl_vector ∗ cuspAdditiveWienerEM (gsl_vector ∗ *state,* double *r,* double *h,* gsl_vector ∗ *noiseSample,* double *Q,* double *dt*)

2.7.1.3 gsl_matrix ∗ generateCuspAdditiveWienerEM (gsl_vector ∗ *state,* double *r,* double *h,* gsl_matrix ∗ *noiseSamples,* double *Q,* double *length,* double *dt,* int *sampling,* double *spinup*)

2.7.1.4 gsl_matrix ∗ generateCuspAdditiveWienerEM (gsl_vector ∗ *state,* double *r,* gsl_vector ∗ *hTransient,* gsl_matrix ∗ *noiseSamples,* double *Q,* double *length,* double *dt,* int *sampling,* double *spinup*)

2.7.1.5 gsl_matrix ∗ generateLorenzLinearWienerEM (gsl_vector ∗ *state,* double *rho,* double *sigma,* double *beta,* gsl_matrix ∗ *noiseSamples,* double *Q,* double *length,* double *dt,* int *sampling,* double *spinup*)

2.7.1.6 gsl_vector ∗ linearWienerField (gsl_vector ∗ *state,* double *Q,* gsl_vector ∗ *noiseSample*)

2.7.1.7 gsl_vector ∗ lorenzLinearWienerEM (gsl_vector ∗ *state,* double *rho,* double *sigma,* double *beta,* gsl_vector ∗ *noiseSample,* double *Q,* double *dt*)

2.8 /Users/atantet/PhD/dev/ATSuite/cpp/transferOperator.hpp File Reference

```
#include <iostream>
#include <vector>
#include <gsl/gsl_vector.h>
#include <gsl/gsl_vector_uint.h>
#include <gsl/gsl_matrix.h>
#include <gsl/gsl_matrix_uint.h>
#include <Eigen/Dense>
#include <Eigen/Sparse>
#include <omp.h>
#include "atmath.hpp"
```

Typedefs

- typedef Eigen::Triplet< double > triplet
- typedef std::vector< triplet > tripletVector
- typedef Eigen::Triplet< size_t > tripletUInt
- typedef std::vector< tripletUInt > tripletUIntVector
- typedef Eigen::SparseMatrix< double, Eigen::ColMajor > SpMatCSC
- typedef Eigen::SparseMatrix< double, Eigen::RowMajor > SpMatCSR

Functions

- void getTransitionMatrix (const gsl_matrix_uint ∗, const size_t, SpMatCSR ∗, SpMatCSR ∗, gsl_vector ∗, gsl_vector ∗)
- void getTransitionMatrix (const gsl_matrix ∗, const gsl_matrix ∗, const std::vector< gsl_vector ∗ > ∗, SpMatCSR ∗, SpMatCSR ∗, gsl_vector ∗, gsl_vector ∗)
- void getTransitionMatrix (const gsl_matrix ∗, const std::vector< gsl_vector ∗ > ∗, const size_t tauStep, SpMatCSR ∗, SpMatCSR ∗, gsl_vector ∗, gsl_vector ∗)
- gsl_matrix_uint ∗ getGridMembership (const gsl_matrix ∗, const gsl_matrix ∗, const std::vector< gsl_vector ∗ > ∗)
- gsl_matrix_uint ∗ getGridMembership (const gsl_matrix ∗, const std::vector< gsl_vector ∗ > ∗, const size_t)
- gsl_vector_uint ∗ getGridMembership (const gsl_matrix ∗, const std::vector< gsl_vector ∗ > ∗)
- gsl_matrix_uint ∗ getGridMembership (gsl_vector_uint ∗, const size_t)
- int getBoxMembership (gsl_vector ∗, const std::vector< gsl_vector ∗ > ∗)
- void filterTransitionMatrix (SpMatCSR ∗, gsl_vector ∗, gsl_vector ∗, double)
- std::vector< gsl_vector ∗ > ∗ getGridRect (size_t, size_t, double, double)
- std::vector< gsl_vector ∗ > ∗ getGridRect (gsl_vector_uint ∗, gsl_vector ∗, gsl_vector ∗)
- void writeGridRect (FILE ∗, std::vector< gsl_vector ∗ > ∗, bool)
- void filterTransitionMatrix (SpMatCSR ∗T, gsl_vector ∗rowCut, gsl_vector ∗colCut, double alpha, int norm)

2.8.1 Typedef Documentation

2.8.1.1 typedef Eigen::SparseMatrix< double, Eigen::ColMajor> SpMatCSC

2.8.1.2 typedef Eigen::SparseMatrix< double, Eigen::RowMajor> SpMatCSR

2.8.1.3 typedef Eigen::Triplet< double> triplet

2.8.1.4 typedef Eigen::Triplet< size_t> tripletUInt

2.8.1.5 typedef std::vector< tripletUInt> tripletUIntVector

2.8.1.6 typedef std::vector< triplet> tripletVector

2.8.2 Function Documentation

2.8.2.1 void filterTransitionMatrix (SpMatCSR ∗ , gsl_vector ∗ , gsl_vector ∗ , double)

2.8.2.2 void filterTransitionMatrix (SpMatCSR ∗ *T,* gsl_vector ∗ *rowCut,* gsl_vector ∗ *colCut,* double *alpha,* int *norm*)

2.8.2.3 int getBoxMembership (gsl_vector ∗ *X,* const std::vector< gsl_vector ∗ > ∗ *gridBounds*)

2.8.2.4 gsl_matrix_uint ∗ getGridMembership (const gsl_matrix ∗ *initStates,* const gsl_matrix ∗ *finalStates,* const std::vector< gsl_vector ∗ > ∗ *gridBounds*)

