

OMP2D Java

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Chapter 1

Namespace Index

1.1 Packages

Here are the packages with brief descriptions (if available):

OMP2D	9
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Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Exception	
OMP2D.MatrixOperations.IncompatibleDimensionsException	11
OMP2D.MatrixOperations	11
OMP2D.OMP2D	17
OMP2D.PursuitFunctions	17

Chapter 3

Class Index

3.1 Class List

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

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OMP2D.MatrixOperations	11
OMP2D.OMP2D	17
OMP2D.PursuitFunctions	17

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

src/OMP2D/ MatrixOperations.java	21
src/OMP2D/ OMP2D.java	21
src/OMP2D/ PursuitFunctions.java	21

Chapter 5

Namespace Documentation

5.1 Package OMP2D

Classes

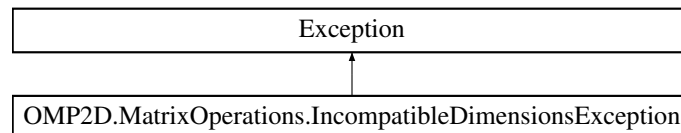
- class [MatrixOperations](#)
- class [OMP2D](#)
- class [PursuitFunctions](#)

Chapter 6

Class Documentation

6.1 OMP2D.MatrixOperations.IncompatibleDimensionsException Class Reference

Inheritance diagram for OMP2D.MatrixOperations.IncompatibleDimensionsException:



Public Member Functions

- [IncompatibleDimensionsException](#) (String msg)
- [IncompatibleDimensionsException](#) ()
- [IncompatibleDimensionsException](#) (String msg, int expected, int actual)

6.1.1 Constructor & Destructor Documentation

6.1.1.1 OMP2D.MatrixOperations.IncompatibleDimensionsException.IncompatibleDimensionsException (String *msg*)

6.1.1.2 OMP2D.MatrixOperations.IncompatibleDimensionsException.IncompatibleDimensionsException ()

6.1.1.3 OMP2D.MatrixOperations.IncompatibleDimensionsException.IncompatibleDimensionsException (String *msg*, int *expected*, int *actual*)

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

- [src/OMP2D/MatrixOperations.java](#)

6.2 OMP2D.MatrixOperations Class Reference

Classes

- class [IncompatibleDimensionsException](#)

Static Public Member Functions

- static double [realInnerProduct](#) (double[] vector1, double[] vector2) throws IncompatibleDimensionsException
- static double[] [normalize](#) (double[] vector, double normVector)
- static double[] [normalize](#) (double[] vector) throws IncompatibleDimensionsException
- static double [norm](#) (double[] vector) throws IncompatibleDimensionsException
- static double[] [addVectors](#) (double[] vector1, double[] vector2, double scalar) throws IncompatibleDimensionsException
- static double[] [addVectors](#) (double[] vector1, double[] vector2) throws IncompatibleDimensionsException
- static double[] [multiplyMatrixVector](#) (double[][] matrix, double[] vector, char thing) throws IncompatibleDimensionsException
- static double[] [scaleVector](#) (double[] vector, double factor)
- static double[][] [outerProduct](#) (double[][] matrix, double[] vector, double[] vectorScalar) throws IncompatibleDimensionsException
- static double[] [kronAtom](#) (double[] vector1, double[] vector2) throws IncompatibleDimensionsException
- static double [maxAbs](#) (double[] vector)
- static double [maxAbs](#) (double[][] matrix)
- static void [allocateElements](#) (double[] vector, double value, int num)
- static double[][] [matrixMultiply](#) (double[][] matrix1, double[][] matrix2, char thing1, char thing2) throws IncompatibleDimensionsException
- static double [vectorMatrixVector](#) (double[] vector1, double[][] matrix, double[] vector2) throws IncompatibleDimensionsException

6.2.1 Member Function Documentation

6.2.1.1 static double [] OMP2D.MatrixOperations.addVectors (double[] *vector1*, double[] *vector2*, double *scalar*) throws IncompatibleDimensionsException [static]

Adds and scales the first vector TODO This should be handle outside this class

Parameters

<i>vector1</i>	
<i>vector2</i>	
<i>scalar</i>	

Returns

Exceptions

IncompatibleDimensionsException	
---	--

6.2.1.2 static double [] OMP2D.MatrixOperations.addVectors (double[] *vector1*, double[] *vector2*) throws IncompatibleDimensionsException [static]

Adds two vectors of the same length together

Parameters

<i>vector1</i>	
----------------	--

<i>vector2</i>	
----------------	--

Returns

The resulting vector

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.2.1.3 static void OMP2D.MatrixOperations.allocateElements (double[] *vector*, double *value*, int *num*) [static]

Fills a vector with a given value up the *n*-th element Not necessary in Java for we have Array.fill()

Parameters

<i>vector</i>	The vector to be filled
<i>value</i>	The value which will be inserted
<i>num</i>	The last numbered index which will be filled 0 to num inclusive

6.2.1.4 static double [] OMP2D.MatrixOperations.kronAtom (double[] *vector1*, double[] *vector2*) throws **IncompatibleDimensionsException** [static]

Applies the Kronecker product of two vectors (QUESTION should this be matrices as well?)

