My Project

Generated by Doxygen 1.8.7

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1.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 2

Class Documentation

2.1 DerivativeMatrix Class Reference

DerivativeMatrix class.

```
#include <derivativeMatrix.h>
```

Public Attributes

- Eigen::MatrixXd x
- std::vector< Eigen::MatrixXd > dm

2.1.1 Detailed Description

DerivativeMatrix class.

Provides a wrap up for the return value of chebdif

2.1.2 Member Data Documentation

2.1.2.1 std::vector<Eigen::MatrixXd> DerivativeMatrix::dm

Vector of differentiation matrices.

2.1.2.2 Eigen::MatrixXd DerivativeMatrix::x

Chebyshev points.

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

- Spectral/derivativeMatrix.h

2.2 MathFuncs::MyMathFuncs Class Reference

Static Public Member Functions

- static double **Add** (double a, double b)
- static double **Subtract** (double a, double b)

- static double **Multiply** (double a, double b)
- static double **Divide** (double a, double b)

The documentation for this class was generated from the following files:

- Spectral/testing.h
- Spectral/testing.cpp

2.3   Spectral::SpectralMethods Class Reference

Spectral Methods class.

```
#include <spectral.h>
```

Static Public Member Functions

- static [DerivativeMatrix chebdif](#) (int n, int m)

2.3.1   Detailed Description

Spectral Methods class.

Provides various numerical routines.

2.3.2   Member Function Documentation

2.3.2.1   DerivativeMatrix Spectral::SpectralMethods::chebdif (int *n,* int *m*)   `[static]`

A static method that computes the differentiation matrices D1, D2, ..., DM on Chebyshev nodes.
The code implements two strategies for enhanced accuracy suggested by W.Don and S.Solomonoff in SIAM J.$\hookleftarrow$
Sci.Comp.Vol. 6, pp. 1253–1268 (1994). The two strategies are(a) the use of trigonometric identities to avoid the computation of differences x(k) - x(j) and(b) the use of the "flipping trick" which is necessary since sin t can be computed to high relative precision when t is small whereas sin(pi - t) cannot.
J.A.C.Weideman, S.C.Reddy 1998.

Parameters

n	Size of differentiation matrix.
m	Number of derivatives required (integer).
	Note: 0 < m <= n-1.

Returns

dm[ell] contains ell-th derivative matrix, ell=1..m.

The documentation for this class was generated from the following files:

- Spectral/spectral.h
- Spectral/spectral.cpp

2.4   Utility::UtilityMethods Class Reference

A utils class.

```
#include <utility.h>
```

Static Public Member Functions

- static void EigenToCSV (Eigen::MatrixXd &x, std::string filename)

  A static method taking an Eigen library matrices and write it to specified file.

2.4.1 Detailed Description

A utils class.

Provides various general purpose methods.

2.4.2 Member Function Documentation

2.4.2.1 void Utility::UtilityMethods::EigenToCSV (Eigen::MatrixXd & *x,* std::string *filename*) `[static]`

A static method taking an Eigen library matrices and write it to specified file.

Parameters

x	Eigen Matrix to be written.
filename	Filename to be written to.

Write Eigen Matrices to files

The documentation for this class was generated from the following files:

- Spectral/utility.h
- Spectral/utility.cpp