2.8.2.5 gsl_matrix_uint ∗ getGridMembership (const gsl_matrix ∗ *states,* const std::vector< gsl_vector ∗ > ∗ *gridBounds,* const size_t *tauStep*)

2.8.2.6 gsl_vector_uint ∗ getGridMembership (const gsl_matrix ∗ *states,* const std::vector< gsl_vector ∗ > ∗ *gridBounds*)

2.8.2.7 gsl_matrix_uint ∗ getGridMembership (gsl_vector_uint ∗ *gridMemVect,* const size_t *tauStep*)

2.8.2.8 std::vector< gsl_vector ∗ > ∗ getGridRect (size_t *dim,* size_t *nx,* double *xmin,* double *xmax*)

2.8.2.9 std::vector< gsl_vector ∗ > ∗ getGridRect (gsl_vector_uint ∗ *nx,* gsl_vector ∗ *xmin,* gsl_vector ∗ *xmax*)

2.8.2.10 void getTransitionMatrix (const gsl_matrix_uint ∗ *gridMem,* const size_t *N,* SpMatCSR ∗ *P,* SpMatCSR ∗ *Q,* gsl_vector ∗ *initDist,* gsl_vector ∗ *finalDist*)

2.8.2.11 void getTransitionMatrix (const gsl_matrix ∗ *initStates,* const gsl_matrix ∗ *finalStates,* const std::vector< gsl_vector ∗ > ∗ *gridBounds,* SpMatCSR ∗ *P,* SpMatCSR ∗ *Q,* gsl_vector ∗ *initDist,* gsl_vector ∗ *finalDist*)

2.8.2.12 void getTransitionMatrix (const gsl_matrix ∗ *states,* const std::vector< gsl_vector ∗ > ∗ *gridBounds,* const size_t *tauStep,* SpMatCSR ∗ *P,* SpMatCSR ∗ *Q,* gsl_vector ∗ *initDist,* gsl_vector ∗ *finalDist*)

2.8.2.13 void writeGridRect (FILE ∗ *gridFile,* std::vector< gsl_vector ∗ > ∗ *gridBounds,* bool *verbose* = `false`)

2.9 /Users/atantet/PhD/dev/ATSuite/cpp/transferOperatorTest.hpp File Reference

```
#include <vector>
#include <cmath>
#include <gsl/gsl_vector.h>
#include <gsl/gsl_vector_int.h>
#include <gsl/gsl_matrix.h>
#include <gsl/gsl_rng.h>
#include <gsl/gsl_randist.h>
#include <Eigen/Dense>
#include <Eigen/Sparse>
#include "atmath.hpp"
#include "atio.hpp"
#include "atspectrum.hpp"
#include "transferOperator.hpp"
```

Typedefs

- typedef Eigen::Triplet< double > triplet
- typedef std::vector< triplet > tripletVector
- typedef Eigen::SparseMatrix< double, Eigen::ColMajor > SpMatCSC
- typedef Eigen::SparseMatrix< double, Eigen::RowMajor > SpMatCSR

Functions

- void getSurrogateSpectrum (gsl_vector_int ∗, size_t, size_t, gsl_matrix ∗, gsl_matrix ∗, const char ∗, double, int, int, bool, double ∗)
- void getSurrogateSpectrumFromCount (SpMatCSR ∗, gsl_rng ∗, gsl_matrix ∗, gsl_matrix ∗, const char ∗, double, int, int, bool, double ∗)
- SpMatCSR ∗ getShuffledCountMatrix (SpMatCSR ∗, gsl_vector ∗, gsl_rng ∗)
- void getShuffledRow (SpMatCSR ∗, size_t, size_t, tripletVector ∗, gsl_rng ∗)

2.9.1 Typedef Documentation

2.9.1.1 typedef Eigen::SparseMatrix<double, Eigen::ColMajor> **SpMatCSC**

2.9.1.2 typedef Eigen::SparseMatrix<double, Eigen::RowMajor> **SpMatCSR**

2.9.1.3 typedef Eigen::Triplet<double> **triplet**

2.9.1.4 typedef std::vector<**triplet**> **tripletVector**

2.9.2 Function Documentation

2.9.2.1 **SpMatCSR** ∗ getShuffledCountMatrix (**SpMatCSR** ∗ *C*, gsl_vector ∗ *nTransPerRow*, gsl_rng ∗ *r*)

2.9.2.2 void getShuffledRow (**SpMatCSR** ∗ *C*, size_t *iRow*, size_t *nTrans*, **tripletVector** ∗ *Ts*, gsl_rng ∗ *r*)

2.9.2.3 void getSurrogateSpectrum (gsl_vector_int ∗ *gridMem*, size_t *N*, size_t *tauStep*, gsl_matrix ∗ *EigValRealDist*, gsl_matrix ∗ *EigValImagDist*, const char ∗ *which* = `"LM"`, double *tol* = `0.`, int *maxit* = `0`, int *ncv* = `0`, bool *AutoShift* = `true`, double ∗ *resid* = `NULL`)

2.9.2.4 void getSurrogateSpectrumFromCount (**SpMatCSR** ∗ *C*, gsl_rng ∗ *r*, gsl_matrix ∗ *EigValRealDist*, gsl_matrix ∗ *EigValImagDist*, const char ∗ *which* = `"LM"`, double *tol* = `0.`, int *maxit* = `0`, int *ncv* = `0`, bool *AutoShift* = `true`, double ∗ *resid* = `NULL`)

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