Parameters

<i>vector1</i>	
<i>vector2</i>	

Returns

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.2.1.5 static double [][] OMP2D.MatrixOperations.matrixMultiply (double *matrix1*[], double *matrix2*[], char *thing1*, char *thing2*) throws **IncompatibleDimensionsException** [static]

Performs the dot product of two matrices

Parameters

<i>matrix1</i>	A matrix of dimensions (m,n)
<i>matrix2</i>	A matrix of dimensions (n,q)
<i>thing1</i>	(QUESTION not sure what this is)
<i>thing2</i>	

Returns

The resulting matrix

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.2.1.6 static double OMP2D.MatrixOperations.maxAbs (double[] *vector*) [static]

Finds the largest absolute value of a given vector

Parameters

<i>vector</i>	
---------------	--

Returns

the largest absolute value

6.2.1.7 static double OMP2D.MatrixOperations.maxAbs (double *matrix*[][]) [static]

Finds the largest absolute value of a given matrix

Parameters

<i>matrix</i>	
---------------	--

Returns

6.2.1.8 static double [] OMP2D.MatrixOperations.multiplyMatrixVector (double *matrix*[][], double[] *vector*, char *thing*) throws **IncompatibleDimensionsException** [static]

Multiplies a given matrix and vector

Parameters

<i>matrix</i>	A matrix of dimensions (m,n)
<i>vector</i>	A vector of dimension m
<i>thing</i>	(QUESTION I'm not sure what this is...)

Returns

the resulting vector

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.2.1.9 static double OMP2D.MatrixOperations.norm (double[] *vector*) throws **IncompatibleDimensionsException** [static]

Performs the Euclidean norm operation on a vector

Parameters

<i>vector</i>	
---------------	--

Returns

The Euclidean norm

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.2.1.10 `static double [] OMP2D.MatrixOperations.normalize (double[] vector, double normVector) [static]`

This is especially silly

Parameters

<i>vector</i>	
<i>normVector</i>	

Returns

6.2.1.11 `static double [] OMP2D.MatrixOperations.normalize (double[] vector) throws IncompatibleDimensions-Exception [static]`

QUESTION What is the purpose of this method given I already have norm

Parameters

<i>vector</i>	
---------------	--

Returns

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.2.1.12 `static double [][] OMP2D.MatrixOperations.outerProduct (double matrix[], double[] vector, double[] vectorScalar) throws IncompatibleDimensionsException [static]`

Performs the outer product

Parameters

<i>matrix</i>	A transposed vector
<i>vector</i>	

<i>vectorScalar</i>	TODO this should be done outside this method
---------------------	--

Returns

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.2.1.13 static double OMP2D.MatrixOperations.reallInnerProduct (double[] *vector1*, double[] *vector2*) throws **IncompatibleDimensionsException** [static]

Performs the inner product operation on two vectors

Parameters

<i>vector1</i>	
<i>vector2</i>	

Returns

The inner product

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.2.1.14 static double [] OMP2D.MatrixOperations.scaleVector (double[] *vector*, double *factor*) [static]

Scales a vector by a given factor

Parameters

<i>vector</i>	
<i>factor</i>	

Returns

The vector scaled

6.2.1.15 static double OMP2D.MatrixOperations.vectorMatrixVector (double[] *vector1*, double *matrix*[[], double[] *vector2*) throws **IncompatibleDimensionsException** [static]

Performs the (QUESTION is there an official name for this?)

Parameters

<i>vector1</i>	
<i>matrix</i>	

<i>vector2</i>	
----------------	--

Returns

The resulting value

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

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

- [src/OMP2D/MatrixOperations.java](#)

6.3 OMP2D.OMP2D Class Reference

Public Member Functions

- [OMP2D](#) ()
- void [calcBlock](#) (double[][] imageBlock, int iterations, double[][] dictX, double[][] dictY, int numAtomsX, int numAtomsY, double[][] orthogonal, double[][] beta)

6.3.1 Constructor & Destructor Documentation

6.3.1.1 OMP2D.OMP2D.OMP2D ()

6.3.2 Member Function Documentation

6.3.2.1 void OMP2D.OMP2D.calcBlock (double imageBlock[], int iterations, double dictX[], double dictY[], int numAtomsX, int numAtomsY, double orthogonal[], double beta[])

Parameters

<i>imageBlock</i>	
-------------------	--

Returns

the index of the the chosen atom to represent this block.

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

- [src/OMP2D/OMP2D.java](#)

6.4 OMP2D.PursuitFunctions Class Reference

Static Public Member Functions

- static double [chooseAtomOMP2D](#) (double[][] dictY, double[][] dictX, double[][] residule, int numAtomsY, int numAtomsX) throws IncompatibleDimensionsException
- static double[] [calcResiduleOMP](#) (double[] signal, double[] orthogonal) throws IncompatibleDimensionsException
- static void [orthogonalizeOMP](#) (double[][] orthogonalDict, double[] vector) throws IncompatibleDimensionsException

- static void `calcBiorthogonal` (double[][] biorthogonal, double[] newAtom, double[] orthogonalAtom, double normAtom) throws `IncompatibleDimensionsException`
- static double `mean` (double[] vector)
- static void `reorthogonalize` (double[][] orthogonalDict, int row, int repetitions) throws `IncompatibleDimensionsException`
- static void `calcIndexYandX` ()
- static int `min` (int a, int b)

6.4.1 Member Function Documentation

6.4.1.1 static void `OMP2D.PursuitFunctions.calcBiorthogonal` (double *biorthogonal*[], double[] *newAtom*, double[] *orthogonalAtom*, double *normAtom*) throws `IncompatibleDimensionsException` [static]

Parameters

<i>biorthogonal</i>	
<i>newAtom</i>	
<i>orthogonalAtom</i>	
<i>normAtom</i>	

Exceptions

<i>IncompatibleDimensionsException</i>	
--	--

6.4.1.2 static void `OMP2D.PursuitFunctions.calcIndexYandX` () [static]

6.4.1.3 static double [] `OMP2D.PursuitFunctions.calcResidueOMP` (double[] *signal*, double[] *orthogonal*) throws `IncompatibleDimensionsException` [static]

QUESTION This function should really be accepting matrices. Maybe create `calcResidueOMP2D`?

Parameters

<i>signal</i>	
<i>orthogonal</i>	

Returns

Exceptions

<i>IncompatibleDimensionsException</i>	
--	--

6.4.1.4 static double `OMP2D.PursuitFunctions.chooseAtomOMP2D` (double *dictY*[], double *dictX*[], double *residue*[], int *numAtomsY*, int *numAtomsX*) throws `IncompatibleDimensionsException` [static]

Selects an Atom from a given dictionary

Parameters

<i>dictY</i>	
<i>dictX</i>	
<i>residue</i>	
<i>numAtomsY</i>	
<i>numAtomsX</i>	

Returns

An Atom QUESTION not sure what's being returned

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.4.1.5 static double OMP2D.PursuitFunctions.mean (double[] *vector*) [static]

Finds of mean of all values in a vector

Parameters

<i>vector</i>	
---------------	--

Returns

The mean value

6.4.1.6 static int OMP2D.PursuitFunctions.min (int *a*, int *b*) [static]

Finds the smallest of two values

Parameters

<i>a</i>	
<i>b</i>	

Returns

The smaller value

6.4.1.7 static void OMP2D.PursuitFunctions.orthogonalizeOMP (double *orthogonalDict*[], double[] *vector*) throws **IncompatibleDimensionsException** [static]

Parameters

<i>orthogonalDict</i>	
<i>vector</i>	

Exceptions

<i>IncompatibleDimensions-Exception</i>	
---	--

6.4.1.8 static void OMP2D.PursuitFunctions.reorthogonalize (double *orthogonalDict*[], int *row*, int *repetitions*) throws **IncompatibleDimensionsException** [static]

Parameters

<i>orthogonalDict</i>	
<i>row</i>	
<i>repetitions</i>	

Exceptions

<i>IncompatibleDimensions- Exception</i>	
--	--

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

- src/OMP2D/[PursuitFunctions.java](#)

Chapter 7

File Documentation

7.1 src/OMP2D/MatrixOperations.java File Reference

Classes

- class [OMP2D.MatrixOperations](#)
- class [OMP2D.MatrixOperations.IncompatibleDimensionsException](#)

Packages

- package [OMP2D](#)

7.2 src/OMP2D/OMP2D.java File Reference

Classes

- class [OMP2D.OMP2D](#)

Packages

- package [OMP2D](#)

7.3 src/OMP2D/PursuitFunctions.java File Reference

Classes

- class [OMP2D.PursuitFunctions](#)

Packages

- package [OMP2D](#)